THIRTY-SECOND ANNUAL REPORT

OF THE

Kentucky Agricultural Experiment Station

OF THE

UNIVERSITY OF KENTUCKY

Lexington, Ky.

FOR THE YEAR 1919

PART I.

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THIRTY-SECOND ANNUAL REPORT

OF THE

KENTUCKY AGRICULTURAL EXPERIMENT STATION

FOR THE YEAR 1919

PART I.

Report of Director

Meteorological Observations.

LETTER OF TRANSMITTAL.

To His Excellency, Hon. Edwin P. Morrow, Governor of Kentucky:

SIR:—Under the authority of the Board of Control of the Kentucky Agricultural Experiment Station, and in accordance with an act of Congress, approved March 2, 1887, entitled, "An Act to establish Agricultural Experiment Stations in connection with the Agricultural Colleges established in the several states under the provision of an act approved July 2, 1862, and under the acts supplementary thereto," and of the act of the Legislature of the State of Kentucky, approved February 20, 1888, entitled, "An Act to accept the provisions of an act passed by the Congress of the United States, approved March 2, 1887, for the etablishment and maintenance of Agricultural Experiment Stations in connection with Agricultural Colleges established by the several states and territories under an act of Congress approved July 2, 1862," I herewith submit the Thirty-second Annual Report of the Kentucky Agricultural Experiment Station.

Very respectfully,

THOMAS COOPER, *Director.*

January 1, 1920.

UNIVERSITY OF KENTUCKY

Lexington, Ky.

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THE KENTUCKY AGRICULTURAL EXPERIMENT STATION.

In Account with the United States Appropriations, 1918-19:

	Hatch Fund	Adams Fund
Receipts from the Treasurer of the United States as per appropriations for fiscal year ended June 30, 1919, under Acts of Congress, approved March 2, 1887 (Hatch Fund) and March 16, 1906 (Adams Fund)	$15,000.00	$15,000.00
Expenditures:		
By salaries	$11,090.19	$11,683.91
Labor	503.78	430.45
Publications	888.05	
Postage and stationery	427.72	3.56
Freight and express	87.68	13.36
Heat, light, water and power	682.14	249.40
Chemicals and laboratory supplies	347.98	552.62
Seeds, plants and sundry supplies	194.27	169.25
Fertilizers		
Feeding stuffs		727.50
Library	200.46	103.90
Tools, machinery and appliances	12.97	25.65
Furniture and fixtures	149.40	20.40
Scientific apparatus and specimens	45.00	147.50
Live stock		795.30
Traveling expenses	321.64	52.72
Contingent expenses	20.00	1.50
Buildings and land	28.72	22.98
Total	$15,000.00	$15,000.00

We, the undersigned, duly appointed Auditors of the corporation, do hereby certify that we have examined the books and accounts of the Kentucky Agricultural Experiment Station for the fiscal year ended June 30, 1919; that we have found the same well kept and classified as above; that the balance brought forward from the preceding year was nothing on the Hatch Fund and nothing on the Adams fund; that the receipts for the year from the Treasurer of the United States were $15,000.00 under the act of Congress of March 2, 1887, and $15,000.00 under the act of Congress of March 16, 1906, and the corresponding disbursements $15,000.00 and $15,000.00; for all of which proper vouchers are on file and have been by us examined and found correct, leaving balances of nothing and nothing.

And we further certify that the expenditures have been solely for the purposes set forth in the acts of Congress approved March 2, 1887, and March 16, 1906, and in accordance with the terms of said acts, respectively.

Signed: P. P. Johnston, Jr.,
Wellington Patrick,
Auditors.

(Seal)
Attest: Wellington Patrick,
Custodian.

ANNUAL REPORT

of the

Director of the

Kentucky Agricultural Experiment Station.

For the Year 1919.

The past year has been one of progress as well as difficulties for the Experiment Station. Changes in personnel, due to opportunities for material increase in salary, have affected the progress of work and made conditions difficult. The projects undertaken have shown favorable progress in spite of the difficulties and viewed from a comparative basis. satisfactory gains have been made.

The position and prospect of agricultural investigation thru the experiment station is so concisely and clearly set forth in a report of the Committee on Experiment Station Organization and Policy presented at the Chicago convention of the Association of American Agricultural Colleges and Experiment Stations, November, 1919, that a portion thereof is quoted as applying not only to the national situation but equally well to the situation so far as the Kentucky Agricultural Experiment Station is concerned.

"During the period of the world war, when agriculture was playing such a vital part and the accumulated results of investigations were being drawn upon to an unprecedented extent, the state agencies for agricultural research remained practically at a standstill in their development, and in not a few cases lost ground. Investigation did not cease but it was interrupted and for the time being it stopped growing. Its efforts were in part diverted and it lost many of its workers,

and when the war closed the changed economic conditions left it in a weaker condition and more in need of support than it has been for a decade. . . .

"There is probably no branch of the college which has felt the increasing cost of maintenance more than the experiment station. It is a large employer of labor, it is often required to buy considerable amounts of feed for its experimental animals, and its laboratory work calls for new apparatus and continuous replenishment of supplies, all of which have increased enormously in price. Salaries have advanced some, but not in proportion to the other expenses.

"It was inevitable, therefore, that agricultural investigation should be seriously crippled all along the line; but because the stations work in a quiet way and have made an effort to adapt themselves temporarily to the resources at their command the nation-wide extent of the setback has not been generally realized. The effects of a decline in station activity do not become apparent at once, and the situation has been further obscured by the extensive outgiving of information which is new to those who receive it.

"The steady and unrestricted progress of investigation is so fundamental to college teaching and to the success of the great movements inaugurated for vocational instruction and agricultural extension that it has been felt desirable to lay bare the actual conditions the stations are confronted with and the outlook for their future. . . .

"It seems clear that if the experiment stations are to maintain the position they have held in the past and provide the backbone of the whole system of agricultural education and advancement, they must receive larger financial support from some source. Their prosperity and welfare are the concern of every institution. Their advancement ought to form a definite part of every progressive policy of an agricultural college. . . ."

The problems of agriculture are so varied and so pressing that the work of the Experiment Station must constantly

develop and enlarge if it adequately meets the needs of the state. Frequently the thought is expressed that there is available a store of agricultural information far in advance of the practis of farmers in the state and that Experiment Stations may rest content with the progress that has been made and await the development of farm practis. A more pernicious statement as to the true situation can scarcely be made. It is true that in many phases of its work, the experiment station is in advance of the average farmer. It is not true that experiment stations may rest upon their past efforts. Never before has there been so pressing a demand for new information and for new investigations. Agriculture is a rapidly developing industry. Requirements of this year may be much changed five years hence. The development of new and cheap sources of nitrate or of phosphate may require a new study of the relationship of these essential elements to crop production. Increased land values, the development of tenancy, all mean that new studies must be made if agriculture is to secure the proper direction. Investigations must be begun months, and sometimes years, in advance of the actual need of the information. Cost of production studies, for example, must be well under way before their need, otherwise they are relatively of little value as the extensive need passes and the study is not used. Similarly, methods of disease control in plants are often essential before actual and profitable production may take place. Investigations of methods of distribution, market demands and organization are required before information may be given or effective practis outlined.

Certain phases of Experiment Station work require emphasis, especially the economic aspect of agriculture that may be studied under the general heads of farm management, marketing and agricultural economics. The farmer is concerned with the price of crops and live stock, the tendency of tenancy, land prices, farm labor and methods of farm organization that will enable him to meet new conditions as they arise. The experiment station and the Department of Agriculture are the

only orgnizations that may effectively carry on different investigations to inform the farmer and to indicate remedies. Progress may be made in these or similar investigations or studies only when additional funds are available. The present work which is in progress and which is fundamentally necessary requires the total resources of the institution.

Needs of the Experiment Station. As indicated in the previous paragraph, the development of the Experiment Station, particularly of its functions of research, is essential to the progress of agriculture in the state, to the proper development of agricultural extension work and to the furnishing of new information for teaching. This progress may be made and functions exercised only thru adequate financing. The Kentucky Experiment Station is supported by a state appropriation of fifty thousand dollars per annum. This must be materially increased if the institution is to develop and to meet adequately the agricultural problems of the state. Many lines of investigation are essential. Perhaps the most needed at the present time are those dealing with the economic problems previously suggested. Additional land, equipment and buildings are required; soil experiment fields should be established on every important soil type area in the state. Such fields represent the most effective method of determining the requirements necessary for increasing and maintaining fertility. In fact, there is no other means of obtaining this information. Nine fields have been established; several more are needed to meet the situation effectively. The expense of each field is comparatively slight, but an investment must be made and operating expenses allowed if the work is to develop. Land with the necessary buildings, equipment and funds for operation should be made available in certain sections of the state which would permit of careful investigations in orcharding, in grass production, the development of live stock in the mountain areas, and investigations in the various truck crops near the larger cities. Only by some such method of local studies may the work of the Experiment Station be most effectively extended to the sections needing it.

Additional farm land is required by the Experiment Station. A farm of 243 acres is insufficient upon which to carry out the various soil, crop and live-stock experiments. So long as this condition exists, the Station will be cramped for room and it will be impossible to develop many branches of live-stock investigations which are in demand by the farmers of the state.

New Projects. Each department, in determining its work systematically, outlines a certain problem or phase of a problem. This particular piece of work is designated as a project. Its purpose and the point at which it is carried on are indicated and a report on the progress of the investigation is made from time to time. A final report is made upon its completion and is published in the form of a scientific paper, bulletin or circular. The following investigational projects were initiated during the past year:

Experiments in calf feeding.

Experiments in the "up grading" and better management of the type of hog found in the mountain districts of Kentucky.

Head lettuce investigations.

Changes in Staff. The personnel of the several departments, other than clerical assistants, is given on page 7 of this report. The following represent the appointments and resignations for the year:

Appointments:

W. W. Dimock, head of the department of veterinary science. July 1, 1919.

J. C. Grimes, assistant in animal husbandry. August 1, 1919.

Glen Hacker, inspector of creameries. October 7, 1919.

Marie Jackson, seed analyst. November 15, 1919.

R. H. Milton, superintendent of Experiment Station Farm. February 1, 1919.

J. B. Nelson, assistant bacteriologist. November 10, 1919.

James Speed, editor. January 16, 1919.

A. J. Steiner, assistant veterinarian. August 15, 1919.

W. D. Valleau, plant pathologist. August 15, 1919.

Resignations:

Philip Lee Blumenthal, chemist. June 5, 1919.

A. L. Brueckner, assistant veterinarian. October 31, 1919.

A. E. Ewan, superintendent of experiment fields. December 31, 1919.

Homer Perry, seed analyst. October 1, 1919.

Marguerite Perry, seed analyst. October 4, 1919.

W. R. Pinnell, special bacteriologist. November 1. 1919.

R. L. Pontius, head, department of veterinary science, March 31, 1919.

William Rodes, chemist. December 11, 1919.

Mabel L. Roe, assistant plant pathologist. July 1, 1919.

James Speed, editor. September 30, 1919.

F. J. Sutton, assistant horticulturist. October 27, 1919.

Additions to Equipment and Property Changes.

During the year all outbuildings and barns upon the Experiment Station farm were repainted and such repairs made as were required to maintain the property. Few repairs and no paint had been applied during the past several years. Many of the structures were badly weathered and the expense involved in the year's maintenance cost was accordingly large.

New stalls and equipment were placed in the dairy barn, modernizing the equipment and replacing stalls that had long ago outlived their usefulness. The silo at the dairy barn was repaired and changed so that its capacity was increased. New water piping was laid in the building and a new Scotch steam boiler installed, replacing one that had been in use.

About 200 rods of new woven wire fencing with steel posts were erected and 1900 feet of road constructed. All main roads on the farm were repaired and put in order.

A Hereford bull was purchased to head the Hereford breeding herd and excellent specimens of the Shorthorn and Angus breeds were added to the live stock. Three Guernsey cows were purchased for the dairy herd and specimens of Buff Plymouth Rocks, Anconas, Black Minorcas and pedigreed birds of Barred and White Plymouth Rock and White Wyandotte were added to the poultry farm.

Hereford Cattle—Experiment Station Farm.

An abattoir, much needed for experimental and classroom purposes, was completed and equipped, opening in February, 1919. Refrigerating machinery has been installed, furnishing ice for the dairy plant and cooling the refrigerator in the abattoir and serum plant.

Publications. The following represent the publications of the Experiment Station for the year 1919:

Bulletins:

No.

220. The Effect of Certain Grain Rations on the Growth of the White Leghorn Chick and Their Influence on Subsequent Egg Production. G. Davis Buckner, A. M. Peter, R. H. Wilkins and J. J. Hooper. March, 1919.
221. Marketing Hemp. John R. Humphrey. June, 1919.
222. Tractor Experience in Kentucky. W. D. Nicholls. Sept., 1919.
223. Feeds and Their Use—Inspection and Analyses. J. D. Turner, H. D. Spears and A. M. Peter. Oct., 1919.
224. Commercial Fertilizers. H. E. Curtis, William Rodes and Harry Allen. December, 1919.

Scientific Papers Which Have Appeared During the Year:

Studies in Forage Poisoning—The Relation of B. Botulinus to Forage Poisoning or Cerebrospinal Meningitis in Horses. Robert Graham and A. L. Brueckner. Journ. of Bacteriology, Vol. IV, No. 1. January, 1919.

Parturient Paresis (Milk Fever in Cows). D. J. Healy. Jour. of the Am. Veterinary Medical Assn. January, 1919.

Salicylic Acid as a Remedy for Chronic Hog Cholera. Daniel J. Healy. Jour. Am. Veterinary Medical Assn. February, 1919.

Translocation of the Mineral Constituents of the Jack Bean. G. Davis Buckner. Jour. Am. Chem. Soc. Vol. XLI, No. 2, February, 1919.

Effect of Certain Compounds of Barium and Strontium on the Growth of Plants. J. S. McHargue. Jour. of Agricultural Research, Vol. XVI, No. 7, Feb. 17, 1919.

A Convenient and Efficient Digestion Apparatus for the Determination of Crude Fiber. H. D. Spears. Jour. Ind. & Eng. Chem. Vol. No. 2, February, 1919.

The Effect of Certain Grain Rations on the Growth of the White Leghorn Chick. G. D. Buckner, E. H. Nollau,

R. H. Wilkins and Joseph H. Kastle. Jour. Agr. Research. Vol. XVI, No. 12. March 24, 1919.

The Effect of Manganese on the Growth of Wheat; A Source of Manganese for Agricultural Purposes. J. S. McHargue. Jour. Industrial and Engineering Chemistry. Vol. 11, No. 4. April, 1919.

A New Form of Distilling Bulb. J. S. McHargue. Jour. Industrial and Engineering Chemistry. Vol. 11, No. 7. July, 1919.

The Bacteriological Descriptive Group Number. Daniel J. Healy. Read before the Kentucky Academy of Science, May, 1919. Abstract in "Science" July 25, 1919.

Some Experiments in Absorptive Phenomena. P. L. Blumenthal, D. J. Healy and A. M. Peter. Read before the Kentucky Academy of Science, May, 1919. Abstract in "Science" July 25, 1919.

The Composition of the Ash of Crab Grass (Digitaria sanguinalis) as Affected by the Soil in Which it is Grown. G. D. Buckner. Jour. Amer. Chem. Soc., Vol. XLI, No. 9, September, 1919.

Moisture is the Cause of Corn Spoiling. J. S. McHargue. The American Elevator and Grain Trade. September 15, 1919.

The Effect of Oxidation of Sulfur in Soils on the Solubility of Rock Phosphate and on Nitrification. O. M. Shedd. Jour. Agricultural Research, Vol. XVIII, No. 6, December 15, 1919.

Soil Survey of Shelby County, Kentucky. Cornelius Van Duyne and L. H. Schoenmann of the U. S. Dept. Agr., and S. D. Averitt of the Kentucky Agricultural Experiment Station. (Advance sheets—Field Operations of the Bur. Soils, 1916).

Scientific Papers Accepted for Publication:

The Cause of Deterioration and Spoiling of Corn and Corn Meal. J. S. McHargue. Accepted by Jour. Industrial and Engineering Chemistry.

The Effect of Calcium on the Composition of the Eggs and Carcass of Laying Hens. G. D. Buckner and J. H. Martin. Accepted by Jour. Biological Chemistry.

Library. The technical library of the Experiment Station has been increased by 560 volumes during the past year, the total number of accessions to date now being 7,550. The library has received during the past year 143 periodicals, more or less technical in their nature and essential to the work of the various departments of the Experiment Station. This library is being increasingly used by the students of the Agricultural College, as it represents a source of material through which students may best secure technical information. The use of the library by students emphasizes the lack of reading room space, and has made imperative additional accommodations for shelving purposes as well as for readers.

A new service was inaugurated by the library during the past year. Employees of the extension division or other employees located away from the Experiment Station may secure books and other literature on technical subjects by writing to the librarian. This material is sent out in as complete a form as possible and may be retained for a period of ten days or two weeks. Similar service is given relative to information appearing in agricultural journals or in technical publications.

PROGRESS OF WORK FOR THE YEAR.

The work has been under the direction of the heads of departments and the progress of the several departments is very largely due to the close attention and effective administration of the following departmental heads:

George Roberts, Head, Department of Agronomy.
E. S. Good, Chairman, Animal Industry Group.

A. M. Peter, Head, Department of Chemistry.
H. Garman, Head, Department of Entomology and Botany.
W. D. Nicholls, Head, Department of Farm Management.
J. D. Turner, Head, Department of Feed Control.
H. E. Curtis, Head, Department of Fertilizer Control.
C. W. Mathews, Head, Department of Horticulture.
J. R. Humphrey, Head, Department of Markets.
W. W. Dimock, Head, Department of Veterinary Science.
J. O. LaBach, Head, Public Service Laboratories.

The following discussion of the work of the various departments does not represent a complete report of all the work performed during the year. It is based upon reports of the heads of departments and typical pieces of interesting and important work have been selected as indicating the development that is taking place and as recording data and observations less formally than they may appear in scientific papers. Upon completion of important pieces of work, the results in detail and their practis are published in bulletins issued from time to time by the Experiment Station.

Soil Fertility. The maintenance of soil fertility is one of the most important problems with which farmers have to deal. For many years past, the department of agronomy has conducted soil experiment fields located in the principal soil areas of the state, namely, at Lexington, Fayette County; Lone Oak, McCracken County; Mayfield, Graves County; Russellville, Logan County; Greenville, Muhlenberg County; Fariston, Laurel County; Campbellsville, Taylor County; Berea, Madison County; Lincoln Ridge, Shelby County.

On the Lexington field, a 4-year rotation of corn, soybeans, wheat and clover is followed on a part of the field on which tests of various fertilizing materials are made. The returns from the several treatments are indicated in the following table.

Serial PlotNo.	Treat-ment	Corn Bus. Ave. 9 Yrs.	Soybeans Bus. Ave. 8 yrs.	Wheat Bus. Ave. 7 yrs.	Clover hay Lbs. 4 yrs.	Soybean* hay 2 yrs.
1-11	RP	47.7	18.9	27.1	4292	3915
2-12	RK	48.1	18.9	27.8	4564	3984
3-13	R	51.9	18.7	27.8	4553	4101
4-14	RPK	50.4	18.8	27.8	4566	3999
5	PK	48.9	18.1	27.7	4506	3900
6	RLP	49.6	19.1	28.6	4776	3570
7	RLK	53.9	19.4	29.2	4359	3750
8	RL	54.7	18.8	28.3	4695	3492
9-15	RLKP	53.7	20.8	30.5	4506	3912
10	O	56.0	19.9	27.0	4506	3402

R=crop residues; P=acid phosphate; K=potash salts; L=limestone; O=no treatment.

* Soybeans planted for hay when clover failed.

In these experiments, the corn stalks, wheat straw, soybean straw and second crop of clover are returned on the plots marked R (crop residues) instead of applying manure. This has been done, however, only during the last four years. A catch crop, usually rye, is sown in the corn at the last cultivation, and is used as a winter cover crop following corn.

The application of fertilizers on the Lexington field has not given a crop return of any significance. The chief problem on this type of soil is the maintenance of nitrogen and organic matter thru the proper use of legume crops in the rotation with the return either of crop residues or manure.

An interesting trial has been in progress for some time on the Lexington field comparing continuous corn culture, one plot of which in the last cultivation, is planted to a legume catch crop consisting of cowpeas sown at the rate of about one bushel per acre. Both plots have a winter cover crop of rye. The average yield of corn over the past 9 years on the plot without the legume catch crop is 32.9 bushels per acre; with the legume catch crop, the yield is 36.1 bushels per acre, a gain of slightly over 3 bushels being obtained by the use of legumes.

Effect of Potash on Corn Yields. A reference was made in Bulletin 199 of the Kentucky Agricultural Experiment Station, to fertilizer tests made on the Experiment Station farm from 1888 to 1894. In these tests large increases of corn were

produced by the application of potash. Upon the renewal of these tests in continuous corn cropping and in a rotation of corn and soybeans in which the corn stalks and soybean straw were returned and rye used as a winter crop, a report was made.

A summary of the yields of corn and soybeans in rotation is shown in the following table. It is evident from the examination of these results that there has been no appreciable increase in production from the application of any fertilizing materials:

Average Yield Per Acre of Corn and Soybeans in Rotation.

Plot No.	Treatment	Corn, Bus. Avg. 3 yrs.	Soybeans, Bus. Avg. 2 yrs.
1	O	62.5	16.0
2	P	62.9	15.2
3	O	63.9	15.8
4	K	61.8	15.2
5	N	63.7	13.4
6	O	63.2	14.6
7	PK	62.7	15.6
8	PN	63.1	17.5
9	KN	63.7	17.4
10	PKN	62.5	16.1

The yield of corn under continuous culture shows somewhat similar results from the application of potash salts. In these trials, the corn stalks are removed and no cover crop is used, which is in accordance with the plan of the old experiments. In the following table, the first column is an average for the same three years in which corn was grown in the rotation of corn and soybeans and is presented in order to show the comparison between the crop grown continuously and corn in rotation with soybeans, the same treatment being applied in each case.

O=no treatment; P=acid phosphate; K=potash salts; N=nitrate of soda.

Average Yield of Corn Per Acre in Continuous Culture.

Plot No.	Fertilizers Used	Average 1915-17-19	Average 1915-19
1	O	60.3	52.5
2	N	65.2	55.6
3	P	60.3	53.7
4	K	58.7	52.3
5	O	58.5	52.7
6	PN	65.1	55.8
7	KN	67.3	56.9
8	PK	64.3	55.3
9	PKN	63.6	54.8
10	O	54.6	47.1

A Study of Moisture Movement in the Soil. The previous report indicated progress on the project to determine the effect of initial moisture content on the subsequent moisture movement of the soil. This project has been practically completed during the year. It has given information of much interest and importance as it has a practical bearing on the often repeated theory of the importance of dry earth mulch in retaining moisture. It also offers a means of applying laboratory data as to moisture movement in the soil to field conditions. It has been found that the distance thru which moisture will move in saturated sand, varying in fineness from 40 to 100 mesh, is approximately one and two-thirds times the distance of movement thru air-dry sand. Applied to soil conditions in the field, this reinforces the statement made by practical farmers that the maintenance of a fine, dry surface mulch is of benefit in maintaining soil moisture in regions where the subsoil contains appreciable amounts of moisture.

O=no treatment; P=acid phosphate; K=potash salts; N=nitrate of soda.

Tobacco Experiments. For several years past, the Experiment Station has been attempting to determine a method of curing burley tobacco by artificial heat. Enough work has been completed to show that as high a grade of leaf can be obtained by flue-curing at a relatively low temperature as by air curing, thus eliminating completely the danger of house-burning.

With the increasing importance of the burley tobacco industry, it is probable that the use of artificial heat may be advantageously resorted to more generally. This would hold true epecially in seasons when climatic conditions are unfavorable for curing.

During the past year, curing experiments were conducted with dark tobacco as grown in western Kentucky. Export tobaccos of this region are open-fire-cured, giving them a strong flavor of creosote. The growing scarcity of wood in many regions is making the curing process very expensive and in time it will be almost impossible to secure the necessary supplies of wood at a reasonable figure. The experiments at the Experiment Station were designed to determine the possibility of accomplishing results equivalent to those obtained by open wood firing by a combination of flue-curing and smoking with wood smoke. The heat in flue-curing is furnished by any kind of fuel. In appearance, the tobacco cured by this process is equal to open-fire-cured in all respects, but does not have quite so pronounced an odor of smoke. This experiment is to be continued. It is not known how the buyers will value the leaf cured in this way.

Burley Tobacco Rotation Experiments. Experiments in which burley tobacco appeared in the rotation were begun in 1915. As indicated in a previous report, the purpose was to determine whether a high-grade leaf can be produced where tobacco is grown in a shorter rotation than the tobacco-blue-grass rotation generally practist. This experiment includes

a number of 4-year and 3-year rotations as well as a 2-year rotation and continuous tobacco plots. Continuous tobacco production without the use of a strain of tobacco resistant to root rot is impracticable as the soil soon becomes so badly infested with the organism causing this disease that the plants are attacked at once after transplanting and the production is very low, in spite of heavy yearly application of stable manure and nitrogenous fertilizers. When a strain of burley tobacco resistant to root rot is planted, the yields have been satisfactory but the quality of the leaf has been poor. Root rot is also appearing in the 3-year rotation, but has not yet appeared in the 4-year rotation. This may indicate that a 3-year interval between crops is long enough to prevent the soil becoming infested with the root rot organism. More time, however, will be required to definitely establish this fact. Fair yields and fair quality have been obtained in the 4-year rotation of tobacco, wheat, clover and orchard grass; also in the 4-year rotation of tobacco, wheat, clover and corn. The quality of the leaf, however, is not equal to that obtained where the land has been in bluegrass from six to eight years.

Fertilizer Experiments With Tobacco. Tests to indicate the effect of application of fertilizers on burley tobacco production were continued in 1919. Tests were made on land where the following rotation is practist: Tobacco two years, followed by wheat in which clover, timothy and bluegrass are sown. The land remains in clover and grass for three years, during which time a rather heavy bluegrass sod is obtained. As it is impossible to pasture this land, all the grass and clover are cut for hay. No manure is used. The tests included applications of nitrogen alone and in combination with phosphorus, potassium and ground limestone. The yields for 1917 and 1918 are indicated in the following table:

Average	1917 Lbs. Per Acre	1918 Lbs. Per Acre
No treatment plots	1659	1178
200 lbs. nitrate of soda per acre	1735	1300
200 lbs. nitrate of soda *100 lbs. sulfate of potash per acre	2012	1421
200 lbs. nitrate of soda 100 lbs. sulfate of potash 200 lbs. acid phosphate per acre	1999	1512
200 lbs. nitrate of soda *100 lbs. sulfate of potash 200 lbs. acid phosphate 2 tons ground limestone per acre	1935	1545

So far as can be determined, the use of fertilizers did not injure the quality of the tobacco leaf. The increase in yield due to fertilizers was chiefly in the heavier grades, leaf and red. Apparently, nitrogen and potassium both increased the yield of leaf and were used with profit.

Wheat Breeding and Selection. The breeding work with wheat is being continued on an extensive scale. The 1918 report described the pure line selections from Jersey Fultz, the wheat which continues to show superiority over the parent variety not only in yield but in stiffness of straw and other physical characteristics. This selection was more resistant to scab, which caused such severe damage to wheat in Kentucky in 1919, than any other variety or strain. The selection has been known as Fultz No. 1. It will be given a name in the near future. Our station was able to distribute a considerable amount of this seed the past year and it is hoped that a larger amount will be available from year to year until it has been thoroly tried out in every section of the state.

Comparison of New Varieties of Wheat That May Be Introduced in the State. Variety tests of wheat continue to show that no varieties are more valuable than those that have

*Muriate of potash used in 1918 on all plots receiving potash.

been grown in Kentucky. Fultz is not surpassed by any variety that has been tested on the station farm. Fulcaster, Currell's Prolific and early strains of Poole, rank very close to Fultz in milling value.

Commercial Nitrogen Tests. The question is often asked whether commercial nitrogen can be used profitably on wheat and whether it should be applied in the fall or in the spring. Experiments have been conducted for a number of years designed to answer the above questions. It may be stated that the experiments have so far shown no gain in yield from the use of commercial nitrogen applied in the fall. Profitable gains have been made from the use of nitrogen as a top dressing on wheat where wheat follows corn. This application should be made in the spring as soon as growth begins and should be at the rate of approximately 100 to 200 pounds of nitrate of soda or its equivalent, depending upon the character of the soil and the condition of the wheat.

Microbic Activity in Soils. The study of microbic activity in Kentucky soils by Dr. Healy has been continued thru the year. Counts of the total number of microbes per gram of soil from the fields on the Experiment Station farm have been repeated with results which compare with the observations of last year. Results are shown in the following table:

	Microbes Per Gram of Soil	
Soil From	1919	1918
Corn field	4,400,000	2,800,000
Tobacco field	2,800,000	3,000,000
Soybean field	2,550,000	500,000
Wheat field	1,900,000	1,000,000
Alfalfa field	1,100,000	1,400,000
Clover field	1,000,000	1,000,000
Bluegrass sod	775,000	2,100,000
Barren soil	200,000	.....

Sulfur in Plants and Soils. The investigation of sulfur-soil-rock-phosphate composts has been continued. A report, en-

titled "The Effect of Oxidation of Sulfur in Soils on the Solubility of Rock Phosphate and on Nitrification," has been prepared and will be published in the Journal of Agricultural Research early in the coming year. The results of this investigation are promising as enough phosphate is dissolved to show that the process may become of practical importance in developing a further source of readily available phosphorus.

Deficiency of Plant-Food Calcium in Soils. One phase of the calcium project carried on under the direction of Mr. Shedd has involved the use of six different Kentucky soils, selected for their relatively low calcium content, the purpose being to obtain evidence as to whether they were capable of supplying sufficient calcium for plant growth. In acidity, these soils range from slightly acid to strongly acid, as determined by the Hopkins method. Calcium citrate, calcium oxalate and a calcium-sodium citrate were applied, respectively, to groups of three pots each, and control groups of three pots each were carried thru with magnesium silicate, precipitated silica and dextrin. Soybeans were grown in all six soils, after which alfalfa was grown in three and sweet clover in the other three. In addition to weighing the plants from each pot, the calcium of the combined crop from each group of three pots was determined. The results are very interesting as showing marked differences in the response of the several soils to the application of calcium compounds. In some, an application of calcium in certain of its compounds materially increased the growth of the crop, but in others it appeared deleterious. As would be expected, the response to calcium in the growth of the plant is more marked in the vegetable part than in the seed. As a rule the plants grown in the presence of calcium compounds contained more of this element than those grown in soils to which none was applied. Preliminary results with soybeans, sweet clover and alfalfa are given below for illustration. The work is being continued.

AIR-DRY WEIGHT IN GRAMS OF SOYBEANS (from Each Group of Three Pots.)

COUNTY	Bath		Russell		Floyd		Laurel		Hardin		Taylor	
Treatment	Hay	Seed	Hay	Seed	Hay	Seed	Hay	Seed	Hay	Seed	Hay	Seed
Check	19.76	2.07	19.00	2.45	16.75	0.53	26.03	0.89	27.16	1.53	17.89	1.45
Magnesium silicate	20.18	2.38	20.15	3.63	15.28	2.19	28.53	0.76	33.23	0.87	20.97	0.27
Calcium-sodium silicate	22.02	3.45	22.34	1.92	20.32	0.85	32.92	0.40	33.34	0.18	25.75	0.52
Silica	17.94	1.79	18.16	3.15	18.60	0.87	27.64	0.67	28.17	0.63	25.35	0.29
Calcium citrate	18.28	2.44	18.77	1.51	15.69	1.38	23.26	2.04	25.91	1.34	24.65	0.75
Calcium oxalate	19.54	1.55	20.13	2.84	17.44	1.19	30.34	1.19	30.11	1.15	25.52	1.33
Dextrin	19.84	0.74	15.51	0.97	11.29	1.14	24.02	1.27	18.22	1.74	20.18	1.51
Acidity of the soils, Hopkins method, lbs. CaO per acre	3266.		56.		1326.		434.		232.		60.	
Total Ca, lbs. per acre	4473.		2720.		1420.		3500.		3140.		3580.	

Each group of three pots	AIR-DRY WEIGHT IN GRAMS OF SWEET CLOVER IN			AIR-DRY WEIGHT IN GRAMS OF ALFALFA IN		
COUNTY	Bath	Russell	Floyd	Laurel	Hardin	Taylor
Treatment						
Check	No growth	17.27	9.53	19.85	20.69	21.12
Magnesium silicate	4.77	34.44	16.17	28.38	32.90	23.58
Calcium-sodium silicate	13.48	36.39	18.83	32.56	44.22	32.64
Silica	No growth	13.14	8.44	13.00	20.83	22.30
Calcium citrate	8.79	35.75	16.36	28.64	35.04	30.08
Calcium oxalate	11.74	29.94	12.82	31.20	32.25	30.64
Dextrin	No growth	16.08	8.14	19.73	24.33	18.93

PER CENT. OF CALCIUM IN SOYBEANS (from Each Group of Three Pots.)

COUNTY	Bath		Russell		Floyd		Laurel		Hardin		Taylor	
Treatment	Hay	Seed	Hay	Seed	Hay	Seed	Hay	Seed	Hay	Seed	Hay	Seed
Check	1.16	.141	1.82	.135	1.50	*	2.30	.179	1.99	.157	2.35	.169
Magnesium silicate	1.17	.121	1.34	.115	1.54	.102	2.06	.170	1.78	.129	1.87	.337
Calcium-sodium silicate	2.05	.106	2.31	.108	2.14	.012	2.89	.160	2.55	.213	2.77	.111
Silica	1.23	.124	1.90	.116	1.54	.129	2.33	.196	2.08	.305	2.33	.308
Calcium citrate	1.68	.101	2.09	.129	1.80	.012	2.53	.160	2.38	.167	2.32	.124
Calcium oxalate	1.76	.124	2.30	.093	1.96	.080	2.72	.158	2.26	.158	2.45	.125
Dextrin	1.00	.144	1.97	.154	1.48	.021	2.43	.159	2.01	.181	2.29	.221

PER CENT. OF CALCIUM IN SWEET CLOVER AND ALFALFA (from Each Group of Three Pots.)

	Sweet Clover			Alfalfa		
COUNTY	Bath	Russell	Floyd	Laurel	Hardin	Taylor
Treatment						
Check	**	2.08	1.98	1.65	1.46	1.62
Magnesium silicate	1.06	1.17	1.35	1.03	1.01	1.40
Calcium-sodium silicate	1.52	1.84	1.79	1.39	1.28	1.43
Silica	**	2.44	1.72	1.55	1.38	1.57
Calcium citrate	1.83	2.02	1.94	1.52	1.49	1.75
Calcium oxalate	1.67	2.05	2.42	1.58	1.66	1.84
Dextrin	**	2.22	1.38	1.48	1.33	1.82

* Lost.
** No growth of plants obtained.

Varying Effect of Limestone With Rock Phosphate and Limestone With Acid Phosphate upon Different Soils.

The results obtained on the experiment soil fields following the application of rock phosphate in connection with limestone or acid phosphate in connection with limestone has led to a brief study to determine the cause. Theoretically, the application of equal amounts of phosphate in connection with limestone irrespective of the source of the phosphate should give approximately equal results. Such, however, has not been the case in several soils in the state. A series of pot experiments upon soils from the Lone Oak and Fariston experiment fields were carried out to ascertain whether or not some difference would appear in the pot experiments and if possible to determine the cause. The yields from the pots, however, were not parallel in all cases with those from the corresponding plots in the field. Results do not justify a report at the present time. The work is being continued. One interesting observation may be mentioned and that is that the application of ground limestone with either form of phosphate appeared to increase very materially the stooling of the wheat plants. This may account for increased crop yields under former conditions.

Soil Survey. A soil survey of Logan County is well advanced, but will require another summer for completion. All samples for the analyses required by the survey were collected in the field by Mr. Averitt and will be reported upon in connection with the final survey.

Soil Analyses. Quantitative analyses have been made by Messrs. Averitt and Iler on 68 samples of soil from 17 counties. In this connection Mr. Averitt has done some interesting experimental work upon the best strength of acid to use in determining the easily soluble phosphorus, potassium and calcium of soils. The indications are that N/10 nitric acid could be substituted for the N/5 strength with advantage.

One hundred and ninety-four qualitative tests have been made upon soils from 60 counties and a partial analysis made of 162 samples. The qualitative examinations are useful to

farmers and county agents by giving practical indications as to whether or not ground limestone and phosphatic fertilizers may be used profitably upon their land. There is a constantly increasing demand for this kind of work. The resources of the Experiment Station do not permit of giving a great deal of attention to this work, altho it is recognized as being of importance. Much useful work might be developed along this line if the Experiment Station had a larger fund available.

Limestone Analyses. Partial analyses of 223 samples of agricultural limestones have been made. This work indicates which limestones are best to grind for agricultural use. The tabulation of analyses of Kentucky limestones now includes about 2400 analyses. In connection with the analysis of limetone, Mr. Averitt has developed a differential method for determining the magnesium in magnesian limestones which is more rapid than the one we have heretofore used.

Lewis County farmers at Experiment Station.

Deterioration of Stored Corn Meal and Corn. An investigation during the year as to the cause of the deterioration of

stored corn meal and corn was completed. Much difficulty has arisen from time to time by the spoilage of corn meal. This has limited the use of corn meal and has caused losses to the miller and to the householder. The practical results of this investigation, reports of which have been published, indicate that if the moisture content of sound corn and sound corn meal does not exceed 12 per cent, the danger of spoiling is practically eliminated. Meal from sound corn with low moisture content has been kept for the period of a year, apparently with no deterioration. It would appear that if millers can obtain sound corn, reducing its moisture content to 12 per cent, then grinding and placing the resulting product in air-tight and sealed containers, the spoilage may be eliminated and the product improved from the standpoint of the consumer.

Hog Cholera. For some years past, Dr. Healy has attempted to isolate and cultivate the specific organism causing hog cholera, so far without definite success. The importance of this investigation is readily recognized by those interested in combating this disease. During the past year, an interesting observation was made while pursuing this study, namely, that following fatal anaphylactic shock, the H-ion concentration of the blood of guinea pigs increases from 7.8 in the control animals to 7.2 in the animals dead from anaphylatic shock.

Clover Bloat. In connection with previous investigations as to the cause of clover bloat, several attempts were made to cause acute bloating experimentally. The result was only a partial success. Two cows were fed clover hay previously wetted with a solution of fermentable sugars, to which active yeast had been added. One cow ate heartily and bloated distinctly; the other cow ate sparingly and did not bloat. On another occasion a cow was drenched with a solution of glucose containing active yeasts and this resulted in distinct bloating. Two cows were fed fresh red clover blossoms in large amounts and then drenched with a solution of glucose containing active yeasts. Neither cow bloated.

Hemorrhagic Septicemia. Hemorrhagic septicemia has been held accountable for many live stock losses. As a disease it is considered destructive and much attention has been given it by the Kentucky Agricultural Experiment Station. An investigation is in progress to determine its extent and prevalence in the state, the conditions under which it occurs and methods of control. This experiment will be supplemented by experiments on the mode of entrance of the microorganism, its pathogenicity and methods of immunization. So far, the investigation has been general in its nature, but data obtained and observations made are materially helping to guide research projects and to develop further need of work on this disease. Hemorrhagic septicemia has been positively diagnosed in cattle, swine, horses and chickens. No positive cases in sheep have come under observation, but it undoubtedly exists. The disease usually occurs as an acute sporadic infection. It also occurs as secondary to other diseases and disease conditions, and is very destructive, the double infection or complication making it almost impossible to treat the affected animals with any promise of success.

Bovine Coccidiosis or Red Dysentery of Cattle. A number of letters have been received at various times describing a disease of cattle characterized by bloody diarrhea, emaciation and not infrequently death. The condition is commonly spoken of as bloody flux and bloody murrain. The disease has been positively identified in one county of the state, but correspondence from veterinarians and stockmen would indicate that the infection is more or less prevalent thruout the state of Kentucky. The disease is of considerable economic importance in that it is of quite common occurrence. Diagnosis is more or less difficult due to the fact that the clinical picture of affected animals resembles in many respects that of other and more serious infections. It is believed that the disease may be satisfactorily controlled and

losses reduced to a minimum. The actual condition under which the disease is transmitted is unknown, but experience and observation indicate the importance of isolation and of careful feeding. An investigation is in progress to determine not only the mode of transmission, but also the method of control.

Actinomycocis or Lumpy Jaw. The disease of cattle and swine termed actinomycocis, characterized by the development of large tumor-like growths in various structures of the body, is widespread in the state and of sufficient importance to warrant mention. This disease is caused by a fungus known as actinomyces or the ray fungus. This disease in cattle is widespread thruout the United States. Its extent in swine is not so well known because it has not been positively identified from the standpoint of etiology. In swine, and particularly in brood sows, the disease is likely to attack the mammary glands. The gland becomes greatly enlarged by fibrous tissues thruout which will be found few or many soft, yellowish or suppurative areas. The functional gland tissue soon becomes destroyed and the value of the brood sow, particularly if she be a highly bred animal, is totally lost. The only treatment known is to remove the affected gland surgically and administer full doses of potassium iodide.

Official Milk Tests of Station Cows. The Experiment Station has developed a splendid dairy herd, this herd being used for experimental work, for student instruction and at the same time being operated on a practical dairy basis. Out of 32 cows that were being milked, 15 have made official tests; 25 will have made their official tests within a short time, the remaining 7 are grades or cross breeds and will be diplaced within the next year by pure bred heifers that have been raised on the farm. Official records made by the cows owned by the Experiment Station are are follows:

Jerseys	Lbs. Milk	Lbs. Butter Fat	Age
Countess Baronetti	5,459.0	321.56	2 years
Villa's Ollie	7,109.9	363.24	2 years
Baronetti's Buttercup	6,876.8	348.48	2 years
Baronetti's Golden McEachen	6,958.8	397.30	3 years
Valentine's Granddaughter	8,175.1	339.83	5 years
Baronetti's Pretty Valentine	6,160.0	385.00	3 years
Baronetti's Countess	7,516.9	420.62	4 years
Raleigh's Countess	7,871.3	378.75	3 years
Hebron's Lady	7,546.0	401.25	6 years
*Hebron's Tera B.	8,759.6	425.67	2 years
Baronetti's Lady Dean	7,778.8	442.38	5 years
Isabella's Golden Dollie	7,366.8	390.96	7 years
Holsteins			
Dora Olin 2d	12,320.9	402.22	9 years
Junior De Kol's Betsy	15,000.8	456.78	10 years
Duchess Rose De Kol	13,186.5	432.23	9 years

Feeding Test With Dairy Cows. During the year, a test was completed comparing the feeding value of palm-kernel meal and velvet-bean feed with the common ration of 1 pound of cottonseed meal, wheat bran and corn meal as used in this state. The results show that velvet-bean feed and palm-kernel meal are satisfactory cow feeds, but palm-kernel meal is not especially palatable and had to be mixed with feeds that the cows liked. The velvet-bean feed was more palatable but was heavy in texture. The best results were secured when mixed with feeds lighter in weight and texture.

Light Horse Improvement. The Experiment Station has charge of 9 thoroughbred stallions presented by the Kentucky Racing Commission in 1915. These stallions have been placed in sections of the state where horse improvement is needed and have sired a number of splendid colts. These colts are brought together each fall at fairs and shown in friendly competition between the owners.

*The cow, Hebron's Tera B., has the highest record for butter fat production of any Jersey junior two-year old in the state.

Infectious Abortion In Cows. This work was carried on for the past year in cooperation with the Department of Veterinary Science. Pregnant cows vaccinated intravenously with a live strain of the Bacillus abortus (Bang), which strain had been modified by passage thru another species of animal, did not abort. This strain is now being experimented with in producing immunity against the disease in cows.

Infectious Abortion in Mares. This investigation has been in progress for some time and has reached a development where Professor Good has produced an effective bacterin to aid in combating the organism producing the abortion in mares. A serum immune to the organism producing the malady was not as satisfactory as was the bacterin. Ten mares in foal were used in this work. A number of studs of mares in this state were successfully immunized against the disease with a bacterin.

Sterility in Animals. The investigation relating to sterility was continued by Professor Anderson during the breeding season from February to September. The results to date show that there are two main causes for barrenness in the females of a herd:

(1) The first of these is sterile males. Stallions, jacks, bulls and boars have been found that were sterile. All the females served by them proved barren to their services. The investigations show that sterile males are one of four classes:

(a) The first class has abundant semen but no sperm cells.

(b) The second class has abundant semen but few, weak sperm cells.

(c) The third class has abundant semen and a normal number of sperm cells but all of them without life.

(d) The fourth class has little or no semen.

(2) The second cause of barrenness is due to some defect in the female. The investigators are searching for the nature of and reason for the defects. Some cases have been found where females are barren because of defective ovaries, and some where the cause is due to hostile secretions of the organs.

In the case of brood mares, about 50 per cent fail to produce each year, entailing an enormous annual loss to the farmers of the state. It is in the hope of finding a partial remedy for this loss that the investigations are being made.

Steer Feeding Experiments. A second test was conducted during the year in comparing corn silage and sorghum silage supplemented with corn, cottonseed meal and straw in the fattening of steers, the supplementary feeds of both lots being the same. In these results the steers receiving corn silage made an average daily gain of 2.15 lbs. and those receiving sorghum silage 1.96 lb. The steers receiving corn silage were in better condition at the end of the test and sold for 50 cents more per cwt. than those receiving sorghum silage, making a profit of $24.01 per head as compared with $15.96 for the lot receiving sorghum silage. The summary of four years' field work shows that sorghum silage yielded 73.5 per cent greater tonnage than did corn silage. Considering the beef produced from the yield of nutrients per acre, the sorghum silage proved the more profitable.

Hogging Down Experiments. (1) The hogging down of corn alone produced 355 lbs. of pork per acre and charging against the experiment the cost of producing an acre of corn ($19.40) the net profit by this system was $30.30 per acre. (2) In hogging down corn and allowing the hogs the run of a self-feeder of tankage, there were produced 616 lbs. of pork, and charging up the cost of producing an acre of corn and the tankage eaten (145 lbs.) there was left a net profit of $59.59 per acre. (3) The hogging down of corn and soybeans grown together, both checkrowed, resulted in producing 350 lbs. of pork and the net profit in this case was $26.77. (4) By hogging down soybeans alone and allowing the animals 2½ per cent of their body weight in corn per day, there were produced 632 lbs. of pork. These hogs ate 54.3 bushels of corn which, charged against the experiment, at $1.50 per bushel plus the cost of producing the acre of soybeans ($23.79), resulted in a loss of $18.52 per acre. This loss was due to a poor crop of

soybeans, the result of a severe drought during the summer, which reduced the yield, and also to the numerous heavy rains during the fall which caused the beans to mold, thus severely damaging the quality of the crop. Experiments of this nature in the past had proved highly profitable. (5) In hogging down soybeans, plus the feeding of corn in a self-feeder, there were produced 844 lbs. of pork. These hogs ate 72.1 bushels of corn which, charged against the experiment, with the cost of producing the crop, resulted in a loss of $13.78 per acre. This loss, also, was due to the poor quality of the beans.

Experimental Work With Poultry. Six projects with laying hens have been in progress during the calendar year, namely:

1. Animal versus vegetable protein in a laying ration.
2. Housing purebred poultry.
3. The breeding of purebred poultry for high egg production.
4. The effect of artificial illumination on egg production.
5. A determination of the most efficient and economical percentage of meat-scrap to use in the laying mash.
6. Exercise as a factor in egg production.

Source of Protein For Hens. The experiment comparing animal and vegetable protein in the laying ration is now in the third year, the second consecutive test having been completed October 31, 1919. The second year's work bears out substantially the result of the first year's test. The two years'-work may be briefly summarized as follows:

Source of Protein	Average Production Per Hen	
	1917-18	1918-19
Cottonseed meal	17.5 eggs	23.2 eggs
Cottonseed meal ½, tankage ½	77.7 eggs	86.4 eggs
Tankage	109.4 eggs	109.8 eggs
Buttermilk	114.8 eggs	149.8 eggs

An additional feature to this experiment is the keeping over of the hens in the tankage and cottonseed meal pens.

The rations of these two pens have been reversed and it is interesting to note that several hens from the cottonseed meal pen which are now being fed on the tankage ration have during the months of November and December exceeded the record for their entire pullet year while on cottonseed meal. This will go to prove that the low records of the pullets fed on cottonseed meal were not due to any inability to lay.

Breeding Work With Poultry. Some idea of the progress that is being made in the breeding work may be gained from the fact that during the year ending October 31, 1919, nine pullets trap-nested over 200 eggs (averaging 222), whereas, during the entire previous six years from the etablishment of the poultry farm to November 1, 1918, only ten hens had passed the 200 mark, the average being 213 eggs. One hen, Kentucky's Queen, a S. C. White Leghorn, made a record of 260 eggs, exceeding the previous farm record by 30 eggs. She has three full sisters which have made records of 219, 197 and 195 eggs respectively. Six other individuals having the same sire as these four made records varying from 190 to 234 eggs. Two-hundred-egg individuals were produced, also, in the White Wyandotte and Rhode Island Red breeds. Another indication of the progress in the breeding work is that 100 pullets in the laying house this past year averaged 136 eggs, whereas the 169 in this house in the year 1915-16 averaged but 105 eggs.

Other Poultry Experiments. Increasing the amount of daylight during the winter months by the use of an electric light connected with an alarm clock showed a marked effect in increasing the production of yearling hens, whereas the pullets do not show such a large increase. This work is being repeated to secure more comprehensive data. The first year's work of the experiment to determine the most efficient percentage of meat-scrap for the laying ration indicates that with general purpose fowls, when equal quantities (by weight) of grain and dry mash are fed, the production is directly proportional to the percentage of meat-scrap in the mash. The aver-

age production was 116, 142, 149 and 158 eggs for the pens receiving 5, 10, 15 and 20 per cent, respectively, of meat-scrap in the mash. A difference of but three eggs per bird in favor of the pen having a straw litter on the floor as compared with a pen being fed their grain on a bare floor indicates that with the egg-breeds (Mediterranean class) the inducing of exercise is not so vital as with the general-purpose fowls. The Leghorns and other egg-breeds are naturally of a nervous disposition and will be on the move the greater part of the day, even tho not forced to exercise.

Calcium Requirement of the Laying Hen. The investigation of the calcium requirement of the laying hen was completed, altho the experiment is to be repeated for the purpose of a check. A report has been published. The most important feature of the investigation has shown the outstanding importance of ample supplies of calcium in securing maximum egg production. The study appears to justify the conclusion that as long as the economy of the laying hen permits the formation of an egg-shell, the contents of the egg will remain reasonably constant, thereby affording an average supply of calcium, magnesium and phosphorus for the proper development of the embryo of the chick. The lack of calcium is not the fundamental cause of the formation of shell-less eggs, as groups or pens of hens fed no calcium did not produce a shell-less egg. Results of the one experiment indicate that the addition of ample supplies of limestone or oyster shell to the ration, as compared to a ration in which grit is supplied by granite, increased the production of eggs 69 per cent. The present results justify calling attention to the importance of ample supplies of calcium.

Bacteriological Products. The Experiment Station is required by law to distribute anti-hog cholera serum, under such conditions as the director may deem advisable. It has for some years pursued the policy of distributing certain other biological products in addition to the serum for the prevention of hog cholera. All biolog-

ical products are subject to careful test and farmers and breeders purchasing these from the Experiment Station are sure of their potency. All serum for protection against hog cholera is not only tested for potency, as is required by the regulations of the federal government, but it is also subject to a retest by the Experiment Station before final distribution.

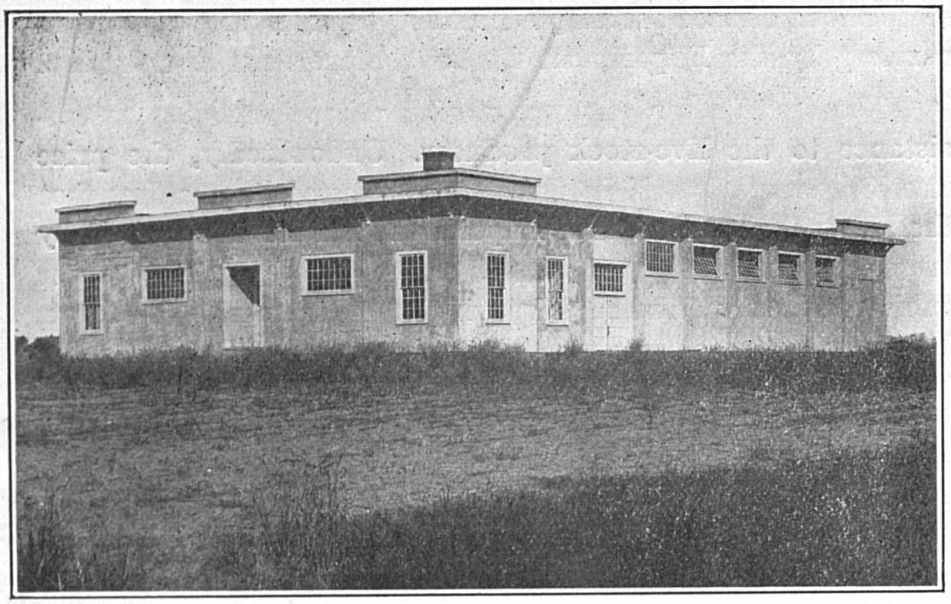
The distribution of these products has been of great assistance to the live-stock producer. Undoubtedly, the price at which serum is sold in the state is affected by the fact that the Kentucky Agricultural Experiment Station is required by law to sell its serum at a price not to exceed one cent per cubic centimeter. The actual saving to the farmers of the state, based upon the sales of the Experiment Station, is not less than $25,000 a year.

During the year 1919, 3,735,300 cubic centimeters of anti-hog cholera serum and 104,913 cubic centimeters of virus were distributed. The virus is produced at the Experiment Station and distributed at the same price as the serum. The value of good virus for the simultaneous treatment against hog cholera can not be over emphasized. This virus is produced at a considerable loss to the Experiment Station, but when the importance of a highly potent virus is considered, the loss is fully warranted.

Botulinus antitoxin which was developed at this Experiment Station is kept on hand for distribution to the veterinarians of the state. No charge has been made for this product. During the past year 5,200 cubic centimeters of this antitoxin was distributed free of charge for test purposes, and the results reported from its use are very favorable.

Blackleg vaccine is furnished the Kentucky Agricultural Experiment Station by the Bureau of Animal Industry of the United States Department of Agriculture. During the year 1919, 27,255 doses of blackleg vaccine were distributed to farmers free of charge. The immunization of animals against this disease is so generally effective that it is advisable to recommend the vaccination of all young animals on the farms and

in communities where the disease is known to exist. Vaccination should occur while the calves are young, thus preventing a later loss.



Livestock Judging Pavilion—Experiment Station Farm.

Use of Dry Lime-Sulfur in Sprays. Four samples of dry lime-sulfur were submitted by the department of horticulture for analysis. It had been noted that the use of the particular samples did not give the results expected. The analyses brought out the important fact that upon following the directions given by the manufacturer for making the lime-sulfur solution, about one-fifth of the total sulfur remained undissolved and the solution obtained was much weaker than the desired strength. In order to secure the strength desired, the quantity of material used ought to be increased to such extent as to render this form of lime-sulfur a very expensive spray. The directions called for a solution of the material in cold water. Experiments show that practically all of the sulfur was brought into solution if a small quantity of boiling water was used on the material, giving a solution capable of being diluted later to the proper strength. Under this treat-

ment, the free sulfur recombines to form approximately calcium penta-sulfid, which is not the case when cold water is used. This experiment, tho minor in its nature, is of great importance to orchard interests and a wide knowledge of the facts and of the method of bringing about a proper strength will aid in the most effective use of the spray.

Effect of Electricity on Plant Growth. Interest has been roused in various sections as to the possible effect of electrification of the soil upon crop production. A joint experiment is being conducted by the departments of agronomy and horticulture to determine the effect of soil electrification upon tobacco and upon sweet corn, tomatoes, beans and potatoes. This trial has been in progress but for one year so the report is necessarily limited. Green beans yielded at the rate of 50 pounds on the non-electrified area, and at the rate of 52 pounds on the electrified area. The yield of marketable tomatoes on the non-electrified area was 434 pounds, and on the electrified area, 337 pounds. The yield of culls was practically the same on the two plots. Potatoes yielded 13 bushels on the non-electrified area, and 14½ bushels on the electrified area. The yield of tobacco on the non-electrified area was 1220 pounds per acre, and on the electrified area 1560 pounds per acre.

The results for the present season should not be considered as being conclusive, as a continuance of the trial for a number of years is necessary in order to ascertain the effect of soil electrification if any.

Variety Orchard. The variety orchard on the Experiment Station farm, planted in 1913, made a satisfactory growth during the year. All trees are in excellent condition, but the severe frosts and freezes of April 25 and 26 completely destroyed all prospect of a crop. The same freeze affected the vineyard plantings and the strawberry crop.

Greenhouse Lettuce Disease. During the past two years, the department of horticulture has carried on work in the growing of head lettuce in the greenhouse. The 1918 fall crop proved a failure, due to an unknown cause, the plants failing

to head and later rotting. A similar failure occurred in the fall of 1919. An attempt was made by Dr. Valleau, the station pathologist, to determine the cause of the failure and to provide a method of culture that would permit the growing of this crop. As the disease was thought to be a soil organism, certain benches were drenched with a 1:100 solution of formalin, applied at the rate of 4 quarts per square foot of bench space. The benches were not covered to prevent the escape of fumes.

The other benches were untreated in order to provide a check. Soon after the varieties of lettuce were well established in the soil, many of the plants began to show severe physiological troubles in the leaf, such as stunting of midvein and consequent wrinkling of the leaf blade; a great irregularity in the distribution of chlorophyl and sometimes small portions of the leaf vein becoming brown. There was also a considerable amount of tip burning. These difficulties were somewhat less marked in the early stages on the drenched soil than on the check plots, but later nearly every plant failed to head. An examination of some 400 root systems revealed numerous lesions on the roots and numerous stubs where the roots had completely rotted off. Cultures from these roots gave a Fusarium. Experiments are now under way to determine the various strains of the organism. Soil sterilization by steaming is being tried as a control measure, also sterilization by formalin but with the use of larger doses of a more concentrated solution and covering beds to prevent a loss of fumes. Surface sterilization of seeds proved of no value as a control measure.

Other organisms causing damage to the greenhouse lettuce were **Sclerotinia libertiana,** Fuckl., which caused some "drop" in one bed; **Botrytis cinerea,** Pers., which caused a very serious head rot of some of the few plants which were selected for seed; Rhizoctonia sp. which caused very small loss due to the rotting of the leaf blades of some of the lower leaves which were in contact with undrenched soil. Rhizoctonia

could in no way be associated with the above described root rot. A small amount of leaf spot due to the **Septoria consimilis**, E. and M., was present on plants which had stood in cold frames for some time and were then set in the house.

An Undescribed Apple Spot. During the fall of 1919, apples were sent in from Henderson County, with inquiry as to the nature of the spot on them. It was stated that this spot had been noticed for the first time in 1919 and then only on a few apples.

It appears as a depression on the surface of the fruit and is either of a normal color or very dark green. Often the former spots were hardly noticeable because of no clear cut demarkations or discoloration of the spot and only gave a slight irregularity to the contour of the fruit. They varied from 5 to 20 mm. across, the deep green ones generally having the lesser diameter. Sections of the deep-green spots showed a spherical area of dense greenish tissue in the neighborhood of 5 to 8 mm. in diameter. Sometimes in the center was a brown area of dry, punky tissue with often a slight cavity in the center. Sections of those with no discoloration on the surface of the fruit disclosed an identical spot, but often as much as 3 or 4 mm. below the surface of the fruit, with perfectly normal tissue intervening. The diseased tissue was bitter in taste. Paraffin sections show a fungus constantly associated with the spots and found in greatest abundance just outside of the zone of dense greenish cells, but extending not more than 1 mm. into the healthy tissue surrounding the spot.

The Broods of the Tobacco Worms. The bulletin on the tobacco worms in preparation in the Department of Entomology and Botany contains the results of a study of the life periods of these insects with a view to learning the number and limits of the annual broods developing in Kentucky and the periods during which the eggs are hatching and the young appearing, as a guide to the best time for treatment. Two broods have been definitely proved to appear in the fields while the crop is growing, one in the middle of June and the

other in early August. The facts brought out by the study imply that two sprayings of the crop are sufficient, one when the early brood appears and the other in August, when the worms are still young and easily killed. The northern tobacco worm and the southern species are proved to have very similar life periods, coinciding so closely as not to render necessary independent treatment.

As a result of the study it may be recommended that tobacco growers adopt the general practise of spraying tobacco each year about the middle of June, making some allowance for the forwardness of the season, and again August 1, coupling this practise with fall plowing to destroy the pupae hibernating in tobacco fields. Spraying done at these dates is believed to offer the best possible assurance of destroying the worms quickly and completely, since the young are much easier to kill with arsenates than are the adults.

A bulletin now in preparation continues the work begun a number of years ago on the corn-ear worm, one of the most destructive pests occurring in Kentucky. The life history, limits of the broods and its parasites were treated fully in bulletin No. 187, published in 1914. The bulletin to be issued shortly deals with the characteristics of the group and the means of distinguishing its members from each other. Some attention is given to rearings of the related bud worm of tobacco and to the structure of the army worms, cutworms, etc., and structural and color characters are presented which it is believed will enable one to identify them in the larval condition with something of the certainty with which a man can be identified by thumb prints.

Taken together the bulletins show that the corn worms and bud worms represent a well defined group of seed eating insects. Our species hibernate in winter in corn fields and tobacco fields, and thus are best dealt with by winter plowing, rotation and keeping plantings of field corn and tobacco as far as practicable from plantings of table corn and tomatoes.

A Study of Tractor Experience in Kentucky. Investigations to determine the experience of Kentucky farmers in the use of tractors were completed in the fall of 1919 and have been published. The facts brought out by this study are interesting as indicating the point of view of tractor owners and the results of operation upon their own farms.

The life of a tractor on the farm was estimated at 7.3 years. The average number of days of work reported for these tractors was practically 50 days per farm for a 12 months period. The acreage of land plowed per day by the tractor varied with the size of the tractor. The 2-plow tractor averaged 6¼ acres; the 3-plow tractor 7¾ acres; and the 4-plow or larger size approximately 11 acres. The great majority of the owners recommended the 3-plow tractor as being the most effective under present conditions in the state. The smallest size farm on which the tractor may be used economically, according to the estimates of the owners, was about 175 acres. Seventy-one per cent of the tractor owners from whom records were obtained reported that they considered the tractor a profitable investment. They operated farms averaging 493 acres in area.

Cost of Tobacco Production. An investigation was started in May, 1919, in cooperation with the Office of Farm Management, United States Department of Agriculture, to determine the cost of producing tobacco under Kentucky farm conditions. While this study may not be of great importance during a period of high tobacco prices, it should be a guide to the farmer at a time when tobacco prices may fall or when the possible profits from tobacco may be compared with that of other crops. The study is being made in two localities; one in the burley, the other in the dark tobacco district. Arrangements were made with 170 representative tobacco growers in these two localities to make a daily record of every hour of labor, team work and of other expenditures incurred on account of the production of the tobacco crop. Each area is in charge of a man who is not only well trained in scientific agriculture and farm management, but who is also experienced in the cultivation and

handling of tobacco. The areas are covered weekly, each farmer is called upon and his record for the week is carefully checked to be certain that all entries are correct and that no expenditures have been omitted.

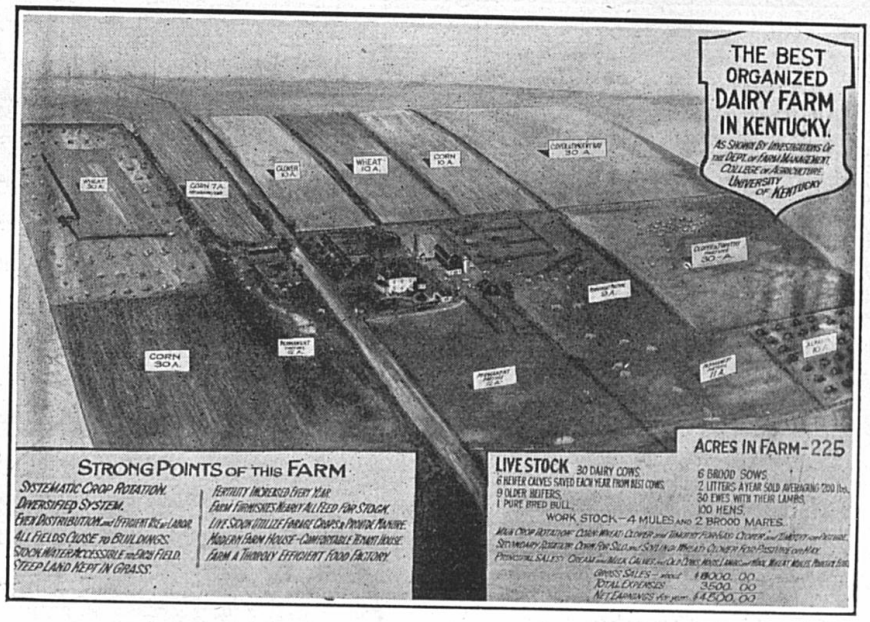
This is the first systematic study of tobacco costs by careful accounting methods that has ever been carried on in the United States and the results are expected to be of the utmost value. It may also be expected that this study will develop data relative to more economical methods of production and handling of the crop, showing to what extent the available acreage and labor of individual farms should be devoted to the tobacco crop; and indicating the other crop and live-stock enterprises which may best fit with the tobacco crop, as well as the proportions which will bring the largest money returns and permit of soil maintenance. Results of this investigation will be made public as soon as the year's work is completed.

Studies in Land Values. During the past few years, a tremendous increase has occurred in land values in central Kentucky and a very considerable increase in the other sections of the state. A study is in progress to determine the relation of land values to the type of farming and the effect of changes in land valuation to tenancy and to production methods.

A Study of Farm Practis on Individual Farms. These studies have been conducted during the current year. Special attention is being given to successful farm practis on farms where bluegrass and orchard grass are leading enterprises. The work on the economics of bluegrass has been largely confined to Fayette and Bourbon Counties; that on orchard grass to Oldham and Jefferson Counties. The production of these crops requires a considerable degree of specialization and it is important that other farm enterprises should be developed that will fit in with the specialized production and increase the farm income and at the same time provide a better use of man and horse labor.

Bluegrass, in a greater measure than any other crop, fits the land for producing the highest priced grades of tobacco.

It also simplifies the labor problem, builds up soil fertility and when properly handled affords a good income from the sale of the seed. In certain sections and on certain farms the combination of the orchard grass crop in proper proportion with corn, tobacco, small grain and clover, together with sheep and beef cattle, has proved highly profitable and very effective in keeping the land in a high state of fertility. The present high prices of land are exercising a tendency toward placing a greater proportion of the farm area in cultivation and a smaller proportion in grass. It is the aim of this study to develop the proportions and combinations of the various crop and live-stock enterprises in connection with the growing of bluegrass and orchard grass.



Plan for Model Dairy Farm in Kentucky.

Market Investigations. Investigations were carried out with respect to two subjects. In October, 1918, the department of markets in cooperation with the department of farm management, conducted a preliminary survey of milk production and distribution in the Paducah, Kentucky, district. As a result

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of that investigation a report was issued showing cost of production and distribution of raw milk in and around Paducah. Distribution costs were figured in the case of milk stations on the cash and carry plan and also on those which conducted a delivery system in connection with the bottling plant. The investigation was carried out on request of producers and consumers and served as a basis of settlement between them later in the year.

An extensive investigation was carried on with respect to the marketing of hemp fiber and comparisons were drawn between hand labor and machine handling of this commodity. Bulletin number 221, Marketing Hemp, was issued by the Experiment Station and it deals with the various methods of marketing broken hemp fiber. The station, thru this investigation, was instrumental in interesting industrialists in an attempt to develop the industry in Kentucky on a power basis and gave its assistance in securing seed supplies and in interesting growers in the production of a sufficient quantity of hemp acreage to supply such a mill if established.

During this period plans were laid for the investigation of common storage for agricultural products in Kentucky and for a survey of cooperative enterprises in this state. The former is important as a price stabilizer in farm products during the winter months and the latter is intended as a study in economics with relation to the high cost of living.

Effect of Chemicals on the Germination of Seeds. Numerous tests of chemical and fertilizing substances on the germination and early growth of seeds of various sorts have been made during the year. The results of 90 such tests with an equal number of checks, making 180 in all, are on hand. These tests are being continued.

Seed Control. Seed testing has occupied the time of several assistants during the year, the work having been largely done on samples received from seedsmen and farmers. The total number of samples of all seeds received was 2,511. The following will give an idea of the work done in this field during the year:

Name of Seed	Purity	Germination	
Red clover	267	267	
Orchard grass	227	227	
Bluegrass	152	152	
Red top	115	115	
Timothy	103	103	
Hemp	21	82	
Sweet clover	76	76	
Alsike clover	48	48	
Alfalfa	35	35	
Miscellaneous	117	374	
Vegetable seeds		377	
Tobacco		93	
Corn		110	
Totals	1161	2059	
Total analyses, purity and germination			3220
Lots of tobacco seed graded			540
Total			3760

The collection of samples of seeds for the purpose of learning the extent to which the seed law enacted two years ago is being violated has not been pushed as was intended before the war. During the year, 84 samples of seeds were collected at different places in the state and tested. There is a general disposition on the part of dealers in field seeds to comply with the law by placing the germination and purity percentages on the seeds they handle. Packet seeds are, on the contrary, being sold in the state, improperly labeled and in violation of the law. The difficulty in enforcing this provision of the law comes largely from the disposition of non-resident wholesale dealers not to label their packets before shipping them into Kentucky. The local dealers can not honestly label such seeds unless the figures are furnished them by the wholesalers, yet the retail resident dealer is the only one liable under

the law and the difficulty will remain until some means is devised of reaching the shipments in interstate commerce.

Incidental to the seed testing, sets of weed seeds have been prepared for distribution to high schools and to seedsmen of the state, the object being to acquaint our teachers of agriculture and others concerned with the pests likely to be scattered with seeds sold in the market. Over fifty of these sets have been distributed, each set including 48 species and among them, all of those specified in the law as especially objectionable.

Nursery Inspection. Twenty-eight nurseries in the state have been inspected during the past year. The war has had an injurious effect on them by depriving their owners of adequate help and as a result some of them were in a bad state of tillage and others were found infested with San Jose scale. With the return to normal conditions, no doubt within a few years, our nurseries will be in better condition. It has been impossible to examine all of the bulbs imported by the florists of the state this year, as was requested by the authorities at Washington. With the help available, the best that could be done was to examine some of those brought to Lexington. However, arrangements have been made by which the Department of Agriculture will inspect these shipments at port of entry. The federal law prohibiting the importation of all nursery stock from foreign countries does not apply to bulbs.

Feed Control. Post-war conditions instead of giving relief to the feed industry in Kentucky from conditions brought about by the war have added to their complexity and to the already high prices and scarcity of materials. The curtailment of distilling and brewing, under conservation and prohibition measures, has eliminated from the Kentucky market in appreciable amounts, such materials as brewers' and distillers' dried grains and malt sprouts. The prevailing high prices and scarcity of feeds generally have opened the way for the use of cheap materials and the introduction of a host of substances new to the feeders in this state. Some of these materials are

worthy substitutes from the standpoint of furnishing feed materials, but the prices paid for them are out of all proportion to their real feed value. The feeder, on account of the pressure of these abnormal conditions, is making observations and studies of the nature and character of materials as never before and the educational feature in matters of feeds and their use, for the past year is noteworthy.

The department of feed control has issued, counted and packed for shipment, over five million tags for the year. These shipments cover over twenty-five hundred packages which have been sent out by express and parcel post.

It has reported thirty-three violations of the law to the federal authorities for prosecution and nineteen to the state authorities. Nineteen of the former and sixteen of the latter cases have been tried, with conviction in each case, and the remainder of the cases are pending.

For the year, there were 2,348 different brands registered for sale in the state, representing about eight hundred firms. The tonnage business is distributed as follows:

	Tons
Horse feeds	35,850
Chicken feeds	23,350
Dairy feeds	22,875
Hog feeds	13,750
Poultry mash	4,500
Cattle feed	3,750
Calf meal	550
Mixed feed (wheat feed with small percentage of corn product)	31,700
Wheat middlings and wheat shorts	29,035
Mixed wheat feed	27,260
Wheat bran	17,960
Red dog	950
Ground wheat	150
Wheat screenings	125
Corn chop	11,400

Corn feed meal	2,325
Hominy feed	3,605
Corn screenings	50
Corn bran	25
Corn gluten feed	25
Corn oil meal	25
Crushed ear corn	50
Cottonseed meal 41%	5,300
Cottonseed meal 38.50%	3,690
Cottonseed feed	4,310
Peanut feed	165
Linseed oil meal	1,000
Tankage	2,675
Meat meal	350
Meat scraps	275
Rye middlings	1,780
Ground rye	275
Mixed rye feed	100
Rice bran	200
Ground barley	6,950
Rolled oats	475
Oat hulls	55
Alfalfa	225
Brewers' grains	375
Yeast grains	100
Palmo mixed feed	700
Velvet-bean feed	125

Fertilizer Control. There were registered with this department 782 brands of fertilizer, classified as follows:

Complete fertilizers	350
Acid phosphates	117
Nitrogenous superphosphates	176
Phosphates and potash	69
Bones, tankage, etc.	69
Sulphate of ammonia	1

The great majority of the samples representing these registrations have already been analyzed and a few more are still on hand for analysis.

Three hundred and seventy-six samples of fertilizer collected by our inspectors during the spring season, or sent in by farmers have been analyzed. On the same basis there are now being analyzed about 200 additional samples. These analyses will be published in a bulletin, the preparation of which will be begun in a short time.

During the year there were issued a total of 5,254,000 blank tags, and stamps to be attached to the same as follows:

67 pound size	12,000
100 pound size	127,500
125 pound size	1,094,160
143 pound size	6,818
167 pound size	81,092
200 pound size	211,320

These stamps represent a total of 103,536 2/3 tons, with a value of $51,768.33, all of which was collected and turned over to the business agent.

In addition to the above stamps which were sold, the following stamps have been issued in exchange for stamps of old issues:

100 pound size	12,763
125 pound size	39,421
167 pound size	11,213
200 pound size	20,600

Creamery and Tester's License Law. Four hundred and thirty-one places of business where cream is bought on the butter-fat basis were licensed at the close of the year 1919. This is an increase of 140 over a year ago. Four hundred and thirty-three testers' licenses have been granted to testers now

operating in the state, representing an increase of 334 since January 1, 1919. This development in the creamery business has created a demand for competent testers and has greatly increased the work of the Examining Board and of the inspectors. An examination for testers is now held at the College of Agriculture on the first Monday of each month. Since March, permits have been issued to testers giving authority to test until the holder of the permit is called for an examination, when it expires automatically. In addition to the monthly examination held at the College of Agriculture, others are held in various sections of the state as the demand warrants. During the past year 18 examinations were held in cities other than Lexington.

A large number of complaints have been received, chiefly from creamery companies, relative to over-reading by testers. A painstaking investigation has been made of these complaints in each instance, altho it has involved a considerable expense and a number of special inspection trips. An effort has been made to educate the testers and the public to the necessity of carefully testing and of neither over- nor under-reading. At the instance of the Examining Board, it was found necesary to revoke the license of two testers for failure to comply with the law, namely, that of J. S. Sparks, Augusta, Kentucky, and Mart Wells, Mt. Sterling, Kentucky. 16,398 pieces of glassware and weights have been tested and found correct. 876 pieces were found incorrect, making a total of 17,274 pieces tested.

At the present time, two inspectors are employed continuously. Upon making an inspection, a copy of the inspector's report is mailed to the firm owning the station and their cooperation secured in the correction of deficiencies. The most important feature of the inspection work is to check the methods of the tester. Inspections of the year show 24 instances where testers were at fault in some particular. Seventeen stations were found where the law as applied to licenses was not complied with and 67 stations in which there was some lack of equipment, notably thermometers.

On August 15, a ruling was issued asking that all operators hold portions of all samples tested for 24 hours, thus giving the inspector an opportunity to check the accuracy of these tests. This ruling has been complied with in the majority of instances and the results obtained have been satisfactory.

During the 18 months since the creamery and tester's license law became operative, it has been necessary to report but one violation to the courts for setflement. This was the failure of the C. W. Jean Company to apply for a license for their cream station at Mt. Sterling. The case was settled by a plea of guilty and a fine of $300 and costs.

During the year $3,176 have been received from station licenses; $1,132.50 from testers' licenses; and $547.26 from the testing laboratory, making a total of $4,855.76.

Public Service Laboratories. An act of 1918 provided that certain specific work, consisting of analyses and identifications, shall be made by the Experiment Station for the State Board of Health. This service has been greatly developt during the past year and a large amount of work has been required from the bacteriological section, with a less amount of work in the analysis of foods. Much miscellaneous work has been carried on, some of which represents specific samples forwarded to the Experiment Station, others representing the official samples collected from various sources. Much of the miscellaneous work is complicated and requires a very considerable amount of time of the analyst. Some of the work required included waters and foodstuffs suspected of containing poison; samples of food suspected of containing ground glass; human and other milk for nutritive value; beverages for the alcoholic content, sent in by court officials and others; stained garments to identify stains suspected of being blood marks; maple sugar, syrups and honey for adulteration; chicken feed and other feeds suspected of containing poison; waters for chemical analysis; vinegars for adulteration, queries as to composition of unknown substances, both food and drugs; but-

ters and canned goods for net content; meats, etc., for wholesomeness or suspected of containing harmful chemicals; concentrated beverages for alcohol; suspected poison cases; unknown liquids and powders for identification; canned goods for adulteration and misbranding.

The following is a statement of the work performed and the determinations made of smears, samples, etc.:

Animal inoculations, bacteriological	4	
Diphtheria specimens, bacteriological	59	
Feces, hookworm	21	
Food and drug samples	651	
Gonorrhea specimens, bacteriological	31	
Malaria specimens, bacteriological	10	
Pleuritic fluid, bacteriological	1	
Meningitis specimens, bacteriological	1	
Rabies, Nigri bodies	5	
Syphilis, Wasserman	447	
Typhoid specimens, bacteriological	126	
Tuberculosis specimens, bacteriological	119	
Urinalysis	18	
		1493

Sanitary examinations—Bacteriological:

Waters	1328	
Milk	247	
Cream	13	
Ice creams	11	
Tomato pulp	2	
Tomato catsup	4	
Vinegar	1	
		1606
Total		3099

METEOROLOGICAL SUMMARIES

For the Year 1919.

Compiled from the records of the U. S. Weather Bureau Station, Lexington, Kentucky.

Monthly and Annual Mean Temperature.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Ann
1872											37	27	
1873	30	35	42	53	66	74	75	74	67	53	40	39	54.0
1874	36	38	44	46	66	77	78	75	71	57	45	38	56.0
1875	27	29	42	49	64	72	76	71	64	52	43	43	52.7
1876	41	39	41	52	65	72	77						
1887											44	35	
1888	31	36	41	56	63	72	76	74	63	51	46	37	54.0
1889	37	32	46	55	63	69	75	72	65	52	43	50	55.0
1890	44	45	39	56	63	77	76	71	67	56	49	37	56.6
1891	37	41	40	57	62	76	73	73	72	55	43	43	56.0
1892	28	41	39	54	63	76	75	75	68	57	41	33	54.1
1893	23	36	43	57	61	72	79	74	70	57	43	37	54.4
1894	38	34	49	54	62	75	76	76	71	58	41	37	55.9
1895	28	23	43	56	62	75	73	76	73	52	45	37	53.7
1896	34	35	38	62	71	72	75	75	67	54	48	38	55.9
1897	30	37	48	53	59	72	76	74	72	64	46	37	55.7
1898	38	36	49	50	65	74	76	76	72	56	43	33	55.8
1899	34	24	42	56	67	75	77	77	68	61	48	33	55.1
1900	36	31	39	55	66	72	77	79	73	65	45	37	56.3
1901	34	29	44	49	63	74	80	74	67	58	40	31	53.6
1902	32	25	45	53	68	71	77	74	67	59	53	34	54.8
1903	32	36	50	53	68	68	77	74	70	57	40	28	54.4
1904	30	31	46	48	64	72	74	74	69	57	44	34	53.5
1905	24	25	49	54	66	72	75	74	68	55	44	35	53.5
1906	37	32	36	57	64	72	74	76	71	55	45	36	54.5
1907	40	32	52	45	59	69	76	73	68	53	42	37	53.8
1908	33	33	50	55	65	72	76	75	72	58	48	38	56.1
1909	37	41	43	54	62	73	73	74	66	53	53	28	54.6
1910	32	31	54	54	59	69	76	73	70	60	40	29	53.7
1911	38	40	43	52	70	74	76	76	72	58	40	41	56.6
1912	23	28	39	57	65	69	75	72	70	59	44	36	53.1
1913	42	33	44	53	65	73	78	77	69	56	49	38	56.5
1914	37	29	40	54	66	76	78	75	67	59	46	30	54.6
1915	32	40	36	59	62	70	74	70	70	60	49	36	54.8
1916	40	33	41	52	67	69	78	76	67	58	47	34	55.2
1917	35	32	44	54	57	70	73	74	67	50	44	25	52.3
1918	20	38	49	52	69	72	74	79	62	61	44	43	55.2
1919	37	36	46	54	62	76	79	74	72	64	45	31	56.3

TEMPERATURE EXTREMES.

Month.	Highest	Year.	Day.	Lowest.	Year.	Day.
January	72	1906	21	-14	1918	12
February	75	1918	28	-20	1899	13
March	85	1910	24	- 1	1873	4
April	88	1915	25	15	1875	18
May	93	1911	28	30	1876	1
June	99	1914	27	40	1910	3
July	102	1901	22	51	1891	9
August	100	1918	6	46	1915	31
September	98	1899	6	32	1899	30
October	89	1919	2	21	1873	29
November	78	1895	7	2	1872	29
December	71	1875	31	- 9	1917	10

MONTHLY AND ANNUAL PRECIPITATION.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Ann
1872											1.21	3.30	
1873	2.53	4.05	3.73	2.89	6.05	4.49	3.37	2.94	1.60	5.47	1.92	4.48	43.52
1874	5.41	4.89	5.90	6.81	0.79	3.55	6.26	1.57	2.89	0.92	4.27	3.83	47.09
1875	2.61	3.12	6.18	2.06	2.43	4.16	11.24	0.62	1.72	2.37	5.87	3.68	46.06
1876	6.60	1.66	3.63	4.20	2.16	4.13	3.84						
1887											3.02	2.71	
1888	4.39	2.93	5.82	3.17	3.29	2.97	4.21	8.76	1.22	3.02	5.15	1.88	46.81
1889	5.66	1.78	1.63	1.52	3.53	3.49	5.82	1.15	6.79	3.06	5.34	1.73	41.50
1890	5.34	8.13	9.91	3.59	4.71	7.43	3.14	7.32	1.82	2.38	3.54	4.05	61.36
1891	4.70	4.36	7.63	1.85	1.17	5.33	3.23	6.48	1.26	1.33	5.38	2.82	45.51
1892	2.35	3.10	4.01	6.57	5.32	3.81	6.22	3.28	4.10	0.45	3.72	3.03	45.96
1893	2.10	4.44	3.30	5.81	3.88	4.24	3.11	1.86	2.25	5.59	3.36	2.61	42.55
1894	3.58	3.33	2.13	4.19	3.81	4.44	0.87	3.67	4.05	1.40	1.38	3.45	36.32
1895	5.60	0.52	2.79	3.17	4.05	2.93	5.07	1.56	0.33	1.28	2.52	5.50	35.32
1896	1.25	3.15	5.41	0.40	3.20	3.74	10.39	3.37	4.25	1.27	4.30	2.56	43.29
1897	2.59	6.33	6.55	5.80	4.48	4.77	4.34	3.21	0.80	0.38	4.83	5.11	49.19
1898	9.56	2.20	8.18	3.29	6.13	7.94	5.72	2.99	3.55	5.27	2.89	2.80	60.52
1899	6.69	2.84	8.61	2.16	3.63	2.55	0.97	4.18	1.90	2.09	1.70	2.92	40.24
1900	2.13	3.17	1.98	1.23	3.54	2.19	2.80	5.75	1.85	0.79	6.38	1.86	33.67
1901	1.49	0.62	2.23	4.52	2.67	3.70	2.61	3.74	2.18	1.33	1.73	3.50	30.32
1902	4.77	0.90	2.92	1.27	2.43	5.19	2.33	1.89	2.60	2.11	3.09	6.60	36.10
1903	1.68	6.16	3.24	3.29	1.75	2.71	2.62	1.49	0.81	2.12	2.84	1.99	30.70
1904	1.92	2.38	4.75	3.08	2.60	2.51	3.13	2.44	1.71	0.57	0.53	3.10	28.72
1905	2.04	2.13	5.87	2.87	5.54	3.31	4.94	4.11	3.20	3.45	3.58	4.13	45.17
1906	2.29	1.84	6.45	1.11	3.15	4.68	3.89	4.92	5.03	0.74	3.95	4.54	42.59
1907	9.06	1.89	4.13	1.83	3.89	3.65	4.42	2.07	2.72	2.76	2.67	2.28	41.37
1908	1.85	4.81	8.17	4.99	4.20	2.12	3.60	2.98	0.38	0.72	1.65	2.13	37.60
1909	3.35	6.86	3.97	6.72	4.15	5.41	5.98	1.26	4.88	2.05	1.96	2.77	49.36
1910	4.46	4.11	0.46	4.22	6.24	5.92	7.66	4.15	7.92	1.67	1.72	2.81	51.34
1911	2.44	2.21	2.31	4.46	1.07	3.01	0.92	2.84	4.37	3.67	3.84	6.20	37.34
1912	1.78	2.50	4.36	6.89	5.11	2.15	4.70	3.23	2.09	0.51	1.02	3.66	38.00
1913	10.35	2.61	6.04	2.41	4.32	3.29	2.43	1.00	1.76	3.40	4.00	2.74	44.35
1914	2.50	3.87	2.24	2.23	1.65	4.77	2.63	4.69	1.82	5.32	1.62	4.40	37.74
1915	4.38	1.12	1.49	0.65	7.23	3.20	5.72	6.03	3.74	0.81	3.90	6.67	44.94
1916	5.65	3.40	3.30	1.01	2.92	5.33	1.72	2.34	2.75	2.04	1.25	3.63	35.34
1917	5.67	2.12	5.48	3.97	3.51	3.54	2.80	1.94	2.46	2.36	1.03	1.97	36.85
1918	4.46	1.92	1.55	2.09	4.13	3.61	2.01	2.68	1.41	4.57	2.24	4.83	35.50
1919	2.48	1.61	3.71	3.51	6.38	4.49	2.28	2.39	1.12	7.95	8.50	6.70	51.12

EXTREMES OF PRECIPITATION AND WIND.

Month.	PRECIPITATION.			WIND.			
	Greatest in 24 hours	Year.	Day.	Max. Vel.	Dir.	Year.	Day.
January	3.50	1913	11	60	sw	1891*	1
February	3.04	1909	23-24	60	sw	1890*	25
March	3.61	1913	25-26	68	sw	1919	17
April	3.24	1909	29-30	64	sw	1909	29
May	2.61	1898	6-7	60	nw	1889*	12
June	4.45	1898	26-27	60	n	1890*	29
July	4.02	1875	11-12	58	nw	1915	30
August	2.98	1915	1-2	72	s	1918	6
September	4.26	1910	18-19	68	w	1889	8
October	2.32	1893	3-4	50	nw	1904*	21
November	3.95	1919	25-26	62	s	1895*	26
December	3.63	1919	6	60	sw	1895	26

* Also in subsequent years.

ANNUAL METEOROLOGICAL SUMMARY.

Month.	Temperature, Degrees Fahrenheit							Relative Humidity. Per cent. 7 a. m.	Precipitation, in Inches.				Per cent of Sunshine.	Wind					Number of Days.												
	Mean.			Extreme.												Maximum For five mins										Max. Temp.		Min. Temp.		
	Maximum.	Minimum.	Monthly.	Maximum.	Date.	Minimum.	Date.		Total.	Maximum in 24 hours.	Date.	Total Snowfall, ins.		Average Hourly Velocity.	Prevailing Direction.	Velocity.	Direction.	Date.	Gales, 40 miles per hour or over.	Clear.	Partly Cloudy.	Cloudy.	Precipitation of .01 inch or more.	With trace or more of snow.	Thunderstorms.	Fog observed	90° or above	Freezing or below.	Freezing or below.	Zero or below
January	45	29	37	63	22	3	3	81	2.48	1.15	1	1.7	53	12.3	SW	35	S	1	0	13	8	10	7	4	0	4	0	6	16	0
February	44	28	36	64	13	17	26	85	1.61	0.43	25	1.3	35	15.4	NW	56	SW	28	4	6	8	14	13	6	0	3	0	3	22	0
March	55	36	46	73	25	19	1	78	3.71	1.42	16-17	T	46	14.4	NE	68	SW	17	5	13	4	14	11	2	2	1	0	0	10	0
April	64	45	54	84	9	24	1	74	3.51	1.39	10	0	48	14.0	SW	42	SW	10	2	9	8	13	14	0	2	3	0	0	5	0
May	70	54	62	90	30	43	13	83	6.38	1.74	8-9	0	39	11.7	SW	34	SW	1	0	8	3	20	15	0	6	5	1	0	0	0
June	85	68	76	93	11	59	29	78	4.49	1.70	23-24	0	59	9.9	SW	38	SE	11	0	10	13	7	14	0	12	0	6	0	0	0
July	88	69	79	94	14	61	17	74	2.28	0.71	5	0	72	10.3	SW	48	S	5	5	15	13	3	8	0	8	1	14	0	0	0
August	82	65	74	91	6	58	9	78	2.39	0.74	20-21	0	65	10.9	SW	42	NW	20	1	16	9	6	8	0	5	0	4	0	0	0
September	81	62	72	92	10	49	26	72	1.12	0.70	21-22	0	72	11.7	SW	48	SW	19	1	18	6	6	5	0	2	0	3	0	0	0
October	72	56	64	89	2	42	18	88	7.95	2.20	14-15	0	27	12.1	SW	38	SW	9	0	4	7	20	18	0	3	3	0	0	0	0
November	53	37	45	69	9	21	13	83	8.50	3.95	25-26	0	50	13.2	SW	62	SW	29	2	13	5	12	12	0	0	4	0	0	8	0
December	39	23	31	60	6	9	10	88	6.70	3.63	6	2.3	38	13.4	SW	36	SW	6	0	9	4	18	7	6	1	6	0	6	25	0
The Year	65	48	56	94	Jul. 14	3	Jan 3	80	51.12	3.95	Nov 25-26	5.3	50	12.5	SW	68	SW	Mar 17	20	134	88	143	132	18	41	30	28	15	86	0

THIRTY-SECOND ANNUAL REPORT

Of the

Kentucky Agricultural Experiment Station

FOR THE YEAR 1919

PART II

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Kentucky
Agricultural Experiment Station
University of Kentucky, Lexington, Ky.

BULLETIN NO. 220
(Research Bulletin)

The Effect of Certain Grain Rations on the Growth of the White Leghorn Chick and their Influence on Subsequent Egg-Production

By

G. DAVIS BUCKNER, A. M. PETER, R. H. WILKINS and J. J. HOOPER

March 29, 1919

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BULLETIN NO. 220

The Effect of Certain Grain Rations on the Growth of the White Leghorn Chick and their Influence on Subsequent Egg-Production

By G. Davis Buckner, A. M. Peter, R. H. Wilkins and J. J. Hooper

In 1916 Buckner, Nollau and Kastle[1] described some experiments in which young chicks fed on grain mixtures containing a relatively high percentage of the amino-acid, lysin, grew normally, while those fed on rations relatively low in lysin were markedly stunted and failed to develop normally, even tho they remained in an apparently good state of health, as shown by their general activity and appetite. These experiments were open to the criticism that they were conducted under laboratory conditions, that the number of chicks used was too small to justify conclusions and that, because of the starchy nature of the grain mixtures, the method employed in their analyses may have given inaccurate numbers for the amino-acid distribution in the proteins.

To throw further light on the subject, an experiment was planned in which these points of criticism would be overcome, as far as possible, and also one intended to determine the normal rate of growth of the White Leghorn chicken, both when hatched and raised by mother hens and when hatched artificially and raised in a brooder, each lot being fed an accepted standard ration. It was considered advisable to conduct, at the same time, experiments wherein the greater part

[1] Buckner, Nollau and Kastle, Bul. 197, Ky. Ag'l Exper. Sta., Jan. 1916. Amer. Jour. Physiology, Vol. XXXIX, No. 2, Dec. 1915, p. 162.

of the lysin fed would be derived from animal sources, and to endeavor to throw more light on the subject of the value of milk in the ration for growing chicks. With these factors in mind, eight lots of chicks were fed according to the following plan:

Lot 1—Ration to be composed of grains relatively high in lysin, supplemented by skim-milk, fed to brooder-raised chicks.

Lot 2—Ration to be composed of grains relatively low in lysin, supplemented by protein-free milk and butter-fat, fed to brooder-raised chicks.

Lot 3—Ration to be an accepted standard ration, fed to brooder-raised chicks.

Lot 4—Ration to be the same accepted standard ration as fed to Lot 3, but in this case to be fed to hen-raised chicks.

Lot 5—Ration to be composed of grains low in lysin and material from animal sources, relatively high in lysin, fed to brooder-raised chicks.

Lot 6—Ration to be composed of grains high in lysin, with cottonseed meal but no animal proteins, fed to brooder-raised chicks.

Lot 7—Ration to be the standard ration fed to Lot 3, minus the sour skim-milk, fed to brooder-raised chicks.

Lot 8—Ration to be derived from grains high in lysin, with cottonseed meal (same as Lot 6), plus skim-milk *ad libitum,* fed to brooder-raised chicks.

All of these lots of chicks had ground grit, oyster shell and charcoal before them at all times and were daily supplied liberally with shredded cabbage and sprouted oats.

The first part of this investigation, in which we studied the effect of these rations on the growth of chicks, extended over a period of 28 weeks, after which time 15 representative pullets from each lot were selected and placed on a standard ration and during the succeeding 12 months a record was kept of the eggs laid by each lot.

The grains used in the rations were selected with respect to their lysin content according to the analyses of the separate

grains as given by E. H. Nollau,[2] formerly of this Station, and Joseph, Grindley & Slater.[3] While there is a variance in the numbers given by these investigators for the amino-acid nitrogen distribution in the proteins of the grains, yet we feel safe in saying that the magnitudes given for lysin are in the same and proper direction; that is, the rations we have designated as high in lysin contain a relatively much larger proportion of that substance than those we have designated as low in lysin, tho the data available do not enable us to state exact percentages. We are at present unable to give any definite conclusions regarding the importance of lysin, yet we feel that the results obtained in these experiments show strikingly the effects of the different rations on the growth of the White Leghorn chick and their influence on subsequent egg-production.

All the chicks used in these eight experiments were of the pure-bred White Leghorn breed, selected from the same parent stock, so that an average growth might be obtained from which conclusions could be justly drawn.

From an incubator-hatching of 1,000 eggs, 7 lots of chicks, each containing 60, were selected entirely at random and placed in separate compartments of a large brooder house, each compartment having access to grass plots of 120 square feet. These lots were numbered 1, 2, 3, 5, 6, 7 and 8, respectively. On the same day were hatched under hens, 150 chicks, of the same breed and parent stock, from which 60 chicks were selected at random, placed with four mother hens and allowed to roam at will over a large area of bluegrass pasture, in part of which the Experiment Station dairy herd ranged. No particular care was given them other than to see that they were duly fed the indicated ration and properly housed at night. This lot was called No. 4. All lots except No. 4 were kept in the brooder house until the end of the sixth week, when the hens weaned Lot 4, at which time each of the 8 lots was placed in a separate coop suitable for that number of chicks. These coops were similar

[2] Nollau, E. H., Jour. Biol. Chem., 21, 611 (1915).
[3] Joseph, Grindley & Slater. Jour. Amer. Chem. Soc., 37, 1778 (1915).

in every way, each having access to a grass plot of about one-fourth of an acre. From this point on, all of these lots of chicks received identical treatment, with the exception of their food. In each of the grass plots shade was provided and, as far as possible, the conditions governing these chicks were ideal.

During the 28 weeks of this part of the experiment no unusual weather conditions occurred except excessive heat during the 11th week, which seemed to cause a loss of appetite, and, since the chicks were entirely free from any disease, we can say that any variation in the general condition and weight of any of the lots except No. 4 might be attributed directly to the rations fed to them.

At the beginning of the experiment all the chicks of these eight lots were weighed individually on a torsion balance sensitive to 0.1 gram and they were so weighed at the end of each week during the 28 weeks over which the first part of the experiment extended. Also, a mortality record was kept and when a chick died from any cause, its weight record was discarded, so that, at the end of 28 weeks, we compiled our results from the records of the chicks remaining at that time. This was done in order to avoid any error in the average weight of the chicks caused by a possible loss in weight previous to death.

When treading began, the cockerels and pullets were separated in all lots except Lot 2, in order to avoid any loss in weight on the part of the pullets, caused by undue exercise. In the case of Lot 2, the external sexual characteristics were rudimentary and at the end of 28 weeks we were unable to distinguish the cockerels from the pullets. It is also of interest to know that there was no attempt made at treading in this lot and it rarely occurred in Lot 6.

This part of the experiment began on April 18 and was discontinued October 31.

The rations, as fed to the separate lots, are as follows:

RATION FED TO LOT 1

Parts	Ingredients	Analysis	Used as
		Per cent.	
1	Soy beans	Protein ..... = 19.4	Dry mash before them at all times. Twice a day wet mash made with skim-milk.
1	Wheat	Ether extract ..... = 12.7	
1	Sunflower seed	Fiber ..... = 10.1	
1	Hemp seed		
1	Wheat Bran		
1	Soy beans	Protein ..... = 19.2	Fed once a day as grain thrown into the straw litter.
1	Wheat	Ether extract ..... = 11.4	
1	Hemp seed	Fiber ..... = 6.2	
1	Cracked corn		

Shredded cabbage and sprouted oats fed daily

RATION FED TO LOT 2

Parts	Ingredients	Analysis	Used as
		Per cent.	
1	Barley	Protein ..... = 19.8	Dry mash before them at all times. Twice a day a wet mash made with protein-free milk.*
1	Rice	Ether extract ..... = 12.6	
1	Hominy	Fiber ..... = 5.5	
1	Oats		
0.5	Butter-fat		
0.6	Gluten flour (81.1% protein)		
1	Barley	Protein ..... = 19.2	Fed once a day as grain thrown into the litter.
1	Rice	Ether extract ..... = 11.2	
1	Hominy	Fiber ..... = 2.1	
0.3	Butter-fat		
0.4	Gluten flour (81.1% protein)		

Shredded cabbage and sprouted oats fed daily.

* The protein-free milk used in these experiments was prepared according to the method described by Osborne and Mendel (Carnegie Pub.) except that the casein was precipitated with lactic acid and the product neutralized with lime, our reason for making this change in the original directions of Osborne and Mendel being to eliminate common salt from the ration, which is said to be toxic to the chicken.

RATION FED TO LOTS 3 AND 4

Parts	Ingredients	Analysis	Used as
	Mixture No. 1	Per cent.	
8	Rolled oats	Protein ..... = 23.15	1st to 5th days, inclusive, No. 1 moistened with sour skim-millk, fed 5 times each day. Mixture 2 in shallow tray containing a little of No. 3 (dry) always before chicks, tray containing grit and charcoal. Sprouted oats once each day.
8	Bread crumbs	Ether extract ..... = 5.30	
2	Sifted beef scrap		
1	Bone meal		
	Mixture No. 2		
3	Cracked wheat	Protein ..... = 12.30	6th to 14th days, inclusive, No. 2 in litter twice a day, No. 3 moistened with sour skim-milk, fed three times a day. No. 3 (dry) always available.
2	Cracked corn	Ether extract ..... = 4.50	
1	Pinhead oatmeal		
	Mixture No. 3		
3	Wheat bran	Protein ..... = 27.30	3rd and 4th weeks. As shown above, except that the moist mash is given twice a day.
3	Corn meal	Ether extract ..... = 6.20	
3	Wheat middlings		
3	Beef scrap (best grade)		
1	Bone meal		
	Mixture No. 4		
3	Wheat (whole)	Protein ..... = 12.20	5th and 6th weeks. Moist mash once a day; mixture 4 in litter twice a day; dry mash always available.
3	Cracked corn	Ether extract ..... = 4.10	
1	Hulled oats		
	Mixture No. 5		
3	Wheat	Protein ..... = 11.30	7th week to maturity. Nos. 3 and 5 hopper fed. One meal a day of moist mash.
3	Cracked corn	Ether extract ..... = 2.80	

Wet mashes made with sour skim-milk.
Shredded cabbage and sprouted oats fed daily.

RATION FED TO LOT 5

Parts	Ingredients	Analysis	Used as
		Per cent.	
3	Rolled oats	Protein ..... = 26.0	Dry mash before them at all times. Twice a day a wet mash made with skim-milk.
3	Ground barley	Ether extract ..... = 4.2	
2	Rice bran	Fiber ..... = 7.7	
3	Beef scrap		
1	Bone meal		
2	Hominy	Protein ..... = 10.1	Fed once a day as grain thrown into litter.
1	Steeled oats	Ether extract ..... = 1.9	
2	Rice	Fiber ..... = 0.6	

Shredded cabbage and sprouted oats fed daily.
Sour skim-milk was given every day.

RATION FED TO LOT 6

Parts	Ingredients	Analysis	Used as
		Per cent.	
3	Wheat bran	Protein ..... = 22.2	Dry mash before them at all times. Twice a day fed as a wet mash made with protein-free milk.
7	Sunflower seed	Ether extract ..... = 12.1	
1	Distillers dried grains	Fiber ..... = 13.6	
1	Cottonseed meal		
2	Wheat	Protein ..... = 19.1	Fed once a day as a grain thrown into litter.
2	Cracked corn	Ether extract ..... = 17.2	
7	Soy beans	Fiber ..... = 9.5	

Shredded cabbage and sprouted oats given daily.

RATION FED TO LOT 7

The ration fed to Lot 7 was the same as that fed to Lots 3 and 4, minus the sour milk.

RATION FED TO LOT 8

The ration fed to Lot 8 was the same as that fed to Lot 6 plus sour milk which was given daily in quantities sufficient to be available at all times.

TABLE 1

Rations Selected With Reference to Relative Lysin Content.

No. of Weeks.	LOT 1 Grains high in lysin; skim-milk.				No. 2 Grains low in lysin.	
	Average weight of 1 chicken, calculated from the weights of			No. surviving each week.	Average weight of 1 chicken, calculated from the weight of 19 cockerels and pullets.	No. surviving each week.
	25 Cockerels	17 Pullets	Mean			
0	41.0	39.4	40.2	60	41.8	60
1	70.4	66.5	68.4	56	52.2	59
2	100.9	96.8	98.8	55	66.1	54
3	146.5	138.7	142.6	55	76.3	52
4	184.1	179.1	181.6	55	89.7	50
5	256.6	236.5	246.5	55	98.8	46
6	296.5	276.5	286.5	55	106.9	45
7	363.4	318.5	340.9	53	124.3	37
8	420.6	382.5	401.5	52	148.6	35
9	474.0	423.1	448.5	52	150.1	34
10	518.2	460.9	489.5	49	162.5	24
11	588.5	523.7	556.1	48	182.3	22
12	653.4	582.4	617.9	47	221.6	21
13	733.4	635.9	684.6	46	244.3	21
14	795.8	684.2	740.0	45	251.1	21
15	828.4	740.1	784.2	45	293.4	20
16	954.9	790.6	872.7	45	325.6	20
17	1024.5	844.2	934.3	45	361.5	20
18	1077.8	930.6	1004.2	45	441.1	20
19	1135.9	964.6	1050.2	44	474.6	19
20	1184.6	1010.2	1097.4	44	526.4	19
21	1231.6	1057.3	1144.4	44	543.7	19
22	1214.5	1055.8	1135.1	44	565.8	19
23	1204.6	1101.1	1152.8	44	615.6	19
24	1215.5	1094.3	1154.9	44	663.8	19
25	1206.7	1079.3	1143.0	44	734.3	19
26	1268.6	1084.5	1176.5	44	763.7	19
27	1250.4	1135.3	1192.8	42	821.9	19
28	1294.3	1182.6	1238.4	42	809.4	19

In Table 1 are presented the weekly weight and mortality records of Lots 1 and 2; they show that at the end of 28 weeks the mean weight of the remaining 42 chicks which received the ration high in lysin was 1238.4 grams while the average weight of the 19 chicks that received the grain ration relatively low in lysin was only 809.4 grams. It is interesting to note that the mortality was very high in Lot 2, only 19 of this lot remaining alive at the end of the 28 weeks, as compared with 42 remaining in Lot 1.

McCollum and Simmons[4] have shown by an extensive study concerning the nutritive limitations of rations composed of

[4] McCollum and Simmonds, Jour. Biol. Chem., Vol. XXXII, No. 3, p. 347.

grains, that when seeds are supplemented by suitable inorganic salts and a sufficient quantity of the fat-soluble food accessory, the limiting factor with respect to growth is the quality of protein. Considering the ration fed to Lot 2 we see that the grains are supplemented by suitable inorganic salts from the grit, oyster shell and protein-free milk and that a sufficient quantity of the fat-soluble A is supplied in the butter fat and the shredded cabbage leaves and sprouted oats. We therefore conclude that the limiting element in the ration fed to Lot 2 is the quality of proteins in the grains.

Comparison of the cuts* of Lots 1 and 2 shows that the chicks of Lot 2 are very much smaller than those of Lot 1; that their external sexual characteristics are rudimentary—in fact, they were undeveloped to such a degree that at the age of 28 weeks the cockerels could not be distinguished from the pullets. It is most interesting to note that, besides the retardation of the sexual characteristics, the function of sex was not developed and treading did not occur, nor was an egg laid by any of the pullets in this lot.** From this it would seem that the nature of the proteins of a grain mixture entering into a diet that was in every other way sufficient, is a limiting factor not only with regard to normal growth of the young chick but also as to the development of the sexual characteristics and functions.

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* The focal distance was the same in all photographs.

** At the expiration of the 28 weeks the ration was changed only by the addition of plenty of sour skim-milk, which brought about profound anatomical and physiological changes. The combs and wattles developed, as did the feathering, shortly followed by crowing and treading on the part of the cockerels. It is also of interest to note that their growth was greatly accelerated. The exact figures are not obtainable because of errors occasioned by change of student assistants helping in the weighings.

TABLE 2

Chicks Artificially Hatched and Raised Versus Chicks Hatched and Raised by Mother Hens; Both Receiving the Same Standard Ration.

No. of weeks.	LOT 3 Artificially hatched and raised				LOT 4 Hatched and raised by hens			
	Average weight of 1 chicken, calculated from the weights of			No. surviving each week.	Average weight of 1 chicken, calculated from the weights of			No. surviving each week.
	25 Cockerels	17 Pullets	Mean		16 Cockerels	34 Pullets	Mean	
0	42.1	41.1	41.6	60	42.2	40.9	41.5	60
1	72.2	69.2	70.7	55	76.8	75.2	76.0	54
2	109.7	95.6	102.6	53	108.2	101.3	104.7	54
3	161.4	140.9	151.1	53	151.2	145.0	148.1	54
4	231.6	191.7	211.6	53	209.5	198.3	203.9	54
5	292.2	248.8	270.5	53	283.8	262.4	273.1	53
6	360.9	288.3	324.6	52	374.2	328.0	351.1	53
7	442.8	354.4	398.6	52	437.8	383.6	410.7	53
8	496.9	395.6	446.2	52	580.6	490.7	535.6	52
9	537.6	409.9	473.7	51	616.6	552.8	584.7	51
10	630.9	488.7	559.8	48	729.2	648.9	689.0	51
11	674.4	506.4	590.4	48	758.4	655.5	706.9	50
12	812.9	622.2	717.5	48	926.9	775.4	851.1	50
13	902.3	682.4	792.3	48	992.7	826.8	909.7	50
14	953.2	695.1	824.1	48	1050.0	869.7	959.8	50
15	980.4	717.3	848.8	48	1106.8	898.0	1002.4	50
16	1063.2	780.9	922.1	48	1167.3	938.3	1052.8	50
17	1154.9	841.8	998.3	48	1235.6	987.2	1111.4	50
18	1252.7	889.4	1071.0	48	1282.7	1037.2	1160.0	50
19	1295.3	922.9	1109.1	47	1323.0	1045.3	1184.1	50
20	1344.8	956.2	1150.5	47	1365.4	1110.7	1238.0	50
21	1396.7	992.2	1194.4	47	1417.5	1149.2	1283.3	50
22	1430.6	1038.4	1234.5	47	1459.4	1233.1	1346.2	50
23	1442.6	1047.6	1245.1	47	1493.2	1249.4	1371.3	50
24	1462.1	1066.2	1264.1	47	1585.6	1329.9	1457.7	50
25	1480.0	1082.6	1281.3	45	1590.1	1339.0	1464.5	50
26	1528.5	1075.4	1301.9	43	1649.1	1368.7	1508.9	50
27	1560.6	1090.2	1325.4	43	1673.4	1405.4	1539.4	50
28	1594.6	1120.4	1357.5	42	1748.1	1447.5	1597.8	50

Turning our attention to Lots 3 and 4, which were the controls, or those fed an accepted standard ration,[5] when raised by mother hens and when artificially raised in a brooder, we see from the weight and mortality records of these two lots, presented in Table 2, that those which were allowed to roam at will with the mother hens during the first 6 weeks after hatching developed a vitality which manifested itself in allowing those chicks to become 240.3 grams heavier, per chick, in 28 weeks than those artificially raised in a brooder. Similarly, the mortality record shows that only 10 had died from unknown causes in the hen-raised lot as against 18 deaths in the artificially raised lot.

[5] The Cornell Reading Courses. Poultry Series, Vol. IV, No. 88, 1915, p. 176.

The difference in size and appearance can be seen in the cuts of these two lots. The better growth of the hen-raised chicks may be due in part, also, to the education given them by the mother hen in the matter of feeding and exercise and to the greater variety in their food during the first six weeks, since it included insects and other things afforded by the larger range.

Comparing Lots 1 and 2 with their control, Lot 3, we see that the pullets of Lot 1 closely follow the weight record of the control thruout the experiment, but the cockerels of this lot always weighed appreciably less than those of the control. After the 6th week it was plainly seen that Lot 1 did not have the vigorous appearance of Lot 3, this being particularly evident in the general condition of the feathering which seemed comparatively ruffled and unkempt, as will be seen by comparing the photographs of these two lots, which show the differences only to a degree. Their vigor and development did not appear equal to that of Lot 3 and these differences became more noticeable as the experiment advanced. However, there was no great difference in the mortality records of these two lots and the same number of chicks survived in each, at the end of 28 weeks.

Lot 2 shows a striking difference from Lot 3, being 548.1 grams lighter at the end of 28 weeks and the mortality record shows that 19 chicks remained alive in Lot 2 as against 50 in Lot 3.

TABLE 3

Grains Low in Lysin Plus Animal Matter High in Lysin Compared With Grains High in Lysin Plus Cottonseed Meal.

No. of weeks	LOT 5 Grains low in lysin plus animal matter high in lysin				LOT 6 Grains high in lysin plus cottonseed meal.			
	Average weight of 1 chicken, calculated from the weights of			No. surviving each week.	Average weight of 1 chicken, calculated from the weights of			No. surviving each week.
	19 Cockerels	24 Pullets	Mean		9 Cockerels	6 Pullets	Mean	
0	44.1	43.0	43.5	60	42.8	40.1	41.4	60
1	80.8	72.1	76.4	58	59.3	59.5	59.4	56
2	99.2	91.0	95.1	58	75.4	71.3	73.3	56
3	148.7	132.4	140.5	57	108.0	99.0	103.5	54
4	202.8	175.7	189.2	57	133.8	112.0	122.9	54
5	282.3	235.6	258.9	56	166.3	138.0	152.1	54
6	333.1	275.5	304.3	56	187.0	141.5	164.2	53
7	393.2	326.5	359.8	52	225.8	163.5	194.6	45
8	469.4	396.8	433.1	52	238.0	181.3	209.6	45
9	541.2	449.8	495.5	50	250.3	189.9	220.1	34
10	587.8	491.2	539.5	47	275.5	193.6	234.5	20
11	690.1	557.6	623.8	47	293.4	208.1	250.7	16
12	825.7	573.0	699.3	47	402.0	298.5	350.2	15
13	922.0	718.7	820.3	47	500.4	374.0	437.2	15
14	977.2	748.3	862.7	47	543.3	392.3	467.8	15
15	1012.4	773.4	892.9	47	573.9	405.6	489.7	15
16	1089.0	825.0	957.0	47	635.7	462.0	548.8	15
17	1190.9	873.4	1032.1	47	712.9	528.5	620.7	15
18	1286.4	957.0	1121.7	47	753.0	581.5	667.2	15
19	1340.8	999.0	1169.9	44	792.3	611.7	702.0	15
20	1405.3	1047.5	1226.4	44	824.6	654.5	739.5	15
21	1469.6	1089.4	1279.5	44	874.2	666.6	770.4	15
22	1476.7	1114.0	1295.3	44	875.1	690.7	782.9	15
23	1523.2	1134.5	1328.8	44	912.5	719.6	816.0	15
24	1522.6	1143.0	1332.8	44	934.6	730.3	832.4	15
25	1530.7	1168.3	1349.5	44	939.3	726.8	833.0	15
26	1588.8	1172.6	1380.7	43	949.5	755.6	852.5	15
27	1651.1	1196.2	1423.6	43	970.1	779.0	874.5	15
28	1717.4	1221.7	1469.5	43	993.2	781.0	887.1	15

In Table 3 are presented the weight and mortality records of Lot 5 which received grains supposed to contain proteins which would not support growth, supplemented by an abundance of protein from animal sources. When comparing this weight record with that of the control, Lot 3, we see that at the end of 28 weeks the average chicken of Lot 5 was 112.0 grams heavier than the average of the control, and that there was only a slight difference in the mortality record of these two lots.

In Table 3 is also shown the record of Lot 6 which was the lot fed the ration derived solely from vegetable sources supposed to be high in lysin. As will be seen, the physical condi-

tion of these chicks compares to a degree with Lot 2, not only as to weight but also, in a measure, as to the undeveloped condition of their external sexual characteristics. However, the cockerels and pullets could be distinguished, as seen in the cut, but while treading did occur in this lot, it was indeed limited when compared to the control. The average bird in this lot was 470.3 grams lighter than the corresponding control bird and it is of interest to note that only 15 birds remained alive at the expiration of 28 weeks, as against 42 in the control. The general development of the birds in the lot was more mature than that of the birds in Lot 2, yet their vitality seemed to be less, as shown by activity, appetite and mortality record. There were no symtoms of Xerophthalmia, so we conclude that they received a sufficient quantity of fat-soluble A from the shredded cabbage leaves and sprouted oats fed daily. The mineral content was sufficient, as was the water-soluble accessory factor, so we conclude that here, too, is a case of inefficient protein. Since the grains in this ration are supposed to be high in lysin, it would appear that lysin is not the limiting factor in regard to the nutritive value of the proteins in the grains fed but that some other factor concerned with the protein is the cause for failure of this lot to grow normally. It is also shown that cottonseed meal cannot be considered as a substitute for material derived from animal sources.

TABLE 4

Effect of Skim-Milk.

No. of weeks	LOT 7 Standard ration minus sour milk				LOT 8 Grains high in lysin plus cotton-seed meal and skim-milk			
	Average weight of 1 chicken, calculated from the weights of			No. surviving each week.	Average weight of 1 chicken, calculated from the weights of			No. surviving each week.
	22 Cockerels	18 Pullets	Mean		17 Cockerels	26 Pullets	Mean	
0	41.2	41.6	41.4	60	39.4	40.5	39.9	60
1	70.0	66.2	68.1	54	72.0	69.9	70.9	55
2	101.6	94.2	97.9	53	103.8	96.4	100.1	55
3	143.1	137.9	140.5	53	150.6	138.1	144.3	55
4	195.1	186.5	190.8	53	208.1	187.8	197.9	55
5	238.5	225.2	231.8	52	264.0	235.2	249.6	55
6	273.4	251.8	262.6	52	308.9	264.0	286.4	55
7	306.3	277.5	291.9	51	344.5	296.8	320.7	52
8	363.5	319.5	341.5	49	407.2	355.9	381.5	52
9	371.9	348.0	359.9	44	421.4	356.8	389.1	51
10	446.7	406.0	426.3	41	477.6	409.6	443.6	45
11	461.2	435.4	448.3	41	528.0	463.0	495.5	45
12	594.5	537.6	566.0	41	656.3	592.5	624.4	45
13	668.5	583.5	626.0	40	747.8	649.6	698.7	45
14	733.1	633.5	683.3	40	807.8	693.0	750.4	45
15	781.1	678.7	729.9	40	847.3	723.7	785.5	45
16	836.5	727.5	782.0	40	919.4	775.5	847.4	45
17	906.5	785.8	846.1	40	1011.7	843.8	927.7	45
18	972.0	857.0	914.5	40	1175.8	968.0	1071.9	45
19	1043.5	920.5	982.0	40	1206.3	1003.1	1104.7	45
20	1116.0	978.5	1047.2	40	1280.0	1040.4	1160.2	45
21	1196.0	1018.4	1107.2	40	1323.2	1079.1	1201.1	45
22	1241.7	1008.7	1125.2	40	1352.6	1097.5	1225.0	45
23	1353.8	1076.0	1214.9	40	1445.4	1111.3	1278.3	45
24	1366.1	1102.2	1234.1	40	1460.2	1124.4	1292.3	44
25	1379.1	1114.4	1246.7	40	1462.5	1128.4	1295.4	44
26	1381.2	1146.3	1263.7	40	1483.7	1136.3	1310.0	44
27	1388.7	1210.3	1299.5	40	1523.6	1222.4	1373.0	44
28	1426.5	1242.1	1334.3	40	1544.6	1257.5	1401.0	43

In Table 4 are presented the weight and mortality records of Lot 7, which received the same ration as did the brooder-raised control No. 3, differing only in that skim-milk was omitted. The appearance of these birds was normal, the only difference being that at the age of 28 weeks the average chick of Lot 7 was 23.2 grams lighter than the control and that two more deaths had occurred. These small variations show that the skim-milk but slightly enhanced the nutritive value of the diet fed to Lot 7, which was already complete and satisfied all conditions regarding the food essentials.

In Table 4 are presented, also, the weight and mortality records of Lot 8 which was fed the same ration as that which

failed to nourish Lot 6, only, in this case, skim-milk was added *ad libitum*. In this instance the average bird weighed 43.5 grams more than the control, at the end of 28 weeks, and the mortality was one less than the control. The average bird of Lot 8, however, was 513.9 grams heavier than that of Lot 6, at the end of 28 weeks, and the mortality was less in Lot 8 than in Lot 6 by 28 birds. This shows again that the proteins in the grains fed to these two lots of chicks were inadequate, even tho they were supposed to be comparatively high in the amino-acid lysin. This also shows that the grain mixture in the control lot was not equal to that fed to Lot 8. As seen in the photographs taken at the end of the 13th week, there is practically no difference in the external appearance of Lots 3, 5 and 7, while Lot 8 is distinctly inferior to them. This inferiority was overcome, however, during the succeeding 14 weeks and their development nearly equalled that of Lot 4 which, under direct observation, appeared better developt and more trim than any of the other lots.

Influence on Egg Production

At the expiration of the 28 weeks covering the growth of these eight lots of chicks, 15 representative pullets from each lot, except Lots 2 and 6, were selected and placed in colony houses. The reason for not selecting birds from these two lots of chicks for the continuation of this experiment was that we were unable to distinguish cockerels from pullets in Lot 2 and there were only 6 pullets remaining in Lot 6.

The object of continuing the experiment in this way was to determine the effect of the several rations on the subsequent egg-production of these six lots of pullets for one year, when fed an accepted winter ration for laying hens. The ration used was as follows:

Ration Fed For Laying Hens.

Parts	Ingredients	Analysis	Used as
		Per cent.	
6	Corn meal	Protein ..... = 25.7	Dry mash before them at all times.
6	Shipstuff	Ether extract ..... = 6.1	
3	Ground oats	Fiber ..... = 5.2	
5	Meat meal		
1	Charcoal		
2	Cracked corn	Protein ..... = 11.7	Fed twice a day as grain thrown into the litter.
2	Wheat	Ether extract ..... = 3.6	
1	Whole oats	Fiber ..... = 3.1	

Grit and oyster shell always available.

The housing conditions were as nearly normal as possible. By keeping a daily record of the eggs laid by each lot we were able to show the effect of the different rations fed during their growing period.

TABLE 5

Effect on Egg-Production Due to Different Rations Fed During Growth.

Lot No.	Title	Total production	Average* production per hen	Mortality	Ranking
1	High lysin	1801	121.1	1	5
3	Check ration, artificial hatch	2012	142.4	1	3
4	Check ration, natural hatch	2224	148.3	0	2
5	Animal lysin	1548	106.0	1	6
7	Check minus sour milk	1962	137.6	2	4
8	Vegetable lysin plus sour milk	2422	166.8	1	1

* In case a hen died during the experiment she was counted as x/52 of a hen in determining the average production per hen, x being the number of weeks she lived.

In Table 5 are presented the results of the total egg-production of each lot.

Taking Lot 3 as the control, we see that the average egg-production per hen in Lot 1 was 21.3 below normal. In connection with the ration fed to Lot 1 it was contended by Dr.

Jos. H. Kastle, late of this Station, that there was some cumulative toxic substance in soy beans, which might account for the lowered vitality of this lot. We are unable to account for the weakened vitality of Lot 1, as shown by weight, general physical condition and egg-production. However, we do not attribute it to any toxic action on the part of the soy beans, because of the fact that soy beans caused no ill effect on Lot 8.

Lot 4 shows that not only is the hen-raised chick superior to the brooder-raised chick, as shown by weight and mortality records, but it is superior to a small extent, also, as to subsequent egg-production. The superior vitality of the hen-raised chick is in all probability caused by the greater freedom of range, education with regard to habits of obtaining food and general conduct as taught by the mother hen and the fact that during the first six weeks of its growth it received a larger and more varied diet.

Lot 5, which received a grain ration low in lysin, plus an abundance of protein material from animal sources, weighed more per average bird, at the end of the first 28 weeks, than did the average control, but the egg production of this lot was the lowest of any of the six lots.

Lot 7 received the same ration as the check, minus sour milk. The results show that the addition of skim-milk to a diet that is already sufficient and complete does not appreciably increase the average weight of the chicks nor their egg production.

Lot 8 was fed a grain ration which was known to be unable to promote growth, supplemented by skim-milk, which was available to the birds at all times. This lot showed the greatest egg production of any of the six lots and the birds were the heaviest of any except the hen-raised lot.

From the results of the foregoing experiments and because of the large number of chicks in each lot, we feel justified in drawing the following conclusions which we think can be applied to the average White Leghorn chick.

1. The proteins of rice, oats, barley, hominy and gluten flour are inefficient in promoting normal growth in the White Leghorn chick.

2. Apparently the proteins of rice, oats, barley, hominy and gluten flour fail to promote the normal sexual development and function of a young chick.

3. Since approximately 30 per cent. of the chicks of Lot 2 were surviving at the expiration of 28 weeks, all of which were in an apparently good state of health, we feel safe in saying that the growth or decline of these chicks is dependent not only on the ration fed but also on the individual vitality of the animal under consideration. Because of the influence which individual vitality may have upon the result, a considerable number of animals should be used in experiments on nutrition.

4. On a ration composed solely of grains relatively high in lysin, with cottonseed meal, supplemented by sufficient mineral matter and a sufficient quantity of the dietary essential, fat-soluble A, obtained from shredded cabbage leaves and sprouted oats, we failed to get normal growth. On this ration, supplemented by skim-milk available at all times, normal growth was obtained, which was shown by weight and egg production.

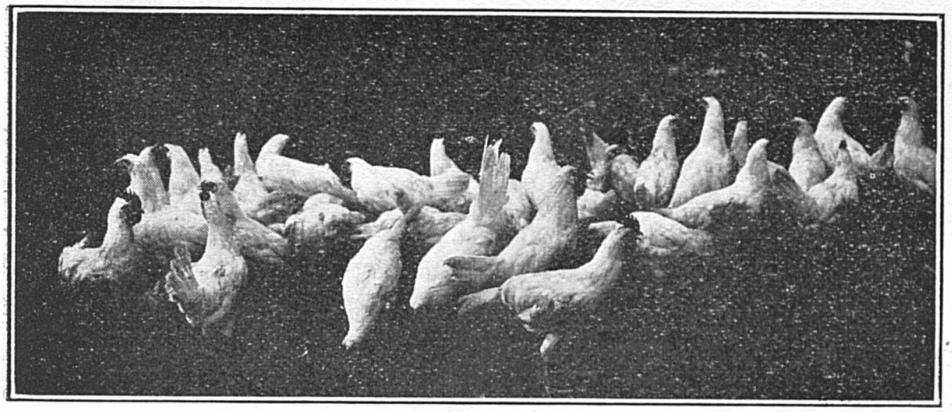
5. It is indicated that skim-milk supplies some factor other than lysin, the lack of which, we believe, limits the nutritive power of the proteins in the grains fed to Lot 6.

6. Skim-milk does not appreciably enhance the growth or subsequent egg production in chicks which receive a normal grain ration containing the quantity of beef scrap fed to Lot 3.

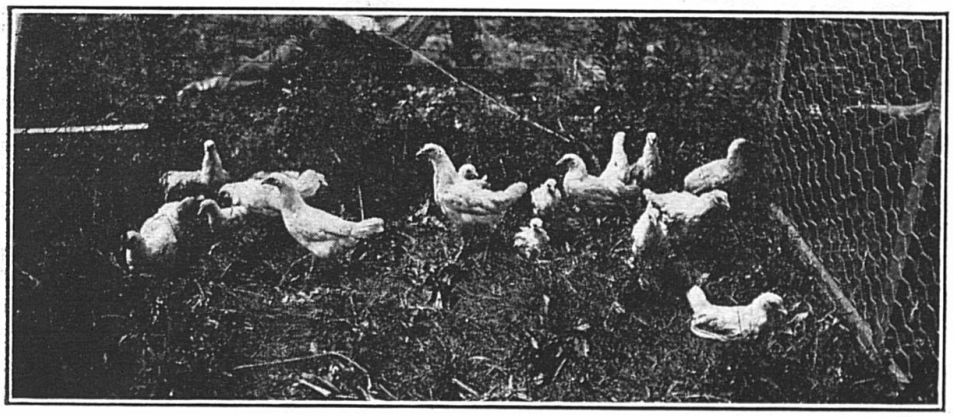
7. The rate of growth of the White Leghorn chick, as shown by the tabulation of the weight record of Lots 3 and 4, closely approximates the normal for hen and brooder-raised chicks.

8. The vitality of hen-raised chicks, in this experiment, is superior to that of artificially raised chicks, as shown by weight and mortality and to a small extent by subsequent egg production.

9. The physical conditions governing the first few weeks of growth markedly affect the vitality of the chick, which is manifest during the entire period of growth.



Lot 1 at the Age of 13 Weeks.



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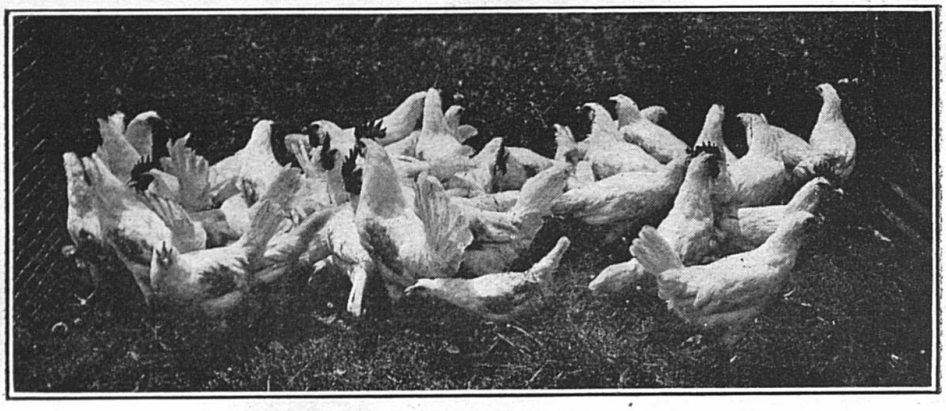

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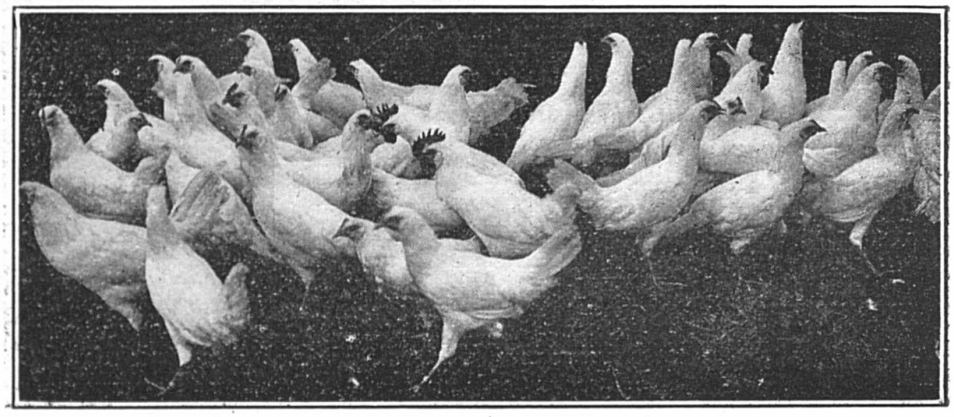

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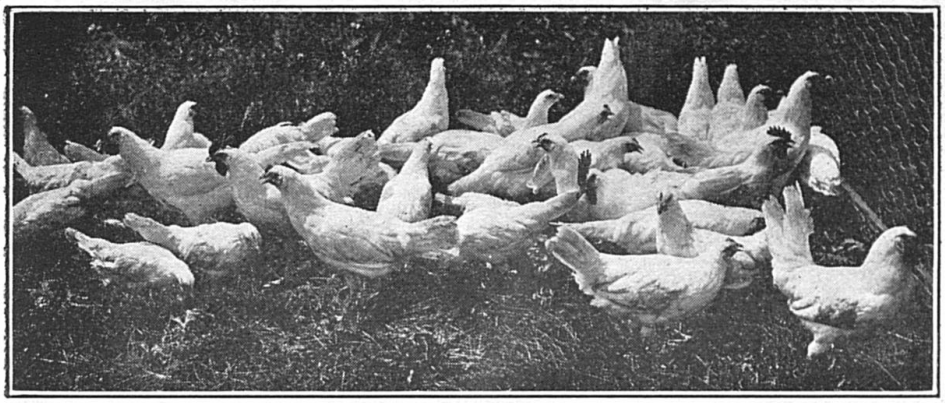

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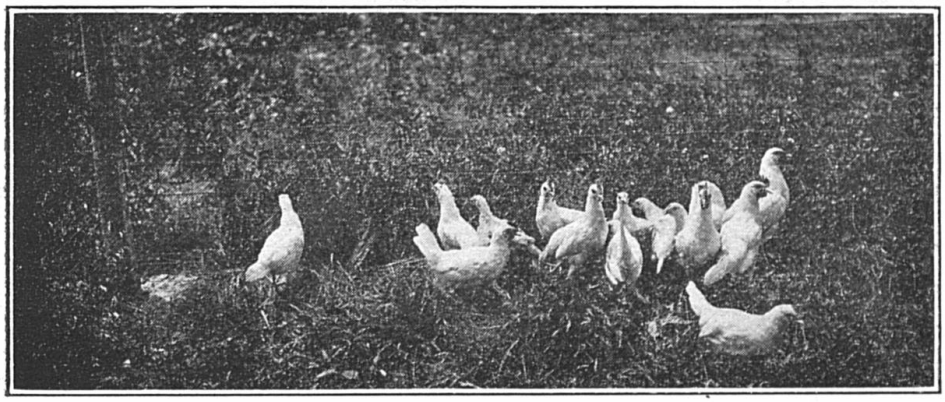

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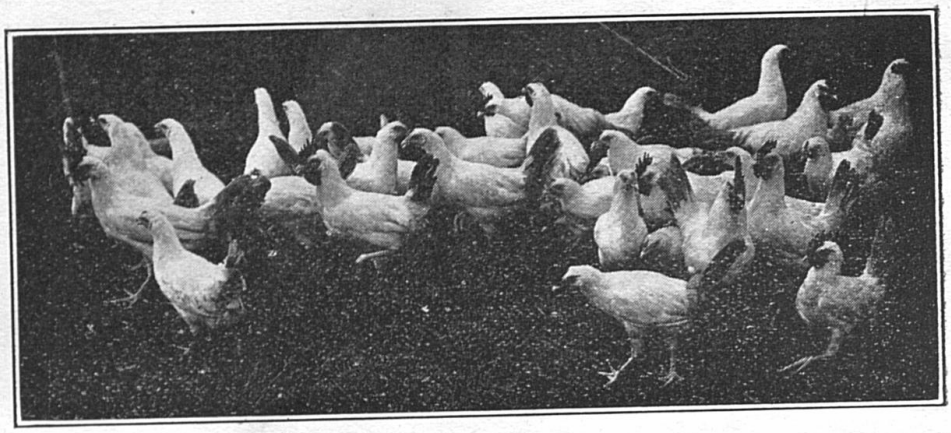

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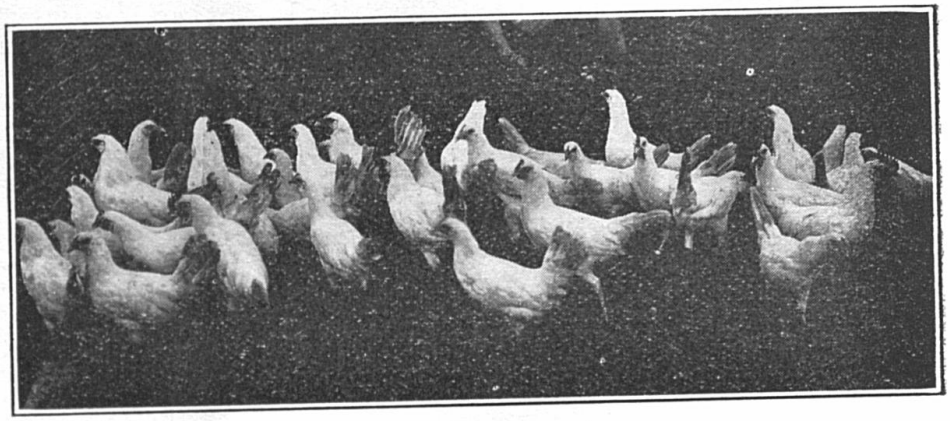

Lot 8 at the Age of 13 Weeks.

Kentucky
Agricultural Experiment Station
University of Kentucky, Lexington, Ky.

BULLETIN NO. 221

MARKETING HEMP

BY
JOHN R. HUMPHREY

JUNE 27, 1919
(21)

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BULLETIN NO. 221

MARKETING HEMP

By JOHN R. HUMPHREY

The history of Kentucky, both socially and economically, is so closely intertwined with the hemp industry that there is no agricultural subject which should be of more interest to the farmers of the State than one dealing with the present economic situation in the marketing of hemp fiber. One hundred and forty-four years ago the first crop of hemp seed was raised near Danville and hemp has been raised, both for seed and for fiber, in the Kentucky River bottoms and in the counties comprising the Lexington Limestone area, in varying quantities since that time.

From contemporary writings in journals and newspapers and other publications thruout this period, it appears that the factors controlling the prosperity of the hemp farmer gradually rose to their high point in 1868, and have, in varying degrees of rapidity, subsided since then, resulting in the very low point of production reached in 1919. The actual amount of hemp raised in the world has not varied in any sense in proportion to that raised in Kentucky, but has rather increased since the last century, while production in Kentucky was receding.

It is, therefore, important to the farmers of Kentucky to know the underlying causes of this situation and the discussions in this bulletin of the various problems affecting the hemp industry are based upon an investigation of conditions in Kentucky and other hemp-growing states, and in the chief consuming and exporting markets of the United States. The object of the discussions herein contained is that of bringing to the producer an insight into the true conditions of the industry in the United States and to furnish him with such information as may tend to place American-grown hemp in more effective competition in home markets with that grown in other countries.

1. A REVIEW OF THE INDUSTRY IN KENTUCKY

It is probable that no agricultural product raised in Kentucky has seen a wider fluctuation in market demand than hemp fiber. Varied conditions which are complained of today, such as shortage of labor and unsatisfactory market demand, have recurred from time to time thruout the whole period of hemp production in this State. Opinion seems to prevail at the present time that the hemp industry is a thing of the past and that the stable demand for the fiber has been usurped by other fibers imported from foreign countries. A clearer understanding of the present conditions and of the outlook for the future may be arrived at by a review of the hemp industry in Kentucky during the past 144 years.

Hemp was first introduced into this State by settlers arriving from Virginia and because the fiber is readily available for use in the manufacture of homespun yarns and cloth, it soon became one of the staple agricultural products of the frontier. In this early period of cultivation the art of home craftsmanship was very highly developed by the women of the plantations, and many kinds of cloth, fine laces and linen were eventually manufactured out of hemp. With the coming of the industrial revolution and the introduction of machinery into the weaving of cloth the home art was more or less abandoned and this was especially true after the invention of the cotton gin. Previous to the invention of the cotton gin the manufacture of cotton cloth was very restricted, owing to the difficulty in separating the fiber from the seeds. Altho hemp is widely adaptable to many uses its refractoriness under treatment of machinery soon brought cotton to the front as a very heavy competitor, and the hemp industry quickly declined in favor of cotton-growing in other states, during a period of several years. The growth of the cotton industry in the South, however, at a later date, thru its demand for cotton bagging and bale rope, soon gave the hemp industry in Kentucky a new importance, bringing hemp production to a point far in excess of what had previously been practist.

About this time there was also a great demand for hemp fiber in the Eastern cordage plants where it was used for the manufacture of rope for the standing rigging of ships and in providing sailcloth similar to cotton duck. In 1864 cotton rose to a relatively high price, much higher per pound than cotton bagging and bale rope which were composed of hemp, and for that reason it became advantageous for cotton ginners to overload their bales with the hemp product. As a result of this the amount of cotton bagging to be used was restricted by manufacturers of cotton goods and demand arose for steel straps to take the place of the ordinary bale rope. Thru this unfortunate circumstance hemp once more lost a wide market. On account of the quicker transit by steamships over sailing vessels India jute was introduced into the United States, and because of its cheapness in comparison with hemp, soon displaced hemp in cotton bagging, and furthermore, the increasing use of steamships greatly reduced the quantity of hemp used in the manufacture of rigging and sailcloth.

The manufacture of hemp products had risen to a point during this period sufficient to require an investment of $500,000 capital in Lexington and an equal amount in other parts of the State, in rope walks and mills where rope, cotton bagging, sailcloth and hemp linen were manufactured. There was also a political phase to the hemp industry at this time; so much so that Henry Clay devoted a great deal of his time and attention to tariffs on foreign hemp, for the protection of Kentucky manufacturers, but contrary to the expectations of these manufacturers the price of hemp products was less after the imposition of the tariff than before its introduction. Russia, the greatest hemp-producing country in the world, continued to be a very heavy competitor with Kentucky and the imposition of the tariff tended to destroy the shipbuilding industry of New England and to drive this industry to England and other European countries during the remainder of the period of decline of building sail ships.

Hence, again in the evolution of the hemp industry, new markets were necessary and it was after this juncture in the history of hemp raising and manufacture that the present uses

of hemp came into prominence and have been maintained more or less steadily up to the present time. Altho Russian hemp was an early and serious competitor of the Kentucky product it is today imported very lightly, but Italian hemp, water retted in the alkali streams flowing thru the lava beds of that country and consequently lighter in color and finer in quality than the dew retted fiber of Kentucky, is now the ruling factor of competition in the hemp market.

The history of the hemp industry leads to the inevitable conclusion that its instability has not been caused by flaws in the cultural side of the question but rather is inherent in those factors which control the marketing of the fiber. The process of retting might be improved by experimentation but the introduction of power machinery and improvements in the manner of breaking, together with the stabilization of demand, which may be brought about by introducing powerful industrial concerns at home, are the three problems which, if solved, would again make the raising of hemp in Kentucky a profitable agricultural undertaking. With an average production of over 1000 pounds of hemp fiber per acre and the proper machinery for harvesting and breaking, hemp should be one of the most profitable crops suitable for culture in the Bluegrass section of the State and, furthermore, should require no more labor in its handling than is devoted to the culture of corn, wheat or other machine-handled products.

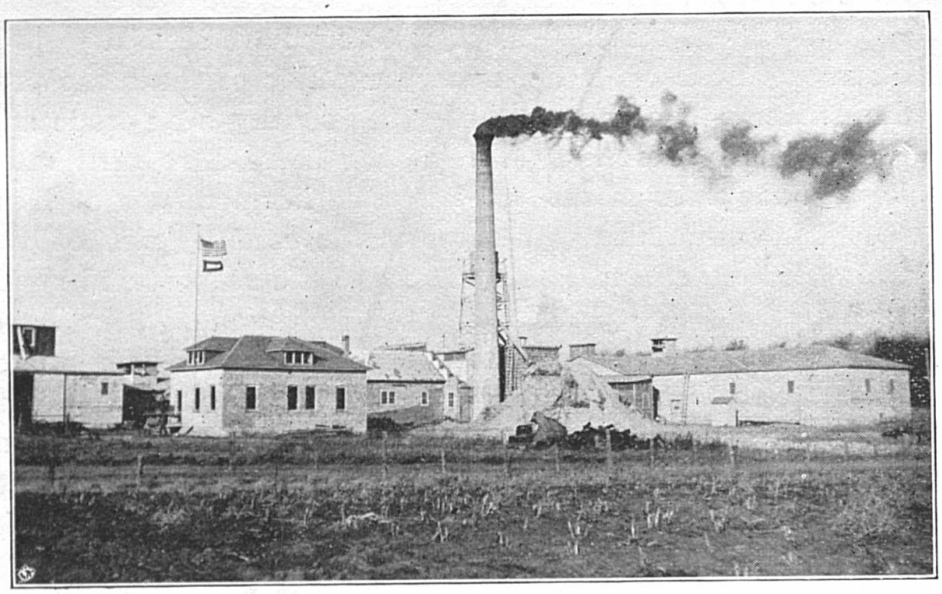
On account of the high prices and the introduction of improved machinery for handling hemp in other parts of the country there has been a constant trend during the last eight or ten years toward the expansion of hemp raising in other States. California, Wisconsin, Indiana and Ohio now produce collectively more hemp than is produced in Kentucky in a favorable year and the industry in Wisconsin, Ohio and Indiana has been stabilized by the erection of breaking plants for the production of long line fiber and tow by machine process, while most of Kentucky's fiber is still prepared by hand labor.

2. METHODS OF PREPARATION FOR MARKET

Methods Pursued in Kentucky. The influence of methods of marketing and preparation of products upon their adaptability to use and upon the demand for those products in the market has such a wide bearing upon the prosperity of any industry and especially on that of hemp production that more care should be exercised in this direction than has usually been thought necessary.

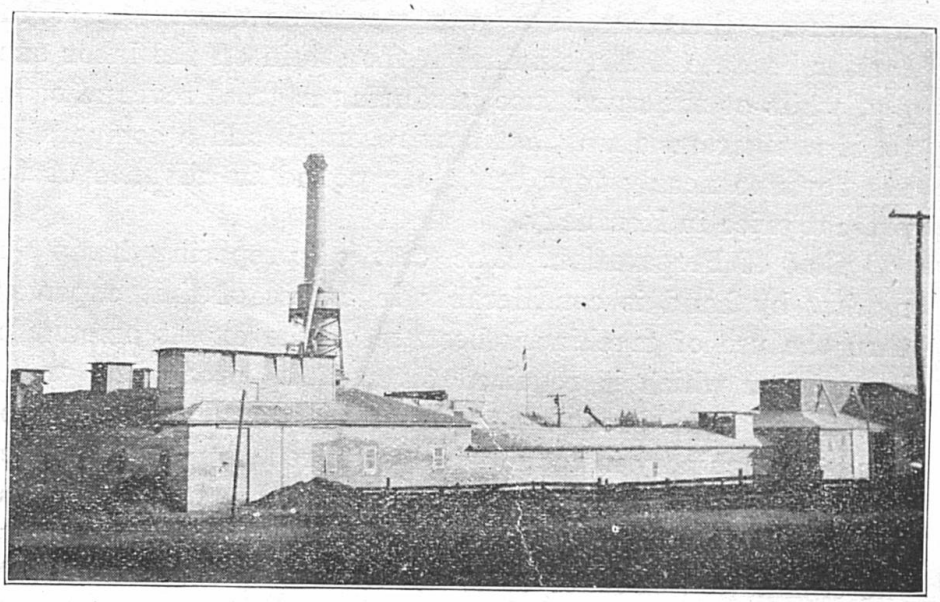
Thruout the period of hemp production in the United States hundreds of patents on hemp-breaking machinery and on methods of treating hemp fiber in order that it might become more tractable under machine spinning have been issued, but for various reasons in the past they have seemed to produce very little effect upon the prosperity of the hemp producer. Hemp-breaking machinery has usually been crude and preparations for retting or bleaching hemp have most often injured the fiber in the process. The hemp raisers of Kentucky, in conformity with those in the eastern part of the United States, still maintain the use of the simple hand brake which, during the periods of ample labor supply, appeared to serve the purpose satisfactorily. The use of the hand brake, however, requires an undue amount of retting in order that the power supplied by hand may be capable of properly cleaning the hurds from the fiber, and this excess amount of retting has tended to darken and coarsen the fiber produced in this State and at the present time its use is very unsatisfactory because of the labor shortage and the unreliability of the weather in the breaking season. Moreover, it cannot be said that the proper reliance can be placed upon hand labor to properly clean the hemp fiber, in view of the fact that it is broken out by the pound and the addition of the maximum amount of hurds is greatly to the advantage of the breaker. The combination of over-retting, coarse fiber, excess amount of dirt and uneven quality of Kentucky hemp are tending gradually to displace it from the more desirable uses in the manufacturing field and to allow its replacement by fibers produced in other States and handled by machinery.

Adaptability of Machinery to the Preparation of Hemp Fiber. Nearly all of the methods of breaking hemp by machinery spoken of above have failed because most of these machines were mere toys in size and not sufficiently strong to do the work, while at the same time the inventors have attempted to make these machines available for use in the fields where the hemp is grown. After the expenditure of large sums of money by manufacturers these methods have proved unsatisfactory, but hemp-breaking plants of another character are in very successful operation in Wisconsin and Indiana. A hemp-breaking plant capable of breaking 15,000 pounds of



A modern hemp mill capable of breaking, cleaning and baling 15,000 pounds of line and tow per day. Hemp hurds are used for fuel and supply power for running the machinery and drying the hemp stalks as they pass thru the dry kiln.

hemp fiber per day requires an investment of from $25,000 to $50,000 and should be located in the center of a hemp-producing area where the fields are within a radius of 15 miles of the plant. The plant is constructed with ample storage space for a supply of hemp stalks, a dry kiln for conditioning the hemp for breaking, a machine room and a storage house for baled fiber. The machinery consists of a hemp brake of ample strength and capacity and power scutchers, balers, conveyors



Another view of a hemp mill showing the dry kiln, the low shed-like structure, in which the hemp is conditioned for breaking.

and other minor machinery, all of which are protected from wind and weather, two of the greatest hindrances to open-air power hemp-breaking. Power is furnished by steam produced by using part of the hurds for fuel. With this equipment hemp fiber of very high quality is secured and the dangers of over-retting are thus done away with by the ability of power breakers to break out hemp of any degree of retting.

The preparation of hemp for market by the farmers under these conditions is accomplished by the use of hemp harvesters and the hemp gather-binder which requires only a small amount of man labor in comparison with that now expended, the hemp stalks being tied in bundles ready for hauling to market at any time after gathering. The power hemp-breaking plant is capable of operation thruout the year in any kind of weather and farmers are able to market their hemp stalks at the most advantageous time to them.

The price paid for hemp fiber in other States using hemp-breaking machinery properly installed in a hemp-breaking plant is slightly higher in the stalk than now paid Kentucky farmers by the dealers for broken fiber. The introduction of

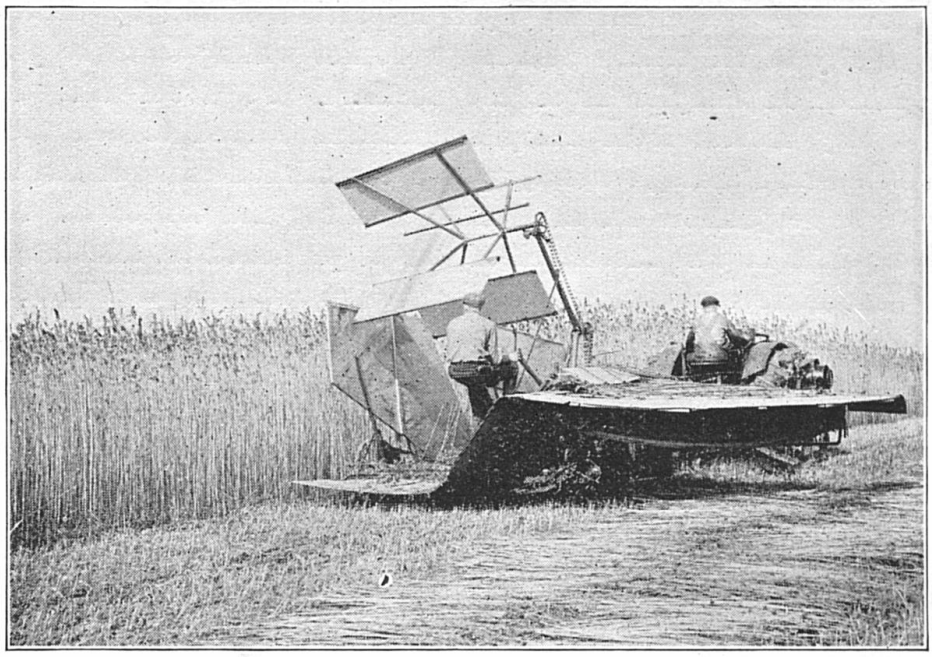
machinery, therefore, is a great economic advantage to the farmer because it has eliminated the strain on the labor supply, while at the same time producing a gross revenue equal to, if not greater than, that now received, and a comparative net revenue nearly four cents per pound in advance of the present price in Kentucky.

Cost of Preparation. The cost of preparing hemp for market by hand is considerably in excess of that expended thru the use of machinery because of the excess amount of hand labor which is required thruout the process of preparation for hand breaking. The cost of actual breaking by hand or machinery is not so widely different, but the improved quality of the product, with consequent better demand, resulting in a ready market to the farmer, when coupled with the elimination of labor costs in preparation for hand breaking, at once shows the desirability of improving practises in hemp marketing in Kentucky.

3. MARKETING METHODS

Local Conditions. The preparation of hemp fiber for the consuming market having continually been a farm industry, the marketing of the product is not participated in by the farmers, except as a local transaction. Hemp breaking, as a commercial industry, has never been established within the State; consequently, the marketing of Kentucky hemp has, until very recently, been entirely in the hands of middlemen known as hemp dealers located at various points within the hemp-raising territory and these dealers have constituted the only market in which the farmers could dispose of their crops.

There is probably no crop which the farmer raises upon which he has so little information regarding price levels, points of consumption and uses, as is the case with hemp, and this condition has been generally brought about by the exclusion of the farmer from contact with any but the local market and the absence of price quotations on hemp, such as are commonly given on live stock and other products. It has, therefore, been unsatisfactory to the farmer to raise a crop con-



A modern hemp harvester cutting and spreading hemp ready for retting.

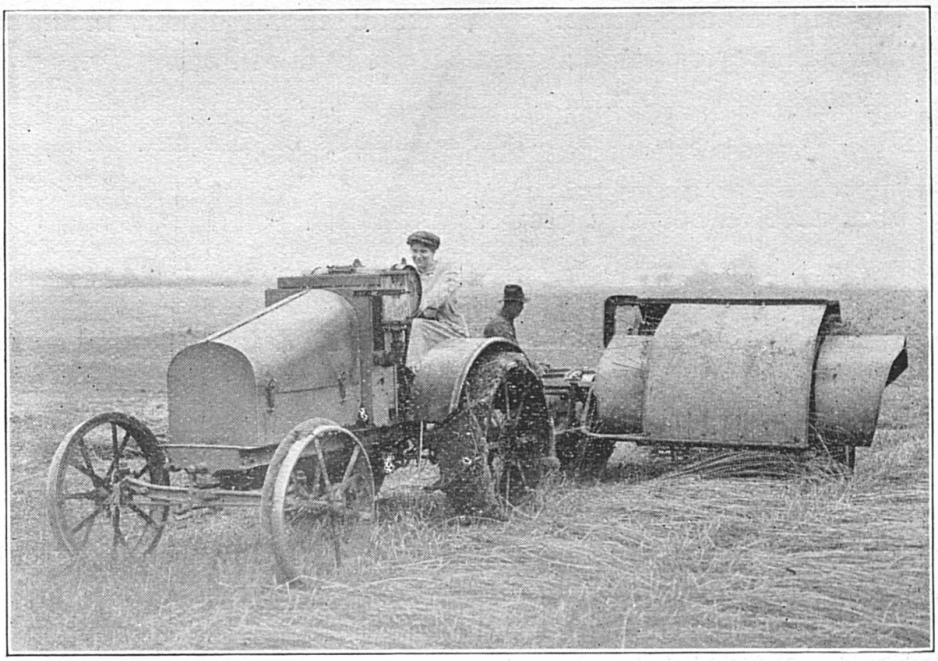
cerning whose uses he knew little and finally to place it upon the market without knowing whether the price offered was the price current or a local quotation.

Advantages of Co-operative Marketing in the Hemp Industry. An experiment was carried out during the selling season of 1917 with the intention of testing out the comparative advantages of cooperative sales of hemp between the farmer and the manufacturer. Farmers' hemp associations were formed in ten counties for the purpose of grading, baling and storing the fiber at local points. Each of the ten counties then elected a representative to a central association, the duties of which were to inspect and sell the fiber. Investigations of the Experiment Station in the terminal markets produced considerable information respecting methods of sale and available outlets. It resulted that the mills were not in favor of buying hemp directly from the individual farmers on account of the added expense entailed and the lack of reliable information regarding the shipper. Hemp being a product which, up to the present time,

has been bought mainly upon inspection backed by the integrity of the seller, the mills were not willing to make purchases on samples from the farmers. To avoid this difficulty several local hemp associations agreed to sell their hemp thru a single agent, upon a commission basis, the agent to be responsible for the grading, selling and collection. The experiment was successful in that it produced an added revenue of several thousand dollars to the farmers participating, but the extent to which the experiment was carried out is not sufficient to establish cooperative hemp sales upon a permanent basis. Only two counties out of the ten sold practically all of their hemp by this arrangement; the other eight, profiting by stabilization of prices produced by the hemp association, eventually sold their hemp to local dealers. In any event, under the existing circumstances, it became impracticable to sell all the hemp produced in Kentucky thru the association unless the association was equipped with facilities for dressing hemp and tow, a condition which did not exist at any time during the year. Hence the sales of hemp which were made were carried out on a basis of raw or undressed hemp. The experiment was chiefly valuable in its indication of the possibility of profitable hemp marketing which might be brought about by proper stabilization of grades and standardization of processes of preparing fiber for market.

That the hemp industry would eventually benefit greatly by an extended organization of the producers, with a stable marketing agency, is borne out by the fact that the producers of Russia have, since 1915, banded themselves together in an Artel, or producers' association, carried out upon practically the same lines as those employed in Kentucky in 1917; this system, having produced very beneficial results in Russia up to 1916, is based upon the same organization which now markets the bulk of the world's flax crop produced in the same country.

European Methods. As stated above, a large proportion of the hemp crop of Russia is marketed thru the hemp producers' cooperative associations, which associations under-



The hemp gather-binder which picks up the stalks after retting and binds them into bundles ready for delivery to the power breaking plant.

take the sale of the hemp and make advances on fiber as delivered, afterwards grading and baling the hemp and placing it in transit. Most of the Russian hemp is sold in European countries, especially England, hence very little comes in dircet competition with American fiber. Italian grown hemp is produced on small farms and sold by individuals to dealers in Italy who, up to the present time, have resold the fiber to English merchants who, in turn, have forwarded it to American manufacturers, usually at greatly increased prices. The prices of Russian and Italian hemp at seaboard in the United States are about equal, at the present time, and the trend of circumstances in both of those countries, consequent upon the scarcity in the labor supply and the disruption of the industry in general, presages an advanced price on fiber over that prevailing previous to the war.

The Situation in Consuming Markets. The chief consuming textile markets of the United States are situated along the Atlantic seaboard where they early became established on account of the close proximity of great industrial centers and

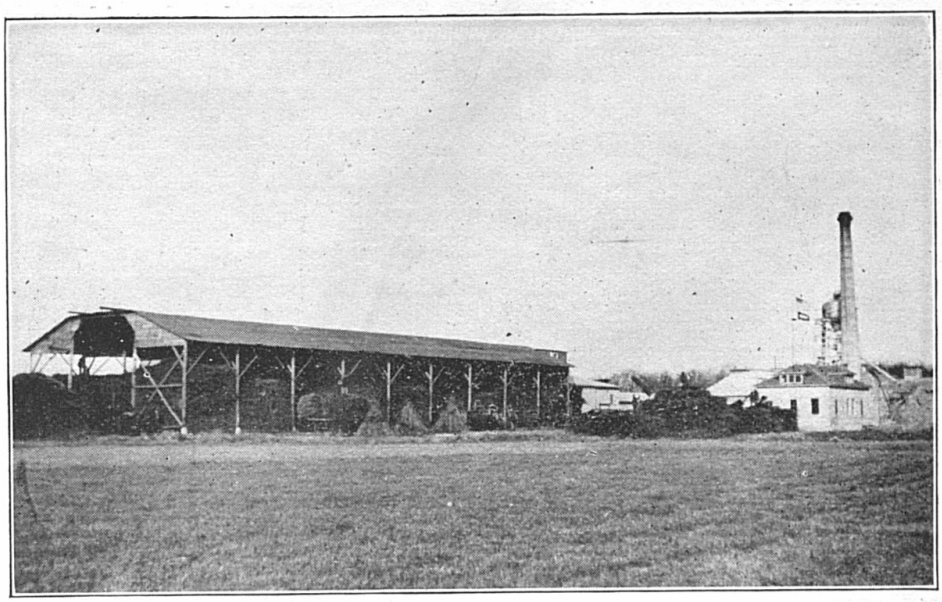
the shipbuilding trade. The trade in all fibers, including hemp, is largely handled thru the medium of fiber brokers who are in close touch with manufacturers. A large proportion of sales is made direct between Kentucky buyers and mills, but almost none, except in the association sales of 1917, have ever been effected between growers and mills.

The establishing of hemp breaking on a commercial basis thru the employment of power plants and the consequent evener grading of Kentucky hemp should bring about closer commercial relations between producer and consumer and tend to establish the quality and price of Kentucky grown fiber on a firmer basis.

4. GRADING AND MARKET STANDARDS

Conditions in the United States. No official grades have been established in the United States for American grown hemp and for this reason the producers are under great handicap with respect to marketing their fiber. The trade has roughly divided Kentucky hemp into several not well defined grades and this condition allows of individual judgment in the matter. The grades under which Kentucky rough hemp is commonly sold are No. 1 Kentucky rough prime, No. 2 Kentucky rough prime, No. 1 tow, and No. 2 tow, while a fifth grade is reserved for tangled and matted fiber mixed with considerable dirt and shives.

Dressed hemp is quoted under grades known as single and double dressed, and double double dressed for long fiber, and single and double dressed tow for shorter fiber. The difficulty in marketing under these grades arises from the fact that the grades are not sharply defined, allowing a variation in any one of the grades from year to year in accordance with the judgment of the party placing the fiber on the market or of the buyer. Because of this condition manufacturers are not inclined to make quotations on grade or description and the process of selling hemp reverts to one of bargaining between buyer and seller.



Showing the method of stacking the hemp as it is delivered for breaking.

American hemp is staple enough in character, however, to allow great improvement in the particular of grades and standards and this can be brought about by one of several methods. Agreements between producers in an association, or thru regulations set forth by consuming factors in the market, or, still better, by improved treatment of the fiber by machinery, and hence more uniform quality, may be the methods best adapted to various communities.

Wherever hemp breaking plants have been established, thus bringing together the hemp producing area in one central marketing institution, there has been a noticeable widening of demand and a tendency toward better market levels, but even this advance in hemp marketing could be greatly aided by establishing hemp grades on a firmer basis. It is certain that the American hemp industry will not become stablized until something of this nature has taken place, and the truth of this assertion is evidenced by results obtained in other parts of the world thru the promulgation of standard fiber grades.

Standards in Manila Hemp. In order to promote the Abaca fiber industry in the Philippines a law was passed by

the Philippine government setting forth the grades for Abaca fiber and defining the rules and regulations for its handling, storing and grading, and setting forth aids for its introduction into commerce. The result of this law has been that buyers in the United States and elsewhere are now enabled to purchase fiber in Manila with some assurance that it will be representative of the marks under which it is purchased. The growers of Manila fiber, of course, were not as well acquainted with American institutions as are the growers of American hemp and it was found impossible to purchase fiber from the Philippines without some regulation of the trade. The immense advance which has taken place in the industry and the widening of demand for Manila fiber since the introduction of standard grades is an indication of the benefits which would accrue to American hemp under like favorable conditions.

European Regulations. Hemp grades are fairly well established in most of the producing countries of Europe. The advance in this direction has not been as marked in Russia, up to the present time, as it bids fair to be in the future. In 1914, Russian hemp producers were beginning the formation of a cooperative hemp handling industry and had outlined plans for grading and marketing their hemp which were far in advance of those in use at that time. The greatest advance in grading in Europe has probably been that which has taken place in Italy, where we find that hemp is divided into six grades known as good, good medium, medium, poor, bad, refuse and tow. The grades are further subdivided in accordance with the locality, different localities producing variable qualities of fiber. These grades are such as good Bologna, good Bondino, good medium Bologna and good Ferrara. The medium, poor and bad are usually classed as of all localities, no distinction being made between areas of production. Each of the above grades is then thoroly defined under such qualifying definitions as "Raw hemp of Bologna, Bondino, Finale, Cento, Ferrara, Romagna, and Polesine is understood as free from the usual refuse (decay, black, etc.)." Thus the Italian grower

Interior view showing long line hemp fiber as it comes from the scutcher. The power baler is shown in the background.

is enabled to place his samples in the hands of foreign buyers on a much higher commercial basis and at better advantage than the American grower, and this, aside from the fact that Italian hemp may be of exceptionally high quality, allows of readier sale than can be obtained for American hemp under present grading conditions. Nearly all foreign fibers are sold under a mark which signifies a guaranty of quality upon which the buyer can rely.

5. USES OF HEMP IN THE UNITED STATES

In considering the uses of hemp at the present time, it is necessary to take into consideration the two limiting factors of comparative price and the peculiar qualities of the fiber. American hemp finds its chief use, under modern conditions, in the manufacture of commercial twine and small cordage, thread, hemp carpet twines, oakum and marlins. Prominent manufacturers of harvester twine have carried out extensive experiments in its use in that product and report that during the past year 1000 tons of long line hemp fiber were thus consumed. Samples of this twine, which is of single strand,

dressed with tar, have given very satisfactory results, both as to strength and wearing qualities, and, could this market be captured for hemp, the present supplies of hemp fiber would be inadequate to fill it. Italian hemp finds its most extensive use in the manufacture of coarse cloth and certain grades of thread, while Russian, to a small extent, is imported for the same use as American.

The limited uses of the several kinds practically define demand, and a shortage of other fibers than American hemp during the war brought this feature out sharply. For instance, the scarcity of jute did not produce any marked effect upon the market, since the uses of jute require fiber less expensive than hemp, nor did the shortage of Italian hemp or Abaca fiber greatly increase the demand for American, since the American fiber is not as well suited to the uses of the former.

An expansion of the field for American hemp manufacture is quite possible thru raising the quality of American fiber and thru ability to produce hemp fiber profitably at a less price per pound. The gradual rise in the price of competing fibers has tended to bring about an expansion of the use of hemp without an actual reduction in price. Considerable limitation is placed upon hemp demand thru the shortage of hemp fiber machinery, a condition which has been brought about by the competition of other fibers and the almost total disappearance of American fiber from the market in 1915. The revival of wooden ship building is tending to give a wider field for the use of hemp tow in the manufacture of marlins and oakum and its use in thread and binder twine, when of the proper quality, presages an increase in the number of tons of hemp required annually hereafter.

In 1913, the last year previous to the war, there were imported from Italy 5,088 tons of hemp, at an average price of 10.08 cents per lb., from Russia, 1,280 tons, averaging 8.68 cents per lb., while the United States produced 5,100 tons which sold at an average of about 9 cents per lb. Statistics on imports show that during the past three years imports have been above the average. In 1916, 6,506 long tons were

imported, at an average cost of 11.27 cents per lb. In 1917, imports rose to 9,635 long tons costing 11.52 cents per lb., and again subsided in 1918, to 6,913 long tons at an average of 18 cents per lb. The amount of hemp used in the country has been practically constant for several years, amounting to from 11,000 to 15,000 tons per year, with a fluctuation during the war period to approximately 18,000 tons, due to the shortage of other fibers and their relatively high price.

6. EXPORT OUTLOOK

The outlook for export of American production of hemp fiber is not clear at the present time. In spite of the fact that conditions in Russia are much disturbed and that that country continues to be handicapped in the world's markets it remains to be seen whether or not the revolution will materially affect the peasants in the production of hemp. Under the Empire every peasant in the hemp producing area was required to raise a certain amount of hemp and it is not known whether the agricultural forces of that country will voluntarily produce a like amount in the future. Areas producing hemp in Russia are so vast that it is likely that a great deal of the fiber will be produced even under adverse conditions. During 1917, Kentucky produced something like 18,000 acres which, when compared with the 515,000 acres produced in the four principal governments of Russia, is an insignificant part of the world's production. The chief country to which America could look for export of hemp is England, and since Russia is the former source of supply of that country, and further considering that India, an English colony, produces large supplies of fiber with cheap labor, it is not likely that under normal conditions America can find a market in England, in competition with other countries.

Some inquiry has been received from English importers during the past year for American fiber, but shipping conditions were not such as would allow of free exportation and only a small amount of fiber has been sent out of the country. For possibly two years after the end of the war an increased

export demand will be felt for American fiber. The natural processes of recovery in the war-torn countries usually first take effect upon agriculture and it is doubtless true that Russian, Indian, Italian and Hungarian producers will succeed in filling the foreign market within the next three years, beyond the advantage of the American farmer. Proper organization of the home market, however, will absorb the entire production of Kentucky and will no doubt be more profitable to Kentucky producers than competition in the export market.

7. THE FUTURE OF THE HEMP INDUSTRY

The Bluegrass section of Kentucky is the natural hemp-producing area of the United States and, with the possible exception of tobacco, the raising of hemp seems to be the least affected by the law of decreasing returns. The early settlers of Kentucky soon found that the good climate and fertility of the soil on the Lexington limestone plateau would produce a greater profit in hemp than in any other commodity, but the discovery of Burley tobacco has upset this relation to some extent. Granting that thru experience the central Bluegrass region has been found to be peculiarly adapted to hemp culture and knowing that hemp will be raised to some extent in the United States in the years to come, even under the present disadvantageous methods of marketing, it appears that more advantages can be obtained by raising hemp in Kentucky than in any other state.

In the discussions in this bulletin, so far, the possibilities of hemp raising for hemp fiber only have been treated and very little stress has been laid upon better processes of retting or treating fiber by chemical processes. It does not seem that the solution of hemp raising as a profitable industry lies in better methods of retting or in artificial treatment of the fiber but rather in a modern spirit of commercialism in the preparation of the fiber for market. The latent industrial possibilities which become apparent when considering a centralized hemp-breaking plant were never available under the old method of

breaking hemp in the fields at widely scattered points. In the operation of a centralized plant great quantities of hurds broken out of the hemp are produced and these, as previously stated, in part are used as fuel for the operation of the plant. There is, however, a relatively large surplus of this material left on hand as refuse, which might be used for the creation of a great amount of additional power, practically without cost, and this power could be used by other industrial concerns, thus producing a revenue to the hemp plant, and hence a higher price to the farmer for his fiber. The ashes obtained from the burning of hemp hurds contain nearly 20 per cent. of pure potash, the percentage varying with the degree of retting; aside from other minerals and by chemical process this may be recovered, either for use as fertilier on the farms or for the manufacture of soap or other products. By chemical treatment the hurds may be freed of all other mineral substances, with the resultant product composed of nearly pure cellulose, thus making them available for manufacture of other products valuable in commerce.

By the application of scientific treatment to the hemp industry there is a possibility of increasing the importance of hemp as an agricultural product by utilizing these by-products, as has been the case in the concentration of the meat industry in the great packing plants, and as is true in cotton growing since methods have been found for utilizing the seeds which formerly went to waste.

In conclusion it may be said that the future of the hemp industry depends largely upon the relative price of other farm products and upon the state of organization within the industry itself, and that the present unsatisfactory position of hemp in the market is susceptible of vast improvement by careful consideration of the changes brought about by modern conditions.

Kentucky
Agricultural Experiment Station
University of Kentucky, Lexington, Ky.

BULLETIN NO. 222

TRACTOR EXPERIENCE IN KENTUCKY

BY

W. D. NICHOLLS

SEPTEMBER, 1919
(45)

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SUMMARY.

According to the experience of 320 Kentucky owners the chief advantages of the tractor for farm work are as follows:

Work can be done rapidly and in proper season.

Man labor is saved.

The number of work stock required to operate the farm is reduced.

Usefulness in doing belt work

Plowing and other heavy work may be done in hot weather.

The land can be broken to a good depth.

The chief disadvantages are as follows:

Difficulty of securing competent men to run tractors.

High initial cost and rapid depreciation.

Excessive costs for repairs.

Extreme delays in getting repairs.

Insufficient use for the tractor on small and medium sized farms having a diversity of crop and stock enterprises.

Necessity of keeping a certain minimum number of work animals for cultivation and miscellaneous hauling, whether the farm has a tractor or not.

Presence of sloping land, stumps and stones on most farms.

Small and irregular fields on the average farm.

Seventy-one per cent. of the tractor owners whose records were obtained in this study, reported that they considered their machines profitable investments. The average size of these farms was 493 acres.

A unit of work with the tractor costs more on small farms than on large farms. The smallest size of farm on which a tractor may be used economically, according to the estimates of these tractor owners, is about 175 acres.

The three-plow size of tractor was recommended by a great majority of the owners reporting on this point.

The average number of days of work reported by these tractors was 49.5 days per farm, for 12 months. Adding to this the custom work done, the work averaged 55.0 days for the year.

The average number of acres of land plowed per day was 6.26 acres for the 2-plow tractor, 7.77 acres for the 3-plow tractor and 10.9 acres for those of the 4-plow size and larger.

The use of the tractor enabled these farmers to reduce the number of work animals from an average of 10.6 to 8.7, a reduction of about 18 per cent.

In the hands of a competent operator the tractor is a dependable source of power for the farm.

The quality of tractor plowing compares favorably with that done by horse-drawn implements.

The prospective tractor operator should take a short course of instruction in tractor operation before attempting to operate a tractor.

According to the estimates of these tractor owners, the amount of fuel used per acre for plowing with tractors of all sizes averaged 2.9 gallons, and the amount of lubricating oil about 1-5 of a gallon per acre.

The life of the tractors, as estimated by 213 owners, was 7.3 years.

The cost per acre for plowing with a tractor is about $1.705 (one dollar and seventy and one-half cents). This includes repairs, depreciation, interest, taxes, insurance, fuel, lubricants and labor.

One hundred and fifty-one of these tractors were used for cutting ensilage. All but eight of these were reported as furnishing ample power for that purpose.

Of the tractor owners doing custom work, a majority expressed the opinion that custom work does not pay (See p. 68).

BULLETIN NO. 222

TRACTOR EXPERIENCE IN KENTUCKY

By W. D. NICHOLS*

Scarcity of labor and the greatly increased cost of maintaining work stock have caused farmers to turn their attention to mechanical power as a possible means of reducing labor and power costs. The rapid development of the farm tractor within the last three or four years has induced many Kentucky farmers to purchase tractors and many more to consider the question whether or not the purchase of a tractor will reduce their operating expenses and increase their profits. As a result there is a demand from every farming section of the State, on the part of prospective purchasers, for detailed information concerning the tractor and its economic possibilities. The object of this bulletin is to furnish this information by showing the results that have been secured by Kentucky tractor owners under actual working conditions on farms. The data here set forth were obtained from detailed reports secured from 320 tractor owners representing practically every important agricultural section of Kentucky. It is believed that these data show quite closely the results which prospective purchasers of tractors may reasonably expect to secure with these machines. The reports included in this study are for the year 1918.

For full effectiveness in the use of the tractor for plowing, the soil must be fairly level and free from stumps and large stones. Also, there must be fairly good-sized fields and a sufficient acreage of cropped land to provide enough work

*Credit is due Miss Ruth M. Duckwall for valuable assistance in the preparation of the material for this bulletin, and to the Office of Farm Management, U. S. Department of Agriculture, for suggestions relative to methods of collecting and tabulating the data.

on the individual farm to justify the very considerable investment and fixed expense which the purchase of the tractor entails. These conditions are furnished by a considerable number of farms in Kentucky. Many farms also have a considerable amount of belt work such as operating silage cutters, shredders, threshers and rock crushers, for which the tractor is well suited. Many such farms are finding the tractor a profitable investment and there is good reason to expect operators of farms of this kind to buy tractors in increasing numbers.

It should be borne in mind that the figures given herein on acreage plowed, fuel consumption and other points, represent the results as reported by men working under actual farm conditions and not the maximum results which may be gotten by experts working with new machines and sharp plows on level land and with other ideal conditions. Some tractor owners, of course, get better results than the average indicated in these pages, but the prospective purchaser, in considering whether the tractor will be profitable for his individual case, has before him a problem in farm management, and it is very necessary that he take into account what his fellow farmers have been able to accomplish under unfavorable as well as favorable conditions.

ADVANTAGES AND DISADVANTAGES OF THE TRACTOR.

Each of the tractor owners whose experience was obtained in this study was asked the question, "What have you found to be the principal advantages of the tractor for your farm work, and what have you found to be the principal disadvantages?" The point of advantage cited by the largest number was the fact that the tractor permits the breaking and fitting of the land quickly and makes it possible to get the crops planted at the proper time, the machines being of particular value in hot weather when there is great liability of over-heating teams in doing heavy farm work. The point of second im-

portance was the fact that the tractor makes possible a considerable saving of man labor and horse labor, often enabling one man to farm a larger acreage and to increase the total crops he can raise, and reducing to a considerable extent the number of work stock required to operate the farm. Usefulness in doing belt work was placed third; deep plowing came next; while many mentioned the advantage that the tractor did not entail a heavy maintenance expense when not in use, as is the case with work stock, which require feed when idle as well as when at work. Only two owners reported that they had used the tractor for night work.

The point of disadvantage cited by the greatest number of these tractor owners was the difficulty experienced in getting competent persons to operate the machine and the fact that the average farm hand can not be trusted with the operation of the tractor. Next in importance among the disadvantages were the high initial cost of the machine, excessive cost of repairs, breakdowns, heavy depreciation charges and the difficulty of keeping the machine adjusted. A disadvantage which was emphasized by many tractor owners was the delay frequently experienced in getting repairs. Other disadvantages frequently mentioned were: the difficulty of operation in rough and stony land and in small and irregular fields, the high cost of operation, and the difficulty of starting the engine in cold weather.

INFLUENCE OF THE TRACTOR ON FARM PROFITS.

For convenient reference the tractor reports were classified into an Eastern and a Western Group. It is, of course, recognized that the adaptability of the tractor is not a question of geographical location or county lines. Table I. shows the location of the tractors included in this study and indicates the effect which these farmers believe their machines have had in increasing or decreasing the total farm profits.

Table I.

Reports of Tractor Owners, by Counties, in Kentucky.

Eastern Group.

County	Total Tractors	No. Reporting Tractors Profitable	No. Reporting Tractors Unprofitable	Number Noncommittal
Jefferson	11	10	1	0
Fayette	10	9	1	0
Nelson	10	7	2	1
Clark	9	9	0	0
Mercer	8	6	2	0
Bourbon	7	6	1	0
Oldham	6	5	0	1
Woodford	5	5	0	0
Jessamine	5	4	0	1
Boone	4	3	1	0
Montgomery	4	2	2	0
Bath	3	3	0	0
Harrison	3	3	0	0
Carroll	3	2	1	0
Boyle	2	2	0	0
Franklin	2	2	0	0
Greenup	2	2	0	0
Lincoln	2	2	0	0
Madison	2	2	0	0
Mason	2	2	0	0
Spencer	2	1	1	0
Henry	2	1	1	0
Shelby	1	1	0	0
Gallatin	1	1	0	0
Owen	1	1	0	0
Fleming	1	1	0	0
Garrard	1	1	0	0
Bracken	1	1	0	0
Trimble	1	1	0	0
Pike	1	1	0	0
Carter	1	1	0	0
Wayne	1	1	0	0
Lawrence	1	0	1	0
Washington	1	0	1	0
Nicholas	1	0	0	1
Scott	1	0	0	1
	118	98	15	5

Table I.

Reports of Tractor Owners, by Counties, in Kentucky.
Western Group.

County	Total Tractors	No. Reporting Tractors Profitable	No. Reporting Tractors Unprofitable	Number Noncommittal
Union	21	16	0	5
Henderson	21	12	4	5
Daviess	18	11	1	6
Christian	20	9	10	1
Warren	14	8	5	1
Hardin	8	7	1	0
Logan	7	6	1	0
Todd	8	4	2	2
Ohio	8	5	2	1
Livingston	7	5	2	0
Fulton	7	5	1	1
Graves	6	5	0	1
Simpson	6	4	1	1
Caldwell	5	4	1	0
McCracken	5	3	1	1
Taylor	5	2	0	3
McLean	4	4	0	0
Trigg	4	4	0	0
Muhlenberg	4	2	0	2
Larue	4	2	2	0
Carlisle	4	2	1	1
Butler	2	2	0	0
Bullitt	2	1	1	0
Ballard	2	2	0	0
Hickman	2	1	1	0
Breckinridge	1	1	0	0
Hopkins	1	1	0	0
Calloway	1	1	0	0
Green	1	1	0	0
Allen	1	0	0	1
Lyon	1	0	0	1
Meade	1	0	1	0
Grayson	1	0	0	1
	202	130	38	34

As shown by the table, 228 owners, or about 71 per cent. of the total number, considered the tractor profitable for their conditions; fifty-three, or 16.5 per cent. considered it unprofitable, and 39, or about 12 per cent. were non-committal on the point.

ECONOMY OF THE TRACTOR AS INFLUENCED BY THE SIZE OF FARM.

In this connection it should be borne in mind that the tractor owners whose experience is included in this study were operating much larger farms than the average for their respective communities. The farms on which the 2-plow size of tractor was used averaged about 411.8 acres, of which 206.5 acres were in spring and fall planted annual crops. The farms having 3-plow tractors averaged 497 acres, with 261.7 acres of spring and fall planted annual crops. The farms having the 4-plow size or larger, averaged 1154 acres, with about 459 acres of spring and fall planted annual crops.

In answer to the question, "Do you consider the tractor a profitable investment for the average farmer in your community?" 47 answered in the affirmative and an equal number in the negative, the remainder being non-committal on the point. One of the principal difficulties in the way of the more general adoption of the tractor is the small size of the average Kentucky farm. The tractor is apt to be unprofitable on the small farm principally for the reason that it places too large a proportion of the total capital in a machine for which the farm does not furnish profitable employment for a sufficient portion of the year. As a result a unit of labor done with a tractor on a small farm costs much more than that done on a larger farm. Table II shows the smallest farm on which these tractor owners, from their experience, believe tractors of the various sizes may be profitably used. The figures given are based on the estimates of 285 tractor owners.

Table II.—Minimum Acreages on Which Tractors are Profitable.

(Based on estimate of 285 tractor owners)

Size of Tractor*	Size of Farm
2-plow	126 acres
3-plow	181.5 acres
4-plow and over	495.5 acres

*The number of 14-inch plows pulled rather than the horse power rating is used in this bulletin to designate the size of the tractor. The former method is considered more reliable than the latter because of the fact that the method of rating the horse power by different manufacturers varies considerably.

Emphasis should be placed on the fact that the figures on Size of Farm in Table II represent the **smallest** size of farm for which, in the opinion of experienced tractor owners, tractors should be purchased, and not the size on which they may be used most profitably.

One obvious plan which may be followed by the tractor owner whose farm is too small to furnish full work for the machine is to rent or buy additional land when it is possible to do so. It is significant that nearly one-half of the men who have found their machines profitable report that they have increased their acreage, this increase averaging 135 acres of additional land per farm. On the other hand, only two of the farmers who found their machines unprofitable acquired additional land after purchasing their tractors.

PROPER SIZE OF TRACTOR.

An important point to be considered in the purchase of a tractor is the selection of a suitable size for the kind and amount of work to be done. The machine selected should be of sufficient size to furnish ample power on the drawbar and on the pulley, but not so large as to entail an unnecessarily high initial cost and fuel consumption.

The number of 14-inch plows pulled, rather than the horse power rating, is used in this bulletin to designate the size of the

tractors. The former method is considered more reliable than the latter because of the fact that the method of rating the horse power by different manufacturers varies considerably.

This investigation showed that 65 per cent. of the farmers operating 275 acres or less, originally bought 2-plow tractors; 30 per cent. bought 3-plow tractors; and a little over 2 per cent. bought the 4-plow size or larger. Of the farmers operating between 275 and 500 acres, 28 per cent. bought the 2-plow size; 65 per cent. the 3-plow size, and 6.4 per cent. bought the 4-plow size or larger. Of the farmers operating 500 acres or more, 33 per cent. bought the 2-plow size; 55 per cent. bought the 3-plow size, and about 9 per cent. the 4-plow size or larger.

Table III.

A Comparison of the Percentages of Different Sizes of Tractors Originally Bought and Sizes Recommended after Tractor Owners Had Had Experience in Operating their Machines.*

Group No.	Size of Farm	2-plow Tractor		3-plow Tractor		4-plow Tractor	
		% Buying	% Recom-mend'g	% Buying	% Recom-mend'g	% Buying	% Recom-mend'g
1	275 acres and less	67	46	30	47	2	7
2	275 to 500 acres	28	20	65	66	6	13
3	Over 500 acres	33	22	55	59	9	19
	Ave. of all farms	46	32	48	57	5	12

Table III. shows how experience led these men to change their opinions as to the desirable size of tractor for their farm work. In all three of the groups there was a marked increase in the number of farmers advocating the 3-plow size and larger, and a falling off of advocates of the 2-plow size. In purchasing their machines, 46 per cent. of these men selected the 2-plow size; 48 per cent. the 3-plow size, and 5 per cent. the 4-plow size or larger. After having had experience

*The section of Table III showing the sizes of tractors originally purchased is based on 309 records, of which 135 are in Group No. 1, 110 in Group No. 2 and 64 in Group No. 3. The section showing sizes recommended is based on the statements of 273 tractor owners, of whom 115 are in Group No. 1, 104 in Group No. 2, and 54 in Group No. 3.

in tractor operation only 32 per cent. recommended the 2-plow size while 57 per cent. recommended the 3-plow size and 12 per cent., the 4-plow size or larger. It appears from the data that the 3-plow size best meets the requirements of the greater number of prospective tractor purchasers in Kentucky.

The 3-plow size has the important advantage over the 2-plow size in that it enables one man to accomplish considerably more in a day than with the smaller size. Moreover, the 3-plow size gives power enough to operate a good-sized ensilage cutter, a medium-sized threshing machine, and other machinery for which power is required.

A considerable number of farmers in this study had only a small amount of belt work to be done, the tractor being needed mainly to meet the need of extra power in rush seasons and to relieve the horses in hot weather. Many of these men found that the 2-plow size fills their requirements and has the advantage over the larger size in smaller initial cost and lower operating expense. A considerable number of these farmers made the mistake of buying a tractor too small to meet their farm requirements, this resulting in overloading the machine. This practis was found unprofitable. Experience indicates that it is much better to have too much power than too little.

WORK PERFORMED BY TRACTOR DURING YEAR.

The unit cost of tractor power depends largely upon the number of days the machine is used during the year. The average for the farms reporting in this study was 49.7 days per year for work done at home. Taking into account the custom work done, these tractor owners secured an average of 55 days of work during the year. The work included spring and fall plowing, harrowing, disking, dragging, operating silage cutters, threshers, shredders, lime crushers, and other operations requiring belt work.

Table IV, which is based on the reports of 186 tractor owners who reported on this point, shows that only 38.7 per cent. of these men secured as much as 55 days of work with

their machines; while 4.3 per cent. secured less than 15 days; 13.5 per cent. less than 25 days; 28 per cent. less than 35 days; 47.4 per cent. less than 45 days and 61.3 per cent. less than 55 days of work. In view of the fact that the cost of tractor

Table IV.—Showing Percentage of Tractor Owners Obtaining Varying Amounts of Work, Based on Reports of 186 Owners.

Amount of Work	No. of Tractors	% of tractors used for number days indicated
Less than 15 days	8	4.3
From 15 to 25 days	17	9.2
From 25 to 35 days	27	14.5
From 35 to 45 days	36	19.4
From 45 to 55 days	26	13.9
55 days and over	72	38.7

work is largely dependent upon the extent to which the tractor is used during the year, it is evident from the figures given in Table IV that the cost per day's work on many of these farms is excessive.

Table V shows the relation of the number of days of work obtained with the tractor to the profitableness of the machine. It will be noted that only 18.5 per cent. of the unprofitable

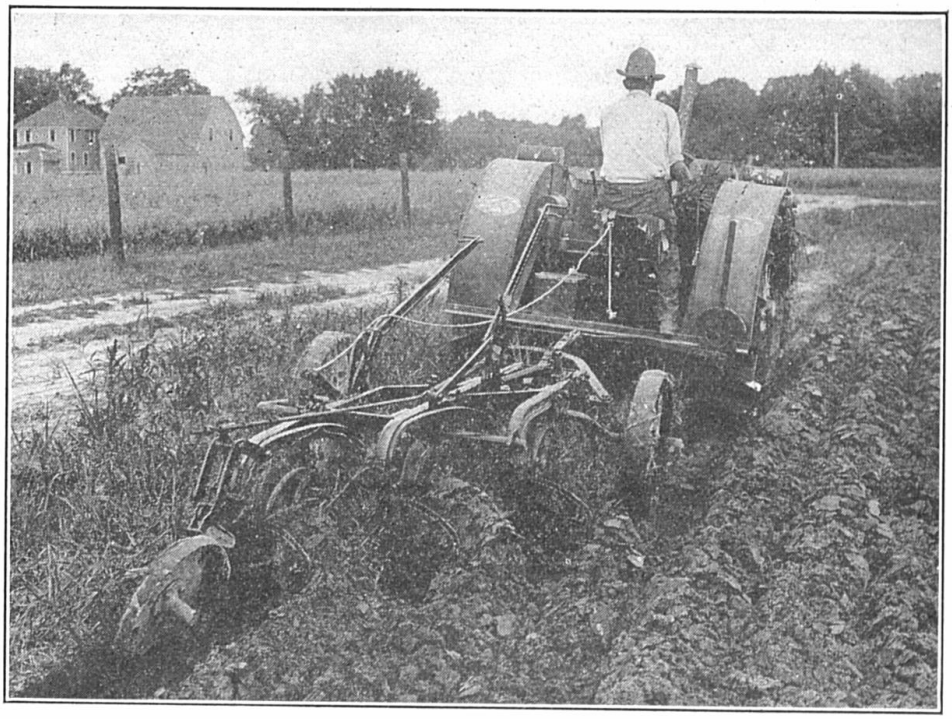
Table V.—Showing Amount of Work Obtained from Profitable and Unprofitable Tractors, Based on Reports of 186 Owners.

Amount of Work	Profitable Tractors		Unprofitable Tractors	
	No. of Tractors	% of tractors used for number of days indicated	No. of Tractors	% of tractors used for number of days indicated
Less than 15 days	3	1.9	5	18.5
From 15 - 25 days	14	8.8	3	11.1
From 25 - 35 days	23	14.5	4	14.8
From 35 - 45 days	29	18.2	7	25.9
From 45 - 55 days	23	14.5	3	11.1
55 days and over	67	42.1	5	18.5

tractors were used as much as 55 days, while 42.1 per cent. of the profitable tractors were used 55 days or more. These figures point to the necessity of the tractor owner organizing his farm work so as to utilize the tractor for the largest possible number of days of productive work. Knowledge of this fact has prompted many of these farmers to rent or buy more land after purchasing a tractor, as previously indicated.

WORK DONE PER DAY.

The 2-plow outfits in this study plowed, on an average, 6.26 acres per day of 10 hours; the 3-plow outfits, 7.77 acres, and the outfits of 4-plows or larger, 10.88 acres per day. The average for all the tractors was 7.28 acres per day. With 14-inch plows and on the basis of a speed of two miles an hour, a 2-plow outfit should break 6 acres, a 3-plow outfit 9 acres, and the 4-plow outfit 12 acres. These theoretical figures, however, are not realized in practis because of unavoidable de-



Tractor drawing three breaking plows.

lays occasioned by the presence of trash, roots, stumps, stones, hard or soft ground, and other unfavorable factors.

SUBSTITUTING THE TRACTOR FOR WORK ANIMALS.

It is an obvious fact that in order to justify the large expenditure which the purchase of a tractor makes necessary, the machine must either enable its owner to reduce the number of work animals he has previously employed in growing a given acreage of crops, or must in some other way increase the net revenues of the farm sufficiently to more than pay all the costs of its maintenance and operation. There is seldom any economy in having a tractor if the same number of horses has to be kept and are standing idle while the machine works.

This and other similar economic studies of the tractor shows that a tractor seldom or never makes it possible for a farmer to dispose of any large proportion of his work stock. On practically all farms there are many kinds of work, such as hauling light loads about the place, pulling the corn planter, mower, tedder and hay rake, which are all light, rapid operations and can usually be done more cheaply with horses than with a tractor. In the main, tractor power is usually more economical in doing work requiring large amounts of power, such as pulling heavy plows and operating silage cutters, threshers and similar machines.

This study shows that the tractor enabled these farmers to reduce the number of their work stock by about 18 per cent. The average number of work animals kept before the tractors were bought was 10.6. Afterwards the number was reduced to 8.7, thus eliminating an average of about two work animals per farm. One evident advantage of the tractor is that it may take the place of the extra work stock which a great many farmers find necessary to keep on hand in order to meet temporary needs during limited periods of rush work.

RELIABILITY.

Of the 253 tractor owners who gave data on the point of reliability of the tractor, 115, or almost 41 per cent., reported that their machines were not out of order a single day when

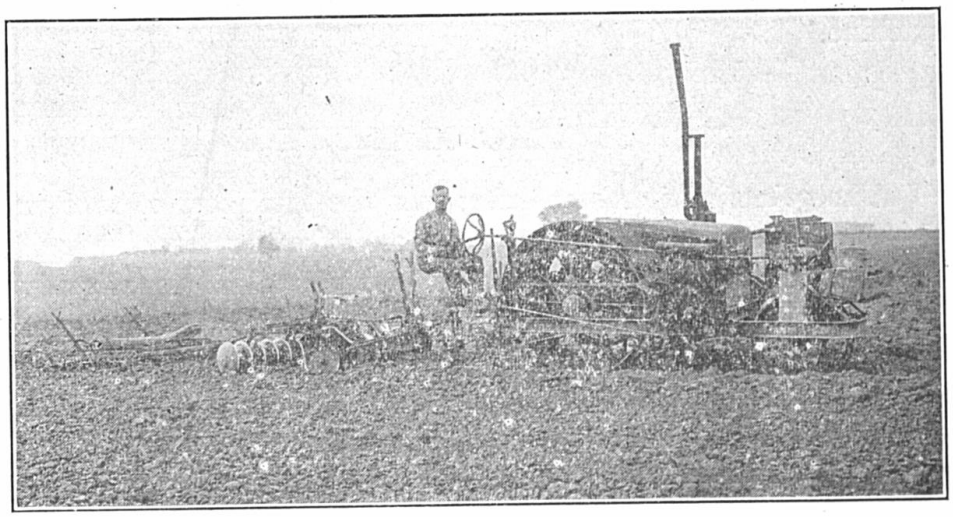
needed. Taking an average of all the farms, the time during the year that the tractors were out of commission when needed was 5.3 days.

As would be expected, less trouble with delays was experienced with those tractors which were operated by their owners or by persons having a direct monetary interest in them. Of the tractors which were unprofitable, 48 per cent. were operated by hired employees, while of those which were profitable, 42 per cent. were operated by hired persons.

QUALITY OF WORK—EFFECT ON CROP YIELDS.

Of 320 farmers whose experience is included in this investigation, 236 stated that the work done by the tractor was better than that done by horses. Fifty-one stated that it was equal to that of horses. Only 8 stated that the work was not as good as that done by horses.

The average depth of plowing by the use of the tractor was 7.8 inches as against a depth of 5.8 inches previously done on the same farms with horse drawn plows—an increase of 2 inches in favor of the tractor. The depth was not appreciably affected by the size of the outfit, being about the same for the two, three and four-gang outfits.



Tractor drawing a disk and a tooth-harrow.

In response to the question as to the effect the tractor had on crop yields, a large majority of the tractor owners indicated that the use of the tractor neither increased nor decreased yields to any appreciable extent.

Nearly all reported that the tractor did satisfactory work in disking and other operations in the preparation of the seed bed.

IMPORTANCE OF COMPETENT OPERATOR.

Eighty-one, or about one out of every four of the tractor owners, called attention to the difficulties experienced in the operation of the tractor due to the lack, on the part of the operator, of the proper knowledge of the machanism and operation of the machine. Several of these men had spent several days getting experience under competent instruction at tractor schools conducted by the tractor companies or by the College of Agriculture and all of these agreed that the small expenditure of time and money thereby entailed was amply returned in the increased amount and quality of work and the avoidance of heavy repair costs which this instruction enabled them to accomplish. The experience of these men indicates that every prospective operator should take a short course of instruction in tractor operation before attempting to operate his own machine.

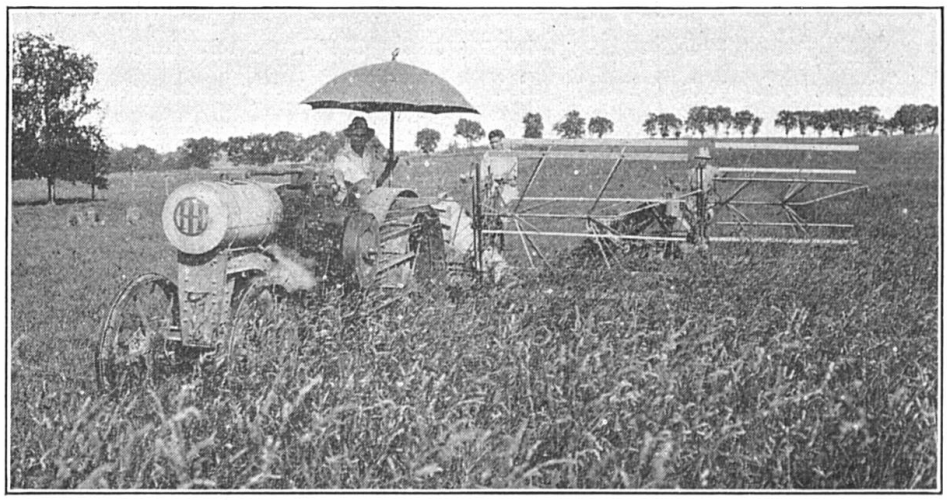
COST OF TRACTOR PLOWING.

The principal items entering into the total cost of tractor plowing are fuel and lubricants, depreciation, repairs, labor of the operator, and interest, taxes and insurance. As previously indicated, the 3-plow tractor most nearly meets the needs of the greater number of Kentucky farms having conditions which justify the purchase of a tractor. This size, therefore, is taken in the calculations of tractor-power costs which follow. The average cost of a tractor of this size, equipped with a 3-gang plow, is about $1,400.

Cost of Fuel and Lubricants.—The amount of fuel required for breaking an acre of land with tractor plows averaged 2.9 gallons. The fuel, in most cases, was kerosene, but in a few cases gasolene was used. The average price of kerosene was 15 cents per gallon and that of gasolene, 25 cents per gallon. On the basis of these prices the fuel cost per acre for plowing was 43.5 cents for the machines using kerosene for fuel.

The quantity of cylinder oil used per acre averaged about 1-5 of a gallon, varying considerably with the different tractors. The average price of oil was 55 cents per gallon, making the cost for this item about 11 cents per acre. Adding to this 1.5 cents per acre to cover the cost of hard oil or grease, the total cost for fuel, oil and grease amounted to 56 cents per acre.

Depreciation—Life of the Tractor.—The life of the tractor, like that of any other machine, depends, to a large extent, upon the care and intelligence used by the operator in handling it. The tractor is continually subjected to very trying conditions of which may be mentioned the heavy work in plowing hard ground, the uneven surface over which it must frequently travel, stones, stumps and roots which often lie in the path of the plow, and the dust from the soil which, in spite of



Tractor drawing two harvesters.

mechanical devices designed to prevent its entrance, tends constantly to get into the bearings where it seriously increases the wear and shortens the life of the machine.

The greater number of tractors included in this study have been in use less than three years and, for this reason, it was impossible to secure actual figures on the life of the machines. In an effort to secure as close an approximation as possible to the length of service which may be reasonably expected, each owner was asked to estimate the number of years his machine would give satisfactory service. According to these estimates the average life of a tractor operated under conditions existing on these Kentucky farms would be 7.3 years. Using that figure and $1,400 as the price of a tractor equipped with 3 plows, the annual depreciation charge is $191.78. On the basis of 55 working days (see page 57) the depreciation charge for a day's work is $3.49. Using 7.77 acres as the area of land broken by the tractor in a day, the cost per acre for plowing is 45 cents. From these figures it is evident that the depreciation charge is one of the heavy costs in operating the tractor. This cost is apt to be overlooked by many persons when considering the cost of tractor operation.

Repairs.—As in the calculation of the depreciation charge for these tractors, it is possible only to approximate the average yearly cost of repairs during the period of the life of the machines. A good many of the farmers who had used the tractor only one year reported no expense for repairs and the average repair cost for this class was only a few dollars. During the subsequent seasons, however, repair costs on the tractor steadily increased and numerous owners mentioned heavy repair costs as one of the principal disadvantages of the tractor. According to studies made by the U. S. Department of Agriculture, the repair costs on farm tractors averaged about 3 per cent. of the original cost of the tractor, for the first three years of its life. Yerkes and Church state* that the

*Farmers Bulletin No. 963, U. S. Department of Agriculture, Washington, D. C.

yearly cost of repairs during the life of the tractor is about 4 per cent. of the original cost. Using that figure, the repair charge on a $1,400 outfit is $56 for the year, $1.02 per day, and 13 cents per acre.

Labor.—In a majority of cases the tractors in this study were operated by the owners or some other person having a personal interest in the machine. When hired operators were employed, the wages paid ranged from $2.00 to $4.50 per day. Taking $3.50 as the charge for the average operator's wage, the item of labor for operating the tractor is 45 cents per acre.

Interest on the Investment, Taxes and Insurance.—The purchase price of a farm tractor (1919) ranges from about $850 to $1,200 for the 2-plow size; $1,000 to $1,800 for the 3-plow size and $1,500 to $3,200 for the 4-plow size and larger. Interest the first year is based on a valuation of $1,400; for the second year, $1,400 less 13.7 per cent. depreciation; for the third year, $1,400 less 27.4 per cent., and so on for each succeeding year during the life of the tractor. Thus assuming a uniform rate of depreciation and not taking into account the final junk value of the machine, the average value of the tractor during its life would be $700. Counting interest at 6 per cent., allowing 1 per cent. to cover taxes and insurance, and with an average investment of $700, the charge of these items is $49 per year, 90 cents per day, or 11.5 cents per acre for plowing.

TOTAL COST FOR PLOWING.

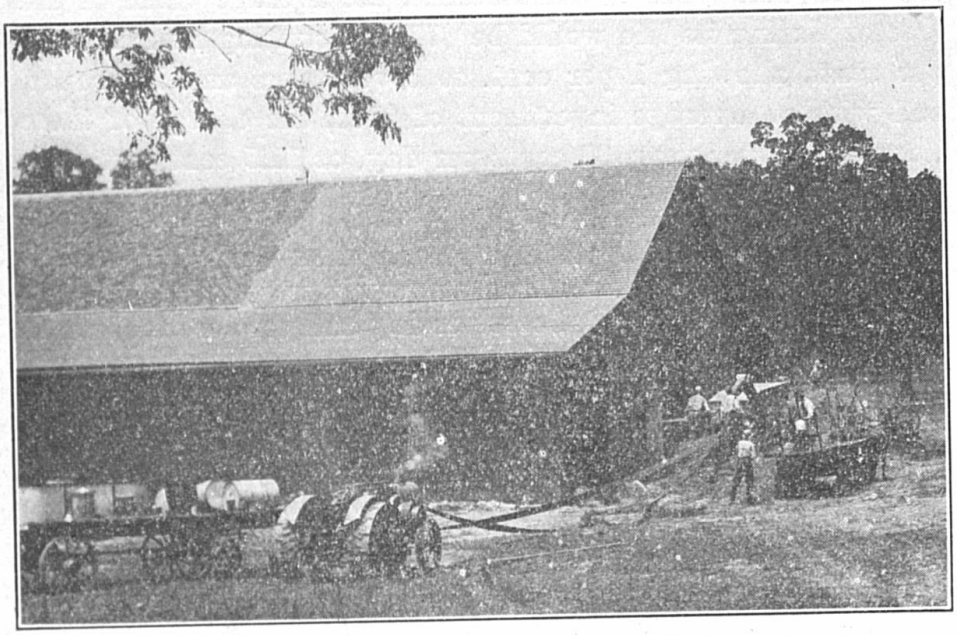
The approximate total cost per day and per acre for breaking an acre of land with a tractor is shown in Table VI which is based on a 3-plow outfit costing $1,400, lasting 7.3 years, and doing 55 days of work during the year. For those using their tractors for less than 55 days of work per year, the cost would be greater than indicated by the table. The costs here given do not include that for housing or for miscellaneous labor expended by the operator in caring for or overhauling the machine at times when it was not actually engaged in field work or belt work.

Table VI.—Approximate Cost of Plowing An Acre With a 3-Plow Tractor, Based on a Cost of $1,400 for the Tractor and Plows, a Life of 7.3 Years, and 55 Working Days per Year.*

Items of Cost	Cost per Day	Cost per Acre
Fuel and lubricants	$ 4.35	$ .56
Depreciation	3.49	.45
Repairs	1.02	.13
Labor	3.50	.45
Interest, taxes and insurance	.90	.115
Total Cost	$13.26	$ 1.705

*These figures do not include the cost of housing.

Cost of Other Operations With the Tractor.—Figures were not obtained in this study to show the cost of a day's stationary work, or for field operations other than plowing. The experience of farmers indicates that when the engine is working at full capacity the fuel and oil expense is about the same for stationary work and for field operations other than plowing, as for plowing.



Tractor driving a thresher.

ECONOMY OF THE TRACTOR.

Judging from the experience of these tractor owners, it is unlikely that the use of the tractor will effect any material reduction in the expense of operating the farm.

It will be noted that the costs for plowing stated in Table VI are based on 55 days of work. Many farmers secure much less than this number of days of work (Table IV). For these farmers the cost per acre for plowing with the tractor plow may be considerably greater than that with the horse-drawn plow, especially when the two-bottom horse-drawn plow is used. The tractor, however, has the advantage in that it may enable its owner to increase his total crop acreage and the amount of crops which one man can handle. This fact is well brought out by the following statement of one large farm operator in Central Kentucky who uses four tractors: "We have found that the big advantage of the tractor is the large amount and rapid work it will do. This work is expensive, but it pays us."

THE TRACTOR FOR SILO FILLING.

A point of large importance to farmers who require power for the purpose of filling the silo is that the machine selected shall be of sufficient size to insure ample power for operating a good-sized silage cutter. One hundred and forty-six of the tractor owners used their machines for silo filling. Of this number 8 reported that their machines did not furnish sufficient power for that purpose. Fifty-six of the machines so used were of the 2-plow size and all of these except 5 furnished ample power for operating cutters which averaged 12.7 inches in width of throat. Seventy-two machines were of the 3-plow size and all of these except three furnished ample power for operating the cutters which averaged 15.6 inches in width of throat.

The largest size of cutter operated by the 2-plow machines was 15 inches, while the greater number were of the 11, 12 and 13-inch size. To insure against overloading the 2-plow tractor it is usually unwise to use a cutter larger than the 13 inch size.

The greater number of the cutters operated by the 3-plow tractors ranged from the 13 inch to the 16 inch size. For best results, especially to avoid overloading, it is usually not advisable to attempt to use a 3-plow engine for operating a cutter larger than 15 inches.

The tractor of the 4-plow size or larger may usually be relied upon for operating a cutter up to the 18 inch size.

CUSTOM WORK.

The experience of the tractor owners indicates that in a majority of cases it does not pay farmers to use their machines for doing custom work. More than half of the farmers in this study who used their tractors for that purpose reported that the practis had been unprofitable. The farms operated by the men who did custom work with their tractors averaged 403 acres in size. Obviously, an area as large as this will, in most cases, furnish a business of sufficient size to require the constant presence of the farmer at home, and the doing of custom work would be more than apt to result in neglect of work on the home farm. This is doubtless the reason for the unprofitableness of custom work in most of these instances.

Custom work was undertaken by a considerable number of farmers in this study because the home farm did not furnish enough work to employ the tractor economically. When this was the case the tractor owner often found it profitable to do custom work for the reason that it increased the number of days the tractor worked during the year and thereby reduced the cost per day for interest, depreciation and other fixed charges.

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Agricultural Experiment Station

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BULLETIN NO. 223

Feeds and Their Use
Inspection and Analyses

BY

J. D. TURNER, H. D. SPEARS
and A. M. PETER

October, 1919
(69)

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BULLETIN NO. 223

Feeds and Their Use—Inspection and Analyses

By J. D. Turner, H. D. Spears and A. M. Peter.*

The scarcity and high price of feeding materials brought about by war conditions have made a number of changes in the feeding-stuff situation in Kentucky. Some of the standard materials common to the Kentucky market, such as brewers' and distillers' dried grains and malt sprouts, are no longer manufactered in appreciable quantities and the wheat by-products, bran, shorts, middlings and mixed wheat feed, are in limited supply and in no wise meet the demand. On the other hand, these conditions have stimulated the introduction of a host of substances new to Kentucky feeders, such as velvet-bean feed, cocoanut meal, peanut feed, barley feed and rye feed. Some of these products are worthy substitutes, from the standpoint of furnishing food materials, but the prices commonly put on them are out of all proportion to their real food values. In addition to these, two new materials of very considerable merit, dried buttermilk and soy-bean meal, are being used in Kentucky. The value and uses of these new materials, together with others of long use, will be discust later in this bulletin.

This bulletin is presented with the purpose of giving the results obtained by this Department in its inspection and examination of the manufacture and sale of commercial feeding stuffs in Kentucky, and in discussing these results it is our purpose to offer such suggestions as will be of mutual interest to both the manufacturer and the feeder, and to show the co-operative relationship that should exist between them.

*Acknowledgement is due and thanks are extended to Dr. G. D. Buckner and Professors E. S. Good and W. S. Anderson, of this Station, for the valuable suggestions and assistance given in the preparation of this bulletin.

The feeding-stuff industry, like farming, in order to meet the necessities for successful operation, must be put on a more scientific basis; yet, it should be borne in mind that the experimental data covering the digestibility and nutritive value of many of the common feeding materials are limited to few trials and are often incomplete. Therefore, the various subject discussions, suggestions and analyses herein given are only "pointers", helpful, if properly studied and valued.

The Law

Other bulletins of this Department have discust the law, its operation, and the function of nutrients, at some length and many authors have published works on the nutrition of animals, but it will not be amiss to briefly present here some of the more important things of general interest relating to these subjects.

The operation of the law and the benefits resulting from it are so generally understood and recognized that violations have been, in most instances, of a minor nature and, when made, are usually thru ignorance or an oversight of the provisions of the law. Due to the great demand for materials and their high prices, old practises long discarded have again been taken up by a few manufacturers and prosecutions have resulted. However, only a few prosecutions have been necessary and, as a whole, the feeding stuffs put on the market in Kentucky have been up to the claims of the manufacturers and the spirit of co-operation of the manufacturers, dealers and feeders has been exceedingly gratifying.

Material covering the operation of the law, copies of the act itself and rulings and regulations of the Department have been sent, from time to time, to those interested or affected by the law.

The purposes of the law, as applied to those directly interested, are fourfold: First, to require all feeding stuffs to be registered and labeled with an official Kentucky label showing the manufacturer's guaranty; second, to protect the consumer against inferior and adulterated feeds and short weights; third, to protect the honest manufacturer and dealer against dishonest competition; fourth, to promote a more economical and intelli-

gent use of commercial feeding stuffs by feeders, whether used as a mixed ration or as a supplement to the materials lower in protein produced on the farm.

Some feeders appear to have a false idea of the requirements and purposes of the law, as to the extent of giving information, as the Department is often asked for the amounts of digestible nutrients in certain mixed or compounded feeds found on the market, and they do not understand why this information is not printed on the State official tag. It is impracticable to give such information in this manner, as no two mixed feeds, varying in the nutritive elements and composition of ingredients, have the same digestibility, and the digestibility of one combination of ingredients will differ from that of another combination of the same ingredients. The law only contemplates giving such information as will guide the purchaser in selecting his feeds, furnishing him with the manufacturer's guaranty to the State, so that he may know with reasonable accuracy the character of the feed he is buying. On the official tag, the manufacturer's guaranty must show the net weight of contents of the bag, the name of the feed, the name and address of the manufacturer or person responsible for placing the feed upon the market, the least amount of crude protein and fat and the maximum amount of crude fiber and the specific name of each ingredient used in making the feed. In addition to the above information, if a material of little or no feeding value (or a material that is not classified as a concentrate) is used, such as corn-cob meal, oat hulls, cotton-seed hulls, clipped oat by-products, etc., the percentage must be given. If screenings are used, the percentage must be stated along with the statement whether ground or unground. With this information it is presumed that the feeder has sufficient information to make an intelligent selection of his feeds.

Feeds are rarely offered for sale in the State that are not regularly registered and labeled in accordance with the requirements of the law, and in most instances the feeds run well up to their claims.

System of Tagging

In addition to the information printed on the State tag, the Department uses a color scheme of three colors, black, red and yellow. This is done in order to classify the feeds relative to their general make-up and help the buyer to recognize by a glance at the tag the general character of the feed. This, in connection with the information printed on the tag, should serve as guide to the purchaser and give reasonable warning and an opportunity to make whatever investigation he desires before he accepts the feeds.

The color system is: First, a manila tag printed in black ink represents a feeding stuff made of the products or by-products of one grain or plant only, such as wheat, or corn, or cotton seed, etc. For example, wheat shorts, mixed wheat feed, wheat bran, cotton-seed meal or corn feed meal would bear manila tags printed with black ink. Such feeds are commonly known as "straight" feeds.

Second, a manila tag printed in red ink indicates that the feeding stuff is made of the products or by-products of two or more grains or plants, such as corn and wheat, or corn, wheat and cottonseed meal, etc. For example, a combination of corn feed meal, wheat bran, alfalfa meal, molasses and cottonseed meal would take a manila tag printed with red ink.

Third, a yellow tag printed in black ink indicates that a feeding stuff contains a material of little or no feeding value, or a material not classified as a concentrate, such as oat hulls, corncob meal, peanut hulls, cottonseed hulls, flax-plant refuse, clipped oat by-product, peat, etc.

The Purchasing of Feeding Stuffs

Commercial feeding stuffs are usually purchased for the purpose of supplementing the feed materials raised on the farm and especially is this true where corn, oats, timothy hay and like materials are the only crops. If alfalfa, cowpeas, soy beans and similar crops can be raised and used on the farms in Kentucky, very little of the concentrates, if any, will be needed, as these

materials are rich in protein and will supply sufficient nourishment, and may be used to supplement the low-protein feeds. The chief economic problem facing the purchaser of feeding stuffs, whether he grows a portion of his feeds or not, is what to feed and how to feed it, in order to get the best results at the least possible cost. One of the most important questions, then, for the feeder is how to buy his feeds or the materials to make up his rations. Many feeders lack the knowledge of the physiological requirements of animals performing the different grades of labor and, in consequence of this fact, there is frequently great waste of feeding material in various ways. Those who feed intelligently are usually feeders who use large quantities of commercial feeds and buy only high-class materials at close prices. It is, therefore, the small feeder who lacks the proper knowledge and will not go to the trouble to investigate.

The feeder should constantly bear in mind that the amount, kind and character of feed an animal requires, depends entirely upon the use to which the animal is going to put the feed. An idle horse does not need the food that a working horse requires, nor does an idle cow need the food that is necessary for a cow giving a large flow of milk. The young, growing animal needs a different kind of ration from that used for fattening purposes. The amount of crude protein will serve only as a general guide in selecting feeding stuffs and the consumer should base his final conclusion on the amount or estimated amount, at least, of digestible nutrients the feed contains. This can be arrived at only in a general way by taking the list of ingredients composing the feed in question as the basis for an estimated formula and calculating from this the probable amounts of digestible nutrients present, by using the data in tables Nos. I and II. The result may not be accurate but will be sufficiently so to give the buyer a general idea of the amounts of the digestible nutrients and character of the feed. Some mixed feeds will run high in crude protein for the reason that a highly concentrated material, such as cottonseed meal, has been used in the mixture for the specific purpose of bringing up the protein in cheap, fibrous, trashy materials.

Consumers should distinguish between crude and digestible nutrients and give special attention to the materials composing the feeds and the guaranteed anlysis as well. The best way to avoid mistakes is to observe the official label and the guaranty.

Points a Feeder Should Consider

No feeder can get the best and most economical results unless he exercises due intelligence in purchasing his feeds. The value of a feed depends upon that portion of the nutrient which an animal can, under ordinary conditions, digest and take into its system for building up the growth, keeping up the heat and energy and repairing the natural waste of the body. It may prove of much value to a feeder if he will observe these suggestions:

Ascertain what the animals need and what will supply these needs, as no animal will give good results without proper food.

If in doubt as to what the animals need, consult the Experiment Station or an expert.

Buy no feed that is not properly registered and tagged with an official tag.

Read and study carefully the information given on the official tag.

High-grade feeds are most economical. Many commercial feeds sold in Kentucky are cheap, inferior and unbalanced, and do not furnish the animal with proper nourishment, thus resulting in a hardship to the anmial and a loss to the owner as well.

The kind and character of feed an animal requires depends entirely upon the use to which that animal is going to put the food.

The amount of crude protein, fat and fiber will serve only as a general guide in selecting a feeding stuff. The purchaser should base his final conclusion on the amount of digestible nutrients which can be reasonably estimated from the tables of average analyses of materials and digestible nutrients.

An excessive amount of food not only overtaxes the digestive organs and invites disease but is an actual waste, as well. On the other hand, an insufficient amount will cause loss for want

of necessary nutrition and diminishes the ability of the animal for performing the desired amount of work. Unless the food is properly balanced one set of tissues of the body may not receive sufficient nourishment, thus causing loss by destroying the equilibrium of the nutrients demanded by the animal system for its proper maintenance and growth.

Points the Manufacturer Should Consider

Registration—All concentrated commercial feeding stuffs must be registered with the Experiment Station and have the State official tag attached before they can be legally sold or offered for sale within the State.

Concentrated Commercial Feeding Stuffs—This term, in the Kentucky law, covers practically all materials used as feeding materials except whole hays, straws, cottonseed hulls, corn stover, and whole seeds and grains when unmixed with other materials.

Brand—Every distinctive brand must bear a State official tag showing the manufacturer's guaranty, as provided in the law.

State Official Tag—The State official tag contains the only legal guaranty recognized in Kentucky, and any guaranties on private labels or containers are not considered within the provisions of the law.

Alteration of Labels—No alteration, either by additions or erasures, of the State official label, is permissible under the law, and any alteration made is in violation of the law.

Change in Guaranty—Registrations are received as permanent and no change will be accepted without a new registration or written authorization to make the change, and if the change made materially lowers the value of the feed, the name of the feed must also be changed. At times the Department may ask for new registrations in order to facilitate matters in the office, but due notice will be given.

Manufacturers' Guaranties—All feeding stuffs must equal or exceed the guaranties made by the manufacturers. An excess of one ingredient will not compensate for a deficiency in another, nor will the combined amount of the analyst's finding of crude protein and fat be accepted for the combined crude protein and fat of the guaranties made by the manufacturer.

Attachment of Label—The State official label must be attached to each and every package of feed. Do not make shipments into the State or make deliveries within the State without properly attaching labels, as you will subject your customers to violations of the law unintentionally.

Points That Dealers and Distributors Should Consider

Study the Law—Be sure you are familiar with the requirements of the law, rules and regulations governing the sales of feeding stuffs. If you are not, consult the Department and secure copies of the law and regulations.

From Whom to Buy—Buy from only reputable concerns—concerns that have good records and are complying with the law, and will assist you in complying with the law.

Selection of Feeds—Have definitely in mind the kind of feeds you wish to purchase for your trade and accept no shipments that are not properly labeled with the State official label. In making your contract for feeding stuffs, do so on the official guaranty and when the shipment is received examine labels closely to see whether they are in accord with the guaranty, before accepting the feed. If the labeling is not in accord with the guaranty, it would be better to refuse to accept the shipment until the matter is adjusted in accordance with the contract.

Assistance by the Department—In case of any irregularity in shipments made by manufacturers to dealers or agents, in misbranding, non-labeling, short weights, or other infraction of the law, if the Department is notified it will act immediately on the merits of the case.

Freight Bills and Invoices—It is sometimes necessary to be able to trace shipments and especially is it necessary on inter-

state shipments in our co-operative work with the United States Department of Agriculture when the goods are found not up to guaranty. Therefore, all freight bills and invoices on shipments of feeding stuffs should be retained by the purchasers.

Rebates—The paying of a rebate for deficiencies does not release a manufacturer or dealer from prosecution for a violation. It does show in many cases good faith and intention on their part. If rebate is made, such rebate should go direct to the actual purchaser or feeder, on an equitable basis. Record of the transaction should be filed with the Department immediately. The Department will, upon request, gladly assist in making settlements of refunds between manufacturer and purchaser when it is clearly within its jurisdiction.

Labeling—It is the practise of some manufacturers to place labels in the car with shipment of feeds without attaching labels to the bags, which often results in confusion or a failure to label at all. In some cases the labels were not put in the car or were misplaced or lost. The labels should be attached when a car is loaded and certainly not later than when the feed is taken from the car.

Chemical Analysis

The law of the State requires a statement of the percentages of protein, fat and fiber, only, in any feed, the idea being that this information, along with the other data covering the ingredients, would protect the purchaser and enable him to intelligently buy his feed, but for the intelligent preparation of a ration other nutrient constituents should be known. Many authoritative works discuss the functions of the constituents of feeds at length, but it is deemed advisable to briefly outline here the part played by them in digestion and nutrition. Henry and Morrison, in Feeds & Feedings, whose work has been consulted repeatedly in preparing this bulletin, define digestion as the changes which food undergoes within the digestive tract of the animal to prepare it for absorption and ultimate use in building new tissues, repairing body waste, and as a source of energy. They define a nutrient to be any food constituent, or group of

food constituents of the same general chemical composition, that may aid in support of animal life.

Water, tho essential to life, is not considered one of the nutrients. It is present in air-dry feeding stuffs, tho it cannot be seen or felt, varying in quantity according to the nature of the material, averaging around ten or twelve per cent. Its presence adds no value to feeding stuffs because it is obtained in abundance from other sources, at no appreciable cost. Besides being of no value in feeds, its presence reduces the percentages of the desirable ingredients by occupying their space, and an excessive amount lowers the keeping qualities of the feed.

Ash contains the inorganic or mineral constituents of feeds. These mineral constituents form the bony structures and are found in all the vital tissues and secretions of the animal body. Their importance may be realized when we recall recent experiments which show that animals deprived of mineral matter generally die sooner than when no food is given them at all. Iron, potassium, phosphorous, calcium, sodium and chlorin are the most important of these constituents. Just how they act, or the part they play in the role of animal and vegetable life, is not completely understood, but the need for them in the animal economy is well established. Grains, seeds and tubers are deficient in calcium, sodium and chlorin. Legumes and the hay made from them, corn stover and the leafy parts of plants generally contain sufficient quantities of these substances. The common practise of giving salt to live stock supplies the need for sodium and chlorin.

Protein is the name applied to the nitrogenous materials which are essential to the life of the animal. It contains about 16 per cent. of the element nitrogen and its amount is obtained simply by multiplying the amount of total nitrogen found by analysis by the factor, 6.25. Protein, the nitrogenous component, is the most important as well as the most costly constituent in a feed and the value of the feed depends very largely on the amount of this constituent it contains. It produces flesh, muscle, ligaments, glandular secretions, milk, blood, tendons, hair, hoof,

hide, and is found in all portions of the animal body, including the bones which contain 25 or 30 per cent. Under certain conditions, as in starvation, protein may serve as a source of heat and energy; it may even go, in part, to the formation of fat, thereby taking the place of the other nutrients, fat and carbohydrates, but no other nutrient can take the place of protein because no other contains nitrogen.

Investigations of recent years show that different groups of proteins perform different functions; that one group will repair body waste and build up new body tissue, while another will suffice only to prevent body decline. It is important, therefore, to distinguish between complete and incomplete proteins, or the specific service rendered by the different protein groups. In order to supply a sufficient quota of protein, or protein groups, it would be the part of wisdom to supply it from different sources so that the elements which might be deficient in one may be supplied by another. A mixed ration, therefore, made up of a number of materials is very desirable.

Nitrogen-free Extract is of importance as a source of heat, nervous and muscular energy. While it does not have as great a power in this respect as fat, it is present in such large quantities in feeds that it serves an important part. The members of this group of constituents differ in nutritive value on account of the wide variance in their digestibility. The starches and sugars are readily soluble and almost completely digested, while pentosans and other less well known substances are digested with much more difficulty and less completely. Nitrogen-free extract is converted into fats in the animal body and any excess over the immediate needs of the body is stored as fat in the tissues.

Fiber is the woody portion or structural material of plants and grains and outer grain coatings. When present in large quantities, it exerts a retarding influence on the digestion of nutrients present in feeding stuffs, as it is itself only partially digested by animals. Its chief value appears to lie in its mechanical effect produced in the intestinal tract.

Fat (ether extract, or crude fat) produces heat, nervous and

muscular energy. Under this name are included not only the fats and oils, but also other substances soluble in ether, such as wax, resins and chlorophyl or coloring matter. As an energy producer its value is 2.25 times greater than that of either carbohydrate or protein.

Carbohydrates are the nitrogen-free extract and fiber together, tho the term is often wrongly used as synonymous with nitrogen-free extract.

Use of the Chemical Analyses

The amount of crude protein and fiber a feed contains will serve as index of its general nature. It will be noted that in a feed high in fiber, the essential nutrients are correspondingly low and their digestibility impaired by its presence. This is not so marked with ruminants; in fact roughage is essential for them, but with animals having small stomachs, such as hogs, much inert material in the feed is injurious. It should be borne in mind that with materials commonly used as fillers, such as cob meal, peanut hulls, oat hulls, cottonseed hulls, velvet bean hulls, etc., the feeder pays about the same price for the fiber or filler in such mixtures as he does for the actual food in first-class materials and he suffers a financial loss, while his animals may suffer for the lack of proper nourishment.

The amount of nitrogen-free extract may serve as a further index to the character of the feed, since a high nitrogen-free extract will indicate a better grade of feed. In analyses of materials or combinations of materials where the amount of nitrogen-free extract is not given, this may be determined by adding together the amounts of protein, fat, fiber, water and ash and subtracting this total from 100. In case the amounts of water and ash are not given and cannot be gotten from the tables of analyses, the average percentages of water and ash in similar materials or their combinations may be used as a basis for calculation, tho the ash varies considerably. The average percentage of water may be taken as 10, the percentage of ash in whole grains, 2.5 and in their by-products as 4.50. For example, the

approximate percentage of nitrogen-free extract in a mixed feed composed of corn feed-meal, wheat bran, wheat shorts, cotton-seed meal and alfalfa meal, with an analysis given as 16.5 per cent. protein, 4.50 per cent. fat and 12.5 per cent. fiber, can be obtained as follows: Taking 10 per cent. as the average moisture and 4.5 per cent as the averge ash, add together 16.5, 4.5, 12.5, 10.0 and 4.5, giving 48.0; subtract this from 100 and we have 52 per cent as the amount of nitrogen-free extract.

Likewise, the nitrogen-free extract can be determined in other formulas where part of the figures can be obtained from the guaranty on the label and the average figures taken on standard materials. These results are not accurate, but will help in forming a judgment as to the character of the feed.

Nutritive Ratio

Nutritive ratio is a term that all feeders should be familiar with. It is the ratio between the amount of digestible protein and the amount of digestible carbohydrates (or fiber and nitrogen-free extract) and digestible fat (or ether extract) which a given feed contains based on their energy values. Protein and carbohydrates have the same energy-producing value, but fat has 2.25 times as much as either; hence, in calculating a nutritive ratio, fat must be put on the same energy basis as the carbohydrates, which is done by multiplying the percentage of digestible fat by 2.25.

If we take as an example wheat middlings containing 12.8 per cent. of digestible protein, 3.9 per cent. of digestible fat and 47.5 per cent. of digestible carbohydrates, we have, by completing the foregoing arrangement: Carbohydrates, 47.5, plus 8.8 (fat, 3.9 times 2.25) divided by protein, 12.8, or $56.3 \div 12.8 = 4.4$; therefore, the nutritive ratio is 1 : 4.4. In this way the nutritive ratio of any feed in which the digestible nutrients can be obtained, may be calculated.

Net Energy Value

Probably the most accurate measure of the feeding value of feeds is the *net energy value*. This represents the amount of

energy which the animal can derive from the feed, over and above what is consumed in the work of mastication and digestion and that remaining unused in the feces, urine and combustible gas. It is a measure of that part of the feed which the animal can use in actual production, such as making growth and fat, producing milk, doing work, etc.

Net energy values are expressed in *therms* per 100 lbs. of feed, a therm being the amount of heat required to raise 100 kilograms of water one degree Centigrade, or approximately 1,000 pounds of water four degrees Fahrenheit. The total energy which a feed is capable of yielding is easily determined by measuring the amount of heat it produces when burned; this does not give us a true measure of the value of the feed, however, because the amounts of energy consumed in the work of preparing the food by chewing and digestion or thrown off in waste products are very different with different kinds of feed. The animal can use a much larger proportion of the total energy of concentrates than of roughages. For example, corn meal and timothy hay yield about the same amounts of total energy from equal weights; about 171 therms and 174 therms, respectively, from 100 pounds, but the deductions to be made for waste, including undigested material, combustible gases arising from fermentations in the digestive tract, unburned substances in the urine and work of mastication and digestion, amount to about 85 therms for 100 pounds of meal and 132 therms for an equal weight of hay. Subtracting these figures from the total energy values, we find that the animal consuming 100 lbs. of corn meal can get from it 85 therms of *net* energy which it can use in work or growth, whereas the consumption of 100 lbs. of hay would have yielded only 43 therms.

The net energy values of many feeds have been determined by the elaborate experiments of Armsby and others. These values, quoted from Armsby's Animal Nutrition, have been included in Table III. They are based on experiments with ruminants, but are thought to be fairly accurate for horses and swine. The requirements of animals are sometimes stated in terms of net energy and rations worked out accordingly. More detailed in-

formation on this subject can be obtained from Bulletin 459 of the U. S. Department of Agriculture or from recent text books on animal nutrition.

Vitamines

Recent investigations have proved the importance of certain substances called vitamines, which are contained in some food materials, but not in all. Altho these substances are present in very small quantities in feed-stuffs and have not been detected by chemical anlysis or obtained in the pure state, three distinct kinds, called "fat-soluble A", "water-soluble B" and "water-soluble C" have been recognized by their solubility and their physiological action. These are provisional names given in the absence of definite knowledge as to the chemical composition and relations of the substances. "Fat-soluble A", so called because it is soluble in fats or oils but not in water, is found in its most concentrated form in butter fat and egg-yolk fat, but not in lard. It occurs in the leafy parts of plants, but not in the vegetable oils, such as cottonseed oil or olive oil. This substance is necessary for growth and maintenance in all animals and its absence leads to a disease known as Xerophthalmia, characterized by sore eyes, accompanied by general decline. The other two vitamines, as their names imply, are soluble in water but not in fats or oils. "Water-soluble B", also a growth-promoting substance, is found in adequate quantity in all natural food-stuffs, such as milk, eggs, grains, leaves, etc. It prevents the occurrence of a disease known as beri-beri in man. "Water-soluble C", also known as the antiscorbutic vitamine, is found in the juice of the orange, the tomato, the swede and elsewhere. It prevents or cures scurvy. It is to supply this substance that the use of orange juice, or the like, is necessary for infants fed exclusively on pasteurized milk. The presence of adequate quantities of all of these vitamines in the food of animals is essential to their health and growth.

Essentials of a Balanced Ration

Until recently, the conception of a balanced ration was that it should contain digestible protein, carbohydrates and fat in the

right relative amounts, and it was assumed that the consumption by the animal of a sufficient amount of such a ration would bring about proper nourishment. Recent investigations have shown that the proportion of digestible protein to digestible energy-producing nutrients, or the nutritive ratio, while of fundamental importance, is only one of the essentials to a balanced ration. It can now be said that a ration is properly balanced only when it satisfies the following conditions:

1. Contains the proper amount of energy-producing substances, such as sugars, starches and fats.
2. Affords the proper supply of complete proteins.
3. Supplies the proper quantity of mineral matter.
4. Contains the proper amount of undigestible material as furnished by the fibrous or structural parts of plants.
5. Supplies the vitamines in adequate amount.
6. Is devoid of an appreciable amount of any poisonous substance having a cumulative effect.

Certain experiments conducted at the University of Wisconsin will serve to illustrate some of the recent advances in our knowledge of feeds. Young heifers fed a ration consisting exclusively of wheat and wheat straw grew until they weighed about 1,000 pounds, when their weights became stationary, followed by a general decline, roughened coats, blindness and failure to reproduce. Cows fed on a wheat ration remained in an apparently good state of health but their calves were often prematurely born and always in a poor state of health. Where the ration consisted entirely of corn products, including all parts of the plant, normal growth, maintenance and reproduction followed. Where the ration consisted solely of oat products, abnormal reproduction resulted. The wheat ration and the oat ration were deficient in mineral matter but, besides this, the wheat ration contained a poisonous substance which is cumulative in its action. The deficiency of mineral matter may be supplied by the addition of the proper salt mixture or by the use of a suitable roughage, such as corn stover or a leguminous hay. The effect of the poisonous substance was overcome, to a certain

extent, by substituting corn stover for part of the wheat straw, and to a greater degree by the use of any leguminous hay.

Experiments of this kind show the serious consequences which may result from improper feeding. It is quite possible that some of the premature births of animals on the farm, attributed to contagious abortion, may have resulted from improper feeding. It is most important that corn stover, corn silage, or one of the leguminous hays form part of the ration of any herbivorous animal, because these materials contain all of the substance necessary to round out a balanced diet, when fed in connection with the ordinary grains.

Average Composition of Feeding Stuffs

Table I comprises the average analyses of materials usually found in commercial feeds. The data are derived, as far as possible, from analyses made in the laboratories of this Station, supplemented by the published results of other laboratories.

Table II contains analyses of materials like oat hulls, peanut hulls, cottonseed hulls, corn-cob meal, velvet-bean hulls, etc. They are not concentrates and are used primarily as fillers or adulterants. Clipped-oat by-product and flax-plant refuse are very variable in quality; as used in mixed feeds they are generally nothing more than oat hulls, broken and ground flax stems, etc. It should be said that materials of this nature can only be described in a general way as being very fibrous and having little feeding value. Their digestibility is usually very low but some of them have an appreciable feeding value and should be conserved. Such can be fed economically as roughages, if obtainable at prices consistent with their low feeding value. When a feeder is in need of specific information on these materials he should consult the Experiment Station or a standard text-book.

Materials like charcoal, grit, salt, peat, calcium carbonate, oyster shells, etc., are not listed in the tables because they do not supply any organic nutrients.

Table III gives the average percentage of digestible nutrients contained in the common feeding stuffs, the nutritive

ratio and the net energy value of each. The figures for digestible nutrients are derived in part by computation from our own analyses, using the coefficients of digestibility given in Henry and Morrison's tables, part are quoted from that work, and the net energy values are copied from tables in "The Nutrition of Farm Animals" by H. P. Armsby, 1917.

TABLE I.—AVERAGE COMPOSITION OF FEEDING STUFFS.

	POUNDS IN 100					
	Water	Ash	Protein	Fat	Carbohydrates	
					Fiber	N. F. Extract
Alfalfa meal	8.0	7.0	14.0	1.5	30.0	39.5
Barley meal	10.5	2.7	11.5	1.8	4.8	68.7
Barley mixed feed	8.4	4.3	10.0	2.5	16.4	58.4
Blood, dried	9.8	3.3	82.0	7.0	.....	3.8
Brewers' dried grains	8.7	3.7	28.5	6.7	13.5	38.9
Buckwheat	13.4	2.3	10.8	2.4	11.5	59.6
Buckwheat mixed feed	11.6	3.9	16.5	4.5	20.5	43.0
Buckwheat middlings	12.0	4.8	28.0	7.5	6.5	41.7
Buttermilk, dried	11.0	6.6	34.0	1.0	.....	47.4
Cane seed	9.9	1.9	10.5	3.4	3.5	70.8
Cocoanut meal	9.0	5.8	19.4	9.0	8.6	48.2
Corn	12.0	1.5	9.5	4.3	2.0	71.7
Corn bran	10.4	2.4	10.0	5.5	11.5	60.2
Corn and cob meal	10.5	1.5	8.0	3.7	7.9	68.4
Corn chop	12.3	1.5	9.0	4.4	2.3	70.5
Corn feed-meal	11.7	1.6	9.0	4.0	2.0	71.7
Corn-germ oil meal	8.5	2.7	22.5	10.5	7.5	48.3
Corn gluten feed	9.2	2.0	25.0	3.5	7.3	53.0
Corn gluten meal	9.0	1.5	35.5	4.0	2.0	48.0
Cottonseed meal 41%	7.5	6.2	41.0	7.0	10.0	28.3
Cottonseed meal 38½%	7.5	6.4	38.5	7.0	12.0	28.6
Cottonseed feed 36%	7.5	6.6	36.0	6.5	14.0	29.4
Cottonseed feed 22%	8.3	6.0	22.0	7.3	22.0	34.4
Cottonseed hulls	8.5	2.7	4.6	2.0	37.0	45.2
Cowpeas	14.0	3.4	22.0	1.5	4.1	55.0
Flaxseed	8.5	4.4	22.6	33.7	7.1	23.7
Hominy meal, feed or chop	9.6	2.5	10.5	7.5	6.5	63.4
Kaffir corn	11.5	1.7	11.0	2.5	2.5	70.8
Linseed meal (old process)	9.0	5.5	34.0	7.5	7.3	36.7
Linseed meal (new process)	9.0	5.5	36.0	3.0	8.9	37.6
Malt sprouts	10.0	6.0	27.3	5.3	11.6	39.8
Meat scrap	8.0	6.5	52.5	7.5	2.6	22.9
Millet	8.5	4.0	10.5	4.0	9.5	63.5
Milo maize	9.5	2.8	10.8	2.8	2.7	71.4
Molasses (beet)	25.5	5.5	3.4	.....	.....	65.6
Molasses (cane)	25.8	6.4	3.0	.....	.....	64.8
Oats	10.4	3.4	10.5	4.4	11.0	60.3
Oat shorts and hulls (85%)	8.5	5.0	7.0	2.5	23.5	53.5
Peanut oil meal (41%)	10.3	4.6	41.0	7.5	4.5	22.1

TABLE I.—AVERAGE COMPOSITION OF FEEDING STUFFS.—Con.

	POUNDS IN 100					
	Water	Ash	Protein	Fat	Carbohydrates	
					Fiber	N. F. Extract
Peanut oil meal (38½%)	10.4	4.7	38.5	7.8	10.1	26.4
Peanut oil feed	8.5	4.4	30.0	6.0	22.0	29.1
Rice bran	10.0	9.5	12.0	10.0	9.5	49.0
Rice polish	10.8	4.8	11.9	9.0	2.0	62.5
Rye	9.5	2.0	11.3	1.5	2.1	73.6
Rye mixed feed	10.5	3.8	14.5	4.7	3.0	63.5
Rye middlings	10.0	3.7	15.7	3.5	4.7	62.4
Soy-bean meal	9.7	5.3	47.5	5.8	5.3	22.4
Sunflower seed	8.6	3.4	16.3	21.0	25.0	25.7
Tankage (digester 60%)	7.0	10.5	60.0	9.5	3.5	9.0
Tankage (50%)	9.0	18.0	50.0	9.5	3.0	10.5
Velvet-bean feed	10.0	4.0	17.5	4.5	17.0	47.0
Wheat	10.5	1.8	11.9	2.0	2.3	71.5
Wheat bran	10.3	6.0	15.0	4.0	8.0	56.7
Wheat middlings or shorts	10.7	4.4	16.5	4.5	5.0	58.9
Wheat mixed feed	9.8	5.4	16.0	4.5	7.5	56.8
Wheat red dog	10.0	3.2	17.5	4.6	2.7	62.0
Wheat screenings	11.9	4.0	12.4	2.2	6.1	63.4
HAYS						
Alfalfa hay	8.6	8.6	14.5	2.0	30.0	38.0
Clover hay (red)	12.9	7.1	12.5	3.0	25.5	38.5
Soy-bean hay	8.6	8.6	16.0	2.8	24.9	39.1
Timothy hay	11.6	4.9	6.2	2.5	30.0	45.0

TABLE II.—AVERAGE COMPOSITION OF MATERIALS USED AS FILLERS

	POUNDS IN 100					
	Water	Ash	Protein	Fat	Carbohydrates	
					Fiber	N. F. Extrac
Buckwheat hulls	10.4	2.3	4.9	1.2	44.0	37.2
Corn bran	10.3	2.5	9.7	6.0	10.5	61.0
Corncob meal	10.0	1.5	2.5	0.5	32.0	53.8
Cottonseed hulls	9.5	2.7	4.6	1.8	44.4	37.0
Clipped oat by-product	8.7	5.6	6.8	2.3	26.3	50.3
Flax plant by-product	8.5	7.5	8.7	7.5	20.5	47.3
Flax screenings	9.3	8.3	9.5	10.6	14.3	48.0
Grain screenings (weed seeds, etc.)	10.6	4.5	13.5	5.9	15.9	49.6
Oat dust	6.8	7.3	12.6	4.2	19.4	59.7
Oat hulls	7.4	6.3	3.7	1.8	29.2	51.6
Peanut hulls	9.3	5.6	4.5	0.8	67.3	12.5
Rice hulls	9.6	16.9	3.3	1.1	35.4	34.0
Wheat chaff	10.0	4.4	4.3	1.4	29.2	48.7
Wheat screenings	10.2	3.9	12.2	4.4	7.7	61.6
Velvet-bean hulls	13.2	6.1	11.6	1.9	24.5	42.7

TABLE III.—AVERAGE DIGESTIBLE NUTRIENTS OF FEEDING STUFFS

	POUNDS IN 100					Net energy per 100 lbs. for ruminants. Therms
	Protein	Fat	Carbohydrates: Fiber	Carbohydrates: Nitrogen-Free Extract	Nutritive Ratio	
Alfalfa meal	9.9	0.6	12.9	28.4	1: 4.3	34.2
Barley meal	10.1	1.5	3.3	64.0	1: 7.0	89.9
Barley mixed feed	8.5	2.2	4.1	54.3	1: 7.4	....
Blood, dried	69.0	.....	....	3.5	1: 0.1	68.1
Brewers' dried grains	22.8	5.8	6.7	21.3	1: 1.8	53.4
Buckwheat	8.1	2.5	3.0	39.7	1: 6.0	59.7
Buckwheat mixed feed	9.9	3.1	7.8	31.0	1: 4.6	....
Buckwheat middlings	25.0	6.2	1.9	35.4	1: 2.0	72.2
Cocoanut meal	17.5	9.0	2.0	39.0	1: 3.5	83.5
Corn, ground	7.1	3.8	1.1	68.1	1:11.0	85.5
Corn bran	6.0	4.4	7.7	48.0	1:11.0	....
Corn and cob meal	4.2	3.1	3.7	60.2	1:17.0	75.8
Cracked corn	7.3	3.6	1.0	69.0	1:11.0	89.2
Corn feed-meal	7.0	3.7	1.1	67.4	1:11.0	85.2
Corn-germ oil meal	16.8	10.1	5.6	37.8	1: 3.9	83.9
Corn gluten feed	21.2	3.0	5.4	47.6	1: 2.8	80.7
Corn gluten meal	30.2	3.7	1.0	43.2	1: 1.7	84.2
Cottonseed meal, choice	34.4	6.7	3.7	23.1	1: 1.2	93.4
Cottonseed meal, prime	32.3	6.7	4.4	22.5	1: 1.3	90.0
Cottonseed feed, 36%	30.3	6.2	5.1	22.0	1: 1.4	....
Cottonseed hulls	0.3	1.6	17.3	16.4	1:13.3	9.9
Cowpeas	18.0	1.1	2.6	52.1	1: 3.2	79.5
Flaxseed	20.3	29.0	4.3	13.0	1: 4.1	83.2
Hominy feed, meal or chops	6.9	6.8	4.8	57.0	1:11.1	88.8
Kaffir corn	5.2	1.3	1.1	35.4	1: 7.6	....
Linseed meal, old process	30.6	6.8	4.2	28.6	1: 1.6	88.9
Linseed meal, new process	31.0	2.9	6.6	33.8	1: 1.5	85.1
Malt sprouts	21.0	4.5	10.1	31.8	1: 2.5	72.7
Meat scrap	48.8	7.3	.....	.....	1: 0.3	73.0
Millet	6.2	3.2	3.9	53.3	1:10.4	....
Milo maize	6.3	2.5	2.7	59.0	1:10.7	....
Molasses, cane	1.1	.....	.....	59.1	1:53.7	55.4
Oats	8.2	3.7	0.4	48.0	1: 6.9	67.6
Oat shorts and hulls (hulls 85%)	5.0	2.0	8.4	29.4	1: 8.5	....
Peanut oil meal, 41%	36.9	7.2	0.4	18.5	1: 0.1	93.6
Peanut oil meal, 38½%	34.6	7.0	0.9	22.2	1: 1.1	....
Peanut oil feed, 30%	21.0	5.4	2.6	14.6	1: 1.4	42.6
Rice bran	7.8	7.7	2.3	39.0	1: 7.5	45.3
Rice polish	8.0	7.0	0.5	56.3	1: 9.1	77.7
Rye	9.5	1.0	.....	65.9	1: 7.2	93.7
Rye mixed feed	12.0	4.2	.....	55.9	1: 5.4	....
Rye middlings	12.6	3.1	.....	55.5	1: 4.5	....
Soy-bean meal	43.7	4.0	4.9	22.4	1: 0.9	99.7
Sunflower seed	13.5	18.9	6.3	17.8	1: 4.9	92.5
Tankage, digester, 60%	55.8	9.2	.....	.....	1: 0.4	93.0

TABLE III.—AVERAGE DIGESTIBLE NUTRIENTS OF FEEDING STUFFS.—Con.

	POUNDS IN 100					Net energy per 100 lbs. for ruminants. Therms.
	Protein	Fat	Carbohydrates: Fiber	Carbohydrates: Nitrogen-Free Extract	Nutritive Ratio	
Tankage, digester, 50%	46.5	9.0	.....	.....	1: 0.4	73.0
Velvet-bean feed	14.9	3.8	13.0	34.5	1: 3.8	....
Wheat	9.0	1.5	1.6	65.6	1: 7.8	91.8
Wheat bran	12.3	2.6	2.5	41.0	1: 4.0	53.0
Wheat mid'lings and sh'ts	12.8	3.9	1.5	46.0	1: 4.4	59.1
Wheat mixed feed	12.5	2.5	2.4	45.0	1: 4.2	....
Wheat red dog	15.4	3.9	0.8	54.6	1: 4.2	75.0
Wheat screenings	8.9	3.6	.....	46.3	1: 6.1	....
HAYS						
Alfalfa hay	9.9	0.6	12.9	27.4	1: 4.3	34.2
Clover hay (red)	7.6	1.8	13.8	25.4	1: 5.7	38.7
Soy-bean hay	11.7	1.2	17.0	25.0	1: 3.8	44.0
Timothy hay	3.0	1.3	15.0	27.9	1:15.3	43.0

Definitions and Descriptions of Feeding Materials

Most of the high-grade materials used in commercial feeding stuffs are the by-products of the grain elevators, flouring mills, sugar, glucose, starch and oil factories, slaughter houses, breweries and distilleries, the amount from the last two having been recently reduced to an inconsiderable quantity. Another source of materials is the light and immature grain of wheat, barley, oats and other grains and cereals, certain weed seeds, oat by-products such as oat shorts, oat middlings and oat hulls, clipped-oat by-products, flax-plant refuse, etc., which range from low to fair in feeding value and should not be wasted but should be utilized in a legitimate manner, on their own merits. Finally, there is another source of materials which is exploited in the trade under false cover, such as the trash and sweepings of elevators and mills, peanut hulls, corn cobs, cocoa waste, certain weed seeds, and similar materials ranging from worthless to dangerous.

Many of the leading materials are so uniformly made, in the manufacture of other articles of commerce, that they have become standardized and classified and defined to come within certain limits, if made of reasonably good materials. The definitions which follow are given as standards by this Department. The percentages of digestible nutrients used in the discussions are taken from Henry and Morrison's Feeds & Feeding.

See Table I for average composition of materials.

See Table II for average digestibility and nutritive ratio.

ALFALFA

Alfalfa hay is possibly of wider use than any other roughage. It can be used with all classes of horses, if fed correctly, but better with horses doing slow, steady work. Alfalfa is an excellent feed for fattening cattle and reduces the quantity of concentrates required to produce a given gain. For the dairy cow there is no better feed, for alfalfa hay is not only rich in crude protein but in mineral matter as well. As a feed for sheep, alfalfa leads the roughages. It can be used to a limited extent in connection with other feeds in fattening hogs and in maintaining stock hogs thru the winter. With a fair understanding of the composition and nature of alfalfa hay, a feeder can use it in feeding all farm animals, with economy and satisfaction.

Alfalfa Meal is the entire alfalfa hay ground, and does not contain an admixture of ground alfalfa straw or other foreign materials.

In view of the fact that the market price of alfalfa meal is often as high as that of wheat bran, or even of mixed wheat feed, or higher, when its feeding value is less and particularly so in feeding dairy cows, its purchase can be recommended only when it sells at an appreciably lower price than these materials. Ordinarily a feeder can produce roughage more economically on his farm than he can purchase alfalfa meal in commercial feeds at prevailing prices.

Two samples were analyzed and exceeded their guaranties, except in fiber, in each sample. The average analysis of the two samples is 16.63% protein, 1.97% fat and 32.22% fiber.

Alfalfa has an average digestibility of 71% of the protein, 38% of the fat and 43% of the fiber.

ANIMAL PRODUCTS

One of the sources of the more highly concentrated and digestible feeds is the by-products of packing houses. These by-products are sold as blood meal, cracklings, digester tankage, meat scrap or meat meal and meat and bone scrap or meat and bone meal. Some of these products contain more or less bone and are therefore correspondingly rich in calcium and phosphorus. Owing to their very concentrated form and high digestibility and the high prices which they command, the feeder should understand their nature and how to use them in connection with other materials, in order to secure the best results.

In addition to the packing-house by-products a considerable amount of animal product is sold as feed, made from dead animals collected in and around cities and stock yards by rendering plants. The carcasses are cooked in live steam under high pressure from six to ten hours, the fats pressed out, and the residues dried. The better grade of this material is used for feed and the lower grades are sold for fertilizer. This product compares in feeding value with digester tankage. It is questionable whether any of this material should be utilized as a feed, both from the standpoint of its source and the liability of it becoming contaminated, in its production at the plant, with some disease germ, from which the animal died.

Blood Meal is ground dried blood. This is the richest of the animal by-products, with an average crude protein content of 80%. It is particularly useful as a substitute for skim-milk in feeding young pigs and

calves. It is used in some classes of mixed feeds to some extent but is employed largely in the lower grades of digester tankage to raise the protein content.

No samples were obtained for analysis.

The average digestibility of blood meal is 84% of the protein.

Cracklings are the residue after partially extracting the fats and oils from the fatty tissue of the animal. If they bear a name descriptive of their kind, composition or origin, they must correspond thereto.

No samples were obtained for analysis.

Digester Tankage is the residue from animal tissue, exclusive of hoof and horn, specially prepared for feeding purposes by tanking under live steam under pressure, drying under high heat, and suitable grinding. If it contains more than 10% of phosphoric acid (P_2O_5) it must be designated Digester Meat and Bone Tankage.

Several grades of tankage are being made, ranging from 35% to 60% protein. In some instances the addition of blood is being made to raise the protein content. Good tankage is high in digestible protein and makes an excellent feed for hogs and is good to include in the ration of horses run down.

Thirty-two samples were analyzed, eighteen of which fell below guaranty in protein and two fell short in fat. Tankage has an average digestibility of 90% of the protein.

Dried Buttermilk averages 30% protein and 6.50% fat and is used to feed swine and poultry. It ranks higher than tankage or meat scrap for this purpose. No samples were obtained for analysis.

Meat Scrap and Meat Meal are the ground residue from animal tissues, exclusive of hoof and horn. If they contain more than 10% of phosphoric acid (P_2O_5) they must be designated *Meat and Bone Scrap* and *Meat and Bone Meal*. If they bear a name descriptive of their kind, composition or origin they must correspond thereto.

This product varies in amount of protein, ranging from 40 to 60%, the value depending on the amount of protein. Blood meal is often added to meat meal, as in the case of tankage, to raise the protein. It makes an excellent feed for hogs and poultry.

Twelve samples were analyzed, three of which fell short in protein.

The average digestibility of meat scrap is 93% of the protein, and 98% of the fat.

BARLEY PRODUCTS

When the closing of the breweries took place as a conservation measure of the Government, a large amount of barley was turned into the channels of trade as commercial feeding stuffs. It is now being pretty generally used as a substitute for corn, due to the prevailing high price of that grain. Barley is one of the most widely cultivated of the cereals and was the chief bread plant of many of the ancient nations, but in the more recent years has been used almost wholly for brewing, and to a much less extent for stock feeding. The reverse is the tendency now.

Experiments show that barley has less digestible protein than oats and more than corn; less fat than in either, and more carbohydrates than oats, but less than corn. In sections where barley is the prevailing crop, it takes

the place of corn and oats as the leading feed. Feeding experiments show corn and oats slightly in favor over barley, tho with barley a good substitute for either.

Barley Meal or Ground Barley is the entire grain ground.

Four samples were analyzed and ran well up to their guaranties.

The average digestibility of barley meal is 88% of the protein, 86% of the fat and 70% of the fiber.

Barley Mixed Feed is the entire by-product from the manufacture of pearl barley or barley flour. It contains the shorts, bran and hulls and averages about 10% protein, 2.50% fat and 16.5% of fiber. One sample was analyzed, the results showing it to be well beyond its claim.

Malt Sprouts are the sprouts of the barley grain. If the sprouts are derived from any other malted cereal, the source must be designated. Malt sprouts has a digestibility of 77% of the protein, 85% of the fat and 87% of the fiber.

BEET PRODUCTS

Dried Beet Pulp is a by-product obtained in the manufacture of beet sugar and consists of the dried residue after the extraction of most of the sugar of the beets.

Six samples were analyzed and all exceeded their guaranties in protein and fat, but four ran too high in fiber.

Beet pulp has an average digestibility of 51% of the protein and 83% of the fiber.

BUCKWHEAT PRODUCTS

Buckwheat is rarely used in feeding stock, except in chicken feeds, tho it has a fair feeding value, running somewhat lower in the nutrients than most of the cereals. It has an average composition of 10% protein, 2% fat and 9% fiber.

Buckwheat Shorts or Buckwheat Middlings are that portion of the grain immediately inside of the hull, after separation from the flour.

They have an average composition of 28.5% protein, 7% fat and 6% fiber, and make a highly nutritious feed.

Buckwheat middlings or shorts have an average digestibility of 87% of the protein, 83% of the fat and 32% of the fiber.

COCOANUT PRODUCTS

Cocoanut Oil Meal is the ground residue after the extraction of part of the oil from the meat of the cocoanut.

One sample was analyzed and fell slightly short in protein. It has an average digestibility of 90% of the protein, 100% of the fat and 23% of the fiber.

CORN PRODUCTS

Corn is regarded as the greatest energizing, heat-giving, fat-furnishing food of any of the cereals, for the animal on the farm, and it produces more animal food on a given area, with less expenditure of labor and outlay of

money, than any other grain or cereal. Not being rich in protein and mineral matter, it fails to furnish the nutrients in proper proportion to meet the needs in growth. These deficiencies must be supplied in other feeds. Corn is rich in starch and oil and produces heat, energy and fat.

Corn has an average digestibility of 74% of the protein, 93% of the fat and 57% of the fiber.

Corn Bran is the outer coating of the corn kernel.

The average analysis of corn bran is 10.5% protein, 8.50% fat and 11.5% fiber. It has no ready sale as a distinct feed on account of its low feeding value and the bulk of its output is used to mix with other materials. However, recent experiments tend to show that corn bran constituting 30% of a mixed ration not derived from corn produced substantially the same amount of milk as wheat bran and the living gains of the animal were about the same. The ash and protein in corn bran are noticeably less than in wheat bran. Digestion experiments with sheep show that 80% of the dry matter is assimilated while only 66% in wheat bran is assimilated. Corn bran has a digestibility of 60% of the protein, 80% of the fat and 71% of the fiber.

Corn Chop is a term commonly applied to cracked or crushed corn, but more generally used to cover that portion of cracked corn after the finer particles have been sifted out and to which corn bran may or may not have been added.

Nineteen samples were analyzed, all of which equaled or exceeded their guaranties in protein, and four fell short in fat.

Cracked Corn or Crushed Corn is what the term implies—the whole grain cracked or crushed, from which nothing has been taken and to which nothing has been added. *Sifted Cracked Corn* is the material left after the small particles have been sifted out.

Thirty samples were analyzed, one of which fell short of guaranty in protein and five in fat.

The average digestibility is 76% of the protein, 86% of the fat and 58% of the fiber.

Corn Feed Meal is the by-product obtained in the manufacture of cracked corn, with or without aspiration products added to the siftings, and is also the by-product obtained in the manufacture of table meal from the whole grain by the non-degerming progess.

Eight samples were analyzed; one fell below in protein and one in fat.

Corn feed meal has an average digestibility of 74% of the protein, 93% of the fat and 57% of the fiber.

Corn Germ Meal is a product obtained in the manufacture of starch, glucose and other corn products, and is the germ layer from which a part of the corn oil has been extracted.

No samples of this product were obtained for analysis.

It has a digestibility of 73% of the protein, 96% of the fat and 75% of the fiber.

Corn Gluten Feed is that portion of corn that remains after the separation of the larger part of the starch and the germ by the process employed in the manufacture of corn starch and glucose. It may or may not contain corn solubles.

Corn Gluten Meal is that part of corn that remains after the separation of the large part of the starch, the germ and bran, by the processes employed in the manufacture of cornstarch and glucose. It may or may not contain corn solubles.

One sample was analyzed and found to be practically up to guaranty.

This product has an average digestibility of 85% of the protein, 85% of the fat and 76% of the fiber.

Grits are the hard, flinty portions of Indian corn ,without hulls and germs, broken finer than hominy and free from dust.

No samples of grits were taken.

Hominy Meal, Hominy Feed, or Hominy Chop is a kiln-dried mixture of the mill-run bran coating, the mill-run germ, with or without a partial extraction of the oil and a part of the starchy portion of the white corn kernel obtained in the manufacture of hominy, hominy grits and corn meal by the degerming process. Yellow hominy product is defined in the same way, except that the product is made of yellow corn.

Twenty-six samples were analyzed; one fell short in protein, one in fat and one ran high in fiber.

This product has an average digestibility of 66% of the protein, 91% of the fat and 76% of the fiber.

COTTON-SEED PRODUCTS

Cotton-Seed Meal is a product of the cotton seed only, composed principally of the kernel with such portion of the hull as is necessary in the manufacture of the oil and must contain at least 38.62% protein. Any material containing less than this amount is termed cotton-seed feed, and the percentage of hull contained in it must be given.

The greater part of the cotton-seed meal sold in the State was of the feed grade, tho in many instances it was guaranteed to be choice and prime meal.

Cotton-seed meal has an average digestibility of 84% of the protein, 93% of the fat and 37% of the fiber.

Choice Cotton-Seed Meal must be finely ground, not necessarily bolted, perfectly sound and sweet in odor, yellow, free from excess of lint, and must contain at least 41% of protein.

Thirty-nine samples of meal guaranteed to be choice meal were analyzed, sixteen of which were below guaranty in protein and twenty-five above in fiber. A number of the meals were of the feed grade and showed adulteration with a large percentage of hulls.

Prime Cotton-Seed Meal must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellow, not brown or reddish, free from excess of lint, and must contain at least 38.62% protein.

One hundred and forty samples guaranteed to be prime meal were analyzed. Sixty-six fell below in protein and seventy ran higher in fiber, showing that a large percentage of this grade of meal was adulterated with cotton-seed hulls.

Cotton-Seed Feed is a mixture of cotton-seed meal and hulls and includes any mixtures of less than 38.62% protein, tho the bulk of this material was guaranteed to contain 36% protein.

One hundred and one samples of cotton-seed feed were analyzed. This product was guaranteed to be 36% protein grade. Twenty-one fell short in protein and nineteen ran high in fiber. A number of these samples contained an excessive amount of hulls.

FLAX PRODUCTS

Flax Plant By-product is that portion of the flax plant remaining after the separation of the seed, the bast fiber and a portion of the shives, and consists of flax shives, flax pods, broken and immature flax seed and the cortical tissue of the stem.

This product has very little feeding value and is used largely as an adulterant. No samples were found for analysis.

Linseed Meal is the ground residue after extraction of part of the oil from ground flax seed.

There are two methods used in extracting the oil, thus producing two kinds of meals, *Old Process* and *New Process* meals. *Old Process Meal* is the ground product obtained after extraction of part of the oil by crushing, cooking and hydraulic pressure, while the *New Process Meal* is the ground product after solvents have been used, instead of hydraulic pressure. Practically all the linseed meals found on the Kentucky market were the old process meals, with a guaranty of 30 to 32% protein. Seventeen samples were analyzed, one of which fell short of guaranty in protein and two ran high in fiber.

Linseed meal has an average digestibility of 89% of the protein, 89% of the fat and 67% of the fiber.

OAT PRODUCTS

The production of oats in Kentucky is small as compared with some of the other States. Next to corn, oats are the most extensively grown cereal in this country. Oats are safest of all feeds for horses and are excellent for dairy cows, and can be fed to advantage to poultry and hogs. They are not good for fattening purposes, but are good for growing animals and breeding swine.

There are a number of oat by-products obtained at the oatmeal factories and grain elevators, the value of which depends upon the proportion of the oat grain or kernel to the hull and other waste. Often light-weight oats of low feeding value are mixed with corn and the ground or chopped product put on the market as corn and oats chop. Large quantities of oat hulls are put out by the oatmeal factories and, as the modern machinery can so completely separate the hulls from the kernel, the chaff-like material that is left has very little feeding value. None of the oat by-products were found in an unmixed state on the Kentucky market, but were found in mixed feeds, usually molasses feeds, which are manufactured without the State. These products are rarely worth the price paid for them and are mixed with other materials in order to find a market for them.

Oat Groats are the kernels of the oat berry.

Oat Hulls are the outer chaffy coverings of the oat grains.

Oat Middlings or Oat Shorts are the floury portions of the oat groat, obtained in the milling of rolled oats.

Clipped Oat By-Products is the resultant by-product obtained in the manufacture of clipped oats. It may contain light, chaffy material broken from the ends of the hulls, empty hulls, light, immature oats and dust.

PEANUT PRODUCTS

Peanut Meal is a product of the hulled peanut and must not contain less than 38.62% protein. Any peanut product containing less than this amount of protein is regarded as peanut feed and the percentage of hulls must be stated. Peanut meal has an average digestibility of 90% of the protein, 90% of the fat and 9% of the fiber.

Choice Peanut Meal is the ground residue after the extraction of part of the oil from peanut kernels, and must not contain less than 41% protein.

Prime Peanut Meal is the ground residue after the extraction of part of the oil from peanut kernels, and must not contain less than 38.62% protein.

Peanut Feed is a mixture of peanut meal and hulls and varies in amount of protein from 28 to 38.62%. The percentage of hulls must be stated in all peanut feeds sold in Kentucky.

RICE PRODUCTS

The production of rice in this country is limited principally to Louisiana and Texas. The rice grain is rather low in protein and fat, but its by-products have considerable value as a stock feed. The source of these products is too far from the Kentucky market to make them an economical feed for this section, but some shipments have been made the past year, due to the scarcity of other materials. Rice meal, rice polish and rice bran have an average digestibility of 65% of the protein, 77% of the fat and 25% of the fiber.

Rice Bran is the cuticle beneath the hull of the rice grain.

One sample of rice bran was taken for analysis and ran above guaranty in fiber.

Rice Hulls are the outer chaffy coverings of the rice grain. They are tough and woody and are considered dangerous to feed to stock and for this reason are prohibited to be sold as feed in Kentucky.

Rice Polish is the finely powdered material obtained in polishing the kernel. No samples were taken for analysis.

RYE PRODUCTS

Rye is not extensively grown in this country. It has been used heretofore largely for the manufacture of alcohol and to some extent as a food for live stock. Because of war conditions considerable amounts are being milled for flour and the by-products are being sold as feed. Animals show no fondness for it, but eat it readily when mixed with other feeds. It is not regarded a good feed to feed alone or in large quantities, but, fed in connection with other materials, it gives fair results. Rye feeds are not used extensively in Kentucky and only since the great demand and high cost of feeds, on account of war conditions, have they been used to an appreciable degree.

Rye Bran is the outer coating of the rye grain, corresponding in character to wheat bran and having about the same food value.

Rye Middlings are the fine particles just beneath the bran coating, corresponding in character to wheat middlings. Six samples were analyzed

and were well up to and even above guaranty, the average analysis being 15.7% protein, 3.50% fat and 7.0% fiber.

Rye Mixed Feed is a mixture of the mill-run bran and middlings obtained in the milling of the rye grain.

One sample was obtained for analysis and ran above guaranty.

SOY-BEAN PRODUCTS

The soy bean is of high value both as a food and a fertilizer and its production is being greatly increased. At the present time it is grown in this country primarily for forage, but the beans are beginning to be used extensively as a food for man and animals. The bean carries 16 to 20% of oil, and this, when extracted, is used for human food and other purposes, while the resultant by-products, called soy-bean cake and meal, are used for stock food and fertilizer.

Soy-bean seeds are rich in protein, fat and mineral matter and make a good feed for growing stock. They have an average digestibility of 84% of the protein, 82% of the fat and 81% of the fiber. Owing to their high digestibility they compare favorably with linseed meal and cottonseed meal as a feed for live stock.

Soy-Bean Meal is the ground residue after extraction of part of the oil from the bean.

It has an average analysis of 47.5% protein, 5.8% fat and 5.3% fiber, and an average digestibility of 92% of the protein, 68% of the fat and 99% of the fiber. It may be classed as one of the most valuable protein feeds.

VELVET-BEAN PRODUCTS

The Velvet Bean is being grown extensively in the South for feeding purposes. Because of war conditions it has been tried out in a number of Northern and Eastern States, but it has not proved the success as a feed in Kentucky as was hoped for it. This was due, perhaps, to some extent at least, to the lack of knowledge in feeding it, and also to the extravagant claims made for it by those who were interested in it from a commercial standpoint.

Feeding tests made with velvet-bean feed at this Station show it to be a very good substitute for some of the common by-products of the milling industry as a feed for cows, but the prices asked for this product are out of proportion to its real value as a feeding material. As a supplement to corn in the feeding of hogs, velvet-bean feed was found to be a poor material.

Velvet-Bean Feed is the product obtained by grinding the natural run of the bean and pod and contains, on the average, about 40% of pod. It has an average analysis of 17.00% protein, 4.50% fat and 16% fiber.

Velvet-Bean Meal is the ground bean after it has been separated from the pod. It is a much better product than velvet-bean feed, being richer in protein and fat and having a higher digestibility. No velvet-bean meal was found on the Kentucky market. This product should not be confused with velvet-bean feed, which contains about 40% velvet-bean hulls.

WHEAT PRODUCTS

In the extent of the production of the cereals in this country wheat ranks third. As compared with corn, oats, barley and rye, wheat is richer in protein, but less than corn and oats in fat and about the same as rye and barley. The average analysis of Kentucky wheats is 12% protein, 2% fat and 2.25% fiber. Wheat has an average digestibility of 74% of the protein, 72% of the fat and 59% of the fiber. Only low-grade wheats are used for feeding purposes, the bulk of sound wheat being used in making food for human consumption.

The by-products from the wheat-milling industry make excellent feeds for stock and form a large part of the legitimate feeds found on the market in Kentucky.

Wheat Bran is the coarse outer coating of the wheat berry, obtained in the usual commercial milling process from wheat that has been cleaned and scoured.

Wheat bran is comparatively rich in digestible protein and fat, light and fluffy, rather high in fiber and rich in mineral matter, except calcium. Bran supplies an abundance of phosphorus, which is so essential in milk and bones, tho it is lacking in calcium, which is needed in still larger amount. Horses fed heavily on bran sometimes suffer from what is called "bran disease", which seriously affects their bones, but the calcium may be supplied in an inorganic form, such as wood ashes, burned lime, etc., or by feeding the calcium plants, such as the legumes.

In order to feed bran economically, one must know its properties. It should be mixed with other ingredients to lighten the ration or give bulk, while at the same time improving its nutritive qualities. It has a laxative effect and for this reason cannot be fed extensively to work animals. It is an excellent feed for the dairy cow, furnishing bulk to the ration and providing protein and phosphorus, so vital to the formation of milk. It is a satisfactory feed for feeding breeding sheep and lambs. It is not a good feed for pigs, tho considered valuable in preparing a ration for breeding swine and stock hogs when they cannot get legume pasture or hay.

Sixty-nine samples were analyzed, some of which contained screenings and were so registered. One only fell below guaranty in protein, seven in fat, but twenty-four ran high in fiber.

Bran has an average analysis of 15% protein, 4% fat and 8.50% fiber, with an average digestibility of 78% of the protein, 68% of the fat and 43% of the fiber.

Standard Middlings or Shorts are the fine particles of the outer and inner bran, separated from bran and white middlings.

Standard middlings and shorts are generally used in the trade as interchangeable terms. They make an excellent feed for hogs of all ages. They should be mixed and fed with other materials, as corn meal, barley meal, ground oats, tankage, etc. When properly mixed with other materials, they form a good combination for the dairy cow, since they are rich in protein and phosphorus. They should not be fed alone to horses, on account of being heavy and pasty and liable to cause colic. Like bran, they are deficient in calcium and this must be supplied by other ingredients which go to make up the ration.

There has appeared on the market in Kentucky a wheat product under the name of "Brown Shorts or Middlings" which is composed of ground wheat bran and a small amount of shorts or middlings. This product has

been rejected for registration in Kentucky under the name of "Brown Shorts or Middlings" on the ground that this is a misnomer, and dealers and consumers are warned to refuse shipments of such material as shorts or middlings. Violations of this nature will be dealt with under the head of adulteration and misbranding.

Eighty-three samples were analyzed, three of which fell below in protein, one in fat, and eighteen ran above guaranty in fiber. This material has a digestibility of 77% of the protein, 88% of the fat and 30% of the fiber.

Shipstuff or Mixed Wheat Feed is a mixture of the products other than the flour obtained from the milling of the wheat berry. In other words, it is a mixture of the bran and middlings or shorts, to which red dog flour may or may not have been added.

Shipstuff forms a combination which can be fed to animals of almost every class with safety and good results, for it is rich in digestible protein and fat and contains an abundance of minerals, except calcium; the laxative properties of the bran are reduced by the presence of middlings and shorts; the heavy and pasty nature of the middlings is overcome; the mineral matter found in both is maintained and the digestible protein and fat are kept up to a high standard. For general feeding it is one of the best feeds.

One hundred and seventy-seven samples were analyzed, of which eleven fell below in protein, nineteen in fat and forty-eight ran above in fiber. Shipstuff has an average digestibility of 78% of the protein, 87% of the fat and 36% of the fiber.

Red Dog Flour is a low grade wheat flour containing the finer particles of bran.

This material is rich in digestible nutrients and has a high feeding value, especially for young pigs, calves and milk cows.

Two samples were taken for analysis and exceeded their guaranties.

MISCELLANEOUS

Brewers Dried Grains are the properly dried residue from cereals, obtained in the manufacture of beer. Due to war restriction and prohibition, the use of this material, for the past two years, has been reduced to a minimum.

Ten samples were analyzed, four of which fell below guaranty in protein and four ran above in fiber.

Distillers Dried Grains are the dried residue from cereals, obtained in the manufacture of alcohol and distilled liquor.

Seven samples were analyzed, one of which fell below in fat and three ran above in fiber.

Garbage, or household and hotel waste, is being collected in cities by specially equipped garbage plants, the material sorted and treated, and the product sold as a garbage tankage for feeding hogs. This material varies in food value, but, thru proper sorting, it can be produced in a highly concentrated form. If the material is not properly cooked, there is danger of poisoning from decayed garbage, and bad results may come, also, from washing materials like lye or soda. Another source of danger from using garbage is from broken glass or dishes that are found in collected garbage of this nature and, unless this material is carefully sorted out of the waste material, death of the animals may result.

Screenings consist of the smaller grains, weed seeds and other foreign materials having feeding value, separated in cleaning the grain.

Screenings vary greatly in composition and quality. Their value may be considerable or rather small, or they may even be dangerous on account of the poisonous weed seeds.

A farmer takes his grain to market and is paid according to the way it is graded. If it contains weed seeds, chaff and inferior grains, it is docked according to the estimated amount of these materials. The grain is taken to the elevator and cleaned, yielding probably a good grade of grain on one side and screenings on the other. The grain is used for milling and the screenings for mixing with feeding stuffs. Most of the screenings coming into the State in mixed feeds are usually ground, thus rendering germination impossible; many of the poultry feeds, however, contain weed seeds in a viable condition. If these weed seeds in a viable form are fed on the farm, they will soon stock the farm with undesirable and noxious weed plants.

Some poisonous fungi and weed seeds are likely to occur in feeds made from crops grown in Kentucky. The most dangerous ones are:

Ergot of rye and grasses (*Claviceps purpurea*).

Cockle (*Agrostemma githago*). This weed seed is commonly known as corn cockle.

Jimson weed (*Datura stramonium and D. tatula*).

Cocklebur (*Xanthium glabratum and Xanthium canadense*).

Sneezeweed (*Helenium antumnale*).

Larkspur (*Delphinium ajacis*).

Smut of corn (*Ustilago maydis*).

Smut of wheat (*Tilletia tritici*).

Moldy corn (due to *Aspergillus glaucus*).

All these weeds mentioned are common on farms in most sections of the State and the list is often increased by the importation of other weed seeds in grains and mixed feeds, including the most objectionable ones. Care should be exercised to avoid purchasing grain and feeds containing weed seeds in a viable condition. If screenings or weed seeds are used in feeds of any sort, they should either be ground or subjected to high temperature to destroy their power to germinate in case they should reach the farm. In some of the molasses feeds and particularly the poultry feeds are found weed seeds in a perfectly viable state and, if permitted to reach land, they will germinate and stock it with weeds.

An examination of a sample, M 16129, of "Feed Barley", revealed the following:

Barley	71.04%
Oats	19.21%
Weed seeds (wild mustard, barnyard grass, smartweed, catchfly, wild buckwheat, green foxtail)	3.45%
Inert matter (dirt and chaff)	6.30%
	100.00%

A sample of "grain screenings" from wheat, oats, rye and barley was examined and showed the following:

Wheat and rye	47.4%
Wild buckwheat	33.7%
Flax	2.1%
Hare's ear	2.3%
Mustard sp.	4.6%
The following weed seeds all together amount to	6.6%

White prickly poppy	1315
Corn cockle	363
Lamb's quarters	1134
Pigeon grass	1633
Foxtail	4172
Oats	680
Oat-grass	272
Stickweed	453
Canada thistle	45
Cress	90
Lady's thumb	181
Compositae Sp.	90
Miscellaneous	453
Corn (parts of seed)	45
Sticks and dirt	3.3%
	100.0%

The most objectionable weed seeds in this sample are wild buckwheat, corn cockle, pigeon grass, foxtail and Canada thistle. Others are also objectionable, tho they are widely scattered everywhere on land and are not difficult ordinarily to suppress on cultivated ground.

A bag of 100 pounds of feed containing 25% or 25 pounds of these screenings, as presented in this analysis, is estimated to have in it 8¼ pounds of wild buckwheat seed, 9,075 corn cockle seed, 40,800 pigeon grass seed, 104,300 foxtail seed and 1,125 Canada thistle seed, which, if permitted to germinate, will stock the farms with these weeds wherever such feeds are used.

MIXED FEEDS

Under this head a class of mixed feeds is included, composed of wheat by-products and a small amount of corn bran and, in most cases, wheat screenings. These feeds vary somewhat in composition and value, depending on the amount of corn bran and screenings used. The bulk of feed made and sold in this State is from this group. The mixing of corn bran with the wheat products does not give any added merit to the wheat products, but, on the contrary, takes from their value as a feed. The adding of corn bran is merely a means of disposing of an inferior material at a price in excess of its value.

One hundred and ten samples were analyzed, sixteen of which fell below in protein, twenty-nine in fat and forty-five ran above in fiber.

MISCELLANEOUS FEEDS OR PROPRIETARY HORSE, DAIRY AND STOCK FEEDS

This is a group of mixed feeds of a general composition made up largely of high-grade materials and may or may not contain molasses. They vary in composition and value. Attention is called to the fact that many of the feeds in this group are made from the best materials obtainable and show care and intelligence in their manufacture, but, on the other hand, many are ordinary mixtures of low-grade materials and are often sold at excessive prices. Some of the brands are sold under fancy and catchy names and under names that are in no sense descriptive of the feeds or materials used. Molasses is added to most of these feeds, ostensibly for the added value it gives the feeds, but on the other hand it is added, in many cases, to cover up inferior materials used in the mixture. The feeder should bear in mind that the name and extravagant claims and excessive prices usually bear no relation to the true composition and that there is no real mystery in the compounding of these feeds.

Three hundred and sixteen samples were analyzed, thirty-two of which fell below guaranty in protein, forty-four in fat and one hundred and thirty ran above in fiber. In some cases these feeds were adulterated, but most of them were clear of adulterants.

MISCELLANEOUS MIXED FEEDS CONTAINING A MATERIAL OF LITTLE OR NO FEEDING VALUE

All feeds containing a material of little or no feeding value, or a material that cannot be classed as a concentrate under the law, are grouped in this class, except poultry feeds containing grit. These feeds vary widely in composition and feeding value. The prices paid for them were excessive, in most cases, and it may be said of these feeds, generally speaking, that they are inferior grades of feeds. Many of these feeds contained materials, tho low in feeding value, yet of sufficient amount of nutrients to justify their use and conservation, but many of the materials are worthless as feeds. The use of these low grade materials as feeds often results in hardship for the animals to which they are fed and a loss to the owners of such animals as well. These feeds are rarely sold on their true merit, the low-grade materials selling for what first class feeds bring. Most of these feeds equaled or exceeded their guaranty, and in many cases the prices were based on a reasonable value of the feed.

Two hundred and eight samples of this group were analyzed, twenty-one of which fell below guaranty in protein, nineteen in fat, and eighty-eight ran above in fiber.

POULTRY FEEDS

The poultry feeds varied considerably in composition, but came well within their guaranty in both protein and fat. A number contained grain screenings with a large percentage of weed seeds present, tho in less amounts than in previous inspections.

One hundred and fourteen samples of chicken feeds were analyzed, ten of which fell below guaranty in protein, seven in fat and eighteen ran above in fiber.

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EXPLANATION OF TABLES

The analyses given in the following tables represent samples taken by our inspectors from various kinds of feeds registered and found on the market. For convenience, the analyses of feeds of the same class are grouped together. In the table of analyses the manufacturer's guaranty is printed in *bold face figures.*

Table IV covers straight feeds, or feeds made of one grain or plant only. The names of the grains or plants from which these feeds are made are given in alphabetical order and the names of the products of each grain or plant are given in alphabetical order also.

Table V contains a class of mixed feeds composed of wheat and corn and their by-products, with wheat screenings ranging from 1 to 15%. The feeds in this group are composed almost wholly of wheat, but where corn product appears, corn bran is the principal ingredient and ranges from a trace to 20 or 30%.

Brewers' and distillers' dried grains are included in Table V as mixed feeds.

Table VI includes all feeds termed "poultry feeds".

Table VII contains the miscellaneous mixed feeds, made up of materials which are clearly classed as concentrates and a combination of grains or cereals.

Table VIII contains the miscellaneous mixed feeds containing a material, or materials, of little or no feeding value.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
	Animal Products				
323-13	Armour's Meat Meal	Armour Fertilizer Works	63.94	9.08	2.30
		Chicago, Ill.	**60.00**	**10.00**	**2.00**
763-16	Same	Same	60.00	7.97	2.98
			60.00	**6.00**	**2.00**
763-17	Same	Same	59.75	10.73	3.95
763-18	Same	Same	58.19	8.50	4.01
763-18	Same	Same	56.63	9.69	3.30
763-18	Same	Same	60.94	8.79	4.28
763-18	Same	Same	59.88	12.74	2.96
763-18	Same	Same	61.13	12.79	2.65
1545-15	Porkpolis Brand Digester Tankage.	Cincinnati Animal Food Co.	59.38	14.69	1.40
		Cincinnati, Ohio.	**60.00**	**8.00**	**3.00**
1962-16	Porkpolis Brand Meat Scraps	Same	54.44	13.28	3.00
			55.00	**8.00**	.....
1962-16	Same	Same	58.75	19.49	2.40
2749-18	Farmer's Feeding Tankage	Dairy Farm Packing Co.	32.44	17.93	6.15
		Lexington, Ky.	**37.81**	**14.38**	**5.03**
1988-18	Darling's Digester Tankage	Darling & Co.	59.75	7.63	4.18
		Chicago, Ill.	**60.00**	**0.50**	**3.00**
1061-13	Darling's Standard Meat Scraps	Same	53.00	5.90	3.45
			45.00	**5.00**	**3.00**
2479-17	Digester Tankage	Early & Daniel Co.	49.19	9.37	3.25
		Cincinnati, Ohio.	**50.00**	**6.00**	.....
2479-17	Same	Same	52.63	7.70	3.48
2479-17	Same	Same	48.31	9.93	2.42
1539-16	Pigs' Delight Digester Meat and Bone Tankage	Eckert Meat Co.	45.88	11.43	2.83
		Henderson, Ky.	**50.00**	**8.00**	**4.00**
1539-16	Same	Same	46.00	15.35	2.73
19-15	Stock Feeding Tankage	Evansville Packing Co.	37.00	17.73	2.25
		Evansville, Ind.	**40.00**	**10.00**	.....
156-17	"Abattoir Brand" Digester Tankage	The Joslin-Schmidt Co.	60 00	14.23	1.25
		Cincinnati, Ohio.	**60.00**	**8.00**	**3.00**
156-17	Same	Same	58.38	8.33	3.00
156-17	Same	Same	59.88	6.63	3.18
1522-17	"Abattoir Brand" Meat Scraps	Same	59.25	11.24	2.99
			55.00	**1.00**	**3.00**

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
323-13	Conrad J. Clausen..... Louisville.	Meat residues	Below guaranty in fat.
763-16	Alexander Brothers..... Cadiz.	Same	Above guaranty in fiber.
763-17	J. C. Everett & Co..... Maysville.	Same	Above guaranty in fiber.
763-18	Pikeville Grocery Co..... Pikeville.	Same	Below guaranty in protein and above in fiber.
763-18	Shelby County F. & G. Co. Shelbyville.	Same	Below guaranty in protein and above in fiber.
763-18	Lagrange F. & G. Co..... Lagrange.	Same	Above guaranty in fiber.
763-18	Cohen Bros. ..... Greenville.	Same	Below guaranty in protein and above in fiber.
763-18	Conrad J. Clausen..... Louisville.	Same	Above guaranty in fiber.
1545-15	J. C. Everett & Co..... Maysville.	Meat scraps.....	
1962-16	J. H. Fedders & Sons..... Covington.	Meat products.....	Below guaranty in protein.
1962-16	Ruef Bros. ..... Covington.	Same	
2749-18	McCauley & Cain..... Versailles.	Meat scraps, dissolved bones.....	Below guaranty in protein and above in fiber.
1988-18	Lagrange F. & G. Co..... Lagrange.	Meat products.....	Above guaranty in fiber.
1061-13	Cincinnati G. & Hay Co.. Cincinnati.	Same	
2479-17	Mfrs. Warehouse.....	Meat residues.....	Below guaranty in protein.
2479-17	Same	Same	
2479-17	Same	Same	Below guaranty in protein.
1539-16	Same	Blood, bone, meat residues	Below guaranty in protein.
1539-16	Same	Same	Below guaranty in protein.
19-15	McClellan Feed Co..... Henderson.	Meat product, consisting of meat, blood and bone.....	Below guaranty in protein. Inferior to guaranty.
156-17	Bedford & Tuttle..... Winchester.	Meat residues	
156-17	Wm. Addams..... Cynthiana.	Meat products.....	Below guaranty in protein.
156-17	J. C. Everett & Co..... Maysville.	Same	
1522-17	Kentucky Feed Co..... Flemingsburg.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2223-16	K. C. M. Brand Meat and Bone Scraps	Kentucky Chemical Mfg. Co. Covington, Ky.	48.01 60.00	12.34 10.00	2.77 3.00
2926-18	K. C. Brand Hog Feed	Same	50.19 50.00	12.70 8.00	2.60 2.00
2244-16	K. C. Brand Meat and Bone Krisps.	Same	53.50 55.00	8.68 8.00	2.63 3.00
231-14	Big Sixty Digester Tankage	Morris & Co. Chicago, Ill.	58.25 60.00	8.56 8.00	3.73 5.00
552-16	Same	Same	56.63	8.72	4.18
552-17	Same	Same	58.88	8.43	2.80
552-17	Same	Same	58.50	9.30	4.72
552-17	Same	Same	55.00	9.03	4.40
552-18	Same	Same	61.75	6.21	4.35
2384-17	Meatone	E. Rauh & Sons Animal F'd Co. Indianapolis, Ind.	50.69 50.00	5.03 6.00	1.83 .....
2384-17	Same	Same	50.00	9.25	2.67
709-11	Atlas Beef Scrap	Southern Seed Co. Louisville, Ky.	56.50 55.00	11.65 5.00	3.09 .....
1263-19	Standard Meat Meal	Standard By-Products Co. Louisville, Ky.	69.13 60.00	3.95 5.00	2.60 4.00
672-15	Swift's Digester Tankage	Swift & Co. Chicago, Ill.	60.25 60.00	9.15 8.00	2.66 3.00
672-18	Same	Same	58.38 60.00	10.33 5.00	5.06 3.00
672-18	Same	Same	58.88	11.08	3.13
672-18	Same	Same	59.25	9.63	3.53
383-12	Swift's Beef Scraps	Same	50.88 50.00	11.38 8.00	.95 .....
673-17	Swift Meat Scraps	Same	49.13 50.00	11.88 8.00	2.24 3.00
2776-18	Western Digester Tankage	Western Packing & Provis. Co. Chicago, Ill.	61.88 60.00	6.33 6.00	1.00 3.00
2776-18	Same	Same	66.88	7.04	2.16
2776-18	Same	Same	65.25	7.05	1.63
.....	Wilson's High Protein Tankage	Wilson & Co. Chicago, Ill.	58.38 60.00	7.56 6.00	4.96 5.00
	Alfalfa Meal				
879-16	Alfalfa Meal	Early & Daniel Co. Covington, Ky.	16.63 13.00	1.94 1.00	31.42 30.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2223-16	Latonia H. & G. Co. ..... Latonia.	Meat and bone scraps	Below guaranty in protein. Inferior to guar.
2926-18	Same	Meat and bone scraps	Above guaranty in fiber.
2244-16	Cincinnati G. & H. Co.. Erlanger.	Same	Below guaranty in protein.
231-14	F. A. Yost Co. ..... Hopkinsville.	Meat scraps	Below guaranty in protein.
552-16	Phil. C. Crume & Son. .... Cox's Creek.	Same	Inferior to guaranty. Below guar'ty in protein.
552-17	Simpson Co. Hardw're Co. Franklin.	Same	Below guaranty in protein.
552-17	Wilson & Son ..... Russellville.	Same	Below guaranty in protein.
552-17	Same	Same	Inferior to guaranty. Below guar'ty in protein.
552-18	Cohen Bros. ..... Greenville.	Same	Below guaranty in fat.
2384-17	F. H. Gordon..... Richmond.	Meat residues	Below guaranty in fat.
2384-17	Wm. Addams ..... Cynthiana.	Same	
709-11	H. G. Brooks & Co. ..... Louisville.	Meat product	
1263-19	Shelby Co. F. & G. Co.... Shelbyville.	Ground dried blood, meat scraps, ground residue from animal tissue exclusive of hoof & horn, grd. bone.	Below guaranty in fat.
672-15	Blue Grass Commission Co. Lexington.	Meat residues	
672-18	Simpson Co. Hardw're Co. Franklin.	Same	Below guaranty in protein and above in fiber.
672-18	Wm. Addams ..... Cynthiana.	Same	Below guaranty in protein.
672-18	W. L. Kimbrough & Son.. Guthrie.	Same	Below guaranty in protein and above in fiber.
383-12	Blue Grass Commission Co. Lexington.	Meat, blood and bone residues...	
673-17	Oscar Farmer & Sons..... Louisville.	Meat residues	Below guaranty in protein.
2776-18	Henderson F. & Com. Co.. Henderson.	Meat scraps, blood.....	
2776-18	Cohen Bros. ..... Greenville.	Same	
2776-18	W. E. Ellis & Co. ..... Hartford.	Same	
.....	Cohen Bros. ..... Greenville.	Blood and meat products.....	Below guaranty in protein.
879-16	Mfgrs. Warehouse	Alfalfa	Above guaranty in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2340-17	Alfalfa meal	Rapier Grain & Seed Co.	16.63	2.00	31.10
		Owensboro, Ky.	14.00	1.50	28.00
	Barley Feeds				
3120-18	Barley Feed	Early & Daniel Co.	12.56	2.38	5.57
		Cincinnati, Ohio.	12.50	2.50	6.00
16-19	Same	Same	12.38	2.43	6.93
16-19	Same	Same	13.19	2.80	5.77
567-19	Same	Same	12.31	2.33	5.93
2821-18	Pillsbury's Barley Mill Feed	Pillsbury Flour Mills Co.	13.88	3.20	10.42
		Minneapolis, Minn.	8.00	2.00	20.00
	Cocoa Oil Meal				
2487-18	P. & G. Cocoa Oil Meal	The Proctor & Gamble Co.	19.50	7.02	9.35
		Cincinnati, Ohio.	20.00	6.00	12.00
	Dried Beet Pulp				
487-15	Dried Beet Pulp	Larrowe Milling Co.	8.69	.60	20.45
		Detroit, Mich.	8.00	.50	20.00
487-15	Same	Same	9.38	1.15	21.68
487-16	Same	Same	9.06	.40	22.32
487-18	Same	Same	9.44	.82	20.43
487-18	Same	Same	8.88	.69	21.00
1376-16	Same	W. H. Small & Co.	10.25	.92	22.89
		Evansville, Ind.	8.00	.50	20.00
	Cracked Corn				
185-15	Acme Cracked Corn	Acme-Evans Company	8.88	3.04	1.93
		Indianapolis, Ind.	8.00	3.00	5.00
185-17	Same	Same	9.13	3.93	2.90
168-17	Cracked Corn	The Allen & Wheeler Co.	8.38	2.69	1.73
		Troy, Ohio.	8.75	3.50	3.00
1572-15	Same	Beaven & Logsden	8.13	3.86	1.95
		St. Mary, Ky.	9.25	4.00	2.00
265-15	Same	Browder Milling Co.	9.19	4.61	1.97
		Fulton, Ky.	7.48	4.74	1.90
265-18	Same	Same	9.00	3.89	2.01
					1.90

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2340-17	M. J. Yopp, Paducah.	Ground alfalfa hay	Above guaranty in fiber.
3120-18	E. K. Tribble, Danville.	Barley	
16-19	W. J. Sutton, Newport.	Same	Above guaranty in fiber.
16-19	Dave Caldwell, Williamstown.	Same	
567-19	Raymond Coal Co., Cynthiana.	Same	
2821-18	Herman Gisiger, Pewee Valley.	Barley bran, bar. mid., bar. hulls 25%, ground bar. screen's 15%	
2487-18	Hudson, Hudson & Fornaw Lancaster.	Dried cocoanut meats	Below guaranty in protein.
487-15	Henderson F. & Com. Co. Henderson.	Residue of sugar beets after extraction of sugar	
487-15	Same	Same	Above guaranty in fiber.
487-16	Oscar Farmer & Sons, Louisville.	Same	Above guaranty in fiber.
487-18	F. H. Vogel, Henderson.	Same	
487-18	Louis Diemer, Buechel.	Same	Above guaranty in fiber.
1376-16	Henderson F. & Com. Co. Henderson.	Same	Above guaranty in fiber.
185-15	Qualls & Denues, Olive Hill.	Shelled corn	
185-17	Kentucky Wholesale Co., Pikeville.	Same	
168-17	Maddox Grocery Co., Olive Hill.	Corn	Below guaranty in fat. Oats present.
1572-15	Mfgrs. Warehouse	Corn	Below guaranty in protein.
265-15	Mfgrs. Warehouse	Same	
265-18	Mfgrs. Warehouse	Same	Below guaranty in fat.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
265-18	Cracked Corn	Browder Milling Co.	9.56	3.58	1.61
		Fulton, Ky.			
739-12	Same	J. W. Davis & Co.	8.13	3.48	1.43
		Elkton, Ky.	8.56	4.16	.....
869-17	Same	Early & Daniel Co.	9.63	3.60	2.43
		Cincinnati, Ohio.	8.60	4.00	2.50
1187-17	Arrow Cracked Corn	Edinger & Co.	8.50	3.29	1.57
		Louisville, Ky.	8.81	3.98	2.02
914-16	Cracked Corn	W. M. Forless	9.19	5.03	2.23
		Henderson, Ky.	9.00	4.00	2.00
2512-17	Same	The Ferger Grain Co.	9.75	4.65	2.23
		Cincinnati, Ohio.	10.00	4.00	2.00
1395-17	Same	Greenup Milling Co.	9.75	4.66	2.23
		Greenup, Ky.	8.59	3.75	1.90
901-17	Same	Gwinn Bros. & Co.	9.56	3.81	2.75
		Huntington, W. Va.	8.19	4.29	1.90
901-18	Same	Same	8.75	3.33	2.14
901-18	Same	Same	8.88	3.15	2.23
901-18	Same	Same	8.63	3.48	2.38
624-13	Kentucky Cracked Corn	Hope Milling Co.	8.81	4.40	1.70
		White Plains, Ky.	8.56	4.95	.....
87-13	Cracked Corn	Horse Cave Mills	8.25	3.40	1.83
		Horse Cave, Ky.	8.87	4.04	....
1618-15	Same	Mayfield Milling Co.	9.13	4.30	1.88
		Mayfield, Ky.	8.50	4.00	2.00
1656-15	Same	Chris. Miller's Sons	9.56	3.75	1.94
		Louisville, Ky.	9.50	3.80	6.50
1244-18	Purity Cracked Corn	Ohio Valley Mill & Supply Co.	8.50	2.85	2.12
		Ashland, Ky.	8.38	3.20	1.67
905-19	Same	Same	9.44	3.78	2.58
960-15	Cracked Corn	Owensboro Milling Co.	10.59	3.30	1.70
		Owensboro, Ky.	8.62	3.64	1.90
1938-16	Same	Pee Pee Milling Co.	8.13	3.13	1.68
		Waverly, Ohio.	7.30	3.65	2 25
578-17	Same	The R. C. Poage Milling Co.	10.13	3.86	2.98
		Ashland, Ky.	8.75	3.63	2.00
578-18	Same	Same	8.88	3.14	1.74
86-19	Same	Same	8.88	3.43	2.15
1093-13	Same	Scottsville Milling Co.	10.23	4.33	1.78
		Scottsville, Ky.	8.60	4.00	.....
1259-14	Same	Woolcott Flour Mills	9.74	3.80	1.78
		Lexington, Ky.	8.65	3.75	1.90

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
265-18	Mfrs. Warehouse	Corn	Below guaranty in fat.
739-12	Mfrs. Warehouse	Same	Below guaranty in fat.
869-17	Banner Produce Co.	Same	
1187-17	Foley Bros. Pewee Valley.	Same	Below guaranty in fat.
914-16	Mfrs. Warehouse	Shelled corn	
2512-17	R. M. Harrison & Son Maysville.	Same	
1395-17	Mfrs. Warehouse	Corn	
901-17	H. H. Borders Ashland.	Same	Below guaranty in fat and above in fiber.
901-18	J. B. Paxton Catlettsburg.	Same	Below guaranty in fat.
901-18	Paintsville Grocery Co. Paintsville.	Same	Below guaranty in fat.
901-18	Kentucky Wholesale Co. Paintsville.	Same	Below guaranty in fat.
624-13	Mfrs. Warehouse	Same	Below guaranty in fat.
87-13	Same	Same	Below guaranty in protein and fat.
1618-15	Same	Same	
1656-15	Same	Same	
1244-18	Hall Bros. Morehead.	Shelled corn	
905-19	Mfrs. Warehouse	Same	Above guaranty in fiber.
960-15	Same	Corn	
1938-16	Gillery Bros. & Co. Russell.	Same	Below guaranty in fat.
578-17	D. A. Leffingwell & Co. Ashland.	Same	Above guaranty in fiber.
578-18	Maddox Grocery Co. Olive Hill.	Same	
86-19	H. H. Borders Catlettsburg.	Shelled corn	
1093-13	Mfrs. Warehouse	Corn	
1259-14	Clearfield Supply Co. Clearfield.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
	Corn Bran				
1676-15	Corn Bran	LaGrange Flour & Feed Mills.	10.75	7.13	9.69
		LaGrange, Ky.	10.06	5.91	.....
.....	Same	Orndorff & Chaney	6.75	3.84	13.89
		Adairville, Ky.	6.94	4.85	.....
953-09	Same	J. Albert Stewart	10.75	10.42	9.61
		Gracey, Ky.	9.00	6.00	12.00
	Corn Blowings				
1941-16	Kiln Dried Corn Blowings	Geo. Keller	11.88	2.79	4.45
		Newport, Ky.	9.69	3.05	5.61
	Corn Chop				
828-17	Corn Chop	Ashland Milling Co.	10.19	3.90	2.43
		Ashland, Ky.	8.50	5.52	2.00
99-18	Same	Chas. Broeker & Co.	10.69	8.13	1.53
		Owensboro, Ky.	9.00	5.00	2.00
1859-16	Same	Jas. A. Cate & Son Co.	8.75	3.43	2.02
		Hopkinsville, Ky.	8.80	4.25	1.90
95-12	Same	Glasgow Milling Co.	10.48	4.72	1.70
		Glasgow, Ky.	8.59	3.75	.....
1649-15	Same	Clearfield Milling Co.	10.54	4.65	2.15
		Clearfield, Ky.	8.65	4.10	2.15
921-10	Same	Crider Roller Mills	9.69	4.23	1.98
		Crider, Ky.	8.50	4.50	.....
216-11	Pure Chops	Crown Roller Mills	8.51	3.73	1.71
		Morganfield, Ky.	8.50	4.50	.....
267-15	Corn Chop	Eagle Mills	8.94	3.53	1.64
		Franklin, Ky.	8.69	3.75	2.00
1289-15	Same	Electric Mill & Feed Co.	9.38	3.58	1.60
		Franklin, Ky.	8.65	4.25	2.00
1499-15	Same	Exchange Milling Co.	9.00	3.98	1.77
		Sturgis, Ky.	9.38	4.90	2.25
1499-18	Same	Same	9.25	4.10	1.80
514-17	Same	R. W. Kevil & Sons	10.44	2.80	3.08
		Mayfield, Ky.	8.50	4.00	2.00
525-15	Same	Leitchfield Milling Co.	8.25	3.91	1.68
		Leitchfield, Ky.	8.69	3.93	2.00
1262-15	Same	Livermore Mills	9.44	4.24	2.15
		Livermore, Ky.	8.65	4.01	2.00
798-15	Quail Chop	Madisonville Milling Co.	9.88	4.57	2.03
		Madisonville, Ky.	8.65	3.93	1.75
1159-12	Corn Chop	Miller Milling Co.	9.42	4.09	1.56
		Utica, Ky.	8.65	3.85	.....
582-08	Same	E. F. Spears & Sons	9.98	3.14	1.68
		Paris, Ky.	8.75	4.00	.....

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1676-15	Mfrs. Warehouse	Corn	
	Same	Same	Below guaranty in fat.
953-09	Same	Same	
1941-16	Ben Jansing Newport.	Corn, kiln dried	
828-17	Mfrs. Warehouse	Cracked corn, corn bran	Below in fat.
99-18	Same	Corn germ, hominy grits	
1859-16	Same	Shelled corn	Below guaranty in fat.
95-12	Same	Corn	
1649-15	Clearfield Supply Co. Clearfield.	Shelled corn	
921-10	Mfrs. Warehouse	Same	
216-11	Same	Corn	Below guaranty in fat.
267-15	Same	Shelled corn	
1289-15	Same	Corn	Below guaranty in fat.
1499-15	Same	Crushed corn, corn bran	Below guaranty in fat.
1499-18	Same	Same	Below guaranty in fat.
514-17	R. D. Robertson Mayfield.	Corn	Below guaranty in fat and above in fiber. Made from damaged grain.
525-15	Mfrs. Warehouse	Same	
1262-15	Same	Same	
798-15	Same	Same	
1159-12	Same	Same	
582-08	Combs Bros. Fleming.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
649-08	Corn Chop	J. H. Wilhite & Co.	10.59	2.95	1.35
		Utica, Ky.	8.59	4.20	.....
746-15	Same	J. F. Wolcott & Co.	10.63	4.68	1.95
		South Carrollton, Ky.	8.65	3.75	1.50
	Corn Feed Meal				
1907-16	Corn Feed Meal	J. J. Badenoch Co.	7.25	2.35	1.50
		Chicago, Ill.	7.00	1.20	3.50
1455-15	Same	The Cincinnati Hay & Grain Co.	10.35	4.25	1.45
		Cincinnati, Ohio.	8.62	4.85	1.90
1606-15	Feed Meal	The Cotton Bros. Co.	8.75	3.53	1.88
		Bellefontaine, Ohio.	9.50	4.00	2.50
2510-17	Famous Feed Meal	Corydon Milling Co.	10.00	7.24	8.30
		Corydon, Ky.	10.00	5.00	12.00
1159-16	Corn Feed Meal	Henry Fruechtenicht	8.13	3.15	1.45
		Louisville, Ky.	9.00	3.60	1.85
1040-17	Same	Kenton Hay & Grain Co.	9.38	2.60	2.80
		Covington, Ky.	8.56	4.10	2.00
1657-15	Feed Meal	Chris Miller's Sons	9.50	4.19	2.27
		Louisville, Ky.	8.25	4.00	6.50
.....	Rex Corn Feed Meal	Rex Mill & Feed Co.	8.75	3.70	2.41
		Nashville, Tenn.	8.75	2.75	1.75
	Corn Gluten Feed				
3083-18	Nutritia Corn Gluten Feed	Eikenberry-Fitzgerald Co.	19.81	2.96	6.39
		Cincinnati, Ohio.	20.00	3.00	8.00
	Hominy Feed				
3-15	That Good Feed	American Hominy Co.	12.75	7.42	4.95
		Indianapolis, Ind.	14.30	6.50	7.00
1-16	Homco	Same	10.31	9.33	4.58
			10.00	6.00	7.00
1-16	Sano	Same	12.00	9.16	5.48
1-18	Same	Same	11.25	7.63	4.68
1-18	Same	Same	10.25	7.63	5.50
.....	Same	Same	11.06	8.83	4.39
244-18	Hominy Meal	Ballard Corn Mills	10.38	8.30	4.74
		Louisville, Ky.	9.06	7.87	5.98
244-18	Same	Ballard & Ballard Co.	10.31	8.15	4.59
		Louisville, Ky.	9.00	7.87	5.98
98-16	Hominy Meal	Chas. Broeker & Co.	10.94	9.52	6.33
		Owensboro, Ky.	10.00	8.00	7.00
98-17	Hominy Feed	Same	11.13	10.23	4.35

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
649- 8	Mfgrs. Warehouse	Corn	Below guaranty in fat.
746-15	Ben Cohen, Central City.	Same	
1907-16	Ashland Feed Co., Ashland.	Corn	
1455-15	Henry Dieters, Covington.	Same	
1605-15	J. S. Stevens & Co., Ashland.	Same	Below guaranty in protein.
2510-17	Mfgrs. Warehouse	Corn germ and tailings, corn bran, broken corn, corn screenings 5%	Excess of bran.
1159-16	Same	Corn	Below guaranty in protein.
1040-17	Same	Same	Below guaranty in fat and above in fiber.
1657-15	Same	Same	
.....	Electric Mill Co., Franklin.	Same	Above guaranty in fiber.
3083-18	Berea College, Berea.	Corn gluten feed	
3-15	Jellico Grocery Co., Harlan.	White corn	Below guaranty in protein.
1-16	Henderson Feed & Commission Co., Henderson.	Same	
1-16	Ritter-Hennings Co., Louisville.	Same	
1-18	Ballard Brothers, LaGrange.	Same	
1-18	C. L. Jewell, Horse Cave.	Same	
.....	Electric Mills Co., Franklin.	Same	
244-18	W. M. Swan, Jeffersontown.	Corn	
244-18	I. F. Tabb, Mt. Sterling.	Same	Below guaranty in fat.
98-16	Mfgrs. Warehouse	Same	
98-17	George Keller, Newport.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
98-17	Hominy Feed	Chas. Broeker & Co.	11.25	9.43	4.90
		Owensboro, Ky.			
98-18	Same	Same	11.38	9.60	5.76
98-18	Same	Same	12.00	9.80	6.35
1142-17	Hominy Meal	Early & Daniel Co.	12.69	8.83	5.50
		Covington, Ky.	9.86	8.22	7.00
1185-18	Arrow Hominy Feed	Edinger & Co.	9.25	3.35	2.55
		Louisville, Ky.	**10.22**	**6.72**	**5.50**
137-19	Hominy Meal	The Eikenberry-Fitzgerald Co.	9.06	3.76	2.94
		Cincinnati, Ohio.	**9.00**	**6.00**	**7.00**
1504-15	Hominy Feed	J. H. Fedders & Sons	12.07	8.50	4.95
		Covington, Ky.	**10.25**	**7.75**	**7.50**
1149-18	Same	Same	11.06	7.60	4.03
1084-15	Same	Geo. Keller	11.33	8.84	5.56
		Newport, Ky.	**9.10**	**6.50**	**7.50**
1044-17	Same	The Kenton Hay & Grain Co.	11.44	10.21	5.66
		Covington, Ky.	**10.00**	**8.21**	**2.50**
941-19	Noxall Mill Feed	Lack-Redford Elevator Co.	11.56	8.85	6.17
		Paducah, Ky.	**11.70**	**8.05**	**9.50**
924-16	Hominy Feed	Louisville Cereal Mill Co.	10.75	7.87	5.15
		Louisville, Ky.	**9.11**	**8.25**	**6.50**
924-17	Hominy Meal	Same	11.88	7.97	6.13
2819-18	Dandy Hominy Feed	Louisville Milling Co.	11.19	7.90	5.40
		Louisville, Ky.	**10.00**	**7.00**	**6.00**
2818-18	Same	Same	10.06	9.89	5.76
.....	Hominy Feed	Minnesota Milling Co.	10.44	4.73	5.15
		St. Paul, Minn.	**11.40**	**7.00**	**10.80**
2482-17	Same	Perin Bros.	11.19	7.08	4.22
		Cincinnati, Ohio.	**10.69**	**9.15**	**6.00**
	Choice Cotton Seed Meals				
.....	Cotton Seed Meal	Alvarado Cotton Oil Mill	36.75	6.99	14.45
		Alvarado, Texas.	**43.00**	**6.00**	**12.00**
.....	First Grade Cotton Seed Meal	Bartlett Oil Mill	36.63	6.08	18.27
		Bartlett, Texas.	**41.20**	**5.00**	**14.00**
56-19	"Battle Brand" Choice Cotton Seed Meal	W. P. Battle & Co.	40.81	7.22	10.89
		Memphis, Tenn.	**41.00**	**6.00**	**10.00**
622-14	"Owl Brand" Cotton Seed Meal	F. W. Brode & Co.	40.88	6.63	10.80
		Memphis, Tenn.	**41.00**	**6.00**	**10.00**
236-15	Same	Same	37.38	6.17	14.33
236-15	Same	Same	38.13	6.13	10.59
236-16	Same	Same	38.75	6.64	13.67

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
98-17	Mfrs. Warehouse	Corn	
98-18	M. O. Hughes, Bowling Green.	Same	
98-18	McCauley & Cain, Versailles.	Same	
1142-17	Mfrs. Warehouse	Same	
1185-18	Shelby Co. Feed & Grain Co., Shelbyville	Same	Below guaranty in protein and fat.
137-19	Berea College, Berea.	Same	Below guaranty in fat. Sample musty. Not hominy meal, but corn feed meal.
1504-15	Rattermann & Summe, Covington.	Same	
1148-18	Mfrs. Warehouse	Same	
1084-15	Sauerbeck Bros., Newport.	Same	
1044-17	Mfrs. Warehouse	Same	Above guaranty in fiber.
941-19	Decker & Vickers, Paducah.	Pure corn hearts, pure corn bran.	
924-16	LaGrange Flour & Feed Mill, LaGrange.	Corn	
924-17	LaGrange Feed & Gr. Co. LaGrange.	Same	
2819-18	Oscar Farmer & Sons, Louisville.	Same	
2919-18	Harris & Crowders, Franklin, Ky.	Same	
.....	American Co-operative As. Owensboro.	Same	Sample is corn feed meal. Not hominy feed. Below guaranty in protein and fat.
2482-17	Ruef Bros., Covington.	Same	Below guaranty in fat.
.....	J. A. Robinson, Danville.	Cotton seed	Below guaranty in protein and high in fiber. Adulterated with hulls
.....	I. S. Tevis, Shelby City.	Same	Below guar. in protein, above in fat. Adult. with cot. seed hulls.
56-19	Headley & Co., Lexington.	Same	Above guaranty in fiber.
622-14	E. Bassett, Madisonville.	Same	Above guaranty in fiber. Adulterated with hulls.
236-15	J. H. Baughman & Co., Stanford.	Same	Below guaranty in protein, above in fiber
236-15	Eagle Mills, Franklin.	Same	Same
236-16	Hudson & Hughes, Lancaster.	Same	Same

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
236-16	"Owl Brand" Cottonseed Meal...	F. W. Brode & Co. Memphis, Tenn.	40.94	7.75	12.49
236-17	Same	Same	40.56	6.55	11.45
236-18	Same	Same	40.06	6.60	12.53
236-18	Same	Same	37.13	5.74	14.78
236-18	Same	Same	39.06	7.09	12.89
236-18	Same	Same	38.81	6.52	13.32
236-18	Same	Same	39.88	6.68	12.23
236-18	Same	Same	40.31	6.58	10.04
236-18	Same	Same	40.31	6.86	12.28
236-18	Same	Same	41.13	6.85	10.99
236-18	Same	Same	44.06	7.19	9.38
236-18	Same	Same	38.19	5.90	14.60
236-18	Same	Same	40.94	6.93	12.00
236-18	Same	Same	43.69	6.97	10.28
.....	Same	Same	39.38	6.85	12.15
.....	Same	Same	40.31	7.08	11.03
1264-19	"Owl Brand" High Grade Cotton Seed Meal	Same	38.13	6.80	13.81
1264-19	Same	Same	44.06	6.83	9.96
100-15	Burnett's Choice Cotton Seed Meal	The Wm. A. Burnett Co. Louisville, Ky.	42.38 41.00	7.43 6.00	9.58 10.00
3022-18	"Eagle Brand" Cotton Seed Meal	The Cottonseed Products Co. Louisville, Ky.	41.31 41.00	6.30 6.00	12.00 10.00
3022-18	Same	Same	35.63	6.06	14.40
3022-18	Same	Same	35.38	6.36	15.18
3022-18	Same	Same	34.00	5.75	16.70
3022-18	Same	Same	38.38	6.34	13.94
3022-18	Same	Same	38.38	6.90	12.70

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
236-16	L. L. Harned..... Boston.	Cotton seed	Above guaranty in fiber. Excess of hulls.
236-17	C. E. Duff..... Mt. Sterling.	Same	Above guaranty in fiber. Excess of hulls.
236-18	F. P. Boyd..... Mt. Sterling.	Same	Below guaranty in protein, above in fiber. Adulter'd with hulls.
236-18	Bowling Green Milling Co. Bowling Green.	Same	Same
236-18	F. H. Gordon..... Richmond.	Same	Same
236-18	P. T. Stader..... Colesburg.	Same	Same
236-18	Alfred Ross ..... Central City.	Same	Same
236-18	J. E. Thompson..... Loretto.	Same	Below guaranty in protein.
236-18	J. K. Fowler..... Boston.	Same	Below guaranty in protein, above in fiber.
236-18	C. C. McDonald..... Mt. Sterling.	Same	Above guaranty in fiber.
236-18	F. H. Gordon..... Richmond.	Same	
236-18	Same	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
236-18	A. B. Hancock..... Paris.	Same	Above guaranty in fiber. Excess of hulls.
236-18	H. R. Prewitt..... Mt. Sterling.	Same	
.....	W. J. and B. A. Thomas.. Shelbyville.	Same	Excess of hulls. Above guaranty in fiber, below in protein.
.....	Same	Same	Above guaranty in fiber. Excess of hulls.
1264-19	C. C. Ellis..... Eminence.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
1264-19	J. S. Bunnell..... Horse Cave.	Same	
100-15	LaGrange Feed & Gr. Co. LaGrange.	Decorticated cotton seed.....	
3022-18	Hoke & Money..... Goshen.	Cotton seed	Above guaranty in fiber.
3022-18	John E. Ellis..... Crestwood.	Cotton seed	Adulterated with hulls. Below guaranty in protein, above in fiber.
3022-18	J. H. Hewett..... Crestwood.	Same	Same.
3022-18	A. C. Barnett..... Pewee Valley.	Same	Same.
3022-18	Glasgow Feed and Pro. Co. Glasgow.	Same	Same.
3022-18	L. B. Hawley..... Crestwood.	Same	Same.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
3022-18	"Eagle Brand Choice" Cotton Seed Meal	The Cotton Seed Products Co. Louisville, Ky.	37.31	5.64	15.20
3022-18	Same	Same	36.63	6.30	14.00
3022-18	Same	Same	37.75	6.15	14.25
3022-18	Same	Same	36.50	6.01	14.81
3022-18	Same	Same	35.67	6.43	15.25
3022-18	Same	Same	37.88	6.35	12.71
3022-18	Same	Same	38.06	6.01	14.10
335-18	Same	Same	38.44	5.86	14.35
1184-18	Choice Cotton Seed Meal	Edinger & Co.	38.56	6.04	13.85
		Louisville, Ky.	**41.00**	**6.00**	**10.00**
1708-15	Globe Brand Choice Cotton Seed Meal	Gus Gronauer & Co.	40.00	6.63	10.93
		Memphis, Tenn.	**41.00**	**7.00**	**10.00**
476-15	Dixie Brand Cotton Seed Meal	Humphreys-Godwin Co.	41.88	10.73	6.31
		Memphis, Tenn.	**41.00**	**6.00**	**10.00**
476-15	Same	Same	41.25	6.28	11.04
1443-14	Choice Cotton Seed Meal	Geo. Keller	39.38	7.64	11.55
		Newport, Ky.	**41.56**	**7.85**	**8.15**
356-15	"Canary Brand" Cotton Seed Meal	Lanier Bros.	37.13	6.05	14.36
		Nashville, Tenn.	**41.00**	**6.00**	**10.00**
356-16	Same	Same	43.81	7.23	9.38
171-19	Same	Same	42.19	6.83	10.82
171-19	Same	Same	39.69	6.35	13.24
171-19	Same	Same	40.63	6.45	12.00
1590-15	"Macado" Cotton Seed Meal	J. M. Macdonald	42.13	6.75	10.23
		Cincinnati, Ohio.	**41.00**	**6.00**	**12.00**
1590-15	Same	Same	38.63	6.96	11.30
1590-15	Same	Same	43.00	6.92	9.85
1590-16	Same	Same	38.56	6.37	15.00
1590-16	Same	Same	41.00	6.91	11.18
2948-18	Sunset Brand Cotton Seed Meal and Cracked Cake	Texas Cake & Linter Co.	41.13	7.75	16.73
		Dallas, Tex.	**41.00**	**5.00**	**14.00**

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
3022-18	Virgil B. Snowden..... Goshen.	Cotton seed	Adulterated with hulls. Below guaranty in protein, above in fiber.
3022-18	H. C. Duncan..... Crestwood.	Same	Same.
3022-18	R. A. Hawley..... Crestwood.	Same	Same.
3022-18	Herman Gisinger..... Pewee Valley.	Same	Same.
3022-18	Hoge & Scruggs ..... Frankfort.	Same	Same.
3022-18	Blue Grass Commission Co. Lexington.	Same	Same.
3022-18	W. B. Belknap..... Goshen.	Same	Same.
335-18	J. C. Pierce..... Goshen.	Same	Same.
1184-18	W. Broadus & Co..... Richmond.	Decorticated cotton seed meal...	Below guaranty in protein, above in fiber. Adulter'd with hulls.
1708-15	W. W. Shadburne..... Louisville.	Cotton seed	Below guaranty in protein, above in fiber. Excess of hulls.
476-15	Hudson & Davis..... Danville.	Pressed cotton seed.....	
476-15	Joe Croxton ..... Winchester.	Same	Above guaranty in fiber. Excess of hulls.
1443-14	Mfrs. Warehouse	Cotton seed	Below guaranty in protein, above in fiber. Adulter'd with hulls.
356-15	Wm. Addams ..... Cynthiana.	Decorticated cotton seed.....	Same.
356-16	Headley & Co..... Lexington.	Same	
171-19	Same	Same	Above guaranty in fiber.
171-19	Same	Same	Below guaranty in protein, above in fiber. Excess of hulls.
171-19	Same	Same	Above guaranty in fiber. Excess of hulls. High in fiber.
1590-15	E. G. Duckwall & Co. .... Louisville.	Decorticated cotton seed.....	
1590-15	W. T. McDonough..... Vine Grove.	Same	Below guaranty in protein. Adultered with hulls.
1590-15	Duncan & Bro..... LaGrange.	Same	
1590-16	Lambert-Grisham Hardware Co., Henderson. ..	Same	Below guaranty in protein, above in fiber. Adulter'd with hulls.
1590-16	I. F. Tabb..... Mt. Sterling.	Same	
2948-18	J. C. Caldwell, Jr. ..... Danville.	Cotton seed	Above guaranty in fiber. Excess in hulls.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
	Prime Cotton Seed Meals				
3110-18	Battle Brand Cotton Seed Meal...	W. P. Battle & Co.	40.69	7.88	10.25
		Memphis, Tenn.	**38.62**	**6.00**	**10 00**
2111-16	"Royal" Prime Cotton Seed Meal	Blue Grass Commission Co.	40.56	7.03	9.60
		Lexington, Ky.	**38.62**	**6.00**	**10.00**
2111-16	Same	Same	39.06	6.29	10.60
237-16	"Dove Brand" Cotton Seed Meal.	F. W. Brode & Co.	38.13	6.23	11.61
		Memphis, Tenn.	**38.62**	**6.00**	**12.00**
237-16	Same	Same	38.25	7.59	13.13
237-16	Same	Same	36.25	7.22	13.25
237-16	Same	Same	35.88	5.93	14.80
237-16	Same	Same	37.44	6.39	13.88
237-16	Same	Same	34.75	6.48	15.95
237-16	Same	Same	39.00	7.80	12.08
237-16	Same	Same	38.19	6.58	12.94
237-16	Same	Same	37.38	5.51	14.03
237-16	Same	Same	37.38	6.52	10.90
237-16	Same	Same	37.63	5.99	13.03
237-16	Same	Same	38.00	7.57	13.03
237-16	Same	Same	37.25	6.25	12.38
237-16	Same	Same	36.75	6.37	13.53
237-16	Same	Same	38.50	6.83	12.40
237-16	Same	Same	39.63	6.67	12.08
237-16	Same	Same	38.13	7.09	13.58
237-16	Same	Same	38.13	7.18	12.60
237-16	Same	Same	35.00	5.81	16.28
237-16	Same	Same	38.25	5.66	13.73
237-16	Same	Same	39.00	6.88	12.43

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
3110-18	Headley & Company ..... Lexington.	Cotton seed.....	
2111-16	Mfrs. Warehouse	Cotton seed.....	
2111-16	Same	Same	Above guaranty in fiber.
237-16	B. F. Page..... Oakland.	Cotton seed.....	
237-16	L. M. Shobe..... Smiths Grove.	Same	Above guaranty in fiber, below in protein.
237-16	Bracken & Davidson..... Franklin.	Same	Below guaranty in protein, above in fiber.
237-16	Ky. Experiment Station.. Lexington.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
237-16	E. T. Ford..... Cave City.	Same	Excess of hulls. Below guaranty in protein, above in fiber.
237-16	Blue Grass Commission Co. Lexington.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
237-16	A. C. Allen..... Oakland.	Same	Above guaranty in fiber.
237-16	S. B. Jones..... Pembroke.	Same	Excess of hulls. Below guaranty in protein, above in fiber.
237-16	J. C. Walton..... Smith's Grove.	Same	Below guaranty in protein. Adultered with hulls.
237-16	B. S. Ewing..... Smith's Grove.	Same	Below guaranty in protein, above in fiber.
237-16	Scott Richardson ..... Smith's Grove.	Same	Below guaranty in protein, above in fiber.
237-16	M. O. Hughes ..... Bowling Green.	Same	Below guaranty in protein, above in fiber.
237-16	Henry Fruechtenicht .... Louisville.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
237-16	Same	Same	
237-16	R. P. Taylor..... Winchester.	Same	
237-16	John Stofer ..... Mt. Sterling.	Same	
237-16	Elizabethtown Milling Co. Elizabethtown.	Same	Above guaranty in fiber,
237-16	R. Lowery ..... Leitchfield, Ky.	Same	Below guaranty in protein, above in fiber.
237-16	Simon Weil & Son..... Glenns Creek.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
237-16	J. H. Baughman & Co. ... Stanford.	Same	Above guaranty in fiber.
237-16	C. J. Clausen..... Louisville.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
237-16	"Dove Brand" Cotton Seed Meal.	F. W. Brode & Co.	38.31	6.35	12.38
		Memphis, Tenn.	38.62	6.00	12.00
237-17	Same	Same	38.63	6.80	10.93
237-17	Same	Same	36.88	7.18	14.18
237-17	Same	Same	36.00	6.53	15.55
237-17	Same	Same	37.63	6.32	11.60
237-17	Same	Same	34.88	6.28	16.23
237-17	Same	Same	37.75	6.68	14.25
237-17	Same	Same	34.88	6.48	15.03
237-17	Same	Same	37.00	5.87	13.15
237-18	Same	Same	35.69	6.28	15.62
237-18	Same	Same	37.13	6.56	14.13
237-18	Same	Same	37.88	6.65	14.11
237-18	Same	Same	39.31	7.49	12.66
237-18	Same	Same	38.69	6.48	13.15
237-18	Same	Same	39.31	7.60	12.63
237-18	Same	Same	37.56	6.98	12.50
237-18	Same	Same	38.69	6.00	13.37
237-18	Same	Same	40.31	6.05	12.20
237-18	Same	Same	40.94	7.20	11.51
237-18	Same	Same	40.44	7.88	11.47
237-18	Same	Same	39.18	6.06	13.30
237-18	Same	Same	40.69	7.73	12.63
237-18	Same	Same	38.94	6.88	11.93
237-18	Same	Same	37.44	6.05	13.53
237-18	Same	Same	38.19	6.23	12.88

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
237-16	E. T. Ford..... Cave City.	Cotton seed	
237-17	E. L. Robertson and J. M. Howard, Glenn Dean. ..	Same	
237-17	Bracken & Davis..... Franklin.	Same	Adulterated with cotton seed hulls. Below in protein, above in fiber.
237-17	C. H. Jett..... Richmond.	Same	Same.
237-17	Same	Same	Adulterated with cotton seed hulls. Below guaranty in protein.
237-17	O'Daniel, Wathen & Co. .. Lebanon.	Same	Adulterated with cotton seed hulls. Below guaranty in protein, above in fiber.
237-17	George Byars ..... Adairville.	Same	Same.
237-17	C. H. Jett..... Richmond.	Same	Same
237-17	Bedford & Tuttle..... Winchester.	Same	Same
237-18	J. S. Bunnell..... Horse Cave.	Same	Same
237-18	Eminence Milling Co. .... Eminence.	Same	Same
237-18	Simon Weil. Lexington.	Same	Same
237-18	Hughes, Hudson & Fornan, Lancaster.	Same	Above guaranty in fiber.
237-18	A. C. Young..... Adairville.	Same	Above guaranty in fiber.
237-18	T. G. Harned..... Boston.	Same	Above guaranty in fiber.
237-18	The Acme Mills ..... Hopkinsville.	Same	Excess of hulls. Below guaranty in protein.
237-18	Leslie Combs..... Lexington.	Same	Excess of hulls. Above guaranty in fiber.
237-18	Roy Dickerson ..... Bardstown.	Same	
237-18	B. S. Harned..... Boston.	Same	
237-18	Grigsby & Co. ..... Bardstown.	Same	
237-18	C. W. Brown..... Bardstown.	Same	Above guaranty in fiber.
237-18	A. A. Nicholls..... Bloomfield.	Same	Above guaranty in fiber
237-18	Same	Same	
237-18	J. C. Abell..... Cox's Creek.	Same	Adulterated with cotton seed hulls. Below in protein, above in fiber.
237-18	Abell & Brown..... Bardstown.	Same	Above guaranty in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
237-18	"Dove Brand" Cotton Seed Meal.	F. W. Brode & Co.	39.50	6.35	13.32
		Memphis, Tenn.	**38.62**	**6.00**	**12.00**
.....	Same	Same	40.81	6.18	11.63
.....	Same	Same	37.31	7.33	13.28
2236-16	Prime Cotton Seed Meal.....	Brownsville Cot. Oil & Ice Co.	32.75	5.81	16.73
		Brownsville, Tenn.	**38.62**	**6.00**	**12.00**
2236-16	Same	Same	38.13	7.73	12.10
2236-16	Same	Same	33.00	5.98	16.43
2236-16	Same	Same	33.13	5.93	16.60
2236-16	Same	Same	33.50	5.93	15.18
2236-16	Same	Same	31.00	5.85	17.80
242-14	"Buckeye" Prime Cotton Seed Meal	The Buckeye Cotton Oil Co.	38.00	6.23	13.10
		Cincinnati, Ohio.	**38.62**	**6.50**	**12.00**
242-14	Same	Same	40.78	6.60	12.65
242-14	Same	Same	35.75	6.03	13.98
306-16	Same	Same	37.63	6.00	12.93
306-16	Same	Same	36.88	6.47	12.87
306-16	Same	Same	34.94	6.03	13.38
306-16	Same	Same	39.13	7.27	12.05
306-16	Same	Same	38.13	6.61	12.98
306-16	Same	Same	40.69	6.49	10.55
306-16	Same	Same	35.88	5.78	15.03
101-16	Burnett's Prime Cotton Seed Meal	The Wm. A. Burnett Co.	37.63	7.65	11.58
		Louisville, Ky.	**38.62**	**6.00**	**10.00**
101-16	Same	Same	37.38	6.25	11.28
101-16	Same	Same	40.75	7.20	10.30
101-16	Same	Same	39.50	7.22	10.58
101-16	Same	Same	39.63	6.68	10.25
101-16	Same	Same	33.38	5.99	15.90

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
237-18	Hudson, Hughes & Fornan, Lancaster.	Cotton seed	Above guaranty in fiber.
.....	F. H. Gordon..... Richmond.	Same	
.....	W. A. Thompson..... Paris.	Same	Excess of hulls. Below guaranty in protein, above in fiber.
2236-16	Franklin Ele. & W. H. Co. Franklin.	Cotton seed	Adulterated with hulls. Below guaranty in protein, above in fiber.
2236-16	Same	Same	Same
2236-16	Frank Richardson ..... Glasgow.	Same	Same
2236-16	L. H. Jordan..... Glasgow.	Same	Same
2236-16	R. F. Jordan..... Glasgow.	Same	Same
2236-16	J. W. Jones..... Smith's Grove.	Same	Above guaranty in fiber. Excess of hulls.
242-14	W. W. Broaddus & Co. ... Richmond.	Cotton seed	Above guaranty in fiber.
242-14	Pikeville Grocery Co. .... Pikeville.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber
242-14	John Jeems ..... Louisa.	Same	Same
306-16	J. C. Everett & Co. ..... Maysville.	Same	Same
306-16	Henry Fruechtenicht..... Louisville.	Same	Same
306-16	Same	Same	
306-16	Wm. Addams ..... Cynthiana.	Same	Above guaranty in fiber.
306-16	Forbes Manufacturing Co. Hopkinsville.	Same	
306-16	Hudson, Hughes & Fornan, Lancaster.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
306-16	Oscar Farmer & Sons..... Louisville.	Same	Excess of hulls. Below guaranty in protein, above in fiber.
101-16	Park City Feed Store.... Bowling Green.	Decorticated cotton seed.....	Below guaranty in protein. Excess of hulls.
101-16	Dickinson Bros. ..... Glasgow.	Same	
101-16	Crawford Arterburn ..... St. Matthews.	Same	
101-16	Same	Same	
101-16	Dickinson Bros. ..... Glasgow.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
101-16	J. C. Coleman..... O'Bannon.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
101-16	Burnett's Prime Seed Cotton Seed Meal	The Wm. A. Burnette Co.....	31.38	5.83	16.45
		Louisville, Ky.	38.62	6.00	10.00
101-17	Same	Same	40.81	6.28	12.19
101-17	Same	Same	35.38	6.68	14.22
101-17	Same	Same	32.00	6.02	16.98
101-17	Same	Same	37.25	7.11	11.18
101-17	Same	Same	40.25	6.24	11.73
101-17	Same	Same	40.63	7.15	9.43
1807-16	Prime Cotton Seed Meal	Cincinnati Grain & Hay Co.	35.88	5.70	14.50
		Covington, Ky.	38.62	6.00	12.00
1747-15	Prime Cotton Seed Meal	The Cotten Seed Products Co.	36.75	7.19	12.73
		Louisville, Ky.	38.00	6.00	10.00
1747-15	Same	Same	39.38	7.50	10.48
1747-15	Same	Same	39.00	7.08	11.90
3003-18	Same	The Cotton Seed Products Co.	37.13	6.50	12.80
		Louisville, Ky.	38.62	6.00	12.00
2203-16	Arrow Prime Cotton Seed Meal	Edinger & Co.	39.75	7.71	11.65
		Louisville, Ky.	38.62	6.00	12.00
2203-18	Same	Same	37.56	6.26	14.83
1857-16	"We Kno" Prime Cotton Seed Meal	Oscar Farmer & Sons	38.63	7.30	12.75
		Louisville, Ky.	38.62	6.00	10.00
1857-16	Same	Same	38.00	7.25	8.90
1857-16	Same	Same	39.00	6.61	12.68
1857-16	Same	Same	37.69	6.90	12.88
1857-17	Same	Same	37.63	5.90	13.78
2006-16	Nutritia Prime Cotton Seed Meal	The Ferger Grain Co.	38.88	6.47	13.15
		Cincinnati, Ohio.	38.60	6.00	12.00
1904-16	Prime Cotton Seed Meal	Henry Fruechtenicht	37.25	6.99	12.95
		Louisville, Ky.	38.62	6.00	10.00
1904-16	Same	Same	36.94	6.49	13.75
3035-18	Prime Cotton Seed Meal	E. L. Gross & Co.	40.56	6.27	11.93
		Louisville, Ky.	38.62	6.00	12.00
3035-18	Same	Same	38.06	6.43	14.83
803-12	Dixie Brand Cotton Seed Meal	Humphreys-Godwin Co.	37.38	6.73	12.70
		Memphis, Tenn.	38.62	6.00	12.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
101-16	C. R. Barnes..... Bardstown.	Decorticated cotton seed.....	Adulterated with hulls. Below guaranty in protein, above in fiber.
101-17	Walker-Richards Co..... Glendale.	Same	Above guaranty in fiber. Excess of hulls.
101-17	Dickinson Bros..... Glasgow.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
101-17	C. H. Jett..... Richmond.	Same	Same
101-17	Henry Fruechtenicht..... Louisville.	Same	Excess of hulls. Below guaranty in protein, above in fiber.
101-17	C. H. Jett..... Richmond, Ky.	Same	Above guaranty in fiber. Excess of hulls.
101-17	J. V. Rouse..... Cox's Creek.	Same	
1807-16	Mfrs. Warehouse	Cotton seed	Adulterated with hulls. Below guaranty in protein, above in fiber.
1747-15	Riedling & Bro..... Louisville.	Same	Below guaranty in protein and above in fiber. Adulter'd with hulls.
1747-15	Edinger & Co..... Louisville.	Same	
1747-15	Same	Same	High in fiber. Excess in hulls.
3003-18	A. C. Barnett ..... Pewee Valley.	Cotton seed	Below guaranty in protein, above in fiber. Excess of hulls.
2203-16	Park City Feed Store.... Bowling Green.	Same	
2203-18	L. M. and O. P. Fry..... Christiansburg.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
1857-16	Mfrs. Warehouse	Decorticated cotton seed.....	Above guaranty in fiber. Excess of hulls.
1857-16	Same	Same	Below guaranty in protein.
1857-16	Same	Same	Above guaranty in fiber. Excess of hulls.
1857-16	Same	Same	Excess of hulls. Below guaranty in protein, above in fiber.
1857-17	Same	Same	Same
2006-16	Bedford & Tuttle..... Winchester.	Cotton seed	Above guaranty in fiber.
1904-16	Mfrs. Warehouse	Decorticated cotton seed.....	Below guaranty in protein, above in fiber. Excess of hulls.
1904-16	Same	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
3035-18	Simpson County Hdw. Co. Franklin.	Cotton seed	
3035-18	Hoge & Scruggs..... Frankfort.	Same	Above guaranty in fiber. Excess of hulls.
803-12	Dorsey Bros. & Fisher.... Carlisle.	Pressed cotton seed.....	Excess of hulls. Below guaranty in protein, above in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
477-17	"Forfat" Brand Cotton Seed Meal	Humphreys, Godwin Co.	34.63	6.13	12.90
		Memphis, Tenn.	38.62	6.00	12.00
447-18	Same	Same	39.31	6.90	11.70
26-18	"Imperial Brand" Cotton Seed Meal	W. B. Johnson & Co.	36.25	6.10	15.73
		Memphis, Tenn.	38.62	6.00	12.00
357-16	"Jersey Brand" Cotton Seed Meal	Lanier Bros.	37.38	7.16	12.64
		Nashville, Tenn.	38.62	6.00	10.00
357-18	Same	Same	38.56	7.65	9.81
2647-18	"Memphis Brand" Cotton Seed Meal	L. B. Lovitt & Co.	36.19	5.83	16.04
		Memphis, Tenn.	38.62	6.00	12.00
2647-18	Same	Same	39.00	7.61	11.65
1506-15	"Kineda" Prime Cotton Seed Meal	J. M. Macdonald	38.88	6.98	13.18
		Cincinnati, Ohio.	38.60	6.00	12.00
1506-15	Same	Same	35.75	6.11	13.20
1506-16	Same	Same	39.06	6.38	11.93
1506-16	Same	Same	39.13	6.96	11.93
1506-16	Same	Same	37.75	5.76	14.28
1506-16	Same	Same	38.88	6.26	12.48
1506-16	Same	Same	37.25	6.73	11.93
1506-16	Same	Same	37.25	6.50	11.80
1506-16	Same	Same	40.56	6.59	11.54
1506-17	Same	Same	39.44	8.00	12.10
.....	Eagle Brand High Grade Cotton Seed Meal	C. L. Montgomery & Co.	37.44	6.60	14.08
		Memphis, Tenn.	38.62	6.00	10.00
573-15	Phoenix Prime Cotton Seed Meal	Phoenix Cotton Oil Co.	35.56	6.29	14.03
		Dyersbury, Tenn.	38.62	7.00	10.00
1964-16	Same	Same	39.19	6.60	12.56
1964-16	Same	Same	42.63	8.83	9.18
1964-16	Same	Same	39.13	7.55	11.65
1964-16	Same	Same	37.56	6.32	12.85
1964-17	Same	Same	37.19	7.98	11.99
1964-17	Same	Same	36.38	7.05	11.21

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
477-17	First Ky. Distillery Supply Co., Glasgow	Pressed cotton seed	Adulterated with hulls. Below guaranty in protein, above in fiber.
477-18	F. P. Boyd. Mt. Sterling.	Same	
26-18	Summers Coal Co. Smith's Grove.	Decorticated cotton seed	Adulterated with hulls. Below guaranty in protein, above in fiber.
357-16	G. Cooksey. Russellville.	Decorticated cotton seed	Below guaranty in protein, above in fiber. Excess of hulls.
357-18	Simpson County Hdw. Co. Franklin.	Same	
2647-18	Walker-Richards Co. Glendale.	Cotton seed meal	Adulterated with hulls. Below guaranty in protein, above in fiber.
2647-18	M. J. Yopp Seed Co. Paducah.	Same	
1506-15	Wm. P. Miller. Louisville.	Cotton seed	Above guaranty in fiber. Excess of hulls.
1506-15	Hines & Stricklett. Vanceburg.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
1506-16	Beard Bros. Hardinsburg.	Same	
1506-16	Robt. Crump Bowling Green.	Same	
1506-16	Park City Feed Store. Bowling Green.	Same	Below guaranty in protein, above in fiber. Excess of hulls.
1506-16	C. H. Jett. Richmond.	Same	
1506-16	Eminence Milling Co. Eminence.	Same	Below guaranty in protein. Excess of hulls.
1506-16	R. D. Riedling. Louisville.	Same	Below guaranty in protein. Excess of hulls.
1506-16	Duncan & Bro. LaGrange.	Same	
1506-17	Park City Feed Store. Bowling Green.	Same	
.....	Geo. W. Maraman & Sons. Shephardsville.	Pressed cotton seed	Below in protein, above in fiber; dark color; large p. c. lint, hulls.
573-15	Leitchfield Milling Co. Leitchfield.	Cotton seed	Below in protein, above guaranty in fiber. Adulterated with hulls.
1964-16	Browder Milling Co. Fulton.	Decorticated cotton seed	Above guaranty in fiber. Excess of hulls.
1964-16	Leitchfield Milling Co. Leitchfield.	Same	
1964-16	R. Lowery Leitchfield.	Same	Above guaranty in fiber.
1964-16	Same	Same	Below guaranty in protein and above in fiber.
1964-17	The Acme Mills. Hopkinsville.	Same	Excess of hulls. Below guaranty in protein, above in fiber.
1964-17	Same	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2421-18	Phoenix Prime Cotton Seed Meal..	Phoenix Cotton Oil Co.....	40.44	5.77	12.65
		Dyersburg, Tenn.	38.62	7.00	10.00
2111-16	Royal Prime Cotton Seed Meal....	Shelby County Cotton Oil Co..	37.38	5.99	13.31
		Memphis, Tenn.	38.62	6.00	10.00
.....	Same	Same	38.50	6.09	12.00
			38.60	6.00	12.00
2111-16	Same	Same	38.25	6.22	12.40
			38.62	6.00	10.00
1386-17	Scoco Brand Cotton Seed Meal....	The Southern Cotton Oil Co..	39.88	6.52	12.64
		Memphis, Tenn.	38.50	7.00	10.00
2037-16	American Red Tag Cotton Seed Meal	Union Seed & Fertilizer Co. ...	37 56	7.41	12.72
		New York City, N. Y.	38.62	6.00	11.50
2037-16	Same	Same	37.88	6.15	15.60
2037-16	Same	Same	38.50	7.67	11.38
2037-16	Same	Same	37.88	7.69	11.98
2037-16	Same	Same	38.50	7.32	9.87
2037-16	Same	Same	38.13	7.45	11.70
2037-16	Same	Same	38.13	7.28	12.20
2037-16	Same	Same	37.50	5.78	10.65
2037-16	Same	Same	35.25	6.50	14.34
402-16	Same	Same	35.13	7.02	15.88
			38.62	6.00	12.00
402-16	Same	Same	38.00	6.73	12.38
.....	Prime Cotton Seed Meal.....	Valley Cotton Oil Co.	35.13	5.88	13.50
		Memphis, Tenn.	38.62	8.00	12.00
	Good Cotton Seed Meal				
58-19	Battle Brand Cotton Seed Meal....	W. P. Battle & Co.	33.19	6.08	17.57
		Memphis, Tenn.	36.00	5.00	15.00
2318-17	Jay Brand Cotton Seed Feed.....	F. W. Brode & Co.	38.63	7.00	12.12
		Memphis, Tenn.	36.00	5.00	14.00
2318-17	Same	Same	36.63	6.46	13.05
2318-17	Same	Same	37.25	6.35	14.38
2318-18	Same	Same	37.19	6.69	12.59
2126-17	Buckeye Good Cotton Seed Meal..	The Buckeye Cotton Oil Co. ...	36.81	5.85	13.85
		Cincinnati, Ohio.	36.00	5.00	14.00
2126-17	Same	Same	35.63	5.85	14.40

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2421-18	Browder Milling Co. ..... Fulton.	Decorticated cotton seed.....	Above guaranty in fiber.
2111-16	Blue Grass Commission Co. Lexington.	Cotton seed	Above guaranty in fiber and below in protein. Excess of hulls.
.....	Simon Weil & Sons..... Lexington.	Same	
2116-16	Blue Grass Commission Co. Lexington.	Same	Above guaranty in fiber. Excess of hulls.
1386-17	Same	Cotton seed	Same.
2037-16	W. R. Moorman & Son... Glen Dean.	Cotton seed	Excess of hulls. Below guaranty in protein, above in fiber
2037-16	S. C. Jennings..... Madisonville.	Same	Same.
2037-16	Eminence Milling Co. .... Eminence.	Same	
2037-16	Blue Grass Commission Co. Lexington.	Same	Below guaranty in protein. Excess of hulls.
2037-16	Beard Bros. ..... Hardinsburg.	Same	
2037-16	R. P. Taylor..... Winchester.	Same	
2037-16	Same	Same	Above guaranty in fiber.
2037-16	Oscar Farmer & Son..... Louisville.	Same	Below guaranty in protein.
2037-16	Geo. Keller ..... Newport.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
402-16	Simon Weil & Son..... Lexington.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
402-16	Forbes Manufacturing Co. Hopkinsville.	Same	Below guaranty in protein.
.....	Elizabethtown Milling Co. Elizabethtown.	Pressed cotton seed.....	Below in protein and fat, above in fiber. Adulter'd with hulls.
58-19	Henry & Harvey..... Carlisle.	Cotton seed meal, cotton seed hulls 20%	Adulterated with cotton seed hulls. Below in protein, above in fiber.
2318-17	Cowherd & Altshelter Mule Co., Hopkinsville..	Cotton seed meal, cotton seed hulls 30%	
2318-17	F. H. Gordon..... Richmond.	Same	
2318-17	Simpson County Hdw. Co. Franklin.	Same	
2318-18	American Co-Operative As. Owensboro.	Same	
2126-17	William Addams ..... Cynthiana.	Cotton seed meal, cotton seed hulls 20%	
2126-17	Blue Grass Commission Co. Lexington.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2126-17	Buckeye Good Cotton Seed Meal..	The Buckeye Cotton Oil Co...	32.75	6.24	16.40
		Cincinnati, Ohio.	**36.00**	**5.00**	**14.00**
2126-18	Same	Same	37.56	7.08	13.61
2126-18	Same	Same	36.63	6.15	15.67
2126-18	Same	Same	37.00	6.81	12.98
2126-18	Same	Same	33.69	6.03	17.01
.....	Same	Same	36.31	5.86	14.47
2127-17	Cotton Seed Meal.....	The Wm. A. Burnett Co.	35.88	7.10	14.90
		Louisville, Ky.	**36.00**	**5.00**	**14.00**
2127-17	Same	Same	38.31	6.83	15.48
2127-17	Same	Same	37.38	7.38	12.75
2127-17	Same	Same	35.50	7.51	12.79
2127-17	Same	Same	33.25	6.40	13.28
2127-18	Same	Same	38.06	7.41	10.68
2127-18	Same	Same	38.25	6.75	13.19
2127-18	Same	Same	38.56	6.68	12.87
2601-17	Goody Brand Cotton Seed Meal....	Central Oil Mills.....	36.69	7.08	12.05
		Jackson, Tenn.	**36.00**	**5.50**	**14.00**
431-19	Cotton Seed Feed.....	Cincinnati Grain & Hay Co. ...	35.69	7.91	13.43
		Covington, Ky.	**36.00**	**5.50**	**14.00**
2207-16	Good Cotton Seed Meal.....	Cotton Seed Products Co.....	37.50	6.86	12.86
		Louisville, Ky.	**36.00**	**6.00**	**14.00**
2207-16	Same	Same	35.19	6.88	14.40
2207-16	Same	Same	35.81	6.73	14.49
2207-16	Good Cotton Seed Meal.....	Same	34.56	6.66	16.23
2207-17	Same	Same	36.13	7.43	12.66
2207-17	Same	Same	37.00	6.58	14.05
2207-17	Same	Same	36.88	7.23	13.28
2207-17	Same	Same	35.75	6.85	12.88
2207-17	Same	Same	37.06	7.25	11.88

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2126-17	J. C. Everett & Co. ..... Maysville.	Cotton seed meal, cotton seed hulls 20%	Adulterated with cotton seed hulls. Below in protein, above in fiber.
2126-18	Blue Grass Commission Co. Lexington.	Same	
2126-18	Same	Same	Excess of hulls. Above guaranty in fiber.
2126-18	LaGrange Feed & Gr. Co.. LaGrange.	Same	
2126-18	William Addams ..... Cynthiana.	Same	Adulterated with hulls. Below guaranty in protein, above in fiber.
.....	J. H. Fedders & Sons..... Covington.	Same	
2127-17	Corbin Feed Store..... Corbin.	Same	Above guaranty in fiber. Same.
2127-17	I. F. Tabb..... Mt. Sterling.	Same	
2127-17	Henry Fruechtenicht .... Louisville.	Same	
2127-17	I. F. Tabb..... Mt. Sterling.	Same	Below guaranty in protein.
2127-17	Gee & Morrison ..... Glasgow.	Same	Below guaranty in protein. Adulterated with hulls.
2127-18	Pikeville Grocery Co. .... Pikeville.	Same	
2127-18	I. F. Tabb..... Mt. Sterling.	Same	
2127-18	A. D. Ashcraft..... Irvington.	Same	
2601-17	Parker & Perdue..... Murray.	Same	
431-19	Mfrs. Warehouse	Cotton seed meal, cotton seed hulls 24%	
2207-16	Ritter-Hennings Co. ..... Louisville.	Cotton seed meal, cotton seed hulls 20%	
2207-16	Simon Weil & Sons..... Lexington.	Same	Below guaranty in protein.
2207-16	Same	Same	
2207-16	W. A. Thomason..... Paris.	Same	Below guaranty in protein, above in fiber. Exess in hulls.
2207-17	Simon Weil & Sons..... Glenn's Creek.	Same	
2207-17	Same	Same	
2207-17	Frankfort Feeding Co. ... Frankfort.	Same	
2207-17	Same	Same	
2207-17	Henry Fruechtenicht .... Louisville.	Same	

TABLE IV —STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2207-18	Good Cotton Seed Meal.....	Cotton Seed Products Co.....	36.94	6.58	14.45
		Louisville, Ky.	36.00	6.00	14.00
2207-18	Same	Same	37.56	6.45	14.00
2207-18	Same	Same	36.56	7.12	13.10
2207-18	Same	Same	39.38	6.02	12.78
2207-18	Same	Same	40.25	7.15	11.74
2207-18	Same	Same	41.69	6.02	11.53
2207-18	Same	Same	40.06	6.50	11.99
2207-18	Same	Same	41.38	6.82	11.65
2207-18	Same	Same	35.19	6.09	15.45
2207-18	Same	Same	35.31	6.80	12.88
2207-18	Same	Same	36.94	6.40	12.16
2207-18	Same	Same	36.63	6.34	14.80
2207-18	Same	Same	40.50	6.28	11.85
2207-18	Same	Same	38.25	6.81	12.85
2207-18	Same	Same	40.50	6.10	11.48
2207-18	Same	Same	40.44	6.43	12.25
2207-18	Same	Same	36.44	6.10	16.21
2588-18	Tuxedo Good Cotton Seed Meal....	The Early & Daniel Co.....	34.56	5.10	17.37
		Cincinnati, Ohio.	36.00	5.00	15.00
2222-16	Arrow Good Cotton Seed Meal....	Edinger & Co.....	36.63	6.28	13.53
		Louisville, Ky.	36.00	6.00	14.00
2222-18	Same	Same	37.75	6.38	14.92
2222-18	Same	Same	37.50	6.15	13.52
2222-18	Same	Same	36.56	6.60	13.50
1085-19	Same	Same	34.75	6.75	13.25
3077-18	Nutritia Cotton Seed Meal.....	Eikenberry-Fitzgerald Co.....	36.31	7.95	15.62
		Cincinnati, Ohio.	36.00	5.00	14.00
3077-18	Same	Same	38.31	7.79	12.87

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2207-18	R. A. Jones..... Williamsburg.	Cotton seed meal, cotton seed hulls 20%	
2207-18	Eminence Milling Co. .... Eminence.	Same	
2207-18	A. L. Holt..... Bloomfield.	Same	
2207-18	Herman Gienger ..... Pewee Valley.	Same	
2207-18	W. B. Belknap's Farm.... Goshen.	Same	
2207-18	S. B. Snowden..... Goshen.	Same	
2207-18	Wade Gans ..... Middletown.	Same	
2207-18	Virgil B. Snowden..... Goshen.	Same	
2207-18	E. H. Taylor..... Frankfort.	Same	Below guaranty in protein, high in fiber. Excess of cot. seed hulls.
2207-18	Salsman & Raine..... Vine Grove.	Same	Below in protein.
2207-18	D. D. Finley ..... Jeffersontown.	Same	
2207-18	S. M. Long & Son..... Shelbyville.	Same	Above guaranty in fiber.
2207-18	Duncan Bros. ..... LaGrange.	Same	
2207-18	A. C. Barnett..... Pewee Valley.	Same	
2207-18	J. W. Hewett..... Crestwood.	Same	
2207-18	Arterburn & Vance..... Bloomfield.	Same	
2207-18	C. M. Phillips..... Shelbyville.	Same	Above guaranty in fiber.
2588-15	Cleveland & Co. ..... Versailles.	Cotton seed meal, cotton seed hulls 20%	Below guaranty in protein, above in fiber. Excess of hulls.
2222-16	Mfrs. Warehouse	Cotton seed meal, cotton seed hulls 20%	
2222-18	Shelby County Feed & Gr. Co., Shelvyville	Same	Above guaranty in fiber.
2222-18	Jeffersontown Milling Co. Jeffersontown.	Same	
2222-18	Geo. W. Maraman & Sons Shepherdsville.	Same	
1085-19	Shelby County Feed & Gr. Co., Shelbyville.	Same	Below guaranty in protein. Excess of hulls.
3077-18	M. D. Royse..... Winchester.	Cotton seed meal, cotton seed hulls 20%	Above guaranty in fiber. Dark in color. Made from damaged seed.
3077-18	Berea College ..... Berea.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
3077-18	Nutritia Cotton Seed Meal.....	Eikenberry-Fitzgerald	33.06	7.10	18.08
		Cincinnati, Ohio.	36.00	5.00	14.00
3077-18	Same	Same	35.16	10.46	17.15
2586-18	Same	Same	36.06	6.43	18.47
135-19	Same	Same	33.31	10.63	17.96
135-19	Same	Same	31.06	10.24	20.98
847-18	"We Kno" Cotton Seed Meal.....	Oscar Farmer & Sons.....	36.06	7.14	14.97
		Louisville, Ky.	36.00	6.00	14.00
847-18	Same	Same	36.69	7.13	14.58
2586-17	Cotton Seed Meal.....	The Ferger Grain Co.....	34.31	6.95	13.90
		Cincinnati, Ohio.	36.00	5.00	14 00
2586-17	Same	Same	37.00	7.00	12.30
2976-18	Good Cotton Seed Meal.....	E. L. Gross & Co.....	35.69	5.93	15.50
		Louisville, Ky.	36.00	5.00	14.00
2976-18	Same	Same	36.69	6.25	13.85
2976-18	Same	Same	35.56	7.25	15.11
2976-18	Same	Same	35.69	6.52	13.62
2976-18	Same	Same	35.94	6.04	14.17
2976-18	Same	Same	35.69	6.05	15.40
2976-18	Same	Same	37.75	6.03	13.95
2976-18	Same	Same	37.56	6.71	14.19
2976-18	Same	Same	35.19	7.38	15.25
2534-17	Danish Brand Cotton Seed Meal...	Humphreys-Godwin Co.	34.44	5.74	15.23
		Memphis, Tenn.	36.00	4.50	16.00
2534-17	Same	Same	35.06	6.20	14.53
2534-17	Same	Same	35.13	5.55	16.22
2534-17	Same	Same	34.38	6.20	12.98
2534-17	Same	Same	34.38	5.92	14.55
2327-17	Imperial Cotto Brand Good Cotton Seed Meal.....	Imperial Cotto Sales Co.	34.38	.....	17.40
		Memphis, Tenn.	36.00	5.50	14.00
2327-17	Same	Same	36.31	5.85	15.38

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
3077-18	Kentucky Feed Co. ..... Flemingsburg.	Cotton seed meal, cotton seed hulls 20%.	Below guaranty in protein, above in fiber. Dark, inferior product.
3077-18	Henry & Harvey..... Carlisle.	Same	Below in protein, above in fiber. Made from dam. seed. Inf. quality.
2586-18	W. W. Broadus & Co. .... Richmond.	Same	Above guaranty in fiber. Made from dam. seed.
135-19	Wm. Addams ..... Cynthiana.	Same	Made from damaged seed. Below in protein, above in fiber.
135-19	R. A. Jones..... Williamsburg.	Same	Below in protein, above in fiber; very dark; unlike meal or feed.
847-18	Let Heady ..... Cox's Creek.	Cotton seed meal, cotton seed hulls 20%	Above guaranty in fiber.
847-18	Mfrs. Warehouse	Same	Same.
2586-15	M. T. Flannery..... Augusta.	Cotton seed meal, cotton seed hulls 20%	Below guaranty in protein. Excess of hulls.
2586-17	Bedford & Tuttle..... Winchester.	Same	
2976-18	L. A. Collins..... Lebanon.	Cotton seed meal, cotton seed hulls 20%	Above guaranty in fiber.
2976-18	Edward M. Riedling..... Louisville.	Same	
2976-18	W. O. Stiles & Co. ..... Bardstown.	Same	Above guaranty in fiber.
2976-18	Ky. Feed & Grain Co. .... Louisville.	Same	
2976-18	Chas. S. Brent & Bro. .... Paris.	Same	
2976-18	Same	Same	Above guaranty in fiber.
2976-18	Same	Same	
2976-18	Glasgow Feed & Pro. Co. . Glasgow.	Same	
2976-18	C. L. Jewell..... Horse Cave.	Same	Excess of hulls. Below guaranty in protein, above in fiber.
2534-17	L. A. Collins..... Campbellsville.	Cotton seed meal, cotton seed hulls 20%	Below guaranty in protein. Excess of hulls.
2534-17	E. A. Simms..... Paris.	Same	Same.
2534-17	Franklin Ele. & W. H. Co. Franklin.	Same	Below in protein. Excess of hulls. Dark color.
2534-17	Lambert-Gresham Co. .... Henderson.	Same	Below guaranty in protein. Excess of hulls.
2534-17	L. A. Collins..... Lebanon.	Same	Same.
983-18	Mfrs. Warehouse ..... LaGrange.	Cotton seed meal, cotton seed hulls 25%	Below guaranty in protein and above in fiber. Excess of hulls.
2327-17	F. W. Mimms ..... Trenton.	Same	Above guaranty in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2327-17	Imperial Cotton Brand Good Cotton Seed Meal	Imperial Cotto Sales Co.	33.25	6.89	15.93
		Memphis, Tenn.	36.00	5.50	14.00
2320-18	Winner Brand Cotton Seed Meal	W. B. Johnson & Co.	35.56	7.54	13.05
		Memphis, Tenn.	36.00	5.50	14.00
2320-18	Same	Same	36.44	7.53	12.63
861-13	Cotton Seed Meal	Kenton Hay & Grain Co.	39.13	7.42	13.68
		Covington, Ky.	37.25	6.72	.....
2534-18	Cotton Seed Meal	Kentucky Feed & Grain Co.	33.88	5.58	14.48
		Louisville, Ky.	36.00	4.50	16.00
2978-18	Acorn Cotton Seed Meal	W. L. Kimbraugh & Son	37.25	6.56	13.42
		Guthrie, Ky.	37.00	6.00	13.00
2238-16	"Holstein Brand" Cotton Seed Meal	Lanier Bros.	33.25	6.99	15.13
		Nashville, Tenn.	36.00	5.00	14.00
2238-16	Same	Same	33.63	6.84	14.50
2238-17	Same	Same	37.50	5.27	12.75
2238-17	Same	Same	34.69	7.45	13.25
2238-18	Same	Same	42.19	7.27	10.59
2238-18	Same	Same	35.06	5.99	16.11
173-19	Same	Same	35.06	7.07	13.38
2201-16	"Avon" Cotton Seed Meal	J. M. Macdonald	37.38	7.14	12.50
		Cincinnati, Ohio.	36.00	5.00	14.00
2295-17	Cotton Seed Meal	Phoenix Cotton Oil Co.	38.25	6.28	12.78
		Dyersburg, Tenn.	35.00	5.00	15.00
2576-17	Phoenix Cotton Seed Meal	Phoenix Cotton Oil Co.	38.44	7.66	12.62
		Memphis, Tenn.	36.00	4.50	15.00
2973-18	Same	Same	35.94	5.56	16.04
2352-18	Cotton Seed Meal	Rapier Grain & Seed Co.	33.94	6.05	16.24
		Owensboro, Ky.	36.00	5.00	17.00
2352-18	Same	Same	35.88	7.48	12.34
2592-17	Economy Cotton Seed Meal	Southern Seed Co.	37.06	7.20	14.20
		Louisville, Ky.	36.00	5.00	14.00
	Oil Meal				
468- 8	Linseed Oil Meal	American Linseed Co.	35.63	5.83	8.59
		Cincinnati, Ohio.	32.36	5.00	11.00
.....	Old Process Linseed Meal	American Linseed Co.	37.94	5.95	7.93
		St. Louis, Mo.	32.00	6.00	5.50
1713-15	Amco Old Process Linseed Meal	American Linseed Co.	29.31	6.60	10.40
		Peoria, Ill.	30.00	5.00	10.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2327-17	American Co-Operative As. Owensboro.	Cotton seed meal, cotton seed hulls 25%	Adulterated with hulls. Below guaranty in protein, above in fiber.
2320-18	Lambert - Gresham Hdw. Co., Henderson	Same	
2320-18	Henderson Feed & Com. Co., Henderson	Same	
861-13	Mfrs. Warehouse	Cotton seed	
2534-18	McCauley & Cain Versailles.	Cotton seed meal, cotton seed hulls 20%	Adulterated with hulls. Below guaranty in protein.
2978-18	Mfrs. Warehouse	Cotton seed meal, cotton seed hulls 22%	
2238-16	Simpson Co. Hdw. Co. Franklin.	Cotton seed meal, cotton seed hulls 20%	Adulterated with hulls. Below guaranty in protein, above in fiber.
2238-16	Same	Same	Below guaranty in protein. Adulterated with hulls.
2238-17	C. S. Brent Seed Co. Lexington.	Same	
2238-17	Hardinsburg Mill & Elevator Co., Hardinsburg.	Same	Below guaranty in protein. Excess of hulls.
2238-18	Cleveland & Co. Versailles.	Same	
2238-18	J. L. Hart Cynthiana.	Same	Excess of hulls. Below guaranty in protein, above in fiber.
173-19	Bedford & Tuttle Winchester.	Same	Below guaranty in protein. Excess of hulls.
2201-16	Edinger & Co. Louisville.	Cotton seed meal, cotton seed hulls 20%	
2295-17	Leitchfield Milling Co. Leitchfield.	Decorticated cotton seed, cotton seed hulls 25%	
2576-17	Elizabethtown Milling Co. Elizabethtown.	Cotton seed meal, ground cotton seed hulls 25%	
2973-18	Browder Milling Co. Fulton.	Cotton seed meal, cotton seed hulls 25%	Above guaranty in fiber.
2352-18	American-Co-Operative As. Owensboro.	Cotton seed meal, cotton seed hulls 31%	Below guaranty in protein. Adulterated with hulls.
2352-18	Mfrs. Warehouse	Same	
2592-17	G. C. Shaw Frankfort.	Cotton seed meal, cotton seed hulls 20%	
468- 8	Berea College Dairy Berea.	Flax seed	
.....	Walter Mathews Paducah.	Same	Above guaranty in fiber.
.....	J. C. Everett & Co. Maysville.	Same	Below guaranty in protein.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1713-16	Old Process Linseed Meal and Screenings, Oil Feed	American Milling Co.	30.31	6.98	7.29
		Peoria, Ill.	30.00	5.00	10.00
1909-16	Old Process Laxo Cake Meal	Chicago Heights Oil Mfg. Co.	26.00	6.58	10.48
		Chicago, Ill.	25.00	6.00	12.00
1909-16	Same	Same	24.88	9.69	12.73
2326-17	Same	Same	28.44	7.60	10.98
875-17	Old Process Oil Meal	The Early & Daniel Co.	35.81	5.68	9.43
		Cincinnati, Ohio.	32.00	6.00	10.00
308-18	Nutritia Old Process Linseed Oil Meal	Eikenberry-Fitzgerald Co.	35.38	5.92	8.50
		Cincinnati, Ohio.	30.00	5.00	10.00
347-13	Oil Meal	Oscar Farmer & Sons.	34.00	6.99	8.95
		Louisville, Ky.	32.00	6.02	8.50
74-16	"We Kno" Oil Meal	Oscar Farmer & Sons.	35.63	7.74	7.85
		Louisville, Ky.	32.81	7.83	9.00
74-17	Same	Same	36.38	8.53	8.45
300-12	Oil Meal	Geo. Keller	34.50	6.33	9.04
		Newport, Ky.	32.00	6.00	10.00
733-14	Same	Same	37.13	6.17	9.01
2227-16	"Kineda Brand" Old Process Oil Meal	J. M. Macdonald.	34.81	6.40	8.50
		Cincinnati, Ohio.	30.00	5.00	10.00
2343-17	Pure Old Process Ground Linseed Cake	Midland Linseed Products Co.	34.44	9.50	7.62
		Minneapolis, Minn.	32.00	5.00	9.50
679-18	S. W. C. Linseed Oil Meal	The Sherwin-Williams Co.	36.19	6.23	8.98
		Cleveland, Ohio.	33.00	6.00	8.00
1305-13	Old Process Linseed Oil Meal	Toledo Seed & Oil Co.	34.13	6.42	8.88
		Toledo, Ohio.	30.00	5.00	10.00
	Rice Feeds				
2382-17	Rice Bran	W. N. Johnson & Co.	13.75	13.52	12.40
		Memphis, Tenn.	14.00	12.50	10.00
	Rye Feeds				
2711-18	Ballard's Rye Feed	Ballard & Ballard Co.	16.44	3.75	7.00
		Louisville, Ky.	13.00	2.50	7.00
3078-18	Rye Middlings and Screenings	Eihenberry-Fitzgerald Co.	16.88	3.92	7.80
		Cincinnati, Ohio.	15.00	3.00	9.00
2277-16	"Nutritia" Rye Middlings and Screenings	The Ferger Grain Co.	17.44	4.30	7.49
		Cincinnati, Ohio.	15.00	3.00	7.00
.....	Rye Middlings	J. R. A. Kern & Sons.	14.88	3.58	7.44
		Milwaukee, Wis.	14.00	3.75	7.25
3051-18	Jersey Rye Middlings and Screenings	M. G. Rankin & Co.	14.38	3.08	5.39
		Milwaukee, Wis.	14.00	3.00	6.00
757-16	Rye Middlings	Washburn-Crosby Co.	17.56	3.50	6.39
		Minneapolis, Minn.	14.00	3.00	6.00
757-17	Same	Same	16.19	3.57	6.18

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1713-16	Henderson Feed & Com. Co., Henderson.	Flax seed and flax seed screenings 20%	
1909-16	Frank Birchler ..... Louisville.	Ground flax seed, ground flax seed screenings 15%	
1909-16	Edinger & Co. ..... Louisville.	Same	
2326-17	Same	Pure lin. meal, 60%; small imp. flax seed and for. seeds (consisting of wheat, wild buck., pig. grass, wild mustard), 40%.	
875-17	G. S. Shaw..... Frankfort.	Flax seed	
308-18	Berea College ..... Berea.	Flax seed	
347-13	Mfrs. Warehouse	Flax seed	
74-16	J. R. and C. M. Durham.. Campbellsville.	Same	
74-17	H. J. Greive..... Louisville.	Same	
300-12	Herm. Feldmann ..... Newport.	Flax seed	
733-14	Mfrs. Warehouse	Same	
2227-16	J. H. Baughman & Co. .... Stanford.	Flax seed	
2343-17	M. J. Yopp Seed Co. ..... Paducah.	Flax seed	
679-18	Blue Grass Commission Co. Lexington.	Flax seed	Above guaranty in fiber
1305-13	J. H. Baughman & Co. ... Stanford.	Flax seed	
2382-17	Cohen Bros. ..... Greenville.	Rice	Above guaranty in fiber. Adulterated with rice hulls.
2711-18	Logan & Haggin..... Georgetown.	Rye bran, rye middlings.....	
3078-18	Hudson & Davis..... Danville.	Rye middlings, ground rye screenings 3%	
2277-16	Hudson, Hughes & Fornan Lancaster.	Rye middlings, ground rye screenings 3%	
.....	Bush & Prichard..... Ashland.	Rye middlings, rye screenings not to exceed mill run.....	
3051-18	R. C. Poage Milling Co. .. Ashland.	Rye middlings, ground rye screenings 15%	
757-16	M. T. Flannery..... Augusta.	Rye	
757-17	R. C. Poage Milling Co. .. Ashland.	Same	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
	Wheat Bran				
902-15	Wheat Bran and Screenings	The Acme Mills	16.81	3.76	10.45
		Hopkinsville, Ky.	14.00	4.00	9.50
902-17	Pure Wheat Bran and Screenings	Same	15.50	4.11	10.55
			14.50	4.00	9.50
1575-15	Wheat Bran	Adairville Milling Co.	17.13	4.30	7.34
		Adairville, Ky.	15.06	4.09	8.50
1575-18	Same	Same	16 00	4.68	8.37
			15.06	4.89	8.50
164-15	Winter Wheat Bran	Akin-Erskine Milling Co.	17.13	4.20	9.75
		Evansville, Ind.	15.00	4.00	9.00
164-17	Same	Same	16.31	4.30	8.85
			15.00	4.00	9.50
164-18	Same	Same	16.56	3.60	8.75
160-14	William Tell Bran	The Ansted & Buck Co.	15.44	4.10	9.38
		Springfield, Ohio.	14.00	3.00	11.50
304-13	Wheat Bran	J. D. Arnsparger	15.20	4.15	11.10
		Georgetown, Ky.	14.34	4.60	.....
830-16	Wheat Bran	Ashland Milling Co.	15.13	4.30	10.68
		Ashland, Ky.	15.37	3.31	8.25
27-14	Wheat Bran	C. H. Aubrey	17.50	3.15	8.91
		Stithton, Ky.	15.94	4.35	9.83
335- 8	Feedstuff	Austin & Cable	18.12	3.71	9.39
		Flippin, Ky.	15.38	4.79	.....
200-17	Ballard's Bran	Ballard & Ballard Co.	15.56	3.97	6.00
		Louisville, Ky.	14.50	4.10	9.00
200-18	Same	Same	15.81	4.60	11.38
200-18	Same	Same	14.63	4.15	11.03
1107-11	Bran	Bushong Brothers	19.96	3.15	7.28
		Tompkinsville, Ky.	15.84	4.38	.....
1803-17	Wheat Bran	The Cincinnati Gr. & Hay Co.	17.00	4.85	11.34
		Covington, Ky.	15.00	4.00	9.08
1644-15	Bran	Clark, Watson & Nichols	18.12	3.99	6.75
		Summer Shade, Ky.	15.81	4.50	7.50
64- 8	Bran	Coe & Wells	21.68	3.43	6.78
		Martinsburg, Ky.	16.81	3.64	.....
297-15	Wheat Bran	College Mill Co.	17.13	3.58	5.13
		Franklin, Ky.	15.56	4.68	7.50
1018-14	Pure Wheat Bran	L. A. Collins	16.94	4.58	6.43
		Lebanon, Ky.	15.50	4.25	8.50
870-16	Wheat Bran	The Early & Daniel Co.	18.38	3.97	8.55
		Cincinnati, Ohio.	14.53	4.00	9.08
1138-17	Same	Same	16.25	4.10	11.00
1588-15	Wheat Bran and Shipstuff	Ellis Flour Mills	18.50	4.36	7.40
		Hartford, Ky.	14.68	3.20	8.50

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
902-15	J. Albert Stewart..... Gracy.	Wheat bran, ground wheat screenings 10%	Above guaranty in fiber.
902-17	Gee & Morrison..... Glasgow.	Same	Above guaranty in fiber.
1575-15	Mfrs. Warehouse	Wheat	Sample is shipstuff.
1575-15	J. W. Wells & Co. ..... Belton.	Same	Same.
164-15	Weaverton Feed Co. ..... Henderson.	Winter wheat	
164-17	Clarence Howard ..... Russellville.	Same	
164-18	F. H. Vogel..... Henderson.	Same	
160-14	M. A. McBride..... Falmouth.	Wheat	Sample is shipstuff.
304-13	Robinson Brothers ..... Georgetown.	Wheat bran	
830-16	Mfrs. Warehouse	Wheat	Above guaranty in fiber.
27-14	R. Lowery ..... Leitchfield.	Wheat	Below guaranty in fat.
335- 8	Mfrs. Warehouse	Wheat bran, screenings 5%.....	Below guaranty in fat.
200-17	Big Sandy Grocery Co.. Catlettsburg.	Wheat	
200-18	J. W. Willis ..... Irvington.	Same	Above guaranty in fiber.
200-18	Big Sandy Grocery Co.. Catlettsburg.	Same	Same.
1107-11	Mfrs. Warehouse	Wheat	Below guaranty in fat.
1803-17	Mfrs. Warehouse	Wheat	Above guaranty in fiber.
1644-15	Mfrs. Warehouse	Wheat	
64- 8	Mfrs. Warehouse	Wheat	
297-15	Maxwell & Maxwell..... Auburn.	Wheat	Below guaranty in fat. Sample is shipstuff.
1018-14	Mfrs. Warehouse	Wheat	
870-16	V. A. Brock..... Sparta.	Wheat	Sample is shipstuff.
1138-17	T. F. Curley..... Walton.	Same	Above guaranty in fiber.
1588-15	W. E. Ellis..... Hartford.	Wheat	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1193-11	Bran	Evans, Hagan & Co.	21.19	3.75	7.23
		Tompkinsville, Ky.	16.75	4.34	.....
1423-15	Wheat Bran and Screenings	J. H. Fedders & Sons.	15.25	4.35	10.17
		Covington, Ky.	15.25	4.17	8.25
2082-16	Wheat Bran	Same	15.38	4.28	6.70
			15.97	4.52	7.00
2516-18	Wheat Bran and Screenings	Fisher Bros.	16.50	3.20	8.10
		Evansville, Ind.	14.00	3.50	13.00
958-18	Wheat Bran	Glasgow Milling Co.	16.38	4.58	7.82
		Glasgow, Ky.	15.50	4.25	8.50
3101-18	Wheat Bran and Screenings	Edw. F. Goeke Co.	16.56	3.86	9.45
		Evansville, Ind.	15.00	3.20	10.00
483-17	Wheat Bran	H. P. Hawkins' Sons	18.00	3.98	10.53
		Paducah, Ky.	16.24	4.42	8.25
483-18	Same	Same	16.25	4.32	11.65
173-15	Pure Bran and Shorts	Horse Cave Mills	17.50	4.72	7.63
		Horse Cave, Ky.	15.50	4.25	7.50
312-10	Bran	J. Harris Jones	18.48	4.58	4.48
		Roseville, Ky.	15.50	4.00	.....
1054-15	Palace Bran	Kehlor Flour Mills Co.	18.94	4.59	9.42
		St. Louis, Mo.	14.50	4.00	10.00
1266-17	Wheat Bran	Geo. Keller	16.13	4.25	9.72
		Newport, Ky.	15.75	4.25	8.00
1675-15	Wheat Bran	LaGrange Flour & Feed Mills.	18.23	4.43	8.60
		LaGrange, Ky.	15.00	4.00	8.50
1829-15	Wheat Bran	Latonia Hay & Grain Co.	17.25	5.76	11.12
		Latonia, Ky.	15.25	4.25	8.50
399-15	Golden Bull Bran	Lawrenceburg Roller Mills.	14.25	4.94	12.00
		Lawrenceburg, Ind.	14.00	3.00	10.00
522-15	Bran	Leitchfield Milling Co.	17.56	3.98	8.70
		Leitchfield, Ky.	16.13	4.43	9.23
506-15	Wheat Bran and Screenings	Louisville Milling Co.	14.50	4.12	11.20
		Louisville, Ky.	14.50	4.00	9.50
506-17	Same	Same	14.75	4.47	10.65
506-17	Same	Same	15.19	4.00	11.43
506-18	Same	Same	16.19	4.46	9.20
506-18	Same	Same	15.25	4.35	10.96
504-15	Wheat Bran	Lycan Bros.	18.38	4.28	7.30
		LaFayette, Ky.	13.93	4.03	8.25
1682-15	Wheat Bran	Lynn Grove Milling Co.	15.88	3.99	7.48
		Lynn Grove, Ky.	16.50	4.50	7.50
1635-15	Wheat Bran	McWhorter & Wells.	16.50	4.19	10.50
		Springfield, Ky.	15.25	3.75	8.50
1313-14	Wheat Bran	P. J. Miller & Bro.	18.05	3.87	7.04
		Glasgow, Ky.	15.25	4.00	8.02

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1193-11	Mfrs. Warehouse	Wheat bran, shorts	Sample is shipstuff.
1423-15	Same	Wheat bran, ground wheat screenings 5%	Above guaranty in fiber.
2082-16	Same	Wheat	Sample is middlings.
2516-18	Wilson & Son Russellville.	Wheat bran, ground wheat screenings 8%	
958-18	E. Dickery & Son Glasgow.	Soft winter wheat	
3101-18	Henderson Feed Com. Co. Henderson.	Wheat bran, ground wheat screenings 8%	
483-17	Jas. R. Moore Coal & Feed Co., Paducah	Wheat	Above guaranty in fiber.
483-18	Overby & Wallace Murray.	Same	Same.
173-15	Mfrs. Warehouse	Wheat bran, shorts	
312-10	Mfrs. Warehouse	Wheat	
1054-15	C. R. Barnes Bardstown.	Pure hard winter wheat	
1266-17	Mfrs. Warehouse	Wheat	Above guaranty in fiber.
1675-15	Mfrs. Warehouse	Wheat	
1829-15	Mfrs. Warehouse	Wheat	Above guaranty in fiber.
399-15	Frank Brown & Co. Mt. Sterling.	Wheat	Above guaranty in fiber. Screenings present.
522-15	Mfrs. Warehouse	Wheat	
506-15	Chris. Miller's Sons	Wheat, ground wheat screenings 3%	Above guaranty in fiber.
506-17	Electric Mills Co. Franklin.	Same	Same.
506-17	Pineville Feed & Gr. Co. Pineville.	Same	Same.
506-18	J. K. Fowler Boston.	Same	
506-18	Helm & Long Okolona.	Same	Above guaranty in fiber.
504-15	T. M. Wooldridge Hopkinsville.	Wheat	Sample is shipstuff, with corn bran.
1682-15	Parker & Perdue Murray.	Wheat	Below guaranty in both protein and fat. Sample is shipstuff.
1635-15	Crawford Bros. Lebanon.	Wheat	Above guaranty in fiber
1313-14	Mfrs. Warehouse	Wheat	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1176-11	Wheat Bran	Moore & Boyter	19.35	4.62	9.38
		Glasgow, Ky.	15.56	4.47	....
544-15	Wheat Bran and Screenings	National Feed Co.	17.31	4.37	10.53
		St. Louis, Mo.	14.00	4.00	10.00
544-16	Same	Same	16.94	3.22	9.90
544-17	Same	Same	16.88	4.75	9.88
544-18	Same	Same	17.50	4.45	10.04
548-15	Nolin Pure Dairy Bran	Nolin Milling Co.	16.69	4.15	9.17
		Nolin, Ky.	15.50	4.25	8.25
1679-15	Wheat Bran	Northwestern Elev'r & Mill Co.	16.81	4.19	9.25
		Mt. Vernon, Ohio.	13.00	4.00	6.50
2020-18	Wheat Bran and Screenings	Oakland Milling Co.	16.00	4.55	7.56
		Oakland, Ky.	12.50	4.00	6.00
1189-13	Bran	Orndorff & Chaney	17.25	3.98	6.33
		Adairville, Ky.	15.06	4.89	8.50
1749-15	Wheat Bran and Screenings	The Thos. Page Milling Co.	17.50	3.93	9.68
		Topeka, Kans.	14.50	3.50	10.00
565-15	Wheat Bran and Screenings	Phoenix Flour Mills	17.31	3.56	11.13
		Evansville, Ind.	15.00	4.00	10.50
2378-17	Wheat Bran and Screenings	Pink & Co.	15.63	4.61	10.32
		Cairo, Ill.	14.50	4.00	9.50
711-15	Bran	Rice & Allen	18.63	4.50	8.05
		Campbellsville, Ky.	14.75	4.00	8.50
24-12	Bran	Smith & Williams	18.12	4.50	8.53
		Pageville, Ky.	16.81	3.93	.....
1496-14	Wheat Bran and Screenings	Stephensport Roller Mills	17.38	3.86	9.43
		Stephensport, Ky.	15.00	4.00	8.00
1334-15	Wheat Bran	Stevenson & Sandusky	18.78	4.17	6.78
		Columbia, Ky.	14.75	4.00	8.00
752-17	Wheat Bran and Screenings	Washburn-Crosby Co.	16.38	5.83	10.85
		Minneapolis, Minn.	13.00	4.00	13.00
752-18	Same	Same	14.56	5.48	12.21
.....	Bran	Williams & Scott	20.02	3.65	8.43
		Etoile, Ky.	16.68	4.83	.....
2114-16	Wheat Bran	M. J. Yopp Seed Co.	17.50	4.78	8.60
		Paducah, Ky.	15.25	4.19	8.10
	Shorts and Middlings				
193-15	Acme Middlings and Screenings	Acme-Evans Company	16.50	3.72	6.28
		Indianapolis, Ind.	16.50	4.00	10.00
1303-19	Big X Middlings and Screenings	Acme-Jones Co.	13.88	5.33	10.78
		Louisville, Ky.	14.00	4.00	11.00
162-15	Clover Leaf Shorts and Screenings	Akin-Erskine Milling Co.	17.49	3.98	6.76
		Evansville, Ind.	14.00	4.00	6.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1176-11	Mfrs. Warehouse	Wheat	
544-15	J. W. Webb & Son. Vanceburg.	Wheat bran, underground wheat screenings 5%	Above guaranty in fiber.
544-16	Same	Same	Below guaranty in fat.
544-17	Walter Mathews Paducah.	Same	
544-18	The H. T. Hackney Co. Middlesboro.	Same	
548-15	Watkins & Co. Elizabethtown.	Wheat bran	Above guaranty in fiber.
1679-15	Bush & Bush Ashland.	Wheat	Above guaranty in fiber.
2020-18	J. J. Dobson Oakland.	Wheat, unground wheat screenings 1%	Above guaranty in fiber.
1189-13	Mfrs. Warehouse	Wheat	Below guaranty in fat. Sample is shipstuff.
1749-15	H. G. Holcamp Louisville.	Wheat, ground wheat screenings 1%	
565-15	Joe Clark Paducah.	Wheat bran, ground wheat screenings 5%	Above guaranty in fiber.
2378-17	Princeton Feed & Pro. Co. Princeton.	Wheat bran, ground wheat screenings 5%	Above guaranty in fiber.
711-15	J. R. and C. M. Durham Campbellsville.	Wheat	
24-12	Mfrs. Warehouse	Wheat	
1494-14	J. H. Brown Cloverport.	Wheat bran, ground wheat screenings 2%	Above guaranty in fiber.
1334-15	Mfrs. Warehouse	Wheat	
752-17	M. T. Flannery Augusta.	Wheat bran, ground wheat screenings 15%	
752-18	Owens & Ducker Butler.	Same	
.....	Mfrs. Warehouse	Wheat	
2114-16	Mfrs. Warehouse	Wheat	Screenings present.
193-15	Qualls & Denues Olive Hill.	Wheat middlings, ground wheat screenings 10%	
1303-19	Jellico Grocery Co. Barbourville.	Wheat middlings, ground wheat screenings 15%	
162-15	Weaverton Feed Co. Henderson.	Wheat bran, ground wheat screenings 1%, salt 1%	Above guaranty in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
162-15	Clover Leaf Shorts and Screenings	Akin-Erskine Milling Co.	17.50	3.52	6.87
		Evansville, Ind.	14.00	4.00	6.00
162-17	Same	Same	17.00	4.13	6.48
162-17	Same	Same	14.81	3.69	6.40
162-18	Same	Same	17.06	4.55	7.00
162-18	Same	Same	15.56	4.02	5.50
167-17	Trojan Middlings and Screenings	The Allen & Wheeler Co.	17.31	4.30	7.40
		Troy, Ohio.	15.00	4.00	6.00
167-18	Same	Same	16.38	4.10	5.82
167-18	Same	Same	15.38	5.00	7.25
829-17	Middlings	Ashland Milling Co.	16.56	4.47	6.55
		Ashland, Ky.	16.81	4.07	7.50
829-17	Same	Same	16.81	4.55	5.60
966-15	Shorts	The Auburn Mills	17.19	4.21	6.46
		Auburn, Ky.	15.85	4.29	9.50
966-17	Same	Same	15.06	4.57	5.68
			16.25	4.50	6.00
202-16	Ballard's Kentucky Farm Feed	Ballard & Ballard Co.	15.50	4.00	7.13
		Louisville, Ky.	15.69	4.26	6.87
202-17	Same	Same	16.44	4.50	7.11
202-18	Same	Same	17.56	4.53	7.71
202-18	Same	Same	19.50	4.36	8.38
202-18	Same	Same	17.00	4.27	6.50
638-19	Same	Same	18.31	4.88	7.08
			15.00	4.45	6.42
638-19	Same	Same	14.75	4.45	7.78
303-16	Delight Middlings	Bloomfield Mill Co.	16.13	4.88	6.43
		Bloomfield, Ky.	16.50	4.50	6.00
143-15	Wheat Middlings	Cameron & Co.	16.50	3.68	3.88
		Carrollton, Ky.	16.00	4.50	6.00
2968-18	Wheat Middlings and Screenings	The Century Mills Co.	17.50	5.82	8.31
		Minneapolis, Minn.	14.00	4.00	11.00
1802-17	Wheat Middlings	Cincinnati Grain & Hay Co.	18.00	4.55	8.05
		Covington, Ky.	15.75	4.25	6.00
983-18	Shorts	Climax Roller Mills	15.50	5.80	6.60
		Shelbyville, Ky.	16.41	4.44	7.50
353-17	Wheat Shorts	Dahnke-Walker Milling Co.	16.13	3.65	9.20
		Union City, Tenn.	14.50	4.00	6.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
162-15	Riedling & Bro. ..... Louisville.	Winter wheat, ground wheat screenings 1%, salt 1%.	
162-17	Morganfield Roller Mills. Morganfield.	Same	
162-17	The Jellico Grocery Co. .. Harlan.	Same	
162-18	F. H. Vogel..... Henderson.	Same	Above guaranty in fiber.
162-18	Morganfield Roller Mills.. Morganfield.	Same	
167-17	H. H. Borders..... Catlettsburg.	Wheat, ground wheat screenings 3%	Above guaranty in fiber.
167-18	Morehead Grocery Co. ... Morehead.	Same	
167-18	Pikeville Grocery Co. .... Pikeville.	Same	High in fiber.
829-17	J. L. Maddox..... Olive Hill.	Wheat	
829-17	Pikeville Grocery Co. .... Pikeville.	Same	Sample is shipstuff.
966-15	G. Cooksey ..... Russellville.	Wheat	
966-17	Wilson & Co. ..... Russellville.	Same	Below guaranty in protein.
202-16	G. C. Shaw..... Frankfort.	Wheat middlings, cleaned and ground wheat screenings 4½%.	
202-17	The Van Leunen Co. ..... Covington.	Same	Above guaranty in fiber.
202-18	I. F. Tabb..... Mt Sterling.	Same	
202-18	G. C. Shaw ..... Frankfort.	Same	Above guaranty in fiber.
202-18	Enterprise Grocery Co. ... Buechel.	Same	
638-19	George Brunton ..... Beaver Dam.	Same	Above guaranty in fiber.
638-19	Joe Lovett ..... Williamsburg.	Same	Above guaranty in fiber.
303-16	G. C. Shaw ..... Frankfort.	Wheat	
143-15	Mfrs. Warehouse	Wheat	
2968-18	H. P. Pearcy..... Middletown.	Wheat middlings, wheat screenings 1½%	
1802-17	Mfrs. Warehouse	Wheat	Above guaranty in fiber.
983-18	Mfrs. Warehouse	Wheat	Below guaranty in protein.
353-17	Overby & Wallis..... Murray.	Wheat shorts	Above guaranty in fiber. Contains a large per cent. of screenings.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1699-17	Wheat Middlings and Screenings..	The Dewey Bros. Co.	16.88	4.25	9.43
		Blanchester, Ohio.	15.00	4.50	8.00
1139-17	Middlings	The Early & Daniel Co.	14.88	3.15	5.00
		Cincinnati, Ohio.	15.50	4.50	6.00
871-18	Same	Same	17.69	5.50	8.88
			14.00	3.00	7.00
368-15	Middlings and Screenings.....	B. A. Eckhart Milling Co.	17.00	4.24	7.35
		Chicago, Ill.	14.00	4.00	8.00
368-17	Same	Same	17.06	4.53	8.10
			14.00	4.00	8.00
2494-17	Wheat and Rye Flour Middlings...	Same	18.25	5.00	5.68
			14.00	4.00	11.00
2007-16	"Nutritia" Winter Wheat Mid-	The Ferger Grain Co.	16.88	3.11	7.53
	dlings and Screenings.....	Cincinnati, Ohio.	15.00	3.50	10.00
141-19	Same	Eikenberry-Fitzgerald Co.....	16.50	5.03	8.01
1002-13	Shorts	Elizabethtown Milling Co.	17.63	4.12	5.90
		Elizabethtown, Ky.	14.97	4.48	.....
2517-17	Wheat Middlings and Screenings..	Fisher Bros.	15.44	5.72	10.78
		Evansville, Ind.	14.00	4.00	10.00
2860-18	Big Gee Shorts and Screenings.....	Edw. F. Goeke Co.	18.06	4.53	6.55
		Evansville, Ind.	14.00	4.00	6.00
1923-16	Wheat Middlings	The Gwinn Milling Co.	16.63	4.84	4.84
		Columbus, Ohio.	16.00	4.00	7.00
899-15	Middlings and Screenings.....	Gwinn Bros. & Co.....	15.16	4.11	4.93
		Huntington, W. Va.	13.91	3.60	4.21
898-17	Middlings and Screenings.....	Same	14.25	5.13	7.23
899-18	Same	Same	15.13	4.88	7.63
794-17	Middlings	P. H. Harsha	14.19	4.83	8.32
		Portsmouth, Ohio.	14.68	3.34	5.66
1958-17	Middlings and Screenings.....	Hopkinsville Milling Co.....	15.31	4.10	8.43
		Hopkinsville, Ky.	16.00	4.25	6.00
1770-15	Calumet Middlings	O. L. Hunter & Co.	17.88	4.69	6.10
		Chicago, Ill.	14.50	4.00	8.00
1770-15	Same	Same	18.25	4.60	7.08
1770-15	Same	Same	18.63	4.44	7.68
505-19	Pure Wheat Middlings.....	Iglehart Bros.	19.81	4.86	6.86
		Evansville, Ind.	16.00	5.00	7.00
1792-17	Sunbeam Middlings and Screenings	Geo. Keller	15.63	4.20	7.91
		Newport, Ky.	15.00	3.50	10.00
298-12	Middlings	Same	17.19	4.01	7.68
			15.50	4.50	.....
1044-17	Middlings	The Kenton Hay & Grain Co...	17.25	5.22	8.38
		Covington, Ky.	14.87	4.10	6.50
400-15	Golden Bull Middlings.....	Lawrenceburg Roller Mills Co..	21.69	4.88	7.03
		Lawrenceburg, Ind.	15.00	3.50	8.50

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1699-17	Consolidated Coal Co. .... McRoberts.	Wheat middlings, ground wheat screenings 10%	Above guaranty in fiber.
1139-17	Mfrs. Warehouse	Wheat	
871-18	Welch's Department Store Berea	Wheat	Above guaranty in fiber.
368-15	Morrell Supply Co. ..... Prestonsburg.	Wheat middlings, ground wheat screenings 5%	
368-17	D. A. Leffingwell & Co.... Ashland.	Same	
2494-17	Same	Wheat bran, wheat middlings, rye mid's, ground wheat screen. 5%	
2007-16	J. W. Webb & Son .. . . Vanceburg.	Wheat middlings, ground wheat screenings 3%	
141-19	J. E. Mitchell..... London.	Same	
1002-13	Mfrs. Warehouse	Wheat	
2517-17	Henderson Feed & Com. Co., Henderson.	Wheat middlings, ground wheat screenings 8%	
2860-18	Same	Winter wheat, ground wheat screenings 1%, salt 1%.....	
1923-16	Kentucky Wholesale Co.. Pikeville, Ky.	Wheat middlings, ground wheat screenings 12½%	
899-15	Pikeville Grocery Co. .... Pikeville.	Wheat middlings, ground wheat screenings 2%	Contains corn bran.
898-17	Bush & Prichard..... Ashland.	Wheat middlings, ground wheat screenings 2%	Above guaranty in fiber.
899-18	Morrell Supply Co ..... Prestonburg.	Same	Same.
794-17	Copley, Ward & Preston.. Paintsville.	Wheat	Above guaranty in fiber.
1958-17	Mfrs. Warehouse	Wheat, ground wheat screenings 4%	Below guaranty in protein, above in fiber.
1770-15	Enterprise Coal & Feed Co. Shively.	Wheat	
1770-15	Riley & Miller..... Louisville.	Same	
1770-15	Bonta & Knight..... Pleasureville.	Same	
505-19	N. I. Toombs..... Madisonville.	Winter wheat middlings.....	
1792-17	Geo. B. Moock..... Newport.	Wheat	
298-12	Mfrs. Warehouse	Wheat middlings, ground wheat screenings 10%	
1044-17	Mfrs. Warehouse	Wheat	Above guaranty in fiber. Contains screenings.
400-15	H. C. Pennington..... Berea	Wheat	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1214-19	Wheat Middlings and Screenings..	D. A. Leffingwell & Co.	15.75	5.35	6.67
		Ashland, Ky.	15.00	4.00	6.50
507-15	Wheat Shorts and Screenings.....	Louisville Milling Co.	17.74	5.18	6.97
		Louisville, Ky.	15.00	4.00	7.00
507-16	Same	Same	16.13	4.25	6.89
507-18	Same	Same	18.44	3.58	10.14
507-18	Same	Same	17.50	3.33	7.05
507-18	Same	Same	17.38	3.90	7.56
507-18	Same	Same	16.94	3.70	8.85
1029-19	Wheat Shorts and Screenings:....	Same	17.06	3.43	8.54
1680-15	Wheat Middlings and Screenings..	Northwestern Elev. & Mill Co..	17.00	4.31	5.58
		Mt. Vernon, Ohio.	15.00	4.00	6.50
2137-17	Same	Same	13.63	4.02	6.06
			15.00	4.00	8.00
1585-17	Shorts	Paducah Milling Co.	17.13	4.77	3.08
		Paducah, Ky.	14.63	2.97	2.28
1751-15	Shorts, Low Grade Flour and Screenings	The Thomas Page Milling Co..	17.63	4.38	8.65
		Topeka, Kans.	16.00	4.00	8.00
2042-16	Pillsbury Standard B. Wheat Middlings and Screenings.....	Pillsbury Flour Mills Co.	15.88	5.38	10.35
		Minneapolis, Minn.	14.00	4.00	11.00
2042-16	Same	Same	16.88	5.68	11.83
350-19	Same	Same	16.13	5.38	10.58
110-14	Standard Middlings	The R. C. Poage Milling Co. ..	17.74	4.99	9.15
		Ashland, Ky.	15.00	4.00	7.45
574-15	Middlings	Same	18.23	3.61	5.40
			15.69	4.33	5.39
574-17	Same	Same	16.38	4.42	6.00
			15.69	4.33	5.38
574-17	Same	Same	16.00	6.13	5.32
178-19	Flour Middlings and Screenings...	The Sleepy Eye Mills.....	16.25	5.98	7.65
		Sleepy Eye, Minn.	15.50	5.10	8.70
1812-15	Star Middlings and Screenings....	Star & Crescent Milling Co. ...	17.81	5.10	6.68
		Chicago, Ill.	15.00	4.00	8.00
378-15	Wheat Middlings and Screenings..	Tell City Flouring Mills.....	17.93	4.17	5.70
		Tell City, Ind.	14.50	4.00	8.00
378-17	Same	Same	14.19	4.69	7.62
911-18	Wheat Middlings	The Trent Milling Co.	13.88	3.28	4.35
		Cincinnati, Ohio.	14.00	4.00	8.00
730-15	Trow's Middlings and Screenings..	W. Trow & Company.....	18.25	4.45	6.86
		Madison, Ind.	16.00	4.50	9.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1214-19	People's Trading Co ..... Catlettsburg	Wheat middlings, ground wheat screenings 5%	
507-15	R A. Dodd..... Wilmore.	Wheat shorts, ground wheat screenings 3%	
507-16	Welsh Department Stores Berea.	Same	
507-18	McClure & Simms..... Springfield	Same	Above guaranty in fiber.
507-18	L. D. Miller..... Buechel.	Same	
507-18	Helm & Long..... Okolona.	Same	
507-18	Welsh's Department Store Berea.	Same	
1029-19	A D. Asheraft..... Irvington.	Wheat shorts, ground wheat screenings 3%.	
1680-15	Bush & Bush..... Ashland.	Wheat middlings, ground wheat screenings 10%	
2137-17	Big Sandy Grocery Co.. Catlettsburg.	Wheat middlings, ground wheat screenings 2%	
1585-17	Mfrs. Warehouse	Wheat	Above guaranty in fiber.
1751-15	H. E. Eilers & Sons..... Louisville.	Shorts, low grade flour, ground wheat screenings 1%	Above guaranty in fiber.
2042-16	Kentucky Wholesale Co.. Pikeville, Ky.	Standard wheat middlings, ground wheat screenings 15%.....	
2042-16	R. C. Poage Milling Co.. Ashland	Same	Above guaranty in fiber.
350-19	Wheeler Grocery Co. ..... Paintsville.	Same	
110-14	Copley, Ward & Preston.. Paintsville, Ky.	Wheat	
574-15	Same	Same	Below guaranty in fat.
574-17	Mfgrs. Warehouse	Same	Above guaranty in fiber. Contains screenings.
574-17	D. A. Leffingwell & Co.. Ashland, Ky.	Same	
178-19	J. H. Fedders & Sons..... Covington.	Flour middlings, ground wheat screenings 13%	
1812-15	Licking Valley Gro. Co. West Van Lear, Ky.	Wheat middlings, ground wheat screenings 4%	
378-15	W. C. Kelley..... Hawesville.	Middlings, Red Dog flour, ground wheat screenings 3 %, salt 1%	
378-17	Same	Same	
911-18	Staggs Brothers ..... Vanceburg.	Wheat	
730-15	O. M. Wood..... Carrollton.	Wheat middlings, ground wheat screenings 8%	

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1078-11	Middlings	Vine Grove Roller Mills	20.00	5.04	3.87
		Vine Grove.	16.50	4.75	.....
753-18	Standard Wheat Middlings and Screenings	Washburn-Crosby Co.	17.31	6.13	9.36
		Minneapolis, Minn.	14.00	4.00	11.00
66-16	Shorts	Winchester Roller Mills	16.38	3.68	6.53
		Winchester, Ky.	16.35	4.05	6.03
66-17	Same	Same	16.00	4.70	8.55
66-17	Same	Same	15.75	4.33	7.18
	Shipstuff (Mixed Wheat Feed)				
191-15	Acme Feed	Acme-Evans Co.	18.23	4.13	8.30
		Indianapolis, Ind.	16.50	4.00	9.00
191-17	Same	Same	15.81	4.24	8.32
191-17	Same	Same	16.31	4.38	8.22
191-18	Same	Same	17.00	3.64	7.16
299-19	Same	Same	15.13	4.65	9.72
396-19	Big X Feed	Acme-Jones Co.	18.31	4.95	9.00
		Louisville, Ky.	15.00	4.00	9.00
396-19	Same	Same	16.69	5.20	10.05
903-15	Shipstuff	The Acme Mills	14.63	5.63	8.25
		Hopkinsville, Ky.	15.00	4.00	8.50
903-16	Same	Same	16.63	5.09	6.50
903-17	Same	Same	15.75	4.67	9.04
903-17	Same	Same	15.88	4.45	10.10
903-18	Same	Same	16.75	4.71	9.75
163-18	Winter Mixed Wheat Feed and Screenings	Akin-Erskine Milling Co.	16.69	3.66	7.14
		Evansville, Ind.	15.00	4.00	9.50
385- 9	Mill Feed	Albright & Sons	17.62	4.12	7.28
		Elgin, Ky.	15.50	4.00	.....
1004-15	William Tell Mixed Wheat Feed and Screenings	The Ansted-Burk Co.	15.81	3.89	8.60
		Springfield, Ohio.	14.50	3.50	11.50
839-15	Shipstuff	C. H. Aubrey	16.00	3.13	3.10
		Stithton, Ky.	15.22	4.10	6.12
967-15	Shipstuff	The Auburn Mills	17.19	4.70	7.68
		Auburn, Ky.	15.75	4.00	7.50
766-17	Shipstuff	Augusta Milling Co.	15.75	4.90	7.66
		Augusta, Ky.	15.31	3.45	8.50
201-18	Mixed Wheat Feed and Screenings	Ballard & Ballard Co.	17.19	4.39	8.65
		Louisville, Ky.	15.09	4.17	7.98

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1078-11	Mfrs. Warehouse		
753-18	Owens & Ducker..... Butler.	Standard wheat middlings, ground wheat screenings 15%.....	
66-16	Davis & Asher ..... Livingston.	Wheat	
66-17	Williams & Shiver..... Grayson .	Same	Above guaranty in fiber.
66-17	Taber & James..... Olive Hill.	Same	Below guaranty in protein, above in fiber.
191-15	Hazard Bakery..... Hazard.	Wheat bran, wheat middlings, ground wheat screenings 15%.	
191-17	Kentucky Wholesale Co. . Pikeville.	Same	Below guaranty in protein.
191-17	J. C. Everett &Co..... Maysville.	Same	
191-18	Dorris & Dunavent..... Mt. Sterling.	Same.....	
299-19	Sharp & McCreary..... Corbin.	Same	Below in protein, above in fiber. Sample mostly bran.
396-19	Wm. Addams ..... Cynthiana.	Same	
396-19	Simmons Feed Store..... Bowling Green.	Same	Above in fiber.
903-15	Pennyroyal Poultry Farm Gracey.	Wheat bran, wheat shorts.....	Screenings and wild buckwheat present.
903-16	S. C. Jennings..... Madisonville.	Same	Corn bran present.
903-17	T. M. Wooldridge..... Hopkinsville.	Same	Above guaranty in fiber.
903-17	O. G. Barrow..... Hopkinsville.	Same	Above guaranty in fiber.
903-18	T. M. Wooldridge..... Hopkinsville.	Same	Above in fiber. Screenings present.
163-18	H. B. Daniel..... Madisonville.	Wheat bran, ground wheat screenings 1%, salt 1%.....	Sample is shipstuff.
385- 9	Mfrs. Warehouse	Wheat	
1004-15	M. A. McBride..... Falmouth.	Wheat bran, middlings, ground wheat screenings 2%	
839-15	R. Lowery ..... Leitchfield.	Wheat bran, shorts	Below guaranty in fat.
967-15	Mfrs. Warehouse	Wheat bran, middlings	
766-17	Mfrs. Warehouse	Wheat bran, shorts	
201-18	Experimental Sta. Farm. Lexington, Ky.	Wheat bran, wheat middlings, cleaned and ground wheat screenings 2¼ %.	Above guaranty in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
289-18	"Winona" Mixed Feed and Screenings	Bay State Milling Co. Winona, Minn.	15.50	5.98	9.54
			15.00	4.00	10.00
895-15	Wheat Bran, Shipstuff and Screenings	Beaver Dam Milling Co. Beaver Dam, Ky.	17.00	4.16	7.25
			16.03	3.60	6.53
57-15	Eclipse Bran and Shorts	The Binns Milling Co. Herndon, Ky.	15.88	5.32	8.35
			15.25	4.10	7.50
334-17	Bull's Eye Mixed Wheat Feed	Blish Milling Co. Seymour, Ind.	16.56	4.51	9.46
			16.00	4.50	8.20
334-17	Same	Same	15.56	4.15	9.28
334-18	Same	Same	17.00	4.46	9.03
230-15	Shipstuff	Blue Grass Milling Co. Campbellsburg, Ky.	17.38	3.92	5.85
			15.75	4.46	3.50
175-11	Shipstuff	Boston Mills Co. Boston, Ky.	18.19	4.09	7.33
			15.50	4.50	.....
1929-16	Same	Boston Mills (J. M. Cattino, Prop.), Boston, Ky.	15.81	4.04	8.88
			15.50	4.50	7.25
1672-15	Shipstuff	V. A. Brock Sparta, Ky.	15.28	3.24	5.48
			15.00	4.29	8.00
1100-11	Mixed Feed	Ashton Bryant Calhoun, Ky.	17.87	4.31	6.29
			15.50	4.00	.....
1232-14	Shipstuff	J. V. Bumpus Louisville, Ky.	17.13	4.01	6.42
			15.65	4.10	8.00
643-14	Shipstuff	R. E. Burns Elgin, Ky.	16.57	3.35	8.69
			15.75	4.00	7.00
1608-15	Blue Ribbon Feed	T. E. Butler Fordsville, Ky.	16.50	3.28	5.18
			15.18	3.98	7.50
296-15	Shipstuff	Cadick Milling Co. Grandview, Ind.	19.22	5.18	4.80
			16.00	4.00	7.00
295-18	Mixed Wheat Feed	Same	17.00	4.54	9.46
			14 54	4 00	10 00
142-15	Shipstuff	Cameron & Co. Carrollton, Ky.	18.23	5.00	4.67
			16.03	4.13	7.50
1360-13	Feedstuff	Cane Valley Milling Co. Cane Valley, Ky.	17.62	3.80	6.09
			15.15	3.31	8.50
376-15	Shipstuff and Screenings	Cannelton Flour Mills Co. Cannellton, Ind.	18.97	4.65	5.61
			16.25	4.18	9.00
1723-15	The Choice	C. B. Carden Fordsville, Ky.	17.13	3.71	4.40
			15.25	4.00	8.50
1311-15	Wheat Bran and Shorts	James Cate & Son Co. Hopkinsville, Ky.	17.25	4.84	8.03
			15.75	4.57	7.02
1311-16	Same	Same	14.63	4.60	8.74
1311-17	Same	Same	14.88	4.05	7.95
987-15	Mixed Wheat Feed and Screenings	The Cincinnati Gr. & Hay Co. Covington, Ky.	17.74	4.39	8.68
			15.15	4.25	8.00
987-17	Same	Same	16.88	4.28	9.52

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
289-18	Rabold Brothers, Bowling Green.	Middlings, wheat bran, ground wheat screenings 6%	
895-15	Mfrs. Warehouse	Wheat bran, shipstuff and ground wheat screenings 9½%	Above guaranty in fiber.
57-15	Forbes Manufacturing Co. Hopkinsville.	Wheat bran, wheat shorts	Above guaranty in fiber.
334-17	A. Williams. Catlettsburg.	Wheat bran, middlings	Above guaranty in fiber.
334-17	Martin & Hodgkin Supply Co., Winchester.	Same	Above guaranty in fiber.
334-18	Louis Diemer Buechel.	Same	Above guaranty in fiber.
230-15	Mfrs. Warehouse	Wheat bran, middlings	Below guaranty in fat, above in fiber.
175-11	Same	Wheat	Contains screenings.
1929-16	Same	Wheat bran and wheat middling	Above guaranty in fiber.
1672-15	Same	Wheat shorts, wheat bran	Below guaranty in fat.
1100-11	Same	Wheat bran, shorts	
1232-14	Owensboro Grain Co. Owensboro.	Wheat bran, middlings	Corn bran present.
643-14	Mfrs. Warehouse	Wheat bran, middlings	Below guaranty in fat, above in fiber.
1608-15	J. H. Roberts. Fordsville.	Wheat bran, middlings	Below guaranty in fat.
296-15	J. W. Fontaine. Brandenburg.	Wheat bran, middlings	Sample is middlings.
295-18	H. J. Haffendorfer. Owensboro.	Soft winter wheat bran, soft winter wheat middlings, ground wheat screenings, 3%	
142-15	Mfrs. Warehouse	Wheat bran, middlings	
1360-13	Mfrs. Warehouse	Wheat bran, shorts	
376-15	Gibson Bros. Cloverport.	Middlings, Red Dog flour, ground wheat screenings 5%	Wheat bran present.
1723-15	Mfrs. Warehouse	Wheat bran, middlings	
1311-15	J. H. Cate, Jr. Hopkinsville.	Wheat bran, shorts	Above guaranty in fiber.
1311-16	E. Bassett. Madisonville.	Same	Below guaranty in protein, above in fiber. Contains corn bran.
1311-17	Mfrs. Warehouse	Wheat bran, wheat shorts	Below guaranty in protein and fat, above in fiber. Contains screenings.
987-15	Henry Dieters Covington.	Wheat bran, middlings, ground wheat screenings 6%	Above guaranty in fiber
987-17	Mfrs. Warehouse	Same	Same.

TABLE IV.—STRAIGHT FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
571-12	Shipstuff	L. A. Collins	15.50	3.30	1.98
		Lebanon, Ky.	16.00	4.50	.....
333-17	Shipstuff and Screenings	R. L. Collins & Son	16.50	4.13	7.05
		Crittenden, Ky.	14.00	4.66	7.50
1544-15	Mixed Wheat Feed	Collins & Montz	17.63	4.45	6.83
		Campbellsville, Ky.	15.50	4.00	7.25
14-15	Famous Feed	Corydon Milling Co.	17.38	4.06	7.22
		Corydon, Ky.	15.25	4.10	8.00
301-15	Shipstuff	Crescent Roller Mill, Inc.	17.06	4.47	6.52
		Taylorsville, Ky.	15.62	3.50	7.50
320-18	Crescent Mixed Wheat Feed	Crescent Milling Co.	15.81	4.65	9.93
		Cynthiana, Ky.	15.65	4.25	8.50
3043-18	Soft Wheat Mixed Feed	Crown Jewel Milling Co.	16.44	4.38	9.38
		Cynthiana, Ky.	17.25	4.25	9.25
171-15	Mixed Wheat Feed	Doe Run & Brandenburg Milling Co., Brandenburg, Ky.	16.08	2.42	1.27
			15.60	4.09	7.50
171-15	Same	Same	17.75	4.17	7.88
59-15	Shipstuff	W. J. Dossey & Sons	19.22	4.28	8.34
		Fountain Run, Ky.	15.75	4.46	8.50
420-18	Shipstuff and Screenings	Eagle Roller Mills	15.38	4.78	8.42
		Lawrenceburg, Ky.	15.50	4.20	7.00
872-18	Mixed Wheat Feed	The Early & Daniel Co.	16.44	4.43	9.26
		Cincinnati, Ohio.	14.00	3.00	11.00
1140-17	Same	The Early & Daniel Co.	16.88	4.31	9.75
		Covington, Ky.	15.36	4.41	8.00
1140-15	Same	Same	18.54	4.09	7.74
872-17	Same	Same	16.44	4.19	9.85
2495-17	Mixed Feed	B. A. Eckhart Milling Co.	16.50	4.80	9.53
		Chicago, Ill.	14.00	4.00	11.00
1176-18	Mixed Wheat Feed and Screenings	Edinger & Co.	16.06	4.23	7.53
		Louisville, Ky.	15.50	3.94	8.50
1176-17	Same	Same	16.50	4.07	10.11
134-19	Nutritia Mixed Wheat Feed and Screenings	Eikenberry-Fitzgerald Co.	13.88	4.15	11.45
		Cincinnati, Ohio.	15.20	2.50	10.00
1582-15	Shipstuff	J. J. Elder	16.56	3.39	5.23
		St. Marys, Ky.	15.50	4.25	8.00
2954-18	Soft Winter Wheat Feed and Screenings	W. M. Farless	16.19	4.82	5.30
		Henderson, Ky.	15.25	4.50	8.00
1167-14	Shipstuff	Farmers Milling Co.	16.19	3.43	7.32
		Beaver Dam, Ky.	15.50	4.25	7.75
2007-16	"Nutritia" Winter Wheat Feed and Screenings	The Ferger Grain Co.	17.31	4.35	7.15
		Cincinnati, Ohio.	15.00	3.50	10.00
1408-15	Shipstuff	Flemingsburg Milling Co.	17.25	3.87	7.60
		Flemingsburg, Ky.	15.75	4.10	7.85
405-12	Shipstuff	J. W. Ford	15.75	3.56	6.27
		Hartford, Ky.	16.00	4.50	.....

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
571-12	Mfrs. Warehouse	Wheat bran, middlings	Below guaranty in protein and fat.
333-17	William Jones Corinth.	Wheat bran, middlings, unground wheat screenings 2%	Below guaranty in fat.
1544-15	Mfrs. Warehouse	Wheat bran, middlings	
14-15	J. H. Harmon (Weaverton Sta.), Henderson.	Wheat bran, middlings, shipstuff, low grade flour, ground wheat screenings, 3%	
301-15	Smith & Harbison Shelbyville.	Wheat bran, shorts	
320-18	Mfrs. Warehouse	Soft winter wheat bran, soft winter wheat middlings	Above guaranty in fiber.
3043-18	Mfrs. Warehouse	Wheat bran, wheat middlings	
171-15	Same	Wheat bran, middlings	Below guaranty in fat.
171-15	Same	Same	
59-15	Same	Wheat bran, wheat shorts	
420-18	O. N. Smith & Co. Frankfort.	Wheat bran, middlings, shorts, ground wheat screenings 5%	Above guaranty in fiber.
872-18	Williamstown Mill & Light Co., Williamstown.	Wheat bran and middlings	
1140-17	Mfrs. Warehouse	Wheat bran, shorts	Above guaranty in fiber. Contains screenings.
1140-15	Ben Jansing, Alexander pike, Newport.	Same	
872-17	J. B. Paxton Catlettsburg.	Wheat bran, middlings	Above guaranty in fiber
2495-17	D. A. Leffingwell & Co. Ashland.	Wheat bran, wheat middlings, rye middlings, ground wheat screenings, 5%	
1176-18	Mfrs. Warehouse	Wheat bran, middlings, ground wheat screenings 3%	
1176-17	Sparks & Brown London.	Same	Above guaranty in fiber.
134-19	J. E. Mitchell London.	Wheat bran, wheat middlings, ground wheat screenings 3%	Below guaranty in protein, high in fiber. No middlings present.
1582-15	Mfrs. Warehouse	Wheat bran, middlings	
2954-18	Mfrs. Warehouse	Soft winter wheat bran, soft winter wheat middlings, soft winter wheat screenings, 3%	
1167-14	Mfrs. Warehouse	Wheat bran, middlings	Below guaranty in fat.
2007-16	Jos. H. Baude Georgetown.	Wheat middlings, ground wheat screenings 3%	
1408-15	Mfrs. Warehouse	Wheat bran, shorts	
405-12	Mfrs. Warehouse	Wheat bran, shorts	

TABLE IV.—STRAIGHT FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2688-18	Mixed Wheat Feed and Screenings	Fulton Mill Co.	15.25	5.32	8.68
		Fulton, Ky.	16.50	4.75	6.00
792-18	Mixed Wheat Feed	Garland Milling Co.	17.06	4.73	8.72
		Greensburg, Ind.	15.25	3.75	9.00
1228-15	Shipstuff	Germantown Milling Co.	15.96	3.94	8.70
		Germantown, Ky.	15.75	4.25	8.50
1188-14	Shipstuff and Screenings	The Ghent Milling Co.	17.49	4.45	6.99
		Ghent, Ky.	15.50	4.00	8.00
272-16	Mixed Wheat Feed and Screenings	Goodpaster & Scott	15.06	3.55	5.68
		Sherburne, Ky.	15.50	4.20	8.00
272-16	Same	Same	14.88	3.95	8.26
2643-18	Green River Feed	Green River Milling Co.	16.88	5.15	6.40
		Owensboro, Ky.	15.65	4.25	7.50
1318-17	Mixed Wheat Feed	Greenup Milling Co.	14.50	4.10	6.13
		Greenup, Ky.	15.50	4.20	8.00
898-17	Mixed Wheat Feed and Screenings	Gwinn Bros. & Co.	15.88	4.20	7.63
		Huntington, W. Va.	13.78	3.96	7.64
2901-18	Purity Feed	Hall Bros.	15.94	3.90	6.84
		Morehead, Ky.	15.25	3.75	9.25
1063-10	Shipstuff	Hancock Bros.	20.33	4.62	5.43
		Albany, Ky.	14.75	4.62	.....
1526-15	Shipstuff	Island Roller Mills	18.36	3.93	7.10
		Island, Ky.	15.75	4.00	8.50
1412-13	Shipstuff	Jones & Woodburn	17.38	3.88	5.74
		Sacramento, Ky.	15.81	4.83	8.50
1086-17	Mixed Wheat Feed	Geo. Keller	17.25	4.53	9.43
		Newport, Ky.	15.25	4.25	8.10
1043-17	Mixed Wheat Feed	Kenton Hay & Grain Co.	17.25	4.33	7.03
		Covington, Ky.	15.31	4.23	8.50
4-18	Mixed Feed	R. U. Kevil & Sons	15.88	4.28	9.56
		Princeton, Ky.	15.00	4.25	8.50
513-18	Mixed Wheat Feed and Screenings	R. U. Kevil & Sons	16.44	4.50	10.66
		Mayfield, Ky.	14.50	4.95	7.87
558-14	Mixed Wheat Feed and Screenings	Kevil Milling Co.	16.38	4.78	9.33
		Kevil, Ky.	16.00	4.25	7.50
1634-17	Mixed Wheat, Feed and Screenings	Eugene LaFont	18.38	4.68	7.39
		Metropolis, Ill.	14.69	4.18	7.69
1634-17	Same	Same	16.94	4.01	6.84
1634-18	Same	Same	17.19	4.30	8.08
398-17	Snowflake Mixed Wheat Feed	Lawrenceburg Roller Mills Co.	16.50	4.45	8.78
		Lawrenceburg, Ind.	15.20	4.30	8.00
401-15	Golden Bull Mixed Wheat Feed and Screenings	Same	15.94	5.63	10.16
			14.50	3.25	10.00
401-18	Same	Same	19.44	4.48	9.38
2233-16	Mixed Wheat Feed	Lebanon Milling Co.	15.06	4.35	7.09
		Lebanon, Ky.	14.56	3.62	5.88

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2688-18	Mfrs. Warehouse	Wheat shorts, wheat bran, ground wheat screenings 5%	Adulterated with corn bran. Below in protein, above in fiber.
792-18	Ruef Bros. Covington.	Winter wheat bran, middlings, ground wheat screenings and cleanings, 5%	
1228-15	Mfrs. Warehouse	Wheat bran, shorts, middlings	Largely wneat bran.
1188-14	J. S. Stout Worthville.	Wheat, unground wheat screenings 1%	
272-16	I. F. Tabb Mt. Sterling.	Wheat bran, middlings, ground wheat screenings 3%	Below guaranty in fat.
272-18	Goodpaster & Scott Owingsville.	Same	Below guaranty in protein.
2643-18	L. E. Chapman Owensboro.	Wheat bran, wheat shorts	
1318-17	Mfrs. Warehouse	Wheat bran, shorts	Below guaranty in protein.
898-17	J. B. Paxton Ashland.	Wheat bran, middlings, ground wheat screenings 2%	
2901-18	Mfrs. Warehouse	Wheat bran, middlings	
1063-10	Mfrs. Warehouse	Wheat bran, shorts, middlings	
1526-15	Mfrs. Warehouse	Wheat bran, shorts	
1412-13	Mfrs. Warehouse	Wheat bran, middlings	Below guaranty in fat.
1086-17	Mfrs. Warehouse	Wheat bran, shorts	Above guaranty in fiber. Contains screenings.
1043-17	Mfrs. Warehouse	Wheat bran, shorts	Contains screenings.
4-18	McLin Bros. Princeton.	Soft winter wheat bran, ground wheat screenings 4%	Above guaranty in fiber.
513-18	C. D. Bryant Mayfield.	Soft winter wheat bran, soft winter wheat shorts, ground wheat screenings, 2%	Above guaranty in fiber. Excess of screenings.
558-14	Mfrs. Warehouse	Shipstuff, ground wheat screenings 8%	Above guaranty in fiber.
1634-17	Fain & Lee Murray.	Wheat bran, wheat middlings, ground wheat screenings 8%	
1634-17	H. P. Hawkins& Sons Paducah.	Same	
1634-18	Western Ky. Grain Co. Mayfield.	Same	Above guaranty in fiber.
398-17	J. C. Everett & Co. Maysville.	Wheat bran, middlings	Same.
401-15	Frank Brown & Co. Mt. Sterling.	Wheat, ground wheat screenings 5%	
401-18	H. C. Pennington Berea.	Wheat bran, middlings	
2233-16	Mfrs. Warehouse	Wheat bran, shorts	Above guaranty in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
969-16	Mixed Wheat Feed and Screenings	Lebanon Milling Co.	14.56	3.62	4.88
		Lebanon, Ky.	15.50	3.83	8.00
722-12	Shipstuff	Leitchfield Milling Co.	18.88	4.98	4.45
		Leitchfield, Ky.	16.18	5.63	.....
148-15	Thoroughbred Feed	Lexington Roller Mills Co.	17.38	4.66	8.67
		Lexington, Ky.	16.38	4.15	7.09
148-16	Same	Same	16.63	3.72	6.95
148-17	Same	Same	15.75	3.70	7.45
297-19	Same	Same	15.38	4.20	8.20
796-15	Mixed Wheat Feed	J. W. Lindsey	18.63	4.78	7.88
		Campbellsville, Ky.	15.75	4.46	8.25
1263-15	Shipstuff	Livermore Mills	17.74	3.84	6.55
		Livermore, Ky.	15.50	4.25	7.25
1699-15	Shipstuff	Loretto Mill Co.	17.56	4.08	5.54
		Loretto, Ky.	15.62	3.83	8.50
1698-16	Same	Same	15.44	3.85	5.33
508-16	Mixed Wheat Feed and Screenings	Louisville Milling Co.	15.63	4.27	9.14
		Louisville, Ky.	14.50	4.00	8.00
508-17	Same	Same	16.56	4.13	8.55
1627-15	Shipstuff	L. D. McCarley & Co.	18.00	3.83	7.05
		Auburn, Ky.	15.50	4.50	7.50
797-17	Bob White	Madisonville Milling Co.	15.25	5.03	9.30
		Madisonville, Ky.	15.50	4.75	9.25
3001-18	Triangle Mixed Wheat Feed and Screenings	The Mansfield Milling Co.	15.06	4.38	7.94
		Mansfield, Ohio.	14.00	4.00	9.00
939- 9	Shipstuff	Mason & Dempsey	16.75	3.30	5.55
		Sunrise, Ky.	15.75	4.46	.....
355-15	Shipstuff	Mayhew Milling Co.	18.36	3.63	6.46
		Owensboro, Ky.	16.00	4.05	6.20
1624-15	Shipstuff	Mayhew & Son	18.23	4.58	7.03
		Bruce, Ky.	15.25	4.00	8.00
503-14	Mixed Wheat Feed	The Mennel Milling Co.	15.69	5.35	9.43
		Toledo, Ohio.	15.00	4.00	8.00
1446-14	Shipstuff	Geo. W. Murphy Co.	17.13	5.25	4.38
		Georgetown, Ky.	16.75	5.04	5.80
1315-15	Bran and Shipstuff	Murray Milling Co.	16.56	4.38	6.73
		Murray, Ky.	15.00	4.00	8.25
1234-15	Shipstuff	New Edmonton Mills	18.78	3.37	7.29
		Edmonton, Ky.	15.50	4.25	8.00
802-13	Mill Feed	Newbern Flour Mills	17.38	4.77	8.80
		Newbern, Tenn.	15.47	3.79	7.27
1325-14	Noblesville Mixed Wheat Feed	Noblesville Milling Co.	16.44	3.83	7.58
		Noblesville, Ind.	16.00	4.00	8.00
537-18	Same	Same	15.75	4.20	9.29

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
939-16	Mfrs. Warehouse	Wheat bran, shorts, ground wheat screenings 2%	Below guaranty in protein.
722-12	Mfrs. Warehouse	Wheat bran, shorts	Below guaranty in fat.
148-15	White Sharp Corbin.	Wheat bran, middlings	Above guaranty in fiber.
148-16	Corbin Feed Store Corbin.	Same	
148-17	Mfrs. Warehouse	Same	Below guaranty in both protein and fat, above in fiber.
397-19	Williams Bros. Williamsburg.	Wheat bran, wheat middlings, ground wheat screenings 3%	Below guaranty in protein, above in fiber.
796-15	M. L. Spurling Campbellsville.	Wheat bran, shorts	
1263-15	Mfgrs. Warehouse	Wheat bran, shorts	
1699-15	Same	Wheat bran, shorts	
1698-16	Modern Mill & Elevato Co., Lebanon.	Same	
508-16	The Ratliff Bros. Co. Carlisle.	Wheat bran, wheat shorts, ground wheat screenings 3%	Above guaranty in fiber.
508-17	The Mahan Co. Winchester.	Same	
1627-15	Mfrs. Warehouse	Wheat bran, middlings	Below guaranty in fat. Adulterated with corn bran.
797-17	Mfrs. Warehouse	Shipstuff, wheat bran, cheat 5%.	
3001-18	Big Sandy Grocery Co. Catlettsburg.	Wheat bran, wheat middlings wheat screenings 1%	
939- 9	Mfrs. Warehouse	Wheat	Below guaranty in fat.
355-15	L. E. Chapman & Co. Owensboro.	Shorts, wheat bran	
1624-15	Mfrs. Warehouse	Wheat bran, shorts	Contains corn bran and corn cockle.
503-14	Caudill, Blair & Co. Morehead.	Wheat	Above guaranty in fiber.
1446-14	Mfrs. Warehouse	Middlings, wheat bran	
1315-15	W. W. McElrath Murray.	Wheat bran, shipstuff	
1234-15	Mfrs. Warehouse	Wheat bran, middlings	Below guaranty in fat.
802-13	Browder Milling Co. Fulton.	Bran, shorts, low grade flour, unground screenings 2%	Above guaranty in fiber.
1325-14	Latonia Hay & Grain Co. Covington.	Wheat bran, middlings, ground wheat screenings 8%	
537-18	Hiner & Stricklett Vanceburg.	Same	Above guaranty in fiber.

TABLE IV.—STRAIGHT FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
549-15	Shipstuff	Nolin Milling Co.	17.38	4.18	7.23
		Nolin, Ky.	15.50	4.50	8.50
549-18	Same	Same	15.63	4.70	8.97
2281-16	Taylor's Mixed Wheat Feed and Screenings	The Northwestern Elevator & Mills Co., Mt. Vernon, Ohio.	16.25	4.23	8.13
			13.00	4.00.	6.50
2281-16	Same	Same	15.88	4.38	7.29
1206-15	Mixed Wheat Feed	W. H. Oldham & Son	17.38	4.07	7.08
		Stamping Ground, Ky.	15.80	3.53	7.50
.....	Shipstuff	Owenton Roller Mills Co.	17.13	4.40	6.98
		Owenton, Ky.	16.00	4.50	.....
3023-18	Mixed Wheat Feed	Paris Milling Co.	16.31	4.63	9.74
		Paris, Ky.	16.50	4.75	9.38
3023-18	Same	Same	16.31	5.00	9.93
1081-15	Ideal Mill Feed	T. L. Penn	17.13	4.84	7.73
		Kevil, Ky.	16.72	4.77	7.50
1503-13	Shipstuff	E. J. Perkins	18.73	4.34	8.03
		Jamestown, Ky.	14.81	4.45	8.50
1062-13	Phelps' Feed Stuff	J. H. Phelps	17.06	3.20	5.75
		Jamestown, Ky.	15 50	4 13	.....
3050-18	Pillsbury's XX Dairy Feed	Pillsbury's Flour Mills Co.	19.31	4.94	2.81
		Minneapolis, Minn.	16.00	4.00	4.00
3050-18	Same	Same	20.56	5.77	3.95
27-17	Quante's Wheat Feed and Screenings	Quante & Sielbeck	16.50	4.48	7.42
		Metropolis, Ill.	15.19	4.23	5.80
27-17	Same	Same	16.75	4.79	8.43
1673-15	O-Joy	L. H. Randolph	16.44	3.88	4.90
		Bandana, Ky.	15.75	4.50	8.00
1446-15	Wheat Bran and Shorts	S. B. Ray	18.36	3.57	6.75
		Gamaliel, Ky.	16.00	4.00	7.50
796-17	Mixed Wheat Feed	Rice & Allen	15.38	5.14	9.18
		Campbellsville, Ky.	15.75	4.46	8.25
1694-17	Shipstuff	J. M. Riley	17.06	4.43	9.80
		Williamstown, Ky.	15.31	3.82	6.00
1487-15	Wheat Bran and Middlings	B. E. Roberts & Co.	17.87	4.65	7.18
		Mill Springs, Ky.	15.25	4.01	8.00
661-15	Shipstuff	Rocky Hill Roller Mills	18.31	4.24	6.85
		Rocky Hill Station, Ky.	15.03	4.56	8.25
150-15	Bran and Shorts	Scottsville Milling Co.	17.49	3.83	7.68
		Scottsville, Ky.	15.00	4.00	7.00
1636-15	Mixed Wheat Feed	Scoville Milling Co.	13.50	4.05	10.88
		London, Ky.	15.25	4.00	8.00
2075-17	Shipstuff	Sebree Roller Mills	16.75	5.22	4.52
		Sebree, Ky.	16.00	4.00	7.00
1429-15	Shipstuff	Sedalia Roller Mills	16.63	3.94	6.73
		Sedalia, Ky.	14.93	3.96	8.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
549-15	Watkins & Co. Elizabethtown.	Wheat bran, wheat shorts	Contains screenings.
549-18	Cole, Hughes & Co. Barbourville.	Same	
2281-16	Bush & Prichard. Ashland.	Wheat bran, shorts, ground wheat screenings 8%	
2281-16	Bush & Bush Ashland.	Same	
1206-15	Mfrs. Warehouse	Wheat bran, middlings	
.....	Mfrs. Warehouse	Wheat	Contains corn bran.
3023-18	Ratliff Bros. Co. Carlisle.	Soft winter wheat bran, wheat shorts, wheat middlings	
3023-18	Mfrs. Warehouse	Same	
1081-15	Mfrs. Warehouse	Wheat bran, shorts	Contains screenings.
1503-13	Mfrs. Warehouse	Wheat bran, shorts	Contains corn cockle.
1062-13	Mfrs. Warehouse	Wheat bran, middlings	Below guaranty in fat.
3050-18	F. H. Gordon. Richmond.	Low grade flour	
3050-18	Ruef Bros. Covington.	Same	
27-17	Orten & Powell. Dawson Springs.	Wheat bran, middlings, ground screenings 9%	Above guaranty in fiber.
27-17	M. J. Yopp. Paducah.	Same	Same.
1673-15	Mfrs. Warehouse	Wheat bran, shorts	Below guaranty in fat.
1446-15	Mfrs. Warehouse	Wheat	Corn cockle present.
796-17	Mfrs. Warehouse	Wheat bran, shorts	Above guaranty in fiber.
1694-17	Mfrs. Warehouse	Wheat bran, middlings	Same.
1487-15	Geo. P. Taylor Co. Somerset.	Wheat bran, wheat middlings	
661-15	Mfrs. Warehouse	Wheat bran, wheat shorts	
150-15	Mfrs. Warehouse	Wheat bran, wheat shorts	Above guaranty in fiber. Contained corn bran.
1636-15	Mfrs. Warehouse	Wheat bran, shorts	Below guaranty in protein, above in fiber.
2075-17	S. C. Jennings Madisonville.	Wheat bran, middlings	
1429-15	B. M. Wilson. Mayfield.	Wheat bran, middlings	Large per cent. of screenings present.

TABLE IV.—STRAIGHT FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
759-10	Shipstuff	L. G. Shehan	19.38	4.17	6.30
		Bardstown, Ky.	15.36	4.36	.....
1696-18	Bullitt Dairy Feed	Shepherdsville Roller Mills	16.13	4.23	8.15
		Shepherdsville, Ky.	15.00	4.25	8.00
2101-18	Mixed Wheat Feed	John H. Shine & Co.	18.63	4.76	9.78
		New Albany, Ind.	14.50	4.00	8.00
1018-15	Shipstuff	Shrewsbury & Washburn	16.88	3.90	6.73
		Caneyville, Ky.	15.00	4.15	8.50
826-15	Sutherland's Feed	D. B. Sutherland	17.50	3.77	6.13
		Bloomfield, Ky.	16.20	4.75	7.85
587- 8	Shipstuff	Simpson & Howser	17.38	3.54	7.33
		Glensboro, Ky.	13.84	4.39	.....
1312-15	Shipstuff	Scaggs Milling Co.	18.19	3.75	5.95
		Horse Cave, Ky.	16.00	4.20	8.25
1565-15	Shipstuff	Smith & Conover	18.53	4.25	7.70
		Columbia, Ky.	15.75	4.25	7.25
1064-10	Shipstuff	Snow Milling Company	20.09	4.33	8.35
		Snow, Ky.	14.75	4.62	.....
1581-15	Shipstuff	Sonora Milling Co.	18.50	4.54	7.75
		Sonora, Ky.	16.00	4.19	7.25
683-15	Try Me Mixed Wheat Feed and Screenings	Sparks Milling Co.	17.88	4.90	8.30
		Alton, Ill.	16.00	3.50	8.00
683-15	Same	Same	17.88	4.45	7.23
			15.00	3.75	10.00
683-17	Same	Same	18.50	4.68	9.72
			16.00	3.50	8.00
24-19	Same	Same	17.25	4.33	8.05
			16.00	3.50	9.00
2959-18	Mixed Wheat Feed	Standard Tilton Milling Co.	18.38	4.63	8.84
		St. Louis, Mo.	14.50	4.00	8.00
2945-18	Mixed Wheat Feed and Screenings	Star Milling Co.	16.19	4.76	9.16
		Clinton, Ky.	15.25	4.00	8.50
981-14	Shipstuff and Screenings	Sturgis Milling Co.	16.38	3.94	7.93
		Sturgis, Ky.	16.00	4.25	7.50
981-14	Same	Same	17.44	4.23	7.34
854-14	Bran and Shipstuff	Adam Temple & Son	17.50	4.07	7.54
		Maxon's Mill, Ky.	15.41	4.93	7.38
2121-17	Shipstuff and Screenings	Tradewater Milling Co.	15.75	4.42	8.50
		Sturgis, Ky.	16.00	4.25	7.50
2128-18	Mixed Wheat Feed and Screenings	Same	15.94	4.06	9.45
			15.50	4.25	7.50
253-19	Mixed Feed	Same	15.69	4.47	8.50
			14.00	4.25	8.50
964-15	Shipstuff and Screenings	Trenton Milling Co.	17.06	3.60	7.69
		Trenton, Ky.	15.41	4.32	8.25
964-18	Same	Same	16.13	5.05	8.39
1294-14	Shipstuff	Trimble Milling Co.	17.50	4.15	4.28
		Milton, Ky.	15.20	4.72	8.50

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
759-10	Mfrs. Warehouse	Wheat	
1696-18	Mfrs. Warehouse	Wheat shorts, wheat middlings, wheat bran, ground wheat screenings, 4%	
2101-18	A. L. Wood, Valley Station.	Wheat bran, middlings, ground wheat screenings 3%	Above guaranty in fiber.
1018-15	R. Lowery, Leitchfield.	Wheat bran, middlings	
826-15	Nichols Bros. Bloomfield.	Wheat bran, shorts	Below guaranty in fat.
587- 8	Mfrs. Warehouse	Wheat	Below guaranty in fat.
1312-15	Same	Wheat bran, middlings	
1565-15	Same	Wheat bran, wheat shorts	Above guaranty in fiber.
1064-10	Same	Wheat bran, shorts, middlings	Contains considerable corn cockle.
1581-15	R. H. Wintersmith Elizabethtown.	Shorts, wheat bran	Above guaranty in fiber.
683-15	L. M. Nuckols, Louisville.	Wheat bran, wheat middlings, ground wheat screenings 2%	
683-15	Ben J. Brumleve, Louisville.	Same	
683-17	Walter Mathews Paducah.	Same	Above guaranty in fiber.
24-19	London Wholesale Grocery Co., London.	Same	
2959-18	H. P. Hawkins & Sons Paducah.	Wheat bran, wheat middlings	Above guaranty in fiber.
2945-18	T. E. Andrews, Hickman.	Soft winter wheat bran, soft winter wheat middlings, ground wheat screenings, 2%	Above guaranty in fiber.
981-14	E. Bassett, Madisonville.	Low grade flour, wheat bran, ground wheat screenings 2%	
981-14	Mfrs. Warehouse	Same	
854-14	H. A. Wurth, Paducah.	Wheat bran, shipstuff	Below guaranty in fat.
2121-17	Mfrs. Warehouse	Low grade flour, wheat bran, ground wheat screenings 2%	Above guaranty in fiber.
2121-18	Same	Wheat shorts, wheat bran, ground wheat screenings 2%	Above guaranty in fiber.
258-19	Same	Wheat bran, wheat shorts, ground wheat screenings 5%	
964-15	Same	Wheat bran, low-grade flour, wheat middlings, ground wheat screenings, 5%	
964-18	Same	Wheat bran, low-grade flour, wheat middlings, ground wheat screenings, 8%	
1294-14	C. S. Griffith, Carrollton.	Wheat bran, middlings	

TABLE IV.—STRAIGHT FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
316-13	Shipstuff	Valley Oak Roller Mills	19.96	5.10	7.18
		Valley Oak, Ky.	15.65	4.13	.....
2556-18	Valier's Mixed Wheat Feed and Screenings	Vallier & Spies Milling Co.	18.50	4.80	10.93
		St. Louis, Mo.	15.00	4.00	9.00
1407-14	Mixed Wheat Feed	The Washington Milling Co.	15.56	4.40	8.33
		Washington C. H., Ohio.	15.75	4.50	7.50
658- 8	Shipstuff	J. H. Wilhite & Co.	19.03	4.70	6.59
		Utica, Ky.	16.09	4.35	.....
876- 9	Shipstuff	D. T. Wilson	17.88	4.20	7.03
		Greensburg, Ky.	16.00	4.50	.....
802-15	Ziliak Mixed Wheat Feed and Screenings	Ziliak & Schafer Milling Co.	17.94	4.31	8.38
		Evansville, Ind.	16.69	4.32	6.49
801-17	Shipstuff	Same	15.94	4.65	6.50
			16.30	4.50	3.90
1344-12	Shipstuff	Zula Milling Co.	18.86	4.03	6.93
		Zula, Ky.	14.72	4.59	.....
	Red Dog Flour				
574-14	Adrian Red Dog Flour	Washburn-Crosby Co.	17.63	5.32	3.50
		Minneapolis, Minn.	17.00	5.00	4.00
574-14	Same	Same	20.50	6.33	3.60

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
316-13	Mfrs. Warehouse	Wheat bran, shorts	
2556-18	Princeton Feed & Produce Co., Princeton.	Wheat middlings, wheat bran, ground wheat screenings 4%..	Above guaranty in fiber.
1407-14	Mfrs. Warehouse	Wheat bran, middlings	Above guaranty in fiber.
658- 8	Mfrs. Warehouse	Wheat	
876- 9	Mfrs. Warehouse	Wheat	
802-15	Henderson Feed & Commision Co., Henderson.	Wheat bran, middlings, ground wheat screenings 1%	Above guaranty in fiber. Large amount of screenings present.
801-17	Walter Mathews..... Paducah.	Wheat bran, middlings	Above guaranty in fiber.
1344-12	Mfrs. Warehouse	Wheat bran, middlings, shorts...	
574-14	Isaac Richmond Co. ..... Prestonburg.	Wheat	
574-14	Pikeville Grocery Co. .... Pikeville.	Same	

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
	Mixed Feed (Wheat and Corn).				
158-15	Mixed Feed	Adams & Langford	17.74	4.00	6.73
		Harrodsburg, Ky.	12.65	5.20	9.50
161-17	Anderson & Spilman Feed	Anderson & Spilman	14.63	3.88	6.70
		Danville, Ky.	13.50	3.68	5.60
161-18	Same	Same	15.44	4.37	8.21
222-18	Mixed Feed	Arlington Roller Mills	16.69	5.05	9.23
		Arlington, Ky.	13.50	4.44	9.10
342-19	Same	Same	15.69	4.43	9.19
831-17	Mill Feed	Ashland Milling Co.	13.94	6.73	7.50
		Ashland, Ky.	13.00	4.00	8.50
831-17	Same	Same	15.44	4.33	9.00
1890-17	Eureka Feed	Same	15.50	4.20	8.08
			14.06	4.77	9.08
166-19	Same	Same	15.81	6.05	9.23
1292-15	Mixed Feed	C. H. Aubrey	16.19	3.41	6.84
		Stithton, Ky.	14.50	4.50	6.50
968-15	Mixed Feed	The Auburn Mills	16.50	4.63	9.56
		Auburn, Ky.	14.25	4.50	9.50
234-17	Mixed Mill Feed	J. H. Baughman & Co.	16.00	4.83	7.41
		Stanford, Ky.	14.38	4.61	8.25
234-18	Same	Same	15.69	4.77	9.79
1151-14	Perfection	Beaver Dam Milling Co.	13.56	3.88	6.68
		Beaver Dam, Ky.	10.41	3.19	9.50
1296-15	Mill Feed	Same	15.63	4.41	6.33
			15.08	4.30	7.80
896-18	Same	Same	16.44	5.03	8.95
			14.00	4.50	8.50
304-15	Mixed Feed	Bloomfield Mill Co.	16.50	3.82	8.98
		Bloomfield, Ky.	15.00	4.00	8.50
30-15	Mixed Feed	Bowling Green Milling Co.	18.13	3.40	6.71
		Bowling Green, Ky.	15.19	4.17	8.50
30-18	Same	Same	15.75	4.50	7.71
30-18	Same	Same	16.19	4.80	7.48
239-15	Mixed Feed	Bransford Mills	17.25	4.03	7.33
		Owensboro, Ky.	15.00	4.00	6.00
239-18	Same	Same	15.69	3.78	7.59
			15.00	4.00	8.00
2119-18	Mixed Feed	L. Brewer	16.94	4.68	9.25
		Mayfield, Ky.	14.50	4.50	5.00
96-17	XX Mixed Feed	Chas. Broeker & Co.	14.31	6.53	6.83
		Owensboro.	13.00	4.00	8.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
158-15	R. J. Smith & Co. ..... Somerset.	Wheat bran, shorts, corn bran, corn hearts	Below guaranty in fat.
161-17	Mfrs. Warehouse	Wheat bran, wheat middlings, low grade flour, ground and unground screenings, corn bran 10%	Above guaranty in fiber
161-18	Same	Same	Above guaranty in fiber.
222-18	Mayfield Feed Co. ..... Mayfield.	Wheat bran, corn bran, unground wheat screenings 3%	No corn bran present.
342-19	Mfrs. Warehouse	Soft winter bran, corn bran, unground wheat screenings 3% ..	
131-17	Pikeville Grocery Co. ... Pikeville.	Middlings, wheat bran, corn bran, unground wheat screenings 3%	Largely corn bran.
831-17	Mfrs. Warehouse	Same	No corn bran. Above guaranty in fiber.
1390-17	The Caudill Grocery Co. . Olive Hill.	Wheat middlings, wheat bran, feed meal	No feed meal present.
166-19	Cyrus & Graham..... Louisa.	Wheat middlings, feed meal, wheat bran, ground wheat screenings, 5%	Below guaranty in fat.
1292-15	R. H. Wintersmith..... Elizabethtown.	Wheat bran, corn bran, corn hearts, ground wheat screenings, 8%	Largely wheat bran.
968-15	Mfrs. Warehouse	Wheat bran, corn bran, ground wheat screenings, 3%	
234-17	L. R. Eversole & Co. .... London.	Wheat bran, shorts, corn bran, ground wheat screenings, 5% ..	No corn bran present. High in fiber.
234-18	Mfrs. Warehouse	Wheat bran, shorts, corn bran, ground wheat screenings 5% ..	
1151-14	Same	Wheat bran, shipstuff, corn, ground wheat screenings, 5%; cob, 8%	
1296-15	Same	Wheat bran, corn bran, shipstuff, ground wheat screenings 9% ..	
896-18	Same	Same	
304-15	W. L. Morris..... Frankfort.	Wheat bran, wheat shorts, corn meal, ground wheat screenings, 5%	
30-15	F. W. Alvis..... Bowling Green.	Wheat bran, shorts, corn bran, ground wheat screenings 3% ...	Below guarantee in fat.
30-18	S. H. Brown..... Bowling Green.	Same	Excess screenings.
30-18	Mfrs. Warehouse	Same	
239-15	Knight's Feed Store.... Owensboro.	Wheat bran, wheat shorts, corn bran, ground wheat screenings, 2%	Above guaranty in fiber.
239-18	H. J. Haffendorfer..... Owensboro.	Same	Excess screenings.
2119-18	C. D. Bryant..... Mayfield.	Soft winter wheat bran, corn bran, unground wheat screenings, 2%	Above guaranty in fiber.
96-17	Mfrs. Warehouse	Shipstuff, wheat bran, hominy feed, ground wheat screenings, 1%	

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1038-15	Mixed Feed	Brookport Milling Co.	17.50	4.39	8.16
		Brookport, Ill.	14.44	4.61	7.95
263-15	Mixed Feed	Browder Milling Co.	17.25	4.86	8.89
		Fulton, Ky.	15.28	4.68	9.00
262-18	Same	Same	15.31	5.28	8.25
263-18	Same	Same	16.06	4.35	8.04
1258-15	Mixed Feed	E. L. Buckley	17.63	4.54	6.25
		Allensville, Ky.	15.31	5.07	7.46
2312-17	Mixed Feed	J. K. Butcher & Co.	15.50	4.58	6.38
		Paintsville, Ky.	14.50	4.25	8.00
295-17	Mixed Feed	Cadick Milling Co.	16.13	3.95	8.15
		Grand View, Ind.	14.50	4.00	7.00
295-17	Same	Same	16.06	4.32	9.10
375-15	Mixed Feed	Cannelton Flour Mills	14.67	4.52	7.36
		Cannelton, Ind.	14.43	3.45	10.00
359-19	Mixed Brans and Screenings	Same	14.81	4.53	9.11
359-19	Same	Same	15.19	4.33	8.72
774-15	Mixed Feed	Cecelian Milling Co.	18.50	4.31	7.65
		Cecelian, Ky.	14.37	4.15	5.00
774-17	Same	Same	14.94	5.80	9.18
292-15	Mixed Brans	Clark & Clark	17.50	4.43	6.37
		Franklin, Ky.	15.42	4.94	5.14
292-17	Mixed Brans	Clark & Durham	16.06	4.57	7.54
		Franklin, Ky.			
982-18	Mixed Brans	Climax Roller Mills	14.25	4.00	9.65
		Shelbyville Ky.	17.00	4.15	9.50
16-15	Famous XX Feed	Corydon Milling Co.	15.89	4.04	7.58
		Corydon, Ky.	14.00	3.50	8.50
1410-15	Mixed Feed	Crab Orchard Milling Co.	15.50	4.20	6.16
		Crab Orchard, Ky.	15.22	4.28	8.50
320-18	Crescent Feed	Crescent Milling Co.	16.25	4.71	8.20
		Cynthiana, Ky.	14.25	4.75	8.97
299-15	Mixed Feed	Crider Roller Mills	16.75	4.28	7.87
		Crider, Ky.	13.56	3.76	10.00
1188-17	Mixed Feed	Crown Jewel Milligh Co.	16.19	4.65	7.76
		Cynthiana, Ky.	15.25	4.50	8.00
1029-13	Crystal Flake Mixed Feed	Crown Roller Mills	14.54	4.84	8.93
		Morganfield, Ky.	12.50	4.50	.....
182- 9	Damon's Brans	C. D. Damon	16.75	4.43	6.88
		Elkton, Ky.	15.00	4.00	8.00
345-17	Mixed Feed	Dawson Milling Co.	14.19	4.12	8.25
		Dawson Springs, Ky.	14.94	4.08	7.50
1020-15	Dorsel's Mixed Feed	The Dorsel Co.	14.50	2.49	4.23
		Newport, Ky.	15.94	4.05	8.30

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1038-15	E. L. Mallory Grain Co. .. Paducah.	Wheat bran, shipstuff, corn bran.	No corn bran present.
263-15	Mfrs. Warehouse	Wheat bran, wheat middlings, ground wheat screenings 7½%	No corn bran, and screenings present.
262-18	Same	Same	
263-18	Same	Same	
1258-15	Y. B. Talley & Co. ..... Guthrie.	Wheat bran, middlings, corn bran	Below guaranty in fat. Screenings present.
2312-17	Mfrs. Warehouse	Middlings, wheat bran, corn bran.	
295-17	L. E. Chapman..... Owensboro.	Wheat bran, corn bran 3%, ground wheat screenings 3%	Above guaranty in fiber. No corn bran present.
295-17	J. M. Williams & Co. .... Springfield.	Same	Above guaranty in fiber. No corn bran present.
375-15	Heston, Whiteworth & Co. Hardinsburg.	Wheat bran, shipstuff, corn bran, ground wheat screenings 5%...	
359-19	J. H. Brown..... Cloverport.	Wheat bran, corn bran, ground wheat screenings 5%.....	Unground screenings present.
359-19	J. W. Quisenberry..... Hawesville.	Same	
774-15	Hagan, Clark & Yates... Elizabethtown.	Wheat bran, shorts, corn bran, corn.	Above guaranty in fiber.
774-17	Mfrs. Warehouse	Same	Above guaranty in fiber. Screenings present.
292-15	Mfrs. Warehouse	Wheat bran, corn bran	Below guaranty in fat, above in fiber. Screenings present.
292-17	F. C. Denton..... Glasgow Junction.	Wheat bran, corn bran	Above guaranty in fiber.
982-18	Mfrs. Warehouse	Wheat bran, corn bran	Below guaranty in protein.
16-15	J. H. Harmon..... Henderson.	Wheat bran, corn bran, middlings, ground wheat screenings 3%...	
1410-15	T. J. Pennington..... Livingston.	Wheat bran, shorts, corn bran....	
320-18	Mfrs. Warehouse	Wheat bran, corn bran.....	Screenings present.
299-15	Mfrs. Warehouse	Wheat bran, corn bran, unground wheat screenings 10%.....	
1188-17	Mfrs. Warehouse	Wheat middlings, wheat bran, corn bran.	
1029-13	Mfrs. Warehouse	Wheat bran, corn bran, unground wheat and corn screenings 5%..	Sample is shipstuff.
182- 9	Mfrs. Warehouse	Wheat bran, corn bran.....	
345-17	Mfrs. Warehouse	Wheat bran, corn bran, unground wheat screenings 3%.....	Above guaranty in fiber. Excess of screenings.
1020-15	A. Kramer ..... Ft. Thomas.	Wheat bran, shorts, corn bran....	Below guaranty in protein and fat. No corn bran present.

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1019-17	Dorsel's Special Feed	The Dorsel Co.	16.38	3.60	5.25
		Newport, Ky.	13.56	3.99	8.00
1021-17	Dorsel's Mixed Brans	Same	15.38	3.55	11.76
			14.97	4.59	8.50
254-15	Mixed Feed	Eagle Mills	16.13	4.21	8.16
		Franklin, Ky.	15.18	5.10	8.50
254-18	Same	Same	16.13	4.13	6.80
1765-15	Mixed Feed	Electric Mills	16.63	3.65	5.55
		Franklin, Ky.	14.50	4.75	8.00
1765-16	Same	Same	14.63	3.75	5.56
422-15	Mixed Feed	Elizabethtown Milling Co.	17.75	4.12	7.69
		Elizabethtown, Ky.	14.80	4.48	6.78
422-18	Same	Same	15.50	4.73	8.70
419-15	Mixed Feed	T. M. Ellis & Co.	16.38	4.98	6.05
		Russellville, Ky.	15.00	4.60	8.00
419-18	Same	Same	15.50	4.06	6.56
1231-18	Leader Mixed Feed	The Eminence Milling Co.	16.38	4.25	7.11
		Eminence, Ky.	14.25	4.25	8.03
249-15	Mixed Brans and Screenings	Exchange Milling Co.	16.94	3.67	6.49
		Sturgis, Ky.	14.50	5.00	8.50
249-18	Same	Same	16.19	4.03	9.17
892-19	Same	Same	14.56	4.25	8.19
11-15	Mill Feed	Farmers Union Mill	17.25	4.66	6.13
		Versailles, Ky.	15.25	4.25	8.70
11-18	Same	Same	15.56	4.75	8.28
11-18	Same	Same	15.69	4.82	8.79
11-18	Same	Same	14.50	5.00	8.87
916-15	Mixed Feed	W. M. Farless	17.25	4.57	8.93
		Henderson, Ky.	15.00	4.00	9.00
2689-18	Mixed Feed	Fulton Mill Co.	16.50	5.01	8.53
		Fulton, Ky.	15.00	4.50	9.50
2689-18	Same	Same	16.56	5.08	9.43
1094-17	Mixed Feed	R. L. Gallaway	16.50	4.85	7.39
		Falmouth, Ky.	15.00	4.00	8.00
1094-17	Same	Same	15.69	4.39	8.89
87-17	Mixed Feed	Garrard Milling Co.	15.19	4.86	7.92
		Lancaster, Ky.	14.50	4.88	8.50
87-17	Same	Same	14.25	4.88	8.40

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	FROM GUARANTY REMARKS—VARIANCE
1019-17	Mfrs. Warehouse	Wheat middlings, fine corn bran	No corn bran present.
1021-17	Mfrs. Warehouse	Wheat bran, corn bran	Below guaranty in fat, above in fiber.
245-17	Mfrs. Warehouse	Wheat bran, corn bran.	
254-18	Same	Soft winter wheat bran, corn bran	
1765-15	Same	Wheat bran, corn bran, ground wheat screenings 15%	Below guaranty in fat.
1765-16	Same	Wheat bran, shorts, corn bran, ground wheat screenings 15%	Same.
422-15	Same	Wheat bran, corn bran	
422-18	Same	Wheat bran, corn bran	Above guaranty in fiber.
419-15	Clarence Howard Russellville.	Wheat bran, corn bran	
419-18	Wilson & Son Russellville.	Wheat bran, corn bran, ground wheat screenings 2%	Below guaranty in fat. No corn bran present.
1231-18	Mfrs. Warehouse	Wheat bran, corn bran 5%, shorts, ground wheat screenings 5%	
249-15	Same	Wheat bran, corn bran, unground wheat screenings 8%	Below guaranty in fat.
249-18	Same	Same	Excess of screenings. No corn bran. Below in fat, above in fiber.
892-19	Same	Same	Middlings present. Below guaranty in fat.
11-15	Mountain Central R. R. Co., McCormick.	Wheat bran, wheat middlings, corn bran, 5%; ground wheat screenings, 5%.	
11-18	H. C. Boyd Berea.	Same	
11-18	Mfrs. Warehouse	Same	
11-18	Same	Same	Below guaranty in protein. Corn cockle present.
916-15	A. T. Callender Henderson.	Wheat bran, corn bran, ground wheat screenings 3%	
2689-18	Mfrs. Warehouse	Wheat bran, corn bran, ground wheat screenings 20%	
2689-18	Same	Same	
1094-17	Same	Wheat bran, middlings, corn bran 5%, ground wheat screenings 2%	Contains corn cockle.
1094-17	Same	Same	Above guaranty in fiber.
87-17	Pineville Feed & Grain Co., Pineville.	Wheat bran, shorts, corn bran, ground wheat screenings 3%	
87-17	Sparks & Brown London.	Same	

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
259-19	Mixed Feed	Garrard Milling Co.	14.44	5.13	6.86
		Lancaster, Ky.	14.00	4.75	8.50
259-19	Same	Same	14.81	4.62	7.86
958-15	Mixed Feed	Glasgow Milling Co.	18.73	4.04	7.09
		Glasgow, Ky.	15.50	4.25	8.50
958-17	Same	Same	16.31	4.04	6.64
468-16	Glass' High Grade Feed	Glass Milling Co.	15.94	4.25	6.90
		Wilmour, Ky.	16.32	4.25	7.44
1013-15	Mixed Feed	The Goldcamp Mill Co.	15.40	3.80	7.45
		Ironton, Ohio.	13.87	4.23	7.55
61-14	Mixed Feed	Gordonsville Milling Co.	16.88	4.24	7.98
		Gordonsville, Ky.	14.41	5.03	8.25
1210-15	Mixed Feed	Green Bros.	16.13	3.90	6.33
		Falls of Rough, Ky.	15.36	4.41	9.25
1476-14	Mixed Feed	Guthrie Milling Co.	15.50	4.39	6.23
		Guthrie, Ky.	12.50	3.99	9.00
1835-16	Same	Same	15.13	4.68	10.94
273-15	Feedstuff	Harlan-Lowe Milling Co.	16.88	5.85	8.90
		Bardwell, Ky.	14.22	4.20	7.80
71-19	Same	Same	16.44	4.33	9.33
1193-19	Express	R. L. Harrison & Sons	14.63	4.83	8.85
		Bagdad, Ky.	15.38	3.85	6.93
2994-18	Mixed Feed	P. H. Harsha	15.25	5.78	9.80
		Portsmouth, Ohio.	13.50	3.25	12.00
274-15	Mixed Feed	Hickman Milling Co.	15.65	4.18	7.45
		Nicholasville, Ky.	14.00	3.50	8.25
1489-15	Lincoln	Hodgenville Milling Co.	18.13	4.65	7.40
		Hodgenville, Ky.	15.00	3.90	8.25
1489-18	Same	Same	15.19	5.35	8.08
371-15	Jersey Mixed Feed	Hope Milling Co.	18.00	4.87	7.93
		White Plains, Ky.	16.31	4.68	8.25
486-17	Star and Crescent	Hopkinsville Milling Co.	13.25	5.26	8.30
		Hopkinsville, Ky.	13.25	4.68	9.50
1269-14	Mill Feed	Hustonville Milling Co.	15.52	3.46	6.35
		Hustonville, Ky.	16.00	3.55	8.25
474-18	Same	Same	15.31	4.13	7.58
			16.00	3.55	8.25
164-19	Mixed Feed	The Ideal Roller Mills	16.44	4.85	8.59
		Falmouth, Ky.	15.00	4.00	8.00
1391-15	Mixed Feed	Irvington Mill & Elevator Co.	15.56	4.39	8.13
		Irvington, Ky.	12.19	4.35	10.00
1391-17	Same	Same	17.25	3.25	6.88
203-19	Same	Same	15.44	4.44	8.18

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
259-19	Mfrs. Warehouse	Wheat bran, corn bran, shorts, ground wheat screenings 3%	
259-19	J. T. Blair. Corbin.	Same	
958-15	Mfrs. Warehouse	Wheat bran, corn bran.	Shipstuff. No corn bran present.
958-17	Gee & Morrison. Glasgow.	Same	
468-16	J. B. Richardson. Somerset.	Wheat bran, corn bran, shipstuff, ground wheat screenings 3%	Shipstuff. No corn bran present.
1013-15	John Jeems. Louisa.	Wheat, corn, ground grain screenings 1%	
61-14	G. Cooksey. Russellville.	Wheat bran, corn bran, ground wheat screenings 2%	Below guaranty in fat.
1210-15	J. H. Roberts. Fordsville.	Wheat bran, corn bran, ground wheat screenings 1%, middlings	Below guaranty in fat. Unground screenings present.
1476-14	Brenner Bros. Guthrie.	Wheat bran, corn bran, unground wheat screenings 2%	Sample is shipstuff.
1835-16	W. L. Kimbrough & Son. Guthrie.	Same	Above guaranty in fiber.
273-15	Fulton Flour-Feed Dealers' Mfg. Co., Fulton.	Wheat bran, corn bran, unground wheat screenings 3%	Above guaranty in fiber. No corn bran present.
71-19	Mfrs. Warehouse	Same	Above guaranty in fiber.
1193-19	Same	Wheat bran, wheat shorts, corn bran, gro'd wheat screen'gs 10%	Below guaranty in protein, above in fiber. Excess of corn bran.
2994-18	Copley, Ward & Preston. Paintsville.	Wheat bran, wheat middlings, corn bran	
274-15	Mfrs. Warehouse	Wheat bran, corn bran, ground wheat screenings 5%	
1489-15	R. B. Hayes & Co. Hodgenville.	Wheat bran, shorts, corn bran	No corn bran.
1489-18	The Jeffries-Essex Co. Elizabethtown.	Same	
371-15	Mfrs. Warehouse	Wheat bran, corn bran, shorts	
486-17	Same	Wheat bran, corn bran, unground wheat screenings 10%	
1269-14	Same	Wheat bran, corn bran	Sample is shipstuff. No corn bran present.
474-18	Sampled in transit to South Fork, Ky.	Same	Below guaranty in protein. Excess of corn bran.
164-19	Mfrs. Warehouse	Wheat bran, middlings, corn bran 5%, ground wheat screen'gs 2%	
1391-15	Same	Wheat bran, shipstuff, corn bran, ground wheat screenings 5%	
1391-17	Same	Same	Below guaranty in fat. No corn bran present.
203-19	Same	Same	

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
88-15	Mixed Feed	Jenkins-Ryan Milling Co.	18.19	4.09	7.53
		Adairville, Ky.	15.00	4.70	8.50
1564-15	Mixed Feed	Joyce Roller Mills	17.87	3.93	6.94
		Joyce, Ky.	14.10	4.28	8.00
770-15	Mixed Brans and Screenings	Keen & Smith	17.38	4.63	7.75
		Burksville, Ky.	13.50	4.50	8.50
515-15	Lyon Feed	Keith Brothers	14.81	5.94	8.40
		Buffalo, Ky.	15.19	5.09	8.25
513-15	Mixed Feed	R. U. Kevil & Sons	16.00	4.40	8.58
		Mayfield, Ky.	14.50	4.95	7.87
513-17	Same	R. U. Kevil & Sons	17.06	4.62	8.19
		Mayfield, Ky.	14.50	4.95	7.87
513-17	Same	R. U. Kevil & Sons	17.38	4.18	7.68
		Mayfield, Ky.			
4-15	Same	R. U. Kevil & Sons	17.56	3.99	8.30
		Princeton, Ky.	15.00	4.00	7.00
4-17	Same	R. U. Kevil & Sons	14.75	4.45	8.75
		Princeton, Ky.			
373-17	Mixed Feed	Kuttawa Milling Co.	14.88	4.75	7.68
		Kuttawa, Ky.	14.90	3.52	8.50
373-18	Same	Same	15.63	4.39	8.03
500-18	Mixed Feed	Lancaster Elevator & Flour	16.31	4.64	8.80
		Mills, Lancaster, Ky.	16.00	5.38	9.00
512-15	Mixed Feed	Ledbetter Milling Co.	17.74	4.49	7.41
		Elizabethtown, Ky.	12.25	4.50	7.00
1219-15	Mixed Feed	D. A. Leffingwell & Co.	16.38	5.46	8.55
		Ashland, Ky.	12.94	4.50	6.50
1219-16	Same	Same	14.50	5.58	9.33
523-15	Eureka	Leitchfield Milling Co.	15.50	5.02	6.86
		Leitchfield, Ky.	14.63	5.15	8.00
1274-15	Mixed Feed	Lewisburg Milling Co.	17.56	4.16	6.03
		Lewisburg, Ky.	15.19	4.94	6.38
517-15	Farmers' Choice	Lewisport Mill Co.	17.50	4.49	6.80
		Lewisport, Ky.	14.00	4.25	9.50
176-15	Mixed Feed	Liberty Roller Mill Co.	15.77	3.52	6.35
		Liberty, Ky.	13.81	4.73	8.50
2135-16	Ideal Cow Feed	Lone Mountain Milling Co.	15.25	4.25	8.58
		Middlesboro, Ky.	15.00	4.00	7.00
3062-18	Mixed Feed	Louisa Flour & Feed Store	14.44	5.75	9.30
		Louisa, Ky.	15.00	4.25	9.25
921-17	Nonesuch Feed	Louisville Cereal Mill Co.	11.38	8.00	6.36
		Louisville, Ky.	11.82	7.80	6.50
821-17	Same	Same	12.81	7.30	5.45
921-17	Same	Same	12.06	7.18	6.45
1127-15	Mixed Feed	Lynn Milling Co.	18.25	4.78	7.65
		Hodgenville, Ky.	11.50	2.50	11.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	FROM GUARANTY REMARKS—VARIANCE
88-15	Same	Wheat bran, corn bran, unground wheat screenings 2%	
1564-15	J. B. Richardson Somerset.	Wheat bran, corn bran 10%, ground wheat screenings 10%	Sample is shipstuff.
770-15	Mfrs. Warehouse	Wheat bran, corn, bran, ground wheat screenings 2%	
515-15	Mfrs. Warehouse	Wheat bran, shorts, corn bran	
513-15	J. E. Atwood Mayfield.	Wheat bran, corn bran, shorts, ground wheat screenings 3%	Below guaranty in fat, above in fiber.
513-17	Joseph Mike Mayfield.	Same	Same.
513-17	Mfrs. Warehouse	Same	Below guaranty in fat. Contains screenings.
4-15	Smith & Newson Princeton.	Wheat bran, corn bran, ground wheat screenings 4%	Above guaranty in fiber.
4-17	G. L. Barns Dawson Springs.	Same	Same.
373-17	Louis Igleheart Dawson Springs.	Shipstuff, corn bran	
373-18	Mfrs. Warehouse	Same	
500-18	Same	Wheat bran, corn bran	Below guaranty in fat. Sample is shipstuff.
512-15	E. L. Mallory Grain Co. Paducah.	Wheat bran, shipstuff, corn bran, ground wheat screenings 10%	
1219-15	Sandy Valley Grocery Co. Paintsville.	Same	Above guaranty in fiber. Sample is wheat bran.
1219-16	Mfrs. Warehouse	Wheat middlings, wheat bran, corn bran, gro'd wheat screen'gs 10%	Above guaranty in fiber. Sample is shipstuff.
523-15	Mfgrs. Warehouse	Wheat bran, corn bran	
1274-15	Ben Cohen Central City.	Wheat bran, corn bran, ground wheat screenings 10%	Below guaranty in fat.
517-15	Robert Miller & Co. Fordsville.	Shipstuff, corn bran, ground wheat screenings 1%	
176-15	C. C. Singleton McKinney.	Wheat bran, corn bran, ground wheat screenings 5%	Below guaranty in fat.
2135-16	Mfrs. Warehouse	Wheat bran, wheat shorts, corn bran, 10%, ground and bolted wheat screenings 7%	Above guaranty in fiber.
3062-18	Mfrs. Warehouse	Wheat bran, wheat middlings, corn bran.	Below guaranty in protein.
921-17	Byrley Supply Co. Pineville.	Hominy meal, wheat bran.	
921-17	R. J. Smith & Co. Somerset.	Same	
921-17	Pennington, Ball & Eager Harlan.	Same	
1127-15	Mfrs. Warehouse	Wheat bran, wheat middlings, corn bran	No corn bran present.

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
262-18	Mill Feed	Madison Milling Co.	14.81	5.32	8.64
		Richmond, Ky.	14.00	4.25	6.25
797-15	Bob White	Madisonville Milling Co.	16.75	4.68	8.65
		Madisonville, Ky.	13.50	4.75	9.25
1229-15	Mixed Feed	Massey Milling Co.	18.13	4.03	6.94
		Bowling Green, Ky.	13.68	5.02	9.25
1617-15	Mixed Feed	Mayfield Milling Co.	17.81	4.57	7.45
		Mayfield, Ky.	15.00	5.00	8.50
1158-12	Mixed Feed	Miller Milling Co.	17.38	3.95	6.38
		Utica, Ky.	14.65	3.85	.....
562-18	Mixed Feed	Model Roller Milling Co.	16.00	4.30	9.30
		Smiths Grove, Ky.	13.80	5.10	10.50
1425-15	Mixed Feed	Monarch Milling Co.	16.38	4.35	7.04
		Mt. Sterling, Ky.	14.76	4.15	8.25
556-15	White Rose Mixed Feed	Morganfield Roller Mill	16.39	4.33	6.70
		Morganfield, Ky.	12.00	4.00	10.00
1007-18	Fine Feed	Mountain City Mill Co.	12.38	6.58	5.64
		Chattanooga, Tenn.	12.50	5.50	8.50
1007-16	Same	Same	14.88	4.67	6.33
1007-16	Same	Same	16.63	4.48	8.10
1366-14	Mixed Feed	Mt. Eden Milling Co.	16.88	4.83	7.04
		Mt. Eden, Ky.	14.50	4.25	8.50
1669-15	Mixed Feed	Geo. W. Murphy Co.	16.14	4.84	7.66
		Georgetown, Ky.	14.06	5.77	6.68
1669-15	Same	Same	14.00	5.93	5.45
761-17	Mixed Feed	Murphy & Ward	14.44	5.23	8.46
		Georgetown, Ky.	15.69	4.56	8.50
2176-17	Mixed Feed	Murray Milling Co.	15.31	3.88	6.88
		Murray, Ky.	15.75	4.25	8.75
56-15	Mixed Feed	J. C. Nelson	17.31	3.18	5.50
		Jamestown, Ky.	12.31	3.01	6.50
1258-18	Mixed Feed	New Era Mills	15.00	4.64	8.68
		Allensville, Ky.	15.31	5.07	7.47
541-15	Mixed Feed	New Haven Mill Co.	17.19	4.37	6.77
		New Haven, Ky.	15.25	4.25	8.00
643-18	Mixed Feed	W. N. Neville	14.94	4.50	7.98
		Arlington, Ky.	15.50	3.50	7.98
403-19	Jersey Cream Feed	Newport Mill Co.	9.63	3.70	14.23
		London, Tenn.	13.50	4.00	8.00
2167-18	Mixed Feed	Oakland Milling Co.	14.50	4.35	7.46
		Oakland, Ky.	14.87	4.10	8.19
1247-17	Purity Mill Feed	Ohio Valley Mill & Supply Co.	12.31	7.33	8.20
		Ashland, Ky.	14.31	6.71	8.25
1247-18	Same	Same	13.13	4.63	6.19
907-19	Same	Same	12.56	5.50	8.05

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
262-18	Mfrs. Warehouse	Wheat bran, corn bran, ground wheat screenings 5%	Above guaranty in fiber.
797-15	Mfrs. Warehouse	Shipstuff, corn bran, wheat bran, cheat 5%	
1229-15	Park City Feed Store, Bowling Green.	Wheat bran, shorts, corn bran	Below guaranty in fat.
1617-15	Mfrs. Warehouse	Wheat bran, corn bran, ground wheat screenings 5%	
1158-12	Mfrs. Warehouse	Wheat bran, middlings, corn bran	
562-18	Mfrs. Warehouse	Wheat bran, corn bran, unground wheat screenings 3%	Below guaranty in fat.
1425-15	I. T. Tabb, Mt. Sterling.	Wheat bran, wheat middlings, corn bran	No corn bran present.
556-15	Young-Conway & Co., Morganfield.	Wheat bran, corn bran, unground wheat screenings 3%	
1007-18	S. Owsley & Son, Middlesboro.	Wheat shorts, middlings, bran, ground wheat and corn screenings 2%, corn bran, corn meal	
1007-16	Jellico Grocery Co., Middlesboro.	Same	Below guaranty in fat.
1007-16	Miss Zella Taylor, Walls End.	Same	Below guaranty in fat.
1206-14	Smith & Harbison, Shelbyville.	Shipstuff, corn bran	
1669-15	Robinson Bros., Georgetown.	Wheat bran, middlings, corn bran	Below guaranty in fat, above in fiber.
1669-15	Logan & Haggin, Georgetown.	Same	
761-17	Same	Wheat bran, middlings, corn bran, ground screenings 3%	Below guaranty in protein.
2176-17	Mfrs. Warehouse	Bran, shipstuff, corn bran 5%, wheat screenings 5%	Below guaranty in fat.
56-15	Mfrs. Warehouse	Wheat bran, corn bran, ground wheat screenings 3%	Sample is shipstuff.
1258-18	Buck & Son, Guthrie.	Wheat bran, middlings, corn bran, ground wheat screenings 2%	Shipstuff, with a large per cent. of screenings.
541-15	Mfrs. Warehouse	Wheat bran, wheat shorts, corn bran	
643-18	Mfrs. Warehouse	Wheat bran, shorts, corn bran, unground wheat screenings 1%	Below guaranty in protein.
403-19	Steely & Steely, Williamsburg.	Wheat bran, wheat shorts, corn bran, wheat screenings 5%, corn screenings 5%	Below guaranty in both protein and fat, above in fiber. Inferior product.
2167-18	J. J. Dodson, Bowling Green.	Wheat bran, corn bran, ground wheat screenings 12%	Below guaranty in protein. Corn bran predominates.
1247-17	Queen & Miller, Ashland.	Wheat bran, middlings, corn bran.	Below guaranty in both protein and fat.
1247-18	Caudill Grocery Co., Olive Hill.	Same	Below guaranty in both protein and fat.
907-19	Caudill & Halls, Morehead.	Same	

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1246-17	Purity Shipp Feed	Ohio Valley Mill & Supply Co.	12.50	8.70	5.78
		Ashland, Ky.	11.97	4.45	6.68
1246-17	Same	Same	17.00	4.93	9.68
959-15	Mixed Feed	Owensboro Milling Co.	18.48	4.08	6.95
		Owensboro, Ky.	15.85	4.13	8.25
127-17	Mixed Feed	Paducah Milling Co.	15.38	4.36	9.75
		Paducah, Ky.	15.00	4.35	8.50
1563-15	Mixed Feed	Palmer & Sinkhorn	17.13	4.07	6.95
		Stamping Ground, Ky.	15.00	3.50	8.50
576-18	Mixed Feed	Paris Milling Co.	15.25	4.39	9.55
		Paris, Ky.	15.25	4.25	9.00
585-18	A No. 1 Mill Feed	Parks & Son	15.56	3.82	7.66
		Richmond, Ky.	13.63	4.25	8.50
581-15	Mixed Feed	Park City Milling Co.	16.44	5.46	6.30
		Bowling Green, Ky.	15.19	4.17	8.50
542-14	Mixed Feed	Parksville Roller Mills	16.13	3.14	6.18
		Parksville, Ky.	13.81	4.18	9.75
2161-16	Ambest Feed	The Patton Milling Co.	14.75	5.34	8.00
		Catlettsburg, Ky.	13.75	3.50	5.70
583-12	Mill Feed	Pembroke Roller Mills	15.75	5.00	9.00
		Pembroke, Ky.	13.44	5.13	.....
1894-17	Mixed Feed	Same	13.50	4.49	9.74
			15.44	4.42	9.22
1894-18	Same	Same	14.88	4.83	8.03
			13.50	4.49	9.74
2077-17	Standard Feed	The R. C. Poage Milling Co.	14.19	4.65	10.10
		Ashland, Ky.	13.94	4.78	8.08
2077-17	Same	Same	16.06	3.75	8.78
87-19	Same	Same	14.56	5.70	7.48
576-17	Ideal Mill Feed	Same	14.38	4.53	8.40
			14.38	4.13	6.33
576-17	Same	Same	16.25	4.43	6.78
246-17	O. K. Feed	F. Raidt Milling Co.	11.94	9.88	7.22
		Louisville, Ky.	11.88	7.85	5.70
1185-15	Mixed Feed	L. A. Rankin & Co.	16.51	4.04	5.10
		Rankin, Ky.	15.25	4.25	8.50
203-15	Mixed Feed	A. J. Rice	17.31	4.45	7.76
		Lawrenceburg, Ky.	14.00	3.75	7.00
1396-17	Mixed Feed	Rockport Milling Co.	16.63	3.95	10.28
		Rockport, Ky.	14.44	4.20	8.03
18-19	Same	Same	16.94	4.08	8.32
656-15	Mixed Feed	Russellville Mills	17.56	3.84	6.24
		Russellville, Ky.	15.70	4.07	8.25
1825-16	Mill Feed	Sadieville Milling Co.	15.50	4.55	9.09
		Sadieville, Ky.	15.25	4.25	8.50
1825-16	Same	Same	15.75	4.63	6.40

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1246-17	Mfrs. Warehouse	Wheat, corn	
1246-17	Big Sandy Grocery Co. Catlettsburg.	Same	Above guaranty in fiber.
959-15	Mfrs. Warehouse	Wheat bran, shipstuff, corn bran, ground wheat screenings 1%	
127-17	Mfrs. Warehouse	Wheat bran, corn bran	Above guaranty in fiber.
1563-15	Mfrs. Warehouse	Wheat bran, middlings, shorts, corn bran 15%	No corn bran present.
576-18	Jackson, Shrout & Co. Owingsville.	Wheat bran, wheat shorts, wheat middlings, corn bran	Above guaranty in fiber.
585-18	Mfrs. Warehouse	Corn bran, wheat bran, shorts, ground wheat screenings 5%	Below guaranty in fat.
581-15	W. I. Tabor & Bro. Bowling Green.	Wheat bran, shorts, corn bran, ground wheat screenings 5%	
542-14	L. R. Eversole & Co. London,	Shipstuff, corn bran	Below guaranty in fat.
2161-16	Big Sandy Grocery Co. Catlettsburg.	Wheat bran, wheat middlings, ground wheat screenings 5%	Above guaranty in fiber.
583-12	Mfrs. Warehouse	Wheat bran, corn bran	
1894-17	O. G. Barrow Hopkinsville.	Shipstuff, corn bran, ground wheat screenings 1%	Below guaranty in protein, above in fiber. Excess of corn bran.
1894-18	Mfrs. Warehouse	Same	
2077-17	Big Sandy Grocery Co. Catlettsburg.	Wheat middlings, wheat bran, corn bran, grn'd wheat screen'gs 5%	Above guaranty in fiber.
2077-17	Mrs. John Werkman Olive Hill.	Same	Above guaranty in fiber.
87-19	Mfrs. Warehouse	Same	
576-17	D. A. Leffingwell & Co. Ashland.	Wheat bran, wheat middl'gs, corn gran, gr'nd wheat screen'gs 5%	Above guaranty in fiber.
576-17	Mrs. John Workman Olive Hill.	Same	
246-17	Byrley Supply Co. Pineville.	Hominy meal, wheat bran	Above guaranty in fiber.
1185-15	J. P. Taylor Co. Burnside.	Wheat bran, corn	
203-15	Mfrs. Warehouse	Wheat bran, middlings, corn bran	Above guaranty in fiber.
1396-17	J. A. Camp Owensboro.	Wheat bran, wheat middl'gs, corn bran, ungr'd wheat screen'gs 3%	Above guaranty in fiber. No corn bran present.
18-19	M. T. Henderson Owensboro.	Same	No corn bran present.
656-15	Mfrs. Warehouse	Wheat bran, wheat shorts, corn bran	
1825-16	Same	Wheat bran, wheat middlings corn bran	Above guaranty in fiber. No corn bran.
1825-16	Same	Same	Contained screenings.

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
680-15	White Swan Mixed Feed	T. A. Sandefur	17.74	3.98	8.87
		Henderson, Ky.	15.25	3.85	9.75
1024-14	Mixed Feed	Scottsville Milling Co.	17.74	3.79	7.19
		Scottsville, Ky.	15.00	4.00	7.50
1251-15	Cream Patent Feed	Sebree Roller Mills	17.25	4.72	7.20
		Sebree, Ky.	15.43	4.28	9.50
1251-18	Same	Same	15.19	4.62	9.15
1006-18	Mixed Feed	Smithfield Milling Co.	15.19	4.93	9.68
		Smithfield, Ky.	15.00	4.50	7.00
668-17	Cow Feed	J. Allen Smith & Co.	16.00	4.28	8.33
		Knoxville, Tenn.	14.50	4.00	8.00
1153-19	Same	Same	15.88	3.59	7.58
			12.50	4.00	8.50
9-16	Mixed Feed	Southern Star Roller Mills	13.88	3.65	6.49
		Perryville, Ky.	14.60	5.18	8.00
690-15	Mixed Feed	E. F. Spears & Son	16.75	4.61	8.05
		Paris, Ky.	14.50	4.50	7.50
690-18	Same	Same	15.13	4.67	9.01
1638-16	Mixed Feed	Stahl & Rudolph	16.63	3.85	7.93
		Barlow, Ky.	14.00	4.00	8.25
1638-16	Same	Same	15.50	4.23	7.45
689-15	Jersey Feed	Standard Roller Mills Co.	18.25	5.12	8.88
		Cerulean, Ky.	15.00	4.00	7.50
689-15	Same	Same	16.88	5.10	8.18
726-15	Tip Top Feed	Star Milling Co.	16.02	4.22	7.38
		Nicholasville, Ky.	14.41	3.71	7.54
726-15	Same	Same	15.94	4.33	6.54
726-18	Same	Same	15.31	4.43	8.84
1299-13	Mixed Feed	Stokes Bros.	17.49	3.44	5.72
		Monticello, Ky.	14.89	4.19	9.00
1386-14	Model Feed	Stout Davis & Co.	18.38	4.09	7.30
		Taylorsville, Ky.	14.31	4.22	8.25
1540-15	Tate & Company's Feed	J. H. Tate & Co.	17.38	3.09	5.20
		Monticello, Ky.	13.50	4.98	8.50
379-15	A Mixed Feed	Tell City Flouring Mills	18.36	4.13	7.84
		Tell City, Ind.	14.50	4.00	9.00
379-18	Same	Same	14.31	3.99	8.67
			15.50	4.00	9.00
380-18	Mixed Bran and Screenings	Same	16.56	4.04	11.06
			15.00	4.00	10.00
116-15	Belle Brans	J. W. Thompson	15.94	4.72	6.90
		Madisonville, Ky.	14.75	4.29	9.25
1730-15	Camp's No Two Wheat Middlings and Corn Meal.	Toledo Grain & Milling Co.	17.13	4.95	3.25
		Toledo, Ohio.	12.00	4.00	6.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
680-15	Henderson Feed & Commission Co., Henderson.	Wheat bran, corn bran, unground wheat screenings 4%	
1024-14	Mfrs. Warehouse	Wheat bran, wheat shorts, corn bran	
1251-15	C. M. Cox Sebree.	Wheat bran, corn bran, unground wheat screenings 5%	
1251-18	Price Ray Sebree.	Same	
1006-18	Ballard Bros. Lagrange.	Wheat bran, wheat shorts, corn bran, ungr'nd wheat scr'n'gs 5%	Above guaranty in fiber.
668-17	The H. T. Hackney Co. Middlesboro.	Wheat bran, wheat shorts, corn meal, corn bran, ground wheat and corn screenings 1%	
1153-19	The Harlan Co-operative Store, Harlan.	Same	
9-16	F. K. Trible Danville.	Wheat bran, shipstuff, corn bran, ground wheat screenings 5%	Below guaranty in protein and fat.
690-15	Hazard Feed Co. Hazard.	Wheat bran, wheat middl'gs, corn bran 5%, gr'nd wheat scr'gs 3%	Above guaranty in fiber.
690-18	R. B. Hutchcraft & Co. Paris.	Wheat bran, wheat shorts, wheat middlings, corn bran 5%, ground wheat screenings 3%	Above guaranty in fiber.
1638-16	B. M. Wilson Mayfield.	Wheat bran, corn bran, unground wheat screenings 5%	
1638-18	H. P. Hawkins' Sons Paducah.	Same	
689-15	Cox & Wilson Gracey.	Wheat bran, corn bran, unground wheat screenings 1%	Above guaranty in fiber.
689-17	Orton & Powell Dawson Springs.	Wheat bran, corn bran	Above guaranty in fiber.
726-15	R. A. Dodd Nicholasville.	Wheat bran, wheat shorts, wheat middlings, corn bran, ground wheat screenings 3%	
726-15	Fayette Coal, Gr. & Feed Co., Lexington.	Same	
726-18	Blue Grass Commission Co., Lexington, Ky.	Same	Above guaranty in fiber.
1299-13	Mfrs. Warehouse Monticello.	Wheat bran, middlings, corn bran	Below guaranty in fat.
1386-14	Mfrs. Warehouse	Wheat bran, corn bran	
1540-15	Mfrs. Warehouse	Wheat bran, corn bran, shorts	Below guaranty in fat.
379-15	W. C. Kelley Hawesville.	Wheat bran, middlings, corn bran, gr'nd wheat scr'gs 5%, salt 1%	Below guaranty in protein.
379-18	W. C. Kelley Hawesville.	Same	
380-18	Hardinsburg Feed Co. Hardinsburg.	Wheat bran, corn bran, ground wheat screenings 2%	Above guaranty in fiber.
116-15	Mfrs. Warehouse	Wheat bran, corn bran	
1730-15	Consolidation Coal Co. Van Lear.	Wheat middlings, fine white corn meal	No corn meal present.

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
529-17	Town Creek Jersey Cow Feed	Town Creek Milling Co.	12.50	4.88	13.13
		Lenoir City, Tenn.	13.00	4.00	8.00
2208-17	Mixed Feed	Tradewater Milling Co.	14.75	4.43	9.23
		Sturgis, Ky.	14.00	4.25	8.50
727-15	Mixed Feed	R. S. Van Arsdall	17.50	4.59	7.35
		Van Arsdell, Ky	15.22	4.55	8.50
2276-16	Mixed Feed	Vaughn Milling Co.	14.88	4.37	10.43
		Horse Cave, Ky.	15.50	4.50	8.50
707-15	Mixed Feed	T. S. Vickers	17.99	4.49	7.32
		Hamlettsburg, Ill.	14.02	3.49	8.89
707-17	Same	Same	15.50	4.03	7.60
975-12	Concentrated Feed Stuff	Vine Grove Roller Mills	17.88	4.45	8.39
		Vine Grove, Ky.	15.94	4.84	.....
1850-18	Same	Same	16.69	4.15	8.28
			14.00	4.50	10.00
761-18	Mixed Feed	Ward Brothers	15.44	4.69	7.39
		Georgetown, Ky.	15.69	4.56	8.50
1393-15	Cream Feed	Phil J. Weisenberger	15.75	4.54	7.73
		Midway, Ky.	14.71	5.16	8.25
917-15	National	A. P. White & Co.	16.88	4.50	9.30
		Cadiz, Ky.	14.37	4.20	7.30
1625-15	Williams' Feed	Williams & Co.	16.50	3.68	6.30
		Sanders, Ky.	15.00	3.29	8.50
68-17	Mixed Feed	Winchester Roller Mills	15.69	4.18	7.74
		Winchester, Ky.	15.50	4.00	7.50
68-18	Same	Same	14.50	3.78	7.14
22-19	Mixed Feed	Same	15.50	5.23	8.40
761-16	Model Feed	R. H. Wolfe & Son	14.25	2.33	3.78
		Georgetown, Ky.	15.69	4.56	8.50
32-14	Woolcott's Mixed Feed	Woolcott Flour Mills	17.19	4.37	7.13
		Lexington, Ky.	15.50	3.73	7.78
747-15	Woolcott's Feed	J. F. Wolcott & Co.	16.50	3.88	5.88
		South Carrollton, Ky.	15.14	4.86	9.50
58-15	Bonanza	J. W. Zaring Grain & Mill Co.	17.69	4.12	5.93
		Richmond, Ky.	14.00	3.75	8.40
58-18	Same	Same	14.44	5.07	7.87
	Distillers' Grains				
1268-17	Distillers' Dried Grains	F. S. Ashbrook Distillery Co.	31.38	9.94	12.76
		Cynthiana, Ky.	30.88	9.93	12.30
2163-17	Atlas Distillers' Grains	Atlas Feed & Milling Co.	31.00	7.58	13.10
		Peoria, Ill.	30.00	10.00	14.00
2125-16	Distillers' Dried Grains	Bonnie Brothers	31.00	8.72	14.84
		Louisville, Ky.	24.00	8.18	14.30
1145-16	Distillers' Corn Dried Grains	The Early & Daniel Co.	13.38	12.80	13.28
		Covington, Ky.	30.71	10.00	11.60

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
529-17	The H. T. Hackney Co. .. Middlesboro.	Wheat bran, corn bran, ground wheat screenings 10%	Below guaranty in protein, above in fiber.
2208-17	Dawson Milling Co. ..... Dawson Springs.	Low grade flour, wheat bran, corn bran 8%, gr'nd wheat scr'gs 2%	Above guaranty in fiber. Excess of screenings and corn bran present.
727-15	Mfrs. Warehouse	Wheat bran, corn bran	
2276-16	Mfrs. Warehouse	Wheat bran, shorts, corn bran	Below guaranty in protein, above in fiber.
707-15	Bynum & Beacham..... Paducah.	Wheat bran, corn bran, shorts, unground wheat screenings 6%	
707-17	Bradley Bros. ..... Paducah.	Same	
975-12	Mfrs. Warehouse	Wheat bran, corn bran	
1850-18	Same	Wheat bran, corn bran, wheat screenings 3%	
761-18	Logan & Haggin..... Georgetown.	Wheat bran, middlings, corn bran, ground screenings 3%	
1393-15	Mfrs. Warehouse	Wheat bran, corn bran	Below guaranty in fat.
917-15	Mfrs. Warehouse	Wheat bran, corn bran, wheat middlings, shipstuff, ground wheat screenings 2%	
1625-15	Mfgrs. Warehouse.....	Wheat bran, middlings, corn bran	
68-17	M. S. Crane..... Jackson.	Wheat bran, corn bran, ground wheat screenings 5%	
68-18	M. S. Qualls & Co. ..... Olive Hill.	Same	Excess of corn bran.
22-19	Williams & Shiver..... Grayson.	Wheat bran, corn bran, ground wheat screenings 5%	Above guaranty in fiber.
761-16	James H. Baude..... Georgetown.	Shipstuff, corn bran	
32-14	Clearfield Supply Co. .... Clearfield.	Wheat bran, shorts, middlings, corn bran, gr'nd wheat scr'gs 2%	Below guaranty in protein and fat.
747-15	Ben Cohen ..... Central City.	Wheat bran, shipstuff, corn bran, ground wheat screenings 5%	
58-15	Jellico Grocery Co. ..... Middlesboro.	Wheat bran, wheat middlings, corn bran, ground wheat scr'ngs 5%	Below guaranty in fat.
58-18	Mfrs. Warehouse	Same	No corn bran.
1268-17	Wm. Addams..... Cynthiana.	Corn, rye, malt	
2163-17	Oscar Farmer & Sons.... Louisville.	Corn, rye, barley, oats	Below guaranty in fat.
2125-16	Elizabethtown Milling Co. Elizabethtown.	Corn, rye, barley malt	
1145-16	Ben Jansing ..... Newport.	Corn, rye, malt	Above guaranty in fiber.

TABLE V.—MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1436-16	Distillers' Dried Grains.....	Glenmore Distillery Co.....	32.56	10.60	13.98
		Owensboro, Ky.	30.00	10.00	11.00
2237-16	Old "76" Distillers' Corn Dried Grains.	Ky. Distillers & Brewers Dried Grains Co., Louisville, Ky.	30.88	8.45	13.78
			31.00	7.77	12.90
2174-17	Distillers' Dried Grains.....	Same	31.88	12.50	11.23
			32.60	13.04	11.78
	Brewers' Dried Grains				
1751-17	Dried Brewers' Grains.....	Central Consumers Co.....	24.69	7.34	16.85
		Louisville, Ky.	29.00	6.00	14.00
1199-16	Corn Three D Grains.....	The Dewey Bros. Co.....	25.63	8.89	9.18
		Blanchester, Ohio.	26.00	9.00	13.00
2253-17	Dried Brewers' Grains.....	Evansville Dry Malt & Feed Co., Evansville, Ind.	20.44	6.83	17.56
			24.00	5.00	16.00
2253-17	Same	Same	29.75	7.45	13.86
			24.00	5.00	16.00
1151-17	Brewers' Dried Grains	Henry Fruechtenicht.....	25.19	6.88	18.66
		Louisville, Ky .	29.00	6.00	14.10
2200-16	Big J Brewers' Dried Grains.....	J. H. Jones Co., Inc.....	29.00	6.72	14.21
		Louisville, Ky.	25.00	5.00	14.00
1482-14	Brewers' Grains	Kenton Hay & Grain Co.....	26.19	7.06	15.44
		Covington, Ky.	28.88	6.94	12.25
2264-17	Dried Brewers' Grains	Ky. Distillers & Brewers Dried Grains Co., Louisville, Ky.	26.00	7.24	15.74
			24.75	6.92	17.98
2264-17	Same	Same	26.13	7.08	16.20
758-15	Brewers' Dried Grains.....	West Louisville Brewing Co...	35.81	6.35	13.02
		Louisville, Ky.	33.44	5.80	13.07

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1436-16	Leitchfield Milling Co. .. Leitchfield.	Corn, barley malt, rye.....	Above guaranty in fiber.
2237-16	Lagrange Flour and Feed Mills, Lagrange.	Corn, rye, malt.....	Above guaranty in fiber.
2174-17	Lagrange Feed and Grain Co., Lagrange.	Corn, barley malt, rye.....	
1151-17	Henry Fruechtenicht .... Louisville.	Corn grits, barley malt.....	Below guaranty in protein, above in fiber. Inferior to guaranty.
1199-16	Lagrange Feed & Grain Co., Lagrange.	Corn, rye, malt.....	
2253-17	M. J. Yopp Seed Co. .... Paducah.	Barley malt, corn flakes, corn grit	Below guaranty in protein, above in fiber. Inferior to guaranty.
2253-17	Same	Same	
1151-17	Cecelian Milling Co. .... Cecelian.	Corn, grits, barley malt.....	Below guaranty in protein, above in fiber.
2200-16	Edward M. Riedling..... Louisville.	Corn grits, barley malt.....	
1482-14	Mfrs. Warehouse	Barley, rice and corn grits.....	Below guaranty in protein, above in fiber. Inferior to guaranty.
2264-17	Conrad J. Clausen..... Louisville.	Corn grits, barley malt, rice.....	
2264-17	Lagrange Flour & Feed Co., Lagrange.	Same	
758-15	George Minor ..... Louisville.	Malt, grits	

TABLE VI.—POULTRY FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
	Poultry Feed				
2339-18	Acme Scratch Feed	Acme-Evans Co. Indianapolis, Ind.	10.13	4.03	3.80
			10.00	2.50	5.00
1344-15	Cluck-Cluck Scratch Feed	American Milling Co. Peoria, Ill.	11.58	3.40	2.52
			10.00	2.50	5.00
1674-17	Same	Same	12.88	3.08	4.10
1674-17	Same	Same	10.88	3.25	2.97
2328-17	Tip Top Scratch Feed	Same	12.38	3.30	4.93
			10.00	2.50	5.00
392-19	Tip Top Chick Feed	Same	12.69	4.30	4.37
			10.00	2.50	5.00
2328-17	Tip Top Scratch Feed with Grit	Same	11.00	2.94	4.39
1961-16	Humpty-Dumpty Chick Feed	The Ansted & Burk Co. Springfield, Ohio.	10.44	2.68	1.98
			11.00	3.70	4.00
1554-16	Humpty-Dumpty Scratch Feed	Same	10.31	3.25	3.33
			11.00	3.00	4.00
2937-18	Sunkist Poultry Feed	Aready Farms Milling Co. Chicago, Ill.	10.44	3.90	4.22
			9.00	2.00	5.00
535-19	Daily Egg Poultry Feed (with Grit).	J. J. Badenoch Co. Chicago, Ill.	10.94	4.35	4.03
			9.50	2.50	5.00
44-17	Perfection Chick Feed	Blue Grass Commission Co. Lexington, Ky.	10.00	2.43	2.62
			10.85	3.10	2.93
43-18	Premium Chicken Feed	Same	9.56	3.84	3.50
			10.13	3.51	2.79
252-17	Kackle Scratch Feed	The C. S. Brent Seed Co. Lexington, Ky.	11.44	3.15	2.81
			12.03	2.90	2.13
252-17	Same	Same	11.88	2.61	3.25
1972-17	Little Chick Feed	Cincinnati Grain & Hay Co. Cincinnati, Ohio.	11.88	3.51	2.94
			10.85	3.95	1.85
1804-15	No Better Poultry Feed	Same	11.38	3.18	2.43
			10.00	2.50	4.00
1804-17	Same	Same	12.25	3.00	4.15
495-14	Graino Mash Feed	Conrad J. Clausen Louisville, Ky.	28.88	4.45	8.00
			24.50	5.13	7.65
1853-15	Conkey's Buttermilk Starting Food for Chicks.	The G. E. Conkey Co. Cleveland, Ohio.	15.38	4.28	3.02
			12.00	3.00	4.00
1853-16	Same	Same	14.81	4.49	3.49
1777-16	Nutro Chick Feed	The Corno Mills St. Louis, Mo.	12.25	2.83	2.81
			10.00	3.00	3.50
1716-17	Corno Hen Feed	Same	12.13	3.33	4.95
			10.00	3.00	3.50

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2339-18	Troutman Bros. Shelbyville.	Cracked corn, oats, wheat, barley, kaffir corn	No wheat present. Large amount of weed seeds present.
1344-15	J. J. Willenbrink Bellevue.	Corn, wheat, barley, kaffir, sunflower seed, oats, buckwheat.	
1674-17	J. C. Everett & Co. Maysville.	Corn, wheat, barley, kaffir corn, sunflower seed, buckwheat.	
1674-17	Louis Diemer Buechel.	Corn, wheat, barley, kaffir, sunflower seed, oats, buckwheat	
2328-17	Walter Mathews Paducah.	Corn, wheat, wild buckwheat, kaffir, sunflower seed, marble salt, oats, barley.	No sunflower seed.
392-19	M. T. Henderson Owensboro.	Wheat, corn, kaffir, millet, pigeon grass	Large per cent. weed seeds present.
2328-17	H. P. Hawkins' Sons Paducah.	Corn, wheat, wild buckwheat, kaffir corn, oats, barley, sunflower seed marble grit	No sunflower seed present. Large per cent. of weed seeds present.
1961-16	J. W. Ramsey & Co. Russell.	Wheat, corn, kaffir corn, milo maize, millet, charcoal 1%	Below guaranty in protein and fat. No millet present.
1554-16	Same	Wheat corn, milo maize, buckwheat, barley, rye, charcoal, sunflower, wheat screenings 4%, kaffir corn	Below guaranty in protein.
2937-18	Kentucky Feed & Grain Co., Louisville.	Wheat, cracked corn, kaffir corn, oats, barley, wild buckwheat, sunflower seed, recleaned wheat scr'ngs 10%	
535-19	R. F. Wheeler Marion.	Wheat, cracked corn, barley corn, oats sunflower seed, milo, oyster shell 2%; grit, 5%.	Contains weed seeds.
44-17	Mfrs. Warehouse	Cracked wheat, cracked kaffir corn, cracked corn, hulled oats, millet seed, grit, 5%.	
43-18	G. L. Crenshaw Georgetown.	Wheat, oats, barley, kaffir corn, grit 2½%; oyster shells 2½%; cracked corn.	Above guaranty in fiber, below in protein. Inferior corn used.
252-17	J. S. Morgan & Co Georgetown.	Cracked corn, wheat, barley, kaffir corn, sunflower seed.	Buckwheat present. Below guaranty in protein, above in fiber.
252-17	Mfrs. Warehouse	Same	Above guaranty in fiber.
1972-17	M. A. McBride Falmouth.	Cracked corn, wheat, kaffir corn, milo maize, millet seed	Above guaranty in fiber. Contained cheat, weed seeds and screenings.
1804-15	Besse Bros. Bellevue.	Cracked corn, wheat, barley, kaffir corn, milo maize, sunflower seed, buckwheat.	
1804-17	Mfrs. Warehouse	Cracked corn, wheat, kaffir corn, milo maize, sunflower seed, buckwheat.	Contained oats, barley, rye and corn cockle. No milo, maize, kaffir.
495-14	Mfrs. Warehouse	Dandy middlings, bran, feed meal, alfalfa meal, beef scraps, gluten meal, oil meal, ground oats.	Below guaranty in fat.
1853-15	W. J. Sutton Newport.	Hulled oats, wheat middlings, wheat corn, prepared buttermilk, bone, iron sulphate, gentian root, prepared mustard seed.	
1853-16	Ritter-Hennings Co. Louisville.	Hulled oats, wheat, corn bran, wheat middlings, prepared buttermilk, iron sulphate, gentian root, prepared mustard seed.	
1777-16	Conrad J. Clausen Louisville.	Cracked wheat, cracked corn, wheat screenings, 12%; cracked kaffir corn, whole millet seed.	No millet present.
1716-17	The H. T. Huckney Co. Middlesboro.	Wheat, cracked corn, kaffir corn, sunflower seed	Above guaranty in fiber. Barley present.

TABLE VI.—POULTRY FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1405-15	Rival Scratch Feed	The Albert Dickinson Co. Chicago, Ill.	11.81	2.93	4.54
			9.50	2.50	5.00
813-15	Globe Scratch Feed	Same	11.88	3.11	2.65
			10.00	2.50	5.00
813-15	Same	Same	12.38	2.79	3.23
808-15	Pine Tree Scratch Feed—No Grit.	Same	11.38	2.71	3.95
			10.00	2.50	5.00
808-16	Same	Same	11.44	3.20	3.53
1407-16	Same	Same	11.25	3.37	1.97
2080-16	Polo Hen Feed	Dixie Mills Co. E. St. Louis, Ill.	10.44	2.73	2.28
			9.00	2.00	5.00
1983-17	Same	Same	11.75	2.72	3.76
			10.00	3.00	3.00
1983-18	Same	Same	11.69	3.04	3.32
			10.00	3.00	5.00
1710-17	Dixie Hen Feed	Same	10.38	2.79	2.88
			10.00	3.00	5.00
98-13	Chicken Feed	C. P. Dodd & Co. Louisville.	10.25	3.01	2.37
			9.62	3.38	.....
98-13	Same	Same	10.00	3.08	2.43
530-13	Cerealia Egg Mash	The Early & Daniel Co. Covington, Ky.	21.38	4.53	10.00
			20.00	5.00	7.50
860-17	Same	The Early & Daniel Co. Cincinnati, Ohio.	22.56	6.04	9.43
			20.00	5.00	7.50
860-18	Same	Same	22.06	5.60	8.96
			20.00	5.00	7.00
866-17	Eadan Scratch Feed—No Grit	Same	11.50	3.08	2.78
			10.00	2.50	5.00
866-18	Same	Same	10.00	2.81	3.73
1136-17	Eadan Scratch Feed	The Early & Daniel Co. Covington, Ky.	11.50	3.52	3.58
2252-17	Same	Same	10.50	2.63	2.82
1134-17	Tuxedo Scratch Feed	Same	10.38	3.73	3.13
1130-15	Arrow Chick Feed	Edinger & Co. Louisville, Ky.	11.69	3.56	3.65
			10.50	2.75	4.00
1179-18	Same	Same	11.44	3.38	4.25
1181-17	Arrow Hen Feed	Same	11.38	3.69	4.53
			10.00	3.00	5.00
1181-17	Same	Same	11.88	4.05	3.45

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1405-15	Henderson Feed & Commission Co., Henderson	Corn, wheat, barley, oats, kaffir corn, wild buckwheat, miscellaneous weed seeds 1%.	
813-15	Same	Wheat, barley, oats, kaffir corn, buck, wheat, sunflower, linseed oil cake.	
813-15	L. E. Chapman, Owensboro.	Corn, wheat, barley, oats, kaffir corn, buckwheat, sunflower seed, linseed oil cake.	
808-15	H. G. Brooks & Co., Louisville	Corn, wheat, barley, oats, kaffir corn, sunflower, buckwheat	
808-16	A. D. Ashcraft, Irvington.	Same	
1407-16	J. E. Weber, Louisville.	Corn, wheat, kaffir corn, millet	
2080-16	J. J. Willinbrink, Bellevue.	Wheat, corn, kaffir corn, milo maize, grit, 10%; barley, sunflower seed, whole wheat screenings, 15%.	Contained weed seeds.
1983-17	Latonia Hay & Grain Co. Latonia.	Wheat, corn, kaffir corn, milo maize, barley, sunflower seed, whole wheat screenings 15%.	
1983-18	W. W. Johnson, Clay.	Wheat, milo, barley, corn, kaffir, whole wheat screenings 10%; sunflower seed.	Oats present.
1701-17	W. L. Kimbrough & Son. Guthrie.	Wheat, corn, kaffir corn, barley, milo maize, sunflower seed	No sunflower seed present.
98-13	Pewee Valley Mercantile Co., Pewee Valley.	Cracked corn, wheat	Oats and kaffir present. Large per cent. cheat, inf. wheat, screenings.
98-13	L. Bauer & Bros. St. Matthews.	Same	Contained oats, kaffir corn and screenings.
530-13	Mfgrs. Warehouse	Meat meal, alfalfa meal, pure oat meal. Old Process oil meal, corn meal, wheat bran, wheat middlings, ground wheat.	Above guaranty in fiber.
860-17	Same	Alfalfa leaf meal, oil meal, corn meal, wheat bran, wheat middlings, ground wheat, oat groats, beef meal.	Above guaranty in fiber.
860-18	Wm. Addams, Cynthiana.	Same	Same.
866-17	J. B. Paxton, Catlettsburg.	Cracked corn, wheat, oats, barley, buckwheat, kaffir corn, rye, sunflower seed.	
866-18	Charles Besse, Bellevue.	Same	
1136-17	Mfgrs. Warehouse	Same	
2252-17	Same	Cracked corn, wheat, oats, buckwheat, kafir corn, sunflower seed, rye, barley, grit 5%.	
1134-17	Same	Cracked corn, wheat, oats, sunflower seed, barley, buckwheat, kaffir corn.	
1130-15	Curry, Tunis & Norwood. Lexington.	Corn, wheat, millet, recleaned wheat screenings 3%; kaffir corn, milo maize.	Wild oats and weed seeds present. No millet. Wheat immature.
1179-18	R. A. McDowell, Simpsonville.	Same	Adulterated with large per cent. of weed seeds.
1181-17	F. K. Trimble, Danville.	Wheat, corn, milo maize, kaffir corn, barley, white clipped oats, sunflower seeds.	No kaffir corn nor milo present.
1181-17	Park City Feed Store, Bowling Green.	Same	No barley, milo nor kaffir corn present.

TABLE VI.—POULTRY FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1181-18	Arrow Hen Feed	Edinger & Co.	10.94	3.95	3.09
		Louisville, Ky.	10.00	3.00	5.00
1181-18	Same	Same	10.25	2.68	2.51
1181-18	Same	Same	10.13	2.75	3.07
1182-15	Arrow Hen Feed (with Grit)	Same	11.88	3.40	2.63
1183-15	Arrow Egg and Growing Mash	Same	19.56	3.88	8.74
			17.00	4.00	9.00
1183-16	Same	Same	20.81	3.65	10.55
439-15	Cackle Poultry Feed (No Grit)	Edwards & Loomis Co.	11.71	3.40	2.93
		Chicago, Ill.	10.00	2.50	5.00
790-18	Park Scratch Feeds	The Eikenberry-Fitzgerald Co.	9.19	3.53	2.98
		Cincinnati, Ohio.	10.00	3.00	7.00
145-19	Same	Same	10.63	3.48	3.33
1118-14	Elmendorf Scratch Feed	Elmendorf Coal & Feed Co.	12.00	2.68	5.15
		Lexington, Ky.	10.88	3.15	3.50
790-16	Park Scratch Grains	The Ferger Grain Co.	10.88	4.03	3.28
		Cincinnati, Ohio.	10.50	3.50	7.00
2605-18	Diamond Scratch Feed	Fisher Brothers	9.13	3.05	3.69
		Evansville, Ind.	9.00	2.00	7.00
27-13	Frost's Poultry Mash	David C. Frost	22.44	4.26	8.40
		Lexington, Ky.	24.00	6.15	.....
27-13	Same	Same	20.00	4.95	4.85
2635-18	"Gee Gee" Hen Feed	Grain Belt Mills Co.	10.38	3.50	2.92
		St. Joseph, Mo.	10.00	3.00	6.00
777-12	Superior Hen Feed	H. P. Hawkins	10.38	3.23	2.40
		Paducah, Ky.	9.04	4.15	.....
2011-16	Hess Egg Mash	W. E. Hess & Co.	16.63	4.05	10.28
		Louisville, Ky.	17.75	5.43	9.00
86-15	Hess Baby Chick Feed	Same	11.81	4.45	4.63
			12.13	4.50	6.28
86-15	Same	Same	12.13	4.97	4.83
.....	Luxury Hen Feed	Howell Grain & Feed Co.	11.06	3.00	3.20
		Union City, Tenn.	10.00	3.00	6.00
1347-15	International Poultry Feed	International Sugar Feed No.	12.19	3.63	3.09
		Two Co., Minneapoils, Minn.	10.00	3.50	5.00
1349-17	International Jewel Hen Feed	Same	11.25	4.03	4.96
			10.00	3.00	5.00
1349-18	Same	Same	10.19	3.43	5.11
2103-18	Little Jo Scratch Feed	Just Mills	10.81	4.85	5.24
		Nashville, Tenn.	10.00	2.50	4.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1181-18	Ed Miller & Sons..... Okolona.	Wheat, corn, milo maize, kaffir corn, barley, white clipped oats, sunflower seeds.	No sunflower seed present.
1181-18	D. D. Finley..... Jeffersontown.	Wheat, milo maize, barley, white clipped oats, sunflower seeds, kaffir corn.	No sunflower seed present.
1181-18	Shelby County Feed & Grain Co., Shelbyville.	Same	No sunflower seed present.
1182-15	G. C. Shaw..... Frankfort.	Wheat, corn, milo maize, kaffir corn, barley, white clipped oats, sunflowe. seed, grit 5%.	Contains wild buckwheat, cockle, mustard and flax seed.
1183-15	Geo. W. Riedling..... Louisville.	Wheat middlings, wheat bran, corn meal, alfalfa meal, ground oats, meat scraps, linseed meal, salt 1%; charcoal 1%.	No linseed meal present. Kaffir corn present. Small per cent. of meat meal present.
1183-16	Woosley & Son..... Elizabethtown.	Ground oats, meat scraps, linseed meal, bone meal, salt 1%; charcoal 1%...	Above guaranty in fiber.
439-15	J. S. Stevens..... Ashland.	Wheat, cracked corn, kaffir corn, oats, barley, sunflower seed....	
790-18	Bedford & Tuttle..... Winchester.	Wheat, cracked corn, oats, kaffir corn, sunflower seed, barley....	Below in protein. Cheat and weed seeds present. No kaffir corn.
145-19	H. H. Borders..... Catlettsburg.	Same	Cane and buckwheat seed present.
1118-14	Mfrs. Warehouse	Cracked corn, wheat, oats, kaffir corn, barley, buckwheat.....	Contains rye and weed seeds. No barley present. Above in fiber.
790-16	R. M. Harrison & Son.... Maysville.	Wheat, cracked corn, oats, kaffir corn, sunflower seed, barley, buckwheat.	No kaffir corn, buckwheat nor sunflower seed present. Weed seeds present.
2605-18	Park City Feed Store.... Bowling Green.	Wheat, cracked corn, sunflower seed oats, charcoal, whole wheat screenings 8%.	
27-13	Mfrs. Warehouse	Shorts, shipstuff, bran, alfalfa corn meal, beef scraps, oil meal	Below guaranty in protein and fat.
27-13	Wm. Lyne..... Nicholasville.	Same	Below guaranty in protein and fat.
2635-18	Forbes Mfg. Co..... Hopkinsville.	Wheat, corn, oats, barley, kaffir corn, milo, sunflower seed.....	
777-12	Walter Matthews..... Paducah.	Wheat, barley, corn, oats, sunflower seed, corn screenings 5%	Below in fat. No barley or sunflower seed. A small p. c. oats, corn cockle present.
2011-16	Mfrs. Warehouse	Alfalfa meal, bran, shorts, feed meal, cotton seed meal, beef scraps, bone meal, ground oats.	Below guaranty in protein and fat, above in fiber.
86-15	Same	Corn, wheat, kaffir corn, rape, millet, flax seed, buckwheat, wild grass seed 2%.	
86-15	Same	Same	
.....	Barket Wholesale Grocery Co., Hickman.	Wheat, corn, kaffir corn.....	Contains screenings, weed seeds and oats.
1347-15	American Co-operative Assoc., Owensboro.	Wheat, oats, barley, corn, kaffir corn, millet	Large per cent. of weed seeds present.
1349-17	W. T. Grissom..... Hickman.	Cracked corn, wheat, barley, oats, kafir corn, sunflower seed, wheat screenings, 25%.	Weed seed present. No sunflower seed.
1349-18	M. D. Royse..... Winchester.	Cracked corn, barley, kaffir corn, sunflower seed, oats, wheat, grain screenings 10%.	
2103-18	P. M. Lanham & Son..... Corbin.	Wheat, cracked corn, oats, kaffir, sunflower seed, recleaned wheat screenings 5%.	Contains barley and weed seeds.

TABLE VI.—POULTRY FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1856-18	Premo Scratch Feed	Kentucky Feed & Grain Co.	10.88	3.80	3.51
		Louisville, Ky.	9.00	2.50	5.00
1856-18	Same	Same	10.25	2.98	3.35
1945-17	Premo Baby Chick Feed	Same	11.25	2.85	2.77
			10.00	3.50	4.00
1074-15	Purina Chicken Chowder	R. H. Menefee & Co.	20.88	4.34	8.23
		Louisville, Ky.	17.00	3.00	9.00
2226-17	National Scratch Feed	National Produce Co.	10.25	3.66	3.82
		Evansville, Ind.	9.00	2.50	6.00
845-16	Lay or Bust	The Park & Pollard Co.	16.75	4.30	10.25
		Boston, Mass.	18.00	1.50	12.00
845-16	Same	Same	20.00	4.23	12.10
845-18	Same	Same	15.38	3.72	8.80
1151-19	Red Ribbon Chick Feed	Same	10.13	2.82	2.05
			10.00	2.00	5.00
846-18	Screened Scratch Feed	Same	10.63	3.28	4.05
			10.00	1.50	5.00
.....	R. E. Peter Poultry Scratch Feed	M. C. Peters Mill Co.	11.13	3.74	3.58
		Omaha, Neb.	10.00	3.00	7.00
1934-16	Tom Boy Scratch Feed	Purity Oats Co.	10.25	2.68	2.95
		Davenport, Ia.	10.00	3.00	5.00
156-14	Big Egg Scratch Grains	The Quaker Oats Co.	10.19	2.53	3.18
		Chicago, Ill.	10.00	2.50	5.00
1235-17	Early Bird Scratch Grains	Same	12.50	3.84	4.77
			10.00	2.50	5.00
855-10	Quaker Chick Feed	Same	11.38	3.05	5.65
			10.00	2.50	5.00
634-16	Purina Chicken Chowder	Ralston Purina Co.	20.56	3.74	9.74
		St. Louis, Mo.	19.00	4.00	9.00
634-17	Same	Same	19.50	4.15	9.26
634-17	Same	Same	20.88	4.38	9.13
634-17	Same	Same	21.38	4.57	10.24
			19.00	4.00	9.00
632-17	Purina Scratch Feed	Same	11.06	3.05	3.03
			10.00	2.50	4.00
632-17	Same	Same	11.06	3.15	3.07
632-17	Same	Same	11.38	3.54	3.78

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1856-18	Helm & Long..... Okolona.	Wheat, cracked corn, kaffir corn, oats, barley, buckwheat, sunflower seed.	
1856-18	Union Store Co..... Louisville.	Same	
1945-17	Mfrs. Warehouse	Corn, kafir corn, millet, milo maize, recleaned wheat screenings 25%.	Below guaranty in fat.
1074-15	H. E. Eilers & Sons..... Louisville.	Wheat middlings, wheat bran, corn meal, alfalfa meal, linseed meal, granulated meat, salt 1%.	
2226-17	Toombs & Robertson..... Madisonville.	Wheat, corn, kafir corn, barley, milo maize, oats, buckwheat, sunflower seed.	
845-16	Ruef Bros. ..... Covington.	Wheat bran, wheat middlings, corn, wheat, oats, barley, kaffir corn, buckwheat, alfalfa, fish, meat, bone, beet pulp, shells 3%, salt.	Below guaranty in protein.
845-16	Wm. Addams ..... Cynthiana.	Same	
845-18	Geo. Keller ..... Newport.	Same	Below guaranty in protein.
1151-19	Same	Cracked corn, cracked wheat, cracked oats, cracked kafir corn, whole millet seed.	
846-18	Same	Cracked corn, buckwheat, oats, milo maize, sunflower seed, wheat, barley, kafir corn.	
.....	J. A. Roam & Co..... Pembroke.	Corn, oats, kafir, milo maize, buckwheat, sunflower seed.	
1934-16	Jellico Grocery Co..... Harlan.	Cracked corn, wheat, hulled oats, kafir corn, barley, recleaned wheat screenings 5%, buckwheat, sunflower seed.	
156-14	J. W. Zaring Grain & Mill Co., Richmond.	Whole wheat, whole kafir corn, cracked Indian corn, sunflower, whole oats, whole barley, recleaned wheat screenings 12%, marble grit 6%.	Contains a large per cent. of weed seeds.
1235-17	M. Livingston ..... Paducah.	Whole wheat, whole kafir corn, cracked Indian corn, sunflower seed, whole oats, whole barley, recleaned wheat screenings 12%.	Contains flax seed, wild buckwheat and weed seeds.
855-10	G. A. Willoughby Grocery Co., Bowling Green.	Corn, wheat, millet, kafir corn, charcoal, ground marble 6%...	Contains barley, oats, buckwheat and weed seeds. No mil. or sun.
634-16	Danville Coal & Ice Co.. Danville.	Wheat middlings, wheat bran, corn meal, alfalfa meal, linseed meal, granulated meat, salt 1%, charcoal 1%.	Above guaranty in fiber.
634-17	J. M. Stone & Son..... Sturgis.	Same	
634-17	T. M. Wooldridge..... Hopkinsville.	Same	Oats present.
634-17	Simpson Co. Hardware Co. Franklin.	Wheat middlings, wheat bran, corn meal, alfalfa meal, linseed meal, granulated meat, salt 1%, charcoal 1%.	
632-17	Same	Wheat, corn, barley, kafir corn, milo maize, buckwheat, sunflower seed.	
632-17	J. M. Stone & Son..... Sturgis.	Same	Oats present.
632-17	T. M. Wooldridge..... Hopkinsville.	Same	

TABLE VI.—POULTRY FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2700-18	Rapier's Blue Hen Scratch Feed..	Rapier Sugar Feed Co.	11.63	4.48	3.91
		Owensboro, Ky.	10.00	2.00	5.00
207-18	Blue Hen Baby Chick Feed	Same	16.75	5.75	5.51
			10.00	3.00	5.00
207-18	Same	Same	12.44	4.10	5.17
211-15	Rapier's Economy Scratch Feed...	Same	11.27	3.27	2.34
			10.00	2.00	5.00
211-17	Same	Same	10.63	3.98	6.65
211-17	Same	Same	12.63	3.31	4.08
211-18	Same	Same	11.38	3.94	5.63
1297-18	Sur Pleez Scratch Feed	Ritter-Henning Co.	11.63	4.30	4.08
		Louisville, Ky.	10.53	3.83	3.53
2915-18	Mixo Hen Feed	Royal Feed and Milling Co.	10.31	2.53	4.92
		Memphis, Tenn.	10.00	2.00	5.00
2608-17	Eureka Hen Feed	Same	11.38	3.17	3.50
			10.00	2.00	5.00
2608-19	Sunrise Hen Feed	Same	10.88	3.50	3.33
			10.00	2.00	5.00
2936-18	Victor Scratch Feed	Security Mill & Feed Co.	9.75	3.15	3.39
		Knoxville, Tenn.	10.00	3.50	10.00
1364-16	Economy Chick Feed	Southern Seed Co.	10.19	2.14	3.36
		Louisville, Ky.	10.00	2.50	6.00
1363-16	Economy Scratch Feed	Same	9.56	3.43	3.15
			10.00	2.50	6.00
1363-18	Same	Same	9.00	2.85	2.33
1223-15	Shawnee Brand Pigeon Feed	Wood, Stubbs & Co.	14.44	3.25	3.28
		Louisville, Ky.	12.00	2.50	3.50
1589-15	Shawnee Brand Scratch Feed	Same	10.25	4.09	2.75
			11.81	3.86	2.75
1763-15	Same	Same	9.75	3.45	2.65
			10.00	2.50	5.00
1589-15	Same	Same	11.09	3.25	2.13
			11.81	3.86	2.75
1589-15	Same	Same	11.19	3.00	3.52
			10.00	3.00	4.00
1483-18	Hen Feed	M. J. Yopp Seed Co.	11.13	3.03	2.88
		Paducah, Ky.	10.22	3.84	4.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2700-18	W. L. Kimbrough & Son.. Guthrie.	Corn, oats, wheat, barley.....	Kafir corn and weed seeds present.
207-18	McCauley & Cain..... Versailles.	Cracked corn, cracked wheat, cracked kafir corn, millet seed, pigeon grass.	Weed seeds and screenings present.
207-18	R. D. Robertson..... Mayfield.	Same	Weed seeds and screenings present.
211-15	Knight's Feed Store..... Owensboro.	Cracked corn, wheat, sunflower seed, clipped barley, milo maize, grits 5%.	Contains sorghum seed.
211-17	Wilson & Son..... Russellville.	Cracked corn, wheat, sunflower seed, clipped barley, milo maize	Above in fiber. Oats and weed seeds present No milo. Foreign material present.
211-17	T. M. Wooldridge..... Hopkinsville.	Same	Oats and inferior wheat present.
211-18	J. A. Camp..... Owensboro.	Same	Contains oats, grit, cheat and weed seeds. No milo maize.
1297-18	Prospect Dept. Store.... Prospect.	Sunflower seed, wheat, cracked corn, kafir corn, barley.....	Above in fiber. Large per cent. weed seeds, cheat, inferior wheat. present.
2915-18	Herbert P. Hawkins..... Paducah.	Cracked shelled corn, oats, milo, wheat screenings 25%, grit 7%	Contained barley and weed seeds.
2608-17	Fain & Lee..... Murray.	Cracked shelled corn, oats, barley, wheat screenings 15%.....	Contained kafir, milo and rye.
2609-19	Davidson Brothers ..... Bowling Green.	Wheat, cracked shelled corn, oats, barley screenings 10%, wheat screenings 15%.	Contains large per cent. of kafir corn.
2936-18	The H. T. Hackney Co.. Middlesboro.	Kafir corn, oats, wheat.....	Milo maize and barley present.
1364-16	Grigsby & Co..... Bardstown.	Wheat, corn, oats, kafir corn, millet, unground grain screenings 15%, grit and shells 5%.	
1363-18	Dickinson Brothers ..... Glasgow.	Wheat, corn, oats, kafir corn, unground grain screenings 15%, grit and oyster shell 5%.	Below guaranty in protein.
1363-18	C. D. Miller ..... Buechel.	Same	Same.
1223-15	Mfrs. Warehouse	Kafir corn, milo maize, red wheat, flint corn, Canada peas, sunflower, buckwheat.	
1589-15	W. H. Luesing & Co..... Louisville.	Corn, kafir corn, milo maize, red wheat, barley, sunflower.....	Below guaranty in protein. Large amount of buckwheat present. Small amount of oats.
1763-15	Joe Lovett ..... Williamsburg.	Corn, kafir corn, milo maize, red wheat, buckwheat, barley, sunflower.....	
1589-15	Catlettsburg Feed & Produce Co., Catlettsburg.	Corn, kafir corn, milo maize, red wheat, barley, sunflower.....	
1589-15	Mfrs. Warehouse	Wheat, corn, kafir corn, milo maize, barley, buckwheat, sunflower.	
1483-18	Mfrs. Warehouse	Corn, wheat, kafir corn, rye, sunflower, unground wheat screenings 10%.	Weed seeds present.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
	Miscellaneus Feeds.				
906-15	Supreme Cow Feed	The Acme Mills, Hopkinsville, Ky.	13.75 12.00	3.35 3.00	11.25 12.00
906-16	Same	Same	13.75	2.91	12.25
2175-16	Same	Same	15.00 15.38	3.78 4.32	11.27 12.33
906-16	Same	Same	17.31	4.35	11.73
906-16	Same	Same	16.25	3.21	12.20
907-16	Supreme Hog Feed	Same	16.63 17.00	4.73 5.50	3.80 4.50
907-17	Same	Same	15.88	5.51	5.82
905-16	Supreme Horse and Mule Feed	Same	11.13 10.00	2.45 3.00	9.81 12.00
905-17	Same	Same	12.00	3.30	11.63
905-17	Same	Same	11.94	2.76	11.00
905-18	Same	Same	11.00	2.54	13.90
905-16	Same	Same	11.63	2.30	9.48
2515-17	Acme Farm Feed	Acme-Evans Co. Indianapolis, Ind.	13.19 12.00	5.35 5.00	10.51 7.00
278-15	Alfacorn Dairy Feed	Alfocorn Milling Co. E. St. Louis, Ill.	18.94 16.00	3.80 4.00	13.75 11.00
276-16	Molasses Alfocorn Horse and Mule Feed.	Same	10.63 9.00	2.97 2.00	9.73 13.50
277-15	Leader Horse and Mule Feed	Same	10.50 9.00	2.48 1.50	15.10 15.00
170-16	Corn and Oats Chop	Allen & Wheeler Co. Troy, Ohio.	10.25 10.00	4.27 4.00	4.56 9.00
1399-16	Cracked Corn and Rolled Oats	American Hominy Co. Indianapolis, Ind.	10.13 9.00	3.68 4.00	3.00 5.00
1398-16	Homco Dairy Feed	Same	15.38 15.00	4.25 5.00	8.75 12.00
1898-16	Same	Same	16.13	3.92	8.63
2348-17	Hexite Horse Feed	Same	12.38 8.00	2.21 2.50	12.55 11.00
1228-15	Sucrene Calf Meal	American Milling Co. Peoria, Ill.	19.94 20.00	4.24 4.00	5.25 3.00
2273-17	Sucrene Horse and Mule Feed (with Alfalfa).	Same	11.44 10.00	3.68 2.50	12.73 12.00
2273-17	Same	Same	12.13	3.60	13.53

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
906-15	Mfrs. Warehouse	Corn, oats, alfalfa meal, shipstuff, cottonseed meal, cane molasses, salt.	
906-16	Same	Same	
2175-16	Forbes Mfg. Co. Hopkinsville.	Alfalfa meal, corn meal, shipstuff, cotton seed meal, brewers' dried grains, cane molasses, salt 1%.	
906-16	Alexander Bros. Cadiz.	Same	No oats present.
906-16	Forbes Mfg. Co. Hopkinsville.	Same	
907-16	Mfrs. Warehouse	Digester tankage, corn meal, wheat shorts	Below guaranty in fat.
907-17	Same	Same	Below guaranty in protein, above in fiber.
905-16	Forbes Mfg. Co. Hopkinsville.	Corn, oats, barley, wheat bran, alfalfa meal, cane molasses, salt 1½%.	Below guaranty in fat.
905-17	Alexander Bros. Cadiz.	Same	
905-17	W. A. Chambers & Co. Hopkinsville.	Same	
905-18	S. B. Jones Pembroke.	Same	Below guaranty in fat, above in fiber.
905-16	Forbes Mfg. Co. Hopkinsville.	Same	Below guaranty in fat. No barley.
2515-17	G. L. Crenshaw Georgetown.	Corn, wheat bran, wheat middlings, hominy feed	Above guaranty in fiber.
278-15	White Sharp Corbin.	Cotton seed meal, wheat bran, hominy feed meal, alfalfa meal, molasses.	Same.
276-16	Same	Alfalfa meal, corn, oats, molasses, salt ½%	
277-15	H. G. Holcamp Louisville.	Alfalfa meal, corn, oats, molasses, salt ½%	Largely alfalfa.
170-16	Ed Vanhoose Paintsville.	Corn, oats	
1399-16	J. S. Stevens & Co. Ashland.	Cracked corn, rolled oats	
1398-16	Same	Homco (hominy feed), wheat bran, cot. seed meal, alfalfa, molasses	
1898-16	Same	Same	Below guaranty in fat
2348-17	H. J. Greive Louisville.	Cracked corn, rolled oats, alfalfa, molasses	Above guaranty in fiber, below in fat.
1228-15	Hurst & Fitch Winchester.	Soluble blood flour, bone meal, soluble starch, malt flour, dried skim milk, corn meal, linseed meal, flour middlings.	
2273-17	J. C. Everett & Co. Maysville.	Molasses, distillers' corn solubles, alfalfa, corn, oats, barley, salt.	Above guaranty in fiber.
2273-17	Pikeville Milling Co. Pikeville.	Same	Same.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2171-16	R. K. D. Arcady Calf Meal	Arcady Farms Milling Co.	25.75	4.80	5.91
		Chicago, Ill.	25.00	5.00	7.00
2052-16	Diamond Horse Feed	The J. S. Ashbrook Co.	10.69	1.93	12.50
		Mattoon, Ill.	9.00	2.00	16.00
2052-17	Diamond A Horse Feed	Same	12.94	2.75	11.10
1067-14	Blatchford's Calf Meal	J. W. Barwell	24.50	6.62	6.63
		Waukegan, Ill.	24.00	5.00	6.75
1067-14	Same	Same	23.69	7.74	8.55
270-15	Blatchford's Calf Mash	Blatchford Calf Meal Factory.	20.13	4.53	8.01
		Waukegan, Ill.	20.00	4.00	7.50
45-15	Peerless Cow Feed	Blue Grass Commission Co.	23.78	5.44	8.45
		Lexington, Ky.	19.50	5.45	7.60
46-17	Monarch Horse Feed	Same	13.13	4.89	8.78
			10.87	3.77	6.88
251-15	Doctor Green	Bradley Bros.	12.38	2.60	10.89
		Paducah, Ky.	10.66	2.67	12.05
251-15	Same	Same	11.25	3.24	9.08
251-17	Same	Same	11.88	4.05	11.59
250-15	Jewel Horse Feed	Same	11.00	2.97	11.41
			9 64	2.35	10.35
250-16	Same	Same	11.31	2.87	10.23
250-17	Same	Same	12.38	3.35	12.10
1282-15	Harvester Molasses Feed	Cairo Milling Co.	11.30	2.07	15.41
		Cairo, Ill.	10.50	2.50	12.00
1282-15	Same	Same	9.51	2.01	15.83
1805-16	"No Better" Horse and Mule Feed	The Cincinnati Grain & Hay Co., Cincinnati, Ohio.	9.69	2.55	11.36
			12.00	4.00	10.00
1805-16	Same	The Cincinnati Grain & Hay Co., Erlanger, Ky.	9.56	2.68	11.97
1805-16	Same	The Cincinnati Grain & Hay Co., Covington, Ky.	17.25	3.55	17.76
1805-17	Same	Same	11.75	3.32	11.70

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2171-16	Kentucky Feed & Grain Co., Louisville.	Wheat flour, malt flour, linseed oil meal, cotton seed meal, powdered milk, salt ½%.	
2052-16	E. Bassett ..... Madisonville.	Corn, oats, alfalfa meal, molasses	
2052-17	Ritter-Hennings Co. ..... Louisville.	Same	
1067-14	Henderson Feed & Commission Co., Henderson.	Locust bean meal, unpressed flax seed, wheat flour, barley meal, ground beans and peas, Old Process oil meal, salt, cocoa shell meal, cocoa nut meal, recleaned cotton seed meal, Foenugreek, dried milk, salt.	
1067-14	Conrad J. Clausen..... Louisville.	Locust bean meal, wheat flour, unpressed flax seed, barley meal, ground beans and peas, Old Process oil meal, cocoa shell meal, cocoanut meal, recleaned cotton seed meal, Foenugreek, dried milk, anise, salt.	Above guaranty in fiber.
270-15	S. B. Jones..... Pembroke.	Locust bean meal, unpressed flax seed, wheat flour, barley meal, ground beans and peas, rice polish, Old Process oil meal, cocoa shell meal, cocoanut meal, recleaned cotton seed, fish, powdered limestone 1-20 of 1%, meal, Foenugreek, dried milk, salt, bone, corn, oatmeal, wheat middlings, beet scraps.	
45-15	Day & Lewis..... Whitesburg.	Cotton seed meal, shipstuff, corn, oats, barley	Above guaranty in fiber.
46-17	Mfrs. Warehouse	Corn, oats, oil meal, bran.....	
251-15	James Grocery Co..... Leitchfield.	Corn, oats, alfalfa meal, molasses	
251-15	Same	Same	
251-17	Mfrs. Warehouse	Same	
250-15	G. F. Phillips..... Paducah.	Corn, alfalfa meal, syrup.....	Above guaranty in fiber.
250-16	Jas. R. Moore Coal & Feed Co., Paducah.	Same	Oats present.
250-17	Mfrs. Warehouse	Same	Above guaranty in fiber.
1282-15	Browder Milling Co. .... Fulton.	Cracked corn, oats, alfalfa meal, molasses	Same.
1282-15	Covington Bros. ..... Paducah.	Same	No oats present. Below guaranty in fat, above in fiber.
1805-16	Martin & Hodgkin Supply Co., Winchester.	Corn, oats, alfalfa meal, wheat bran, brewers' dried grains, molasses, salt ½ of 1%.	Below guaranty in protein and fat, above in fiber.
1805-16	Mfrs. Warehouse	Same	Below guaranty in protein and fat, above in fiber.
1805-17	Kenton Hay & Grain Co. . Latonia, Ky.	Same	Above in fiber. Largely brewers' grains. No corn, oats nor alfalfa.
1805-17	C. A. Oeder ..... Butler.	Same	Below guaranty in fat, above in fiber.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1805-18	"No Better" Horse and Mule Feed.	The Cincinnati Grain & Hay Co., Covington, Ky.	9.63	2.98	7.33
			12.00	4.00	10.00
1806-16	"No Better" Sweet Dairy Feed..	The Cincinnati Grain & Hay Co., Cincinnati, Ohio.	17.94	4.18	9.33
			19.00	5.50	12.50
1806-17	Same	The Cincinnati Grain & Hay Co., Covington, Ky.	18.38	4.16	14.10
1806-17	Same	Same	16.00	4.03	16.97
1806-18	Same	Same	16.65	3.55	14.10
1607-15	Pure Corn and Oats Feed.....	The Cotton Bros. Co.	10.00	3.87	3.85
		Bellefontaine, Ohio.	10.00	4.00	9.00
225-18	Corno Sweet Feed.....	The Corno Mills Co.	10.75	3.13	13.97
		St. Louis, Mo.	10.00	2.50	15.00
225-18	Same	Same	11.50	2.67	12.26
1494-15	Dickinson's Hobby Horse Feed....	The Albert Dickinson Co.	12.63	2.22	12.68
		Chicago, Ill.	9.00	1.50	15.00
92-15	Anchor Horse and Mule Feed....	Dixie Mills Co.	11.63	3.28	11.25
		E. St. Louis, Ill.	10.00	3.50	12.00
93-15	Anchor Molasses Horse and Mule Feed.	Same	9.81	3.44	7.60
			11.00	3.00	12.00
93-16	Anchor Horse and Mule Feed.....	Same	11.44	2.57	7.25
95-15	Diamond Horse and Mule Feed....	Same	10.38	2.50	12.88
			9.00	1.50	12.00
91-15	Dixie Horse and Mule Feed.....	Same	10.13	2.68	11.80
			10.00	2.50	12.00
91-16	Same	Same	10.38	2.89	11.88
91-16	Same	Same	11.50	2.73	12.70
91-17	Same	Same	13.75	3.50	10.92
39-19	Dixie Horse and Mule Feed.....	Same	10.31	3.23	12.23
			10.00	2.50	12.00
1065-14	Dixie Dairy Feed.....	Same	15.56	4.22	16.53
			16.00	3.50	12.00
3103-18	Dixie Hog Feed.....	Same	18.81	9.31	12.04
			18.00	4.00	10.00
2780-18	Holsum Horse Feed.....	Same	10.31	2.71	10.76
			9.00	1.00	16.00
1255-19	Same	Same	9.06	2.60	13.45
3102-18	Polo Hog Fat.....	Same	17.31	9.39	10.23
			18.00	4.00	10.00
880-17	Ben Hur	The Early & Daniel Co.	12.38	2.42	16.63
		Cincinnati, Ohio.	10.00	2.00	15.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1805-18	H. B. Ringo..... Mt. Sterling.	Corn, alfalfa, brewers' dried grains, oats, molasses, salt ½%.....	Below guaranty in protein and fat.
1806-16	Martin & Hodgkin Supply Co., Winchester.	Malt sprouts, brewers' dried grains, distillers' dried grains, hominy meal, cotton seed meal, wheat bran, molasses, salt ½ of 1%.	Below guaranty in protein and fat.
1806-17	Mfrs. Warehouse	Same	Below guaranty in protein and fat, above in fiber.
1806-17	Same	Same	Contained only brewers' grains, wheat bran, molasses.
1806-18	Mfgrs. Warehouse.....	Same	Below guaranty in protein and fat, above in fiber.
1607-15	J. S. Stevens & Co. ..... Ashland.	Corn, oats	
225-18	Walter Mathews ..... Paducah.	Crushed oats, ground choice alfalfa, cracked corn, molasses...	
225-18	The H. T. Hackney Co.. Middlesboro.	Same	
1494-15	J. E. Weber..... Louisville.	Corn, oats, barley, alfalfa meal, molasses	
92-15	Oscar Farmer & Sons.... Louisville.	Ground alfalfa, corn, oats.....	
93-15	Henderson Feed & Commission Co., Henderson.	Ground alfalfa, corn, oats, molasses	Below guaranty in protein.
93-16	Same	Same	Below guaranty in fat.
95-15	Same	Same	Below guaranty in fiber.
91-15	Same	Same	
91-16	Same	Same	
91-16	Ruef Bros. ..... Covington.	Same	Above guaranty in fiber.
91-17	Geo. Keller ..... Newport.	Same	
39-19	Morrison & Mitchel..... Marion.	Corn, oats, ground alfalfa, sugar cane molasses	
1065-14	Henderson Feed & Commission Co., Henderson.	Ground alfalfa, rice bran, cotton seed meal, sugar cane molasses.	Above guaranty in fiber.
3103-18	S. C. Jennings..... Madisonville.	Ground alfalfa, copra meal, wheat middlings, corn feed meal, rice bran. tankage, molasses.	Above guaranty in fiber.
2780-18	Boston Mills ..... Boston.	Ground corn, oats, ground alfalfa, molasses, ground grain screenings 15%.	Barley present.
1255-19	Oscar Farmer & Sons.... Louisville.	Corn, oats, ground alfalfa, unground screenings from corn, oats, barley and kafir 15%, molasses.	
3102-18	J. B. Benjamin..... Providence.	Corn gluten feed, copra meal, wheat middlings, rice bran, corn feed meal, ground grain screenings 10%.	Below guaranty in protein.
880-17	The H. T. Hackney Co.. Harlan.	Corn, oats, alfalfa, molasses.....	Above guaranty in fiber.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
880-17	Ben Hur	The Early & Daniel Co.	11.06	2.52	16.18
		Cincinnati, Ohio.	10.00	2.00	15.00
459-15	Ce-re-a-lia Sweets for the Dairy	The Early & Daniel Co.	22.05	4.35	9.46
		Covington, Ky.	19.00	4.50	9.00
861-16	Same	Same	18.50	4.41	8.23
861-16	Same	Same	19.00	4.15	9.33
459-17	Same	Same	19.44	4.80	9.98
861-17	Ce-re-a-lia Sweets for the Dairy	The Early & Daniel Co.	20.88	4.04	8.18
		Cincinnati, Ohio.	19.00	4.50	9.00
861-18	Same	Same	22.63	4.30	9.23
			19.00	4.50	10.00
568-19	Same	Same	19.88	4.14	9.59
865-16	Tuxedo Chop	The Early & Daniel Co.	13.94	4.45	11.18
		Cincinnati, Ohio.	12.50	4.00	10.00
865-17	Same	Same	13.94	4.49	11.78
865-17	Same	Same	12.75	3.58	11.10
865-17	Same	Same	15.25	4.50	10.88
865-17	Same	Same	13.50	4.08	11.91
865-17	Same	Same	13.69	4.00	12.40
865-18	Same	Same	10.75	3.80	10.73
			10.00	3.00	10.00
589-19	Same	Same	11.63	4.15	10.65
			10.00	3.00	12.00
2221-18	Arrow Dairy Feed	Edinger & Co.	17.50	3.85	17.75
		Louisville, Ky.	19.00	4.50	11.00
2221-18	Same	Same	21.50	3.79	24.38
2454-17	Arrow Hog Meal	Same	15.75	4.20	8.78
			19.00	3.00	12.00
2454-17	Same	Same	14.94	4.23	9.78
2454-17	Same	Same	16.13	3.80	7.40
2454-17	Arrow Pig Meal	Same	22.06	5.78	9.91
2454-18	Arrow Hog Meal	Same	21.81	4.51	12.15
1178-15	Arrow Horse and Mule Feed	Same	11.81	2.49	15.18
			11.00	3.50	13.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
880-17	Hudson & Davis..... Danville.	Corn, oats, alfalfa, molasses.....	Above guaranty in fiber.
459-15	Frank Huntemann & Son Covington.	Corn meal, cotton seed meal, molasses, brewers' grains, distillers' dried grains, malt sprouts.	No corn meal present.
861-16	The Early & Daniel Co.. Erlanger, Ky.	Brewers grains, distillers' grains, cotton seed meal, corn meal, malt sprouts, molasses, gluten feed, bran, middlings.	Below guaranty in protein.
861-16	Kentucky Wholesale Co.. Pikeville.	Same	
459-17	Mfrs. Warehouse	Same	No malt sprouts present. Above in fiber.
861-17	J. B. Paxton..... Catlettsburg.	Same	Below guaranty in fat.
861-18	Welch's Department Store Berea.	Same	
568-19	The H. T. Hackney Co.. Harlan.	Same	
865-16	Kenton Hay & Grain Co.. Covington.	Alfalfa meal, molasses, brewers' grain, rolled northern oats, sifted cracked corn.	Above guaranty in fiber.
865-17	J. B. Paxton..... Catlettsburg.	Same	Same.
865-17	Kentucky Wholesale Co.. Pikeville.	Same	Same.
865-17	J. M. Riley..... Williamstown .	Same	Same.
865-17	Bush & Bush..... Ashland.	Same	Same.
865-17	F. K. Trible..... Danville.	Same	Same.
865-17	Banner Produce Co..... Greenup.	Molasses, corn, oats, alfalfa meal, brewers' grain	Same.
589-19	Charles Besse ..... Bellevue.	Same	
2221-18	Jeffersontown Milling Co. Jeffersontown.	Brewers' grains, distillers' grains, corn meal, bran, middlings, cotton seed meal, alfalfa, molasses.	Above guaranty in fiber.
2221-18	Park City Feed Store.... Bowling Green.	Same	Excess of alfalfa. Below guaranty in fat, above in fiber.
2454-17	Shelby County Feed & Gr. Co., Shelbyville.	Wheat middlings, digester tankage, corn meal, alfalfa meal, cotton seed meal, corn germ meal, salt 1%.	Below guaranty in protein. No tankage present.
2454-17	Same	Same	Below guaranty in protein.
2454-17	The Johnson Lumber & Feed Co., Buechel.	Same	Below guaranty in protein.
2454-17	Same	Same	
2454-18	Grigsby & Co..... Bardstown.	Same	
1178-15	D. B. Lake & Co..... Springfield.	Corn, oats, barley, alfalfa, molasses, salt	Below in fat, above in fiber. No barley present. Wheat present.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1178-17	Arrow Horse and Mule Feed.....	Edinger & Co.....	13.81	2.30	16.78
		Louisville, Ky.	11.00	3.50	13.00
1178-18	Same	Same	10.25	1.88	15.73
1178-18	Same	Same	9.00	2.34	18.38
365-11	Eureka Ground Feed.....	Same	12.38	4.73	4.03
			10.63	4.52	.....
1868-18	Blue Boar Hog Feed.....	The Eikenberry-Fitzgerald Co.	16.69	4.07	7.39
		Cincinnati, Ohio.	17.00	5.50	13.00
1868-18	Same	Same	15.63	6.14	7.63
1868-18	Same	Same	14.75	3.40	9.53
1868-18	Same	Same	16.81	3.11	8.36
1868-18	Same	Same	14.56	5.42	10.10
1868-18	Same	Same	14.75	5.68	9.50
1868-18	Same	Same	14.88	4.68	7.73
785-18	"Nutritia" Dairy Feed.....	Same	18.81	5.57	9.98
			18.00	5.00	12.00
785-18	Same	Same	16.75	6.43	10.85
148-19	Sunshine Dairy Feed.....	Same	14.75	3.70	9.93
			16.00	3.00	12.00
1515-17	Elmendorf Barleycorn Cow Feed..	Elmendorf Coal & Feed Co....	21.25	4.87	11.23
		Lexington, Ky.	15.41	4.28	7.95
1515-18	Same	Same	21.75	4.88	13 96
131-13	Elmendorf Ben Ali.....	Same	16.63	4.85	10.08
			10.97	3.50	.....
783-15	Elmendorf Tango Horse Feed.....	Same	12.06	3.17	8.43
			11.02	4.05	8.68
783-17	Same	Same	11.75	3.43	10.42
			10.89	2.52	6.33
783-18	Same	Same	12.31	2.60	11.05
93-19	Reliable Horse and Mule Feed....	Excello Feed Milling Co.....	11.63	2.85	14.89
		St. Joseph, Mo.	10.00	3.00	15.00
.....	Sho-Me Horse Feed.....	Same	10.13	2.53	16.04
			9.00	2.00	17.00
1418-15	Fairplay Horse Feed.....	Fairplay Feed Mills.....	11.25	1.93	17.99
		Linton, Ind.	9.00	2.00	15.00
1864-16	Our Pride	Oscar Farmer & Sons.....	12.00	2.64	17.53
		Louisville, Ky.	10.23	2.00	14.18

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1178-17	Park City Feed Store.... Bowling Green.	Oats, corn, barley, alfalfa, molasses, salt	Below in fat, above in fiber. No barley present.
1178-18	Shelby County Feed & Gr Co., Shelbyville.	Same	No barley present. Below in protein and fat, above in fiber.
1178-18	Woosley & Son..... Elizabethtown.	Same	Below in protein and fat, above in fiber.
365-11	G. C. Shaw..... Frankfort.	Oats, corn, barley, wheat.....	No barley present.
1868-18	W. W. Broadus & Co. .... Richmond.	Digester tankage, hominy meal, gluten meal, corn meal, mixed wheat feed.	Below guaranty in fat.
1868-18	J. C. Everett & Co. ..... Maysville.	Same	Below guaranty in protein.
1868-18	Staggs Bros. ..... Vanceburg.	Same	Below in protein and fat. Largely corn products. Inferior to guaranty.
1868-18	Bedford & Tuttle..... Winchester.	Same	Below in fat.
1868-18	Greenup Milling Co. ..... Greenup.	Same	Below in protein. Much inferior to guaranty.
1868-18	H. H. Borders..... Catlettsburg.	Same	Below in protein. Inferior to guaranty.
1868-18	J. C. Everett & Co. ..... Maysville.	Same	Below in protein and fat. Brewers' grains and screenings present. Inferior to guaranty.
785-18	Bedford & Tuttle..... Winchester.	Mixed wheat feed, malt sprouts, cotton seed meal, corn meal, barley, salt, lin seed meal, brewers' grains, gluten meal.	
785-18	Henry & Harvey..... Carlisle.	Same	Below in protein. Inferior to guaranty.
148-19	Same	Hominy meal, corn meal, wheat mixed feed, alfalfa meal, brewers' grains gluten meal, barley middlings, corn bran, cotton seed meal, cotton seed hulls 2%, molasses, salt.	Below in protein. Inferior to guaranty.
1515-17	Mfrs. Warehouse	Corn meal, shipstuff, brewers' grain, cot. seed meal, corn brar	Above in fiber. Contains large per cent. of rolled oats.
1575-18	Same	Same	Above in fiber. Oats, cracked corn and alfalfa meal present.
131-13	Same	Rolled oats, rolled barley, cracked corn, wheat bran.....	
783-15	Shepherd, Engle & Given. Lexington.	Rolled oats, crushed corn, alfalfa meal, brewers' grains, cane molasses.	Below guaranty in fat.
783-17	R. R. Chapman..... Torrent, Ky.	Same	Above guaranty in fiber. Wheat bran present.
783-18	Mfrs. Warehouse	Same	Above guaranty in fiber. Wheat bran present.
93-19	The Lovett Fruit & Produce Co., Middlesboro.	Alfalfa meal, corn chops, oats, molasses, salt 1%.....	
.....	Headly & Co. ..... Lexington.	Alfalfa meal, corn chops, oats, molasses, salt	
1418-15	Riedling & Bro. ..... Louisville.	Corn, oats, barley, alfalfa, molasses, salt 1%.....	Above guaranty in fiber. No barley present.
1864-16	H. G. Holcamp..... Louisville.	Whole oats, crushed corn, ground alfalfa, molasses, salt 1%.....	Above guaranty in fiber.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1119-12	Snow King Germ Food	J. H. Fedders & Sons	12.25	7.56	6.48
		Covington, Ky.	12.25	7.70	7.25
1568-16	Derby Horse Feed	The Ferger Grain Co.	9.76	2.48	9.82
		Cincinnati, Ohio.	10.00	3.00	12.00
785-16	Nutritia Dairy Feed	Same	27.38	4.89	10.70
			24.00	7.00	13.00
785-16	Same	Same	20.63	5.51	10 90
785-17	Same	Same	22.88	5.63	11.28
785-17	Same	Same	23.75	4.78	11.02
1869-16	York Dairy Feed	Same	16.56	4.28	12.45
			17.00	4.50	13.00
1869-16	Same	Same	24.00	4.83	10.83
1869-17	Same	Same	17.19	4.30	17.25
1788-16	Ferger's Sunshine Dairy Feed	Same	18.19	3.36	11.53
			18.00	4.00	8.00
788-17	Same	Same	19.38	4.38	11.15
			18.00	4.00	12.00
788-17	Same	Same	17.75	3.15	7.35
2278-17	Queen City Horse and Mule Feed	Same	12.44	2.86	11.22
2278-18	Same	Same	13.88	3.01	13.13
			10.00	3.01	12.00
1080-15	Ferger's Nutritia Horse Feed	Same	10.56	3.23	9.83
			11.00	4.00	8.00
1080-15	Same	Same	10.75	3.65	11.11
2259-16	Nutritia Horse Feed	Same	11.75	3.63	11.18
			12.00	4.00	10.00
2259-17	Same	Same	13.88	3.69	10.80
2259-17	Same	Same	12.38	3.77	9.43
2259-17	Same	Same	12.50	3.63	11.70
786-15	Nutritia Dairy Feed with Molasses	Same	17.38	3.55	7.82
			18.00	6.00	8.00
1868-16	Blue Boar Hog Feed	Same	17.44	4.24	7.93
			18.00	6.00	13.00
1868-17	Same	Same	17.19	9.30	5.28
			17.00	5.50	13.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1119-12	Mfrs. Warehouse	Corn, barley	
1568-16	R. M. Harrison & Son.... Maysville.	Corn, oats, wheat bran, cotton seed meal, alfalfa hay, molasses	No wheat bran nor cotton seed meal present. Below in fat.
785-16	J. C. Everett & Co. ..... Maysville.	Distillers dried grains, hominy meal, malt sprouts, cotton seed meal, linseed meal, wheat middlings, wheat bran, salt.	Below guaranty in fat.
785-16	Hager Produce Co. ..... Catlettsburg.	Same	Below in protein and fat, above in fiber. Inferior to guaranty.
785-17	J. C. Everett & Co. ..... Maysville.	Same	Below guaranty in both protein and fat.
785-17	Big Sandy Grocery Co. .. Catlettsburg.	Same	Below guaranty in fat.
1869-16	Hager Produce Co. ..... Catlettsburg.	Ground oats, wheat bran, middlings, malt sprouts, distillers' dried grains, cotton seed meal.	No oats or cotton seed meal present.
1869-16	J. W. Webb & Son..... Vanceburg.	Same	
1869-17	G. L. Crenshaw..... Georgetown.	Same	Above guaranty in fiber.
1788-16	Hines & Stricklett..... Vanceburg.	Wheat bran, corn meal, alfalfa meal, molasses, wheat middlings, distillers' dried grains, cotton seed meal, hominy meal.	Below guaranty in fat, above in fiber.
788-17	Dorsey Bros. & Fisher... Carlisle.	Wheat middlings, hominy meal, wheat bran, corn meal, distillers' dried grains, cotton seed meal, alfalfa meal molasses, salt.	
788-17	D. A. Leffingwell & Co. .. Ashland.	Same	Below guaranty in fat.
2278-17	Cleveland & Co. ..... Versailles.	Crushed corn, crushed oats, wheat bran, cotton seed meal, alfalfa meal, brewers' grains, molasses, salt.	Above guaranty in fiber.
2278-18	J. W. Webb & Son..... Vanceburg.	Same	
1080-15	Cleveland & Co. ..... Versailles.	Oats, cracked corn, wheat bran, alfalfa meal, cotton seed meal, molasses.	Below guaranty in fat, above in fiber.
1080-15	Hines & Stricklett..... Vanceburg.	Same	Above guaranty in fiber.
2259-16	J. C. Everett & Co. ..... Maysville.	Oats, cracked corn, wheat bran, alfalfa meal, cotton seed meal, brewers' grains, molasses, salt.	Above in fiber. No cotton seed meal present.
2259-17	Big Sandy Grocery Co. ... Catlettsburg.	Same	Below in fat, above in fiber.
2259-17	Dorsey Bros. & Fisher.... Carlisle.	Same	
2259-17	M. T. Flannery..... Augusta.	Same	Above in fiber. No cotton seed meal present.
786-15	Hines & Stricklett..... Vanceburg.	Distillers' dried grains, hominy meal, malt sprouts, cotton seed meal, linseed meal, wheat middlings, wheat bran, molasses.	Below guaranty in protein and fat.
1868-16	J. C. Everett & Co. ..... Maysville.	Digester tankage, hominy meal, gluten meal, corn meal, middlings, salt.	Below guaranty in both protein and fat.
1868-17	Big Sandy Grocery Co. .. Catlettsburg.	Same	

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2530-17	Diamond Cow Feed	Fisher Bros.	22.50	3.97	16.35
		Evansville, Ind.	16.00	3.00	15.00
2530-18	Same	Same	21.38	5.35	11.98
			24.00	3.50	17.00
9-19	Same	Same	24.31	5.21	12.70
2528-17	Red Crown Horse Feed	Same	12.81	3.08	17.22
			9.00	1.50	15.00
2528-18	Same	Same	11.50	2.58	13.11
3073-18	Yankie Mixed Feed	Same	15.38	5.00	9.10
			15.00	4.00	13.00
1153-16	Blue Grass Dairy Feed	Henry Fruechtenicht	21.44	5.07	15.79
		Louisville, Ky.	18.00	4.00	12.00
1153-16	Same	Same	22.38	3.99	22.08
1152-16	Blue Grass Horse Feed	Same	10.44	2.97	11.93
			10.00	2.50	16.00
1244-19	Same	Same	10.25	2.17	16.08
1244-19	Same	Same	9.88	2.23	12.60
1481-17	Screenings	Glenmore Distillery Co.	11.63	3.53	5.00
		Owensboro, Ky.	8.50	1.50	10.00
1481-18	Same	Same	13.13	2.48	12.75
1095-15	Ben Hur Horse and Mule Feed	Golden Grain Milling Co.	11.75	2.26	11.00
		E. St. Louis, Ill.	10.00	2.00	12.00
2697-18	Butter Fat Dairy Feed	Same	19.88	3.79	18.60
			18.00	4.00	16.50
2697-18	Same	Same	17.75	2.79	20.00
108-15	Cornette Horse and Mule Feed	Same	10.38	1.53	13.30
			9.00	1.50	14.00
261-14	Golden Grain Puritan Brand Feed	Same	11.44	1.45	18.20
			9.00	1.50	12.00
103-18	Golden Grain Horse and Mule Feed	Same	8.63	2.19	14.34
			9.00	2.00	14.00
106-15	Puritan Horse and Mule Feed	Same	10.75	2.02	15.41
			9.00	1.50	14.00
106-15	Same	Same	9.75	1.60	18.15
106-17	Same	Same	11.13	3.08	18.50
			9.00	1.50	16.00
106-17	Same	Same	10.82	3.22	16.84
2214-16	Val-U Horse and Mule Feed	Same	11.75	2.05	19.23
			9.00	1.50	18.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2530-17	Henderson Feed & Commission Co., Henderson.	Cotton seed meal, hominy feed, middlings, wheat bran, molasses, salt ½ of 1%, alfalfa meal, linseed oil meal, corn feed meal.	Above guaranty in fiber.
2530-18	X. C. Maxon..... Adairville.	Same	Below in protein. Inferior to guaranty.
9-19	N. I. Toombs..... Madisonville.	Same	
2528-17	Henderson Feed & Commission Co., Henderson	Corn, oats, alfalfa meal, molasses, salt 1%.....	Above guaranty in fiber.
2528-18	Simmons Feed Store..... Bowling Green.	Same	
3073-18	Wilson & Son..... Russellville.	Wheat middlings, wheat bran, linseed oil meal, corn feed meal..	
1153-16	Corbin Feed Store..... Corbin.	Corn meal, brewers' grain, cotton seed meal, molasses, wheat bran	No cotton seed meal nor wheat bran present. Corn bran present, above guaranty in fiber.
1153-16	Cecilian Milling Co..... Cecilia.	Same	Above in fiber. Largely cotton seed meal, cotton seed hulls and alfalfa meal.
1152-16	Corbin Feed Store..... Corbin.	Corn, oats, alfalfa, molasses.....	
1244-19	Cole, Hughes & Co..... Barbourville.	Same	
1244-19	Bonta & Knight ..... Pleasureville.	Same	
1481-17	Rapier Sugar Feed Co.. Owensboro.	Screenings from corn, rye and barley	
1481-18	Price Ray ..... Henderson.	Same	Above guaranty in fiber.
1095-15	Henderson Feed & Commission Co., Henderson.	Corn, oats, molasses, alfalfa meal, salt ½ of 1%.....	
2697-18	The Ashland Milling Co.. Ashland.	Cotton seed meal, corn gluten feed, wheat bran, wheat middlings, alfalfa meal, molasses, salt ½%, copra meal.	Above guaranty in fiber. No wheat product present.
2697-18	R. C. Poage Milling Co.. Ashland.	Same	Above guaranty in fiber.
108-15	Ritter-Hennings Co..... Louisville.	Corn, oats, alfalfa meal, molasses, ½ of 1% salt.....	
261-14	Fulton Flour & Feed Dealers & Mfg. Co., Fulton.	Cracked corn, rolled oats, molasses, alfalfa meal, salt 1%...	Above guaranty in fiber.
103-18	Joe Lovett ..... Williamsburg.	Corn, oats, alfalfa meal, molasses, salt ½ of 1%.....	
106-15	T. E. Ford..... Paducah.	Corn, oats, alfalfa meal, molasses, salt ½ of 1%.....	Above guaranty in fiber.
106-15	Fulton Flour & Feed Dealers & Mfg. Co., Fulton.	Same	Same.
106-17	T. E. Ford..... Paducah.	Corn, oats, alfalfa meal, molasses, salt ½ of 1%.....	Same.
106-17	Same	Same	Same.
2214-16	Ritter-Hennings Co..... Louisville.	Corn, oats, alfalfa meal, Palmo meal 5%, salt ½ of 1%.....	Same.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2290-17	Green Leaf Alfalfa Molasses Feed	Grain Belt Mills Co.	10.61	0.82	18.47
		St. Joseph, Mo.	10.00	0.75	26.00
2603-18	"Red D" Dairy Feed	Same	17.31	3.87	13.77
			16.00	4.00	15.00
2603-18	Same	Same	18.25	5.42	14.74
2514-17	"Extre" Horse and Mule Feed	Same	12.25	1.97	13.08
			9.00	2.00	14.00
630-19	Same	Same	10.56	2.15	12.53
2287-17	Bronco Horse and Mule Feed	Same	12.06	2.26	12.15
			10.00	1.50	15.00
2287-17	Same	Same	12.00	1.43	15.51
2288-17	Pennant Horse and Mule Feed	Same	14.00	1.68	19.20
			10.00	1.00	18.00
1213-18	Dairy Feed	Greenup Milling Co.	12.13	4.23	8.35
		Greenup, Ky.	13.63	2.99	6.50
449-17	Excelsior Horse Feed	Hales & Edwards Co.	10.69	3.65	5.25
		Chicago, Ill.	10.00	3.50	8.00
686-19	Harvester Horse Feed	Same	10.81	2.45	14.20
			10.00	2.00	15.00
453-16	Red Horn Dairy Feed	Same	25.63	4.03	11.95
			25.00	4.00	15.00
12-16	Halliday's Red "H" Feed	H. L. Halliday Milling Co.	10.69	2.30	14.30
		Cairo, Ill.	10.00	2.00	12.00
12-16	Same	Same	13.38	2.64	12.53
2287-17	Pennant Horse and Mule Feed	Same	10.81	2.63	11.89
			9.00	2.00	15.00
481-15	Golden Grain	H. P. Hawkins	10.75	2.68	8.25
		Paducah, Ky.	10.33	3.05	9.78
481-16	Same	Same	11.44	2.59	10.25
481-16	Same	Same	10.88	2.87	7.28
			10.33	3.05	9.78
481-17	Golden Grain Alfalfa Feed	Same	12.38	2.10	14.50
			10.33	3.05	9.78
481-18	Golden Grains	Same	10.44	2.70	9.28
			10.33	3.05	9.78
481-18	Same	Same	10.75	3.13	10.77
482-15	Diamond Jack	Same	10.88	2.77	9.25
			10.17	2.65	8.04
482-15	Same	Same	10.81	2.72	6.68
482-16	Same	Same	10.75	2.90	9.54

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2290-17	H. P. Hawkins' Sons.... Paducah.	Alfalfa meal, molasses, salt 1%..	
2603-18	Edward M. Riedling..... Louisville.	Cotton seed meal, alfalfa meal, ground wheat screenings 22½%, molasses, salt ½ of 1%.	
2603-18	Forbes Mfg. Co..... Hopkinsville.	Same	
2514-18	Same	Corn, oats, alfalfa meal, molasses, salt ½%.....	
630-19	Edward M. Riedling..... Louisville.	Same	
2287-17	Ohio Valley Mill & Supply Co., Ashland.	Corn, oats, alfalfa meal, molasses, salt 1%.....	
2287-17	Walter Mathews ..... Paducah.	Same	
2288-17	Ziliak & Schafer Milling Co., Paducah.	Corn, oats, alfalfa meal, molasses, salt 1%	Above guaranty in fiber.
1213-18	Mfrs. Warehouse	Wheat bran, middlings, corn grits, corn bran	Below guaranty in protein, above in fiber.
449-17	Edward M. Riedling..... Louisville.	Rolled oats, sifted cracked corn, rolled barley	
686-19	Same	Alfalfa, molasses, crushed corn, oats, barley	
453-16	Same	Cotton seed meal, gluten feed, alfalfa meal, oil meal, malt sprouts, hominy feed, dried brewers' grains.	
12-16	Browder Milling Co..... Fulton.	Corn, oats, alfalfa meal, molasses	Above guaranty in fiber.
12-16	Same	Same	
2387-17	Bynum & Beecham..... Paducah.	Corn, oats, alfalfa meal, oat and corn screenings 5%.....	
481-15	W. W. McElrath..... Murray.	Corn, oats, alfalfa, molasses.....	No oats present.
481-16	Same	Same	Above guaranty in fiber.
481-16	Same	Same	Excess amount of corn present in this feed.
481-17	Mfrs. Warehouse	Corn, oats, alfalfa, molasses.....	Below guaranty in fat, above in fiber. Excess of alfalfa and a shortage of oats.
481-18	W. W. McElrath..... Murray.	Corn, oats, alfalfa, molasses.....	
481-18	Mfrs. Warehouse	Same	Above guaranty in fiber. No oats present. Corn bran present.
482-15	Parker & Perdue..... Murray.	Oats, corn, alfalfa, molasses.....	Above guaranty in fiber. No oats present.
482-15	Bynum & Beecham..... Paducah.	Same	No oats present.
482-16	G. F. Phillips..... Paducah.	Same	Above guaranty in fiber. No oats present.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
482-16	Diamond Jack	H. P. Hawkins' Sons	11.13	2.44	7.43
		Paducah, Ky.	10.17	2.65	8.00
482-17	Same	Same	11.75	3.53	14.68
1467-15	O. K. Uncle Sam Horse and Mule Feed.	Henderson Grain Co.	12.38	2.43	16.30
		Henderson, Ky.	10.00	2.50	12.00
1190-13	Hess Crushed Feed	W. E. Hess & Co.	11.75	4.33	5.75
		Louisville, Ky.	11.88	5.59	8.04
1348-14	Hess' Molasses Crushed Feed	Same	11.50	2.80	18.08
			12.25	2.75	12.00
82-16	Same	Same	13.56	2.18	14.55
1307-19	Golden Dairy Feed	Same	14.31	3.28	18.70
			14.90	3.70	18.65
2156-16	Champion Horse and Mule Feed	W. E. Huffman	12.13	2.69	15.23
		Louisville, Ky.	10.00	2.50	12.00
2476-17	International Milk Made Dairy Feed.	International Sugar Feed No.	24.56	4.83	14.94
		Two Co., Minneapolis, Minn.	24.00	5.00	12.50
2476-18	Same	Same	27.69	7.33	12.76
			24.00	5.00	15.00
2476-18	Same	Same	28.13	7.81	12.15
2476-18	Same	Same	24.06	6.43	13.84
1283-15	Dr. Reed's Alfalfa and Molasses Feed.	Illinois Milling Co.	9.79	1.65	13.04
		Cairo, Ill.	10.50	2.50	12.00
1860-16	Crown Stock Feed	Jenkins-Ryan Mill Co.	12.13	4.87	4.80
		Adairville, Ky.	12.50	4.85	7.50
1946-18	Just Horse Feed	Just Mills	10.00	2.87	14.23
		Nashville, Tenn.	10.00	2.00	12.00
2102-16	Just Grainola Feed	Same	10.81	3.55	7.60
			10.30	3.25	8.00
2102-18	Same	Same	9.88	4.68	9.19
			9.60	3.30	8.20
1946-17	Just Horse Feed	Same	12.63	3.28	14.43
			10.00	2.00	12.00
2019-18	Premo Horse and Mule Feed	Kentucky Feed & Grain Co.	12.84	2.80	13.58
		Louisville, Ky.	9.00	1.50	14.00
2234-17	Kutter Horse and Mule Feed	Kornfalfa Feed & Milling Co.	12.70	1.94	17.00
		Kansas City, Mo.	9.00	1.00	20.00
2553-17	Latonia Feed	Latonia Hay & Grain Co.	17.25	3.86	2.15
		Latonia, Ky.	16.50	7.50	8.50
1289-12	Dezarn's Gold Medal Horse Feed	Lynn Milling Co.	11.94	3.86	4.42
		Hodgenville, Ky.	11.44	4.90	.....
1290-12	Dezarn's Gold Medal Cattle Feed	Same	13.00	4.43	3.61
			12.72	4.59	.....
1740-15	C. C. Horse Feed	Murray Milling Co.	11.25	3.46	11.34
		Murray, Ky.	10.13	4.15	9.15
1740-15	Same	Same	11.06	3.41	10.38

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
482-16	Moore Coal & Feed Co. .. Paducah.	Oats, corn, alfalfa, molasses.....	
482-17	Mfrs. Warehouse	Same	Above guaranty in fiber. No oats present.
1476-15	Same	Cane molasses, alfalfa meal, cracked corn, corn, oats, salt 1%	Above guaranty in fiber. No oats present. Contains barley.
1190-13	Same	Corn, oats, bran, salt 2%.....	Below guaranty in fat.
1348-14	Same	Alfalfa, molasses, bran, corn, oats	Below guaranty in protein, above in fiber. No bran present.
82-16	Same	Same	Above guaranty in fiber. No bran present.
1307-19	Same	Alfalfa meal, corn feed meal, mixed wheat feed.....	
2156-16	Lagrange Flour & Feed Co., Lagrange, Ky.	Wheat bran, wheat middlings, corn, oats, alfalfa, molasses, salt ½ of 1%.	Above guaranty in fiber.
2476-17	M. D. Royse..... Winchester .	Cotton seed meal, wheat bran, wheat shorts, rice bran, salt...	Above guaranty in fiber. No rice bran present.
2476-18	M. D. Royce..... Winchester.	Cotton seed meal, wheat bran, rice bran, wheat shorts.....	
2476-18	Farmers & Consumers Co. Frankfort.	Same	
2476-18	Forbes Mfg. Co..... Hopkinsville.	Same	
1283-15	M. Livingston & Co.... Paducah.	Cracked corn, oats, alfalfa meal, molasses	Below guaranty in protein and fat, above in fiber.
1860-16	E. M. Gish..... Central City.	Wheat bran, corn bran, cracked corn, whole oats, unground wheat screenings ½ of 1%.	
1946-18	P. M. Lanham & Son..... Corbin.	Corn, oats, ground alfalfa, molasses, salt 1%.....	Above guaranty in fiber.
2102-16	Jellico Grocery Co..... Middlesboro.	Corn, oats, barley, molasses, salt 1%	
2102-18	M. P. Lanham & Son.... Corbin.	Cracked corn, oats, ground alfalfa, molasses, salt 1%.....	Above guaranty in fiber.
1946-17	Jellico Grocery Co..... Middlesboro.	Corn, oats, ground alfalfa, molasses, salt 1%.....	Above guaranty in fiber.
2019-19	C. R. Barnes..... Bardstown.	Corn, oats, alfalfa meal, molasses, ½ of 1% salt.....	
2234-17	Wm. Norton's Sons..... Louisville.	Corn, oats, alfalfa, molasses.....	
2553-17	Mfgrs. Warehouse.....	Palm oil, flour middlings, Red Dog flour	Below guaranty in fat.
1289-12	R. H. Wintersmith..... Elizabethtown.	Corn, oats, middlings, wheat bran	Below guaranty in fat.
1290-12	Mfgrs. Warehouse.....	Corn, cotton seed meal, middlings, wheat bran	
1740-15	Mfgrs. Warehouse.....	Corn, oats, alfalfa meal, molasses corn bran	Below guaranty in fat, above in fiber.
1740-16	Parker & Perdue..... Murray.	Same	Same.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1739-15	K. Y. Horse Feed	Murray Milling Co.	10.75	3.34	7.88
		Murray, Ky.	10.00	4.07	8.00
2198-16	Black Beauty Horse Feed	John G. Newman Co.	12.44	2.58	12.64
		Evansville, Ind.	9.00	2.00	16.00
2350-17	Big Deal Horse and Mule Feed	Ohio Valley Seed Co.	12.75	3.73	13.61
		Evansville, Ind.	8.00	2.00	16.00
2066-16	Sunny South Horse and Mule Feed	Same	10.38	3.08	9.90
			10.00	2.50	14.00
2066-17	Same	Same	11.75	3.05	11.40
2066-17	Same	Same	11.25	2.64	10.06
2066-18	Same	Same	10.31	2.93	11.80
953-13	GreenMeadow Dairy Feed	Omaha Alfalfa Milling Co.	14.31	.74	21.56
		Omaha, Neb.	11.00	1.00	25.00
997-14	Peerless Alfalfa Horse and Mule Feed.	Same	11.25	1.94	14.23
			10.00	2.00	12.00
140-15	Al-Corn-O Horse Feed	Same	10.27	1.47	14.29
			10.00	2.00	12.00
140-15	Same	Same	13.13	2.46	15 00
132-16	Evergreen Horse Feed	Omaha Alfalfa Milling Co.	12.16	1.91	12.56
		Omaha, Neb.	10.00	2.00	12.00
2485-17	Spring Pasture Feed	Paducah Grain & Elevator Co.	12.13	3.16	14.50
		Paducah, Ky.	13.00	2.44	16.64
128-16	Green Meadow Corn, Oats and Alfalfa Feed.	Paducah Milling Co.	10.25	2.75	7.87
		Paducah, Ky.	10.22	3.20	10.00
128-16	Same	Same	11.25	3.00	7.00
128-17	Same	Same	12.88	2.80	12.50
118-15	Peter's Arab Horse Feed	M. C. Peters Mill Co.	11.25	2.95	12.35
		Omaha, Neb.	9.00	2.00	15.00
118-18	Same	Same	10.81	3.09	9.48
			10.00	2.00	15.00
118-18	Same	Same	11.13	2.83	12.38
119-18	King Corn Horse and Mule Feed	Same	12.19	2.87	18.03
			10.00	1.50	18.00
645-19	Peter's King Corn Horse and Mule Feed.	Same	12.38	2.20	15.84
645-19	Same	Same	12.00	1.60	19.20
1429-19	Corn and Oats Chop	The R. C. Poage Milling Co.	10.31	4.43	6.15
		Ashland, Ky.	10.31	4.85	5.23
650-16	Purina Cow Chow Feed	Ralston Purina Co.	26.50	3.93	15.35
		St. Louis, Mo.	24.00	5.00	12.00
650-17	Same	Same	24.63	6.13	15.12

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1739-15	Mfrs. Warehouse	Corn, oats, alfalfa meal, molasses	Below guaranty in fat.
2198-16	T. H. O'Brien, Dawson Springs.	Corn, oats, alfalfa, molasses	
2350-17	Henderson Feed & Commission Co., Henderson.	Corn, oats, alfalfa meal, corn bran, kaffir corn, molasses	
2066-16	Skillman Feed Co. Owensboro.	Corn, oats, alfalfa, molasses	
2066-17	L. E. Chapman, Owensboro.	Same	
2066-17	Henderson Feed & Commission Co., Henderson.	Same	
2066-18	L. E. Chapman, Owensboro.	Same	
953-13	Hudson & Davis, Danville.	Alfalfa meal, molasses	
997-14	McClelland Feed Co. Henderson.	Cracked corn, oats, alfalfa meal, molasses	Above guaranty in fiber.
140-15	Ruef Bros. Covington.	Corn, oats, alfalfa meal, molasses	Below guaranty in fat, above in fiber.
140-15	A. Switzer Produce Co. Paducah.	Same	Above guaranty in fiber.
132-16	Jos. Exall & Co. Paducah.	Corn, oats, alfalfa meal, molasses	
2485-17	Mfrs. Warehouse	Corn, oats, alfalfa, molasses	Below guaranty in protein.
128-16	G. F. Phillips, Paducah.	Corn, oats, alfalfa, molasses	
128-16	Moore Coal & Feed Co. Paducah.	Same	Contains wheat and screenings.
123-17	Mfrs. Warehouse	Same	Above guaranty in fiber.
118-15	L. E. Chapman, Owensboro.	Cracked corn, whole oats, alfalfa meal, molasses	
118-18	Louis de Cognets & Co. Lexingotn.	Corn, oats, alfalfa, molasses	
118-18	Corley Hdw. & Grocery Co., Barbourville.	Same	
119-18	Louis de Cognets & Co. Lexington.	Corn, oats, alfalfa, molasses	
645-19	Corley Hdw. & Grocery Co., Barbourville.	Same	
645-19	J. A. Roam & Co. Pembroke.	Same	Above guaranty in fiber.
1429-19	Big Sandy Grocery Co. Catlettsburg.	Corn, oats	Above guaranty in fiber.
650-16	Danville Coal & Ice Co. Danville.	Cotton seed meal, hominy feed, brewers' grains, molasses, ground alfalfa, salt 1%.	Below guaranty in fat, above in fiber.
650-17	Same	Same	Above guaranty in fiber.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
650-17	Purina Cow Chow Feed	Purina Mills, Br., Ralston Purina Co., St. Louis, Mo.	27.63	3.80	15.69
			24.00	5.00	12.00
650-17	Same	Same	27.63	3.81	14.62
			24.00	3.70	16.00
650-18	Same	Ralston Purina Co. St. Louis, Mo.	25.56	4.58	11.70
			24.00	4.80	12.00
650-18	Same	Same	24.06	4.05	12.27
650-18	Same	Same	26.44	4.25	13.78
			24.00	3.70	16.00
650-18	Same	Same	25.56	3.86	11.55
			24 00	4.80	12.00
1703-17	Purina O'Moline Feed	Same	12.38	3.88	8.20
			9.70	3.20	8.00
1703-17	Same	Same	10.50	3.24	8.45
1703-18	Same	Same	11.44	3.50	7.67
1703-18	Same	Same	11.56	3.28	8.36
557-19	Same	Same	9.88	3.14	8.05
1866-16	Purity Dairy Feed	Purina Mills, Br., Ralston Purina Co., St. Louis Mo.	22.25	3.72	19.48
			20.00	3.80	15.00
2274-17	Same	Same	20.25	3.00	18.90
			20.00	3.60	16.50
2274-17	Same	Same	26.38	3.38	16.05
2274-17	Same	Same	25.88	3.83	16.43
641-15	Purina Feed with Molasses	Same	12.45	2.64	13.62
			9.30	1.70	11.70
641-17	Same	Same	11.38	2.85	11.70
641-17	Same	Same	12.25	2.97	11.98
641-17	Same	Same	14.88	3.82	11.73
641-18	Same	Same	11.44	3.05	12.16
			9.30	1.70	13.00
641-18	Same	Same	10.00	2.78	13.51
645-18	XX Good Feed with Molasses	Same	11.19	2.93	15.27
			9.00	1.50	15.00
1880-17	Purina Pig Feed	Same	15.75	4.60	12.13
			12.00	1.75	9.00
647-16	Peek's Mule Feed with Molasses	Illinois Feed Mills, Br., Ralston Purina Co., St. Louis, Mo.	9.68	1.99	15.51
			9.00	2.00	12.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
650-17	Owensboro Grain Co. .... Owensboro.	Cotton seed meal, hominy feed, brewers' dried grains, ground alfalfa, molasses, salt 1%.	Below guaranty in fat, above in fiber.
650-17	Martin & Hodgkin Supply Co., Winchester.	Cotton seed meal, brewers' dried grains, gluten feed, ground alfalfa, molasses, salt 1%.	
650-18	The Jellico Grocery Co. .. Harlan.	Cotton seed meal, O. P. linseed oil meal, corn gluten feed, hominy feed, ground alfalfa, molasses.	
650-18	S. C. Jennings... ..... Madisonville.	Same	
650-18	Eminence Milling Co. .... Eminence.	Cotton seed meal, brewers' dried grains, corn gluten feed, ground alfalfa, molasses, salt 1%.	
650-18	Simpson Co. Hardware Co. Franklin.	Cotton seed meal, O. P. linseed oil meal, corn gluten feed, hominy feed, ground alfalfa, molasses, salt 1%.	Below guaranty in fat.
1703-17	Owensboro Grain Co. .... Owensboro.	Cracked corn, oats, ground alfalfa, molasses, salt 1%.....	
1703-17	Danville Coal & Ice Co. .. Danville.	Same	
1703-18	Oscar Farmer & Sons.... Louisville.	Same	
1703-18	S. B. Jones..... Pembroke.	Same	
557-19	The Jellico Grocery Co. .. Harlan.	Same	
1866-16	Kenton Hay & Grain Co.. Covington.	Cotton seed meal, brewers' dried grains, gluten feed, ground alfalfa, molasses, salt 1%.	Above guaranty in fiber.
2274-17	Bush & Bush..... Ashland.	Cotton seed meal, brewers' dried grains, corn gluten feed, ground alfalfa, molasses, salt 1%.	Below guaranty in fat, above in fiber.
2274-17	Latonia Hay & Grain Co. Latonia.	Same	
2274-17	Oscar Farmer & Sons..... Louisville.	Same	
641-15	Danville Coal & Ice Co. .. Danville.	Cracked corn, whole oats, ground alfalfa, molasses, salt 1%.....	Above guaranty in fiber.
641-17	Jellico Grocery Co. ..... Harlan.	Same	
641-17	T. M. Wooldridge..... Hopkinsville.	Same	
641-17	Danville Coal & Ice Co... Danville.	Same	
641-18	West Kentucky Coal Co. . Sturgis.	Same	
641-18	S. H. Brown..... Bowling Green.	Same	
645-18	W. W. Broadus & Co. .... Richmond.	Cracked corn, oats, ground alfalfa, molasses, salt 1%.....	
1880-17	Owensboro Grain Co. .... Owensboro.	Corn feed meal, alfalfa, molasses, peat 5%, salt.....	Above guaranty in fiber.
647-16	Brenner Brothers..... Guthrie.	Cracked corn, whole oats, ground alfalfa, molasses, salt 1%.....	Above guaranty in fiber.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
218-16	Rapier's Big Four Horse and Mule Feed.	Rapier Sugar Feed Co. ..... Owensboro, Ky.	11.06	3.38	12.53
			10.00	**2.50**	**12.00**
218-18	Same	Same	10.25	3.23	13.50
1220-15	Rapier's Red Wing Horse and Mule Feed.	Same	13.63	3.03	18.63
			9.00	**2.00**	**12.00**
1220-17	Same	Same	12.25	3.18	18.40
1220-18	Same	Same	10.44	2.73	14.95
217-16	Rapier's Otene Horse and Mule Feed.	Same	11.88	2.44	18.60
			9.00	**2.00**	**12.00**
217-16	Same	Same	13.06	2.28	17.63
217-16	Same	Same	13.50	2.11	17.98
217-17	Same	Same	13.56	2.53	17.21
217-17	Same	Same	12.50	3.31	16.92
217-18	Same	Same	10.94	2.75	14.00
1475-16	Rapier's Alfalfa Horse and Mule Feed.	Same	11.25	2.43	15.61
			10.00	**2.50**	**12.00**
1756-15	Rapier's Creamo Dairy Feed.....	Same	17.94	3.58	17.09
			16.50	**3.50**	**16.00**
1756-15	Same	Same	19.63	3.87	16.47
214-15	Same	Same	18.67	2.63	15.93
			16.50	**3.50**	**12.00**
1756-16	Same	Same	19.63	4.37	15.82
1756-16	Same	Same	18.00	4.12	17.64
1756-16	Same	Same	16.75	4.68	17.23
1756-17	Same	Same	16.19	3.09	20.60
1756-17	Same	Same	17.25	3.16	20.93
1756-17	Same	Same	16.88	3.10	22.90
1756-17	Same	Same	17.13	4.04	19.61
1756-17	Same	Same	13.94	2.59	17.48

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
218-16	L. E. Chapman, Owensboro.	Corn, oats, alfalfa meal, cane molasses, salt 1%	
218-18	Jellico Grocery Co., Barbourville.	Same	Above guaranty in fiber.
1220-15	E. L. Mallory Grain Co., Paducah.	Corn, alfalfa meal, oats, molasses, salt 1%	Above guaranty in fiber. Largely alfalfa.
1220-17	Walter Mathews, Paducah.	Same	Same.
1220-18	Elizabethtown Milling Co., Elizabethtown.	Same	Same.
217-16	Lagrange Flour & Feed Mills, Lagrange.	Alfalfa meal, oats, cracked corn, cane molasses, salt 1%	Unsound material used. Above in fiber.
217-16	A. J. Bartlett, Franklin.	Same	Above guaranty in fiber. Largely alfalfa.
217-16	T. H. O'Brien, Dawson Springs.	Same	Same.
217-17	The Mahan Co., Winchester.	Same	Same.
217-17	T. M. Wooldridge, Hopkinsville.	Same	Same.
217-18	W. N. Holt, Irvington.	Same	Above guaranty in fiber. Screening present.
1475-16	J. A. Camp, Owensboro.	Alfalfa meal, cracked corn, oats, cane molasses	Above guaranty in fiber. Excess of alfalfa.
1756-15	Hudson & Hughes, Lancaster.	Cotton seed meal, linseed meal, alfalfa meal, gluten feed, molasses, ground and bolted grain screenings 35%, salt 1%.	No gluten feed. Above guaranty in fiber.
1756-15	Knight's Feed Store, Owensboro.	Same	
214-15	E. L. Mallory Grain Co., Paducah.	Same	Below guaranty in fat, above in fiber.
1756-16	A. J. Bartlett, Franklin.	Same	Above guaranty in fiber.
1756-16	Forgy & Wells, Pembroke.	Same	Unsound materials used. Above in fiber.
1756-16	Same	Same	Above guaranty in fiber. Largely alfalfa meal and screenings used.
1756-17	The Mahan Co., Winchester.	Same	Above guaranty in fiber.
1756-17	Lagrange Flour & Feed Mills, Lagrange.	Same	Made of inferior material. Above in fiber.
1756-17	M. J. Yopp, Paducah.	Same	Largely alfalfa and screenings. Above in fiber.
1756-17	T. M. Wooldridge, Hopkinsville.	Same	Largely alfalfa and screenings. Above in fiber.
1756-17	J. L. Hart, Cynthiana.	Same	Below in protein and fat, above in fiber. Inferior materials, no linseed meal, cotton seed hulls, and oat hulls present.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1756-17	Rapier Creamo Dairy Feed	Rapier Sugar Feed Co. Owensboro, Ky.	15.50 16.50	3.29 3.50	20.37 12.00
1756-17	Same	Same	14.94	4.29	18.90
1756-18	Same	Same	16.19 16.50	4.72 3.50	17.44 16.00
1756-18	Same	Same	23.94	4.00	13.59
1264-16	Rapier's Pig Meal	Same	17.38 12.00	3.18 2.50	13.20 12.00
1264-16	Same	Same	13.88	5.01	16.58
1264-17	Same	Same	16.63	2.99	14.43
1264-17	Same	Same	18.25	5.93	14.12
1264-17	Same	Same	14.25	3.74	18.59
1264-17	Same	Same	14.81	3.53	14.68
1264-18	Same	Same	10.94	2.40	15.56
1264-18	Same	Same	11.25	2.51	12.23
1264-18	Same	Same	12.50	2.14	15.66
1264-18	Same	Same	12.13	2.27	12.22
1264-18	Same	Same	13.63	3.45	10.78
1264-18	Same	Same	12.31	3.32	13.02
1264-18	Same	Same	12.44	2.96	10.00
423-19	Same	Same	10.94	2.02	10.06
1816-16	Riedling's Purity Horse and Mule Feed.	Riedling & Bro. Louisville, Ky.	12.63 9.00	1.83 2.00	17.65 15.00
1479-15	Evergreen Horse Feed	W. J. Riedling Alfalfa Products Co., Louisville, Ky.	11.13 10.00	1.97 2.50	18.33 12.00
1518-15	Special Horse Feed	Same	12.13 10.00	2.47 2.00	16.12 12.00
1480-16	Peerless Horse Feed	Same	12.13 10.00	2.86 2.00	17.95 12.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1756-17	J. C. Dunavent..... Eminence.	Cotton seed meal, linseed meal, alfalfa meal, gluten feed, molasses, ground and bolted grain screenings 35%; salt 1%.	Made of inferior materials. Below guaranty in protein and above in fiber.
1756-17	Same	Same	Below in protein, above in fiber. Inferior to guaranty.
1756-18	Climax Roller Mills..... Shelbyville.	Same	Above guaranty in fiber.
1756-18	First Kentucky District Supply Co., Glasgow.	Same	
1264-16	Lagrange Flour & Feed Mills, Lagrange.	Louisiana cane molasses, alfalfa leaf meal, O. P. linseed oil meal, recleaned ground wheat screenings 55%, feed meal, salt 1%.	Above guaranty in fiber.
1264-16	J. O. Redford & Co..... Horse Cave.	Same	Same.
1264-17	T. M. Wooldridge..... Hopkinsville.	Same	Above guaranty in fiber. Largely alfalfa and grain screenings.
1264-17	E. L. Mallory Grain Co.. Paducah.	Same	Same.
1264-17	First Kentucky District Supply Co., Glasgow.	Same	Same.
1264-17	The Mahan Co..... Winchester.	Same	Above in fiber. No feed meal or oil meal, largely alfalfa and screenings.
1264-18	Dorsey Bros. & Fisher.... Carlisle.	Same	Below in protein, above in fiber. Largely alfalfa and grain screenings.
1264-18	The Mahan Co..... Winchester.	Same	Below in protein. Largely alfalfa and screenings.
1264-18	R. L. Hardy..... Russellville.	Same	Above guaranty in fiber. No linseed meal nor feed meal present.
1264-18	First Kentucky District Supply Co., Glasgow.	Same	Largely alfalfa and screenings.
1264-18	Kentucky Feed Co..... Flemingsburg.	Same	Same.
1264-18	Dorsey Bros. & Fisher.... Carlisle.	Same	Above guaranty in fiber.
1264-18	J. L. Hart..... Cynthiana.	Same	
423-19	B. G. Waller & Son..... Morganfield.	Same	Inferior to guaranty. Below in protein.
1816-16	N. Goldsmith ..... Louisville.	Corn, oats, barley, alfalfa, molasses, salt	Above in fiber. No oats nor barley.
1479-15	H. G. Brooks & Co..... Louisville.	Corn, oats, alfalfa, molasses.....	Below in fat. above in fiber. Largely alfalfa.
1518-15	W. H. Luesing Co..... Louisville.	Alfalfa, meal, corn, oats, molasses, salt ½ of 1%.....	Above guaranty in fiber.
1480-16	Mfrs. Warehouse	Corn, oats, alfalfa meal, molasses.	Above guaranty in fiber.

TABLE VII.—MISCELLANEOUS MIXED FEEDS.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1968-16	Ryde's Cream Calf Meal	Ryde & Company	26.75	5.38	8.60
		Chicago, Ill.	25.00	5.00	6.00
1094-14	Double "S" Crushed Feed	A. Schneider's Sons	12.38	3.63	9.50
		Louisville, Ky.	12.19	4.03	10.38
367-19	Security Horse Feed	Security Mills & Feed Co.	11.00	3.50	10.15
		Knoxville, Tenn.	10.00	3.00	10.00
3052-18	Grainola Hog Feed	Simmons & Norris	20.69	5.05	6.38
		Cincinnati, Ohio.	20.00	5.00	7.00
493-19	Atlas Horse and Mule Feed	Southern Seed Co.	9.62	2.43	15.05
		Louisville, Ky.	10.00	2.50	12.00
1227-17	Atlas Dairy Feed	Same	24.13	3.74	20.94
			18.00	4.00	16.00
3020-18	Same	Same	18.00	2.98	23.26
			18.00	3.00	16.00
497-19	Palmoil Middlings and Screenings	The Trent Co.	16.19	7.87	7.43
		Cincinnati, Ohio.	16.50	7.50	8.50
2452-17	Kuhmele	James Walsh & Co.	27.81	9.63	14.06
		Lawrenceburg, Ind.	21.80	6.00	16.10
1517-15	Ground Feed	Wood, Stubbs & Co.	11.25	1.80	2.10
		Louisville, Ky.	10.81	3.44	2.33

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1968-16	Bush & Prichard..... Ashland.	Carob beans, flaxseed, wheat flour, cotton seed meal, beans and lentils, foenugreek, anise, cocoa hull, meal, salt.	Above guaranty in fiber.
1094-14	Mfrs. Warehouse	Corn, oats, wheat, alfalfa meal, brewers' dried grains, condition powders.	
367-19	Williams Bros..... Williamsburg.	Corn, oats, alfalfa meal, molasses	
3052-18	Wm. Addams ..... Cynthiana.	Corn feed meal, corn bran, wheat bran, wheat middlings, hominy meal, rye middlings, O. P. linseed oil meal, corn gluten feed, digester tankage, salt.	
493-19	Steely & Steely..... Williamsburg.	Alfalfa, oats, corn, molasses, salt ½%	Above guaranty in fiber.
1227-17	Fayette Coal, Grain & Feed Co., Lexington.	Corn meal, brewers' grains, distillers' dried grains, cotton seed meal, alfalfa, wheat bran, molasses, salt 1%.	Above guaranty in fiber.
3020-18	G. C. Shaw..... Frankfort.	Alfalfa meal, cotton seed meal, corn meal, molasses, salt 1%..	Same.
497-19	Wm. Addams ..... Cynthiana.	Palm oil, wheat middlings, ground wheat screenings 5%.....	
2452-17	J. H. Fedders & Sons..... Covington.	Corn, wheat middlings, cotton seed meal, corn, distillers' dried grains, alfalfa meal, salt.	
1517-15	W. H. Luesing & Co. .... Louisville.	Corn meal, kaffir corn meal, wheat meal	Below guaranty in fat.

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
	Miscellaneous Feeds—Little or No Value.				
2220-16	Acme Stock Feed	Acme-Evans Company, Indianapolis, Ind.	8.00 10.00	3.44 4.00	12.85 9.00
1492-18	E.-Z. Dairy Feed	Same	19.13 16.00	4.57 3.50	13.64 12.00
302-19	Same	Same	16.69	3.85	16.20
2415-17	Big J. Bean Meal and Hulls	Acme-Jones Company, Louisville, Ky.	18.38 19.00	4.27 4.00	14.37 14.00
2750-18	Big X Dairy Feed	Same	17.00 17.00	3.20 4.25	16.82 15.00
2750-18	Same	Same	17.13 16.00	3.56 3.00	15.53 16.10
2750-18	Same	Same	15.56 17.00	3.65 4.25	15.73 15.00
114-19	Same	Same	15.50 16.00	3.58 3.00	20.55 16.10
2212-16	King Cotton Horse and Mule Feed	Alfocorn Milling Company, E. St. Louis, Ill.	13.88 9.00	3.03 1.50	14.65 15.00
2260-16	Amco Dairy Feed	American Milling Company, Peoria, Ill.	28.19 25.00	8.65 8.00	14.78 14.00
2260-17	Same	Same	27.44 25.00	6.02 8.00	15.19 16.00
1882-16	Sucrene Dairy Feed	Same	19.13 16.50	5.03 3.50	14.40 12.00
1882-16	Same	Same	21.63	6.51	14.78
1882-17	Same	Same	20.50 16.50	4.20 3.50	15.42 14.00
1882-18	Same	Same	17.44	3.68	15.13
1882-18	Same	Same	18.38	3.98	10.19
1882-18	Same	Same	19.75	4.58	15.88

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2220-16	The Jellico Grocery Co. .. Harlan.	Corn, corn feed meal, barley (oat middlings, oat shorts and oat hulls) 40%.	Below guaranty in protein and fat, above in fiber.
1492-18	Hodgkin Grocery Co. .... Winchester.	Corn, wheat bran, wheat middlings, cotton seed meal, hominy feed, brewers' dried grains, linseed oil meal, oat hulls 25%, salt ½%.	Above in fiber.
302-19	Sparks & Brown..... London.	Brewer's dried grains, cotton seed meal, wheat middlings, hominy meal, linseed oil meal, corn gluten feed (oat middlings and oat hulls) 30%, salt.	Above guaranty in fiber.
2415-17	R. D. Riedling..... Louisville.	Velvet bean meal, velvet bean hulls 35%	Below in protein.
2750-18	M. J. Yopp Seed Co. .... Paducah.	Velvet bean meal, velvet bean hulls 20%, corn feed meal, cotton seed meal (oat hulls and oat middlings) 20%, salt ½%.	Below guaranty in fat, above in fiber.
2750-18	Harvey Stour & Son..... Buechel.	Cotton seed meal, corn feed meal, gluten feed (oat hulls and oat middlings) 40%, salt ½%.	
2750-18	Lagrange Feed & Grain Co., Lagrange.	Same	Below guaranty in protein and fat.
114-19	Lovett Fruit & Produce Co., Harlan.	Cotton seed meal, gluten feed, corn feed meal (oat hulls and oat middlings) 40%, salt ½%.	Below guaranty in protein, above in fiber.
2212-16	A. Schneider's Sons..... Louisville.	Corn, alfalfa meal, clipped oat by-product 20%, molasses	
2260-16	J. C. Everett & Co. ..... Maysville.	Corn gluten feed, distillers' dried grains, salt, clipped oat by-product 15%.	Above guaranty in fiber.
2260-16	Hurst & Fitch..... Winchester.	Same	Below in fat. Cotton seed meal present.
1882-16	J. C. Everett & Co. ..... Maysville.	Molasses, cotton seed meal, corn gluten feed, ground and bolted grain screenings 25%, corn distillers' dried grains, clipped oat by-product 20%.	Above guaranty in fiber.
1882-16	Same	Same	Above guaranty in fiber.
1882-17	J. C. Everett & Co. ..... Maysville.	Molasses, cotton seed meal, corn gluten feed, ground and bolted grain screenings 20%, clipped oat by-product 20%, corn, distillers' dried grains, corn, distillers' solubles.	Above guaranty in fiber.
1882-18	Latonia Hay & Grain Co.. Latonia.	Molasses, cotton seed meal, corn gluten feed, clipped oat by-product 20%, ground and bolted grain screenings 15%, corn distillers' dried grains and solubles, pall kernel meal, calcium carbonate ½%, salt ½%.	Above guaranty in fiber.
1882-18	D. A. Leffingwell & Co. .. Ashland.	Molasses, cotton seed meal, ground and bolted grain screenings 15%, clipped oat by-product 20%, corn distillers' dried grains and solubles, calcium carbonate ½%, salt ½%, corn meal.	
1882-18	Sadieville Milling Co. ... Sadieville.	Same	Above guaranty in fiber.

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
373-19	Sucrene Dairy Feed	American Milling Co.	19.44	4.38	21.47
		Owensboro, Ky.	16.50	3.50	14.00
1392-15	Amco Fat Maker	American Milling Co.	16.19	4.87	10.63
		Peoria, Ill.	10.00	3.50	12.00
382-19	Sucrene Hog Meal	Same	21.13	5.67	9.91
			18.00	4.00	10.00
1339-17	Sucrene Horse and Mule Feed	Same	9.50	3.61	16.36
			9.00	2.50	12.00
245-17	Tip Top Sugared Feed	Same	14.81	6.02	14.46
			12.00	2.50	14.00
2049-16	Arcady Dairy Feed	Arcady Farms Milling Co.	15.88	5.33	16.50
		Chicago, Ill.	16.00	3.50	15.00
2105-16	R. K. D. Arcady Hog Meal	Same	22.75	5.25	7.98
			18.00	5.00	10.00
2105-18	Arcady (R. K. D.) Hog Meal and Peat.	Same	17.75	6.00	7.43
2105-18	Same	Same	19.44	5.48	8.26
2105-18	Same	Same	18.56	5.20	8.23
2105-18	Same	Same	19.69	5.51	8.28
2224-16	Peerless Cow Feed	The J. S. Ashbrook Co.	17.19	3.33	15.58
		Mattoon, Ill.	15.00	3.00	12.00
1505-19	Diamond "A" Hog Meal	Same	16.13	8.75	14.40
			16.00	8.00	14.00
.....	Fox Brand Cotton Seed Feed	F. W. Brode & Co.	19.63	3.20	27.13
		Memphis, Tenn.	20.00	5.00	22.00
	Cotton Seed Meal and Hulls Mixed	The Buckeye Cotton Oil Co.	19.81	3.60	26.47
		Cincinnati, Ohio.	20.00	3.50	27.00
2680-18	Unshelled Peanut Oil Feed	Same	29.94	6.03	28.65
			30.00	6.00	22.00
1849-17	"Buco" Cotton Seed Feed	Buckeye Cotton Oil Co.	19.94	3.70	24.63
		Cincinnati, Ohio.	20.00	3.50	27.00
1849-18	Same	Same	18.88	3.00	26.35

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
373-19	Park City Feed Store.... Bowling Green.	Molasses, ground and bolted wheat screenings 15%, clipped oat by-product 25%, corn feed meal, ground barley, cotton seed meal, cocoanut meal, calcium carbonate ½%, salt ½%.	Above guaranty in fiber Excess oat hulls.
1392-15	Pruitt Feed Co..... Henderson.	Molasses, clipped oat by-products 25%, oats, corn, germ oil meal, salt.	
382-19	M. T. Henderson..... Owensboro.	Molasses, alfalfa meal, corn feed meal corn germ meal, linseed meal, ground barley, soluble blood flour, peanut oil meal (peanut meal and hulls) 5%, cocoanut meal, calcium carbonate ½%, salt ½%.	
1339-17	H. P. Hawkins' Sons.... Paducah.	Molasses, corn, corn distillers' dried grains, corn distillers' solubles (oat middlings, oat shorts and oat hulls) 25%, salt.	Excess of hulls. Above guaranty in fiber.
245-17	Hurst & Fitch..... Winchester.	Molasses, clipped oat by-products 30%, cotton seed meal, corn distillers' dried grains, corn distiller's solubles, ground and bolted grain screenings 25%, salt.	
2049-16	C. R. Barnes..... Bardstown.	Malt sprouts, brewers' dried grains, cotton seed meal, corn gluten meal, dried and bolted clipped oat by-product 25%, cleaned, ground and bolted grain screenings 20%.	Above guaranty in fiber. Excess screenings.
2105-17	Same	Wheat middlings, corn germ meal, corn feed meal, digester tankage, linseed meal, cleaned, ground and bolted grain screenings (wheat, oats, barley flax) 40%, peat 5%, salt ½ of 1%.	
2105-18	Glasgow Feed & Produce Co., Glasgow.	Wheat middlings, linseed oil meal, digester tankage, corn feed meal, corn germ meal, cleaned, ground and bolted grain screenings 20%, molasses, peat 5%, salt 1%.	
2105-18	Kentucky Feed & Grain Co., Louisville.	Same	
2105-18	Same	Same	
2105-18	Same	Same	
2224-16	Pruitt Feed Co..... Henderson.	Ground corn, wheat bran, wheat middlings, cotton seed meal, alfalfa meal (oat middlings, oat shorts and oat hulls, 10%) molasses.	Above guaranty in fiber. Excess of hulls.
1505-19	Ruef Brothers ..... Covington.	Corn germ meal, linseed oil meal, delinted cotton seed hulls 10%, corn feed meal, rice bran.	
.....	Elizabethtown Milling Co. Elizabethtown.	Cotton seed meal, cotton seed hull bran	Excess of hulls. Below guaranty in fat, above in fiber.
.....	J. H. Fedders & Sons..... Covington.	Cotton seed meal, cotton seed hulls	Above guaranty in fiber. Excess of hulls.
2680-18	Ruef Bros..... Covington.	Peanut meal, ground peanut hulls 20%	
1849-17	Overby & Wallis..... Murray.	Cotton seed meal 50%, cotton seed hulls 50%	Below guaranty in protein.
1849-18	Walter Mathews..... Paducah.	Same	

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1849-16	"Buco" Cotton Seed Feed	Buckeye Cotton Oil Co.	20.44	3.15	28.18
		Cincinnati, Ohio.	20.00	3.50	27.00
1849-17	Same	Same	21.00	3.78	26.65
2362-17	Animo Horse and Mule Feed	Same	11.88	2.02	20.69
			9.00	2.25	18.00
2362-18	Same	Same	10.56	2.40	18.05
			9.00	2.00	19.00
2364-17	Animo Sweet Dairy Feed	Same	11.94	1.63	26.53
			13.00	2.50	26.27
2361-17	Animo Special Horse and Mule Feed.	Same	11.81	2.58	19.51
			10.00	2.50	15.00
2580-17	Velvet Bean Feed	Butler County Feed & Milling Co., Greenville, Ala.	17.63	4.33	16.49
			18.00	4.25	14.00
2580-18	Same	Same	17.00	4.40	14.28
2580-18	Same	Same	18.63	4.28	13.65
1288-16	Daisy Dairy Feed	Cairo Milling Co.	12.31	2.08	13.79
		Cairo, Ill.	13.25	3.50	12.50
1284-16	Velvet Molasses Feed	Same	11.94	3.24	14.13
			9.00	2.00	12.00
1284-17	Same	Same	9.50	2.80	17.44
1284-17	Same	Same	8.06	1.88	20.50
1654-15	Sugarola Horse and Mule Feed	The Central Grain & Milling Co., Columbus, Ohio.	11.33	2.88	14.08
			10.00	3.00	15.00
1655-15	Creamola Dairy Ration	Same	17.13	3.48	14.65
			16.00	4.00	14.50
2465-17	"Creamo Brand" Cotton Seed Meal.	The Cincinnati Grain & Hay Co., Covington, Ky.	20.56	4.28	25 32
			20.00	4.50	22.00
2694-18	Velvet Bean Feed	Same	16.88	4.08	15.17
			18.00	4.25	14.00
1115-18	Corno Dairy Feed	The Corno Mills Co.	19.50	5.18	14.72
		St. Louis, Mo.	15.00	3.50	15.00
1113-15	Corno Horse and Mule Feed	Same	9.88	3.08	14.65
			10.00	3.50	15.00
1114-16	Corno Sweet Feed	Same	13.18	1.31	15.06
			10.00	2.50	15.00
1773-15	Nutro Sweet Horse Feed	Same	9.00	2.38	19.05
			9.00	2.50	15 00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1849-16	Fulton Flour-Feed Dealers & Mfg Co., Fulton.	Cotton seed meal 50%, cotton seed hulls 50%.	Above guaranty of fiber. Excess of hulls.
1849-17	Covington Bros. & Co. ... Murray.	Same	
2362-17	Covington Bros. & Co. ... Paducah.	Corn, alfalfa, oats, cotton seed meal, ground lintless cotton seed hulls, 20%, molasses, salt 1%.	Above in fiber. Excess of cotton seed hulls.
2362-18	Overby & Wallis..... Murray.	Same	
2364-17	D. A. Leffingwell & Co.. Ashland.	Corn meal, alfalfa, cotton seed meal, cotton seed hulls 30%, salt ½%.	Below in protein and fat, above in fiber. Adulterated with hulls
2361-17	Covington Bros. & Co. ... Murray.	Corn, oats, alfalfa, cotton seed meal, ground lintless cotton seed hulls 18%, molasses, salt 1%.	Above guaranty in fiber. Excess of hulls.
2580-17	J. S. Morgan & Co. ..... Georgetown.	Ground velvet beans 69%, ground velvet bean hulls 31%.....	Above guaranty in fiber. Excess of hulls.
2580-18	R. L. Hardy..... Russellville.	Same	Below guaranty in protein.
2580-18	Lagrange Feed & Grain Co., Lagrange.	Ground velvet beans 69%, ground velvet bean hulls 31%.....	
1288-16	Covington Bros. ..... Paducah.	Ground corn, wheat bran, alfalfa meal, ground grain screenings 10% (oat middlings, oat shorts and oat hulls) 10%, molasses.	Below guaranty in protein and fat, above in fiber.
1284-16	Same	Cracked corn, alfalfa meal, ground grain screenings 10% (oat middlings, oat shorts and oat hulls) 10%, molasses.	Above guaranty in fiber. Wheat present. Excess of hulls.
1284-17	Same	Same	Above in fiber. Oats present. Excess of hulls.
1284-17	W. D. Roberts..... Mayfield.	Same	Below in protein and fat, above in fiber. Adulterated with excess of hulls.
1654-15	Ashland Feed Co. ..... Ashland.	Molasses, crushed oats, cracked corn, alfalfa meal, ground grain screenings 4% (oat shorts, oat hulls and oat middlings) 20%.	
1655-15	Same	Molasses, malt sprouts, new process oil meal, ground grain screenings 45%, oat middlings, oat shorts, oat hulls 16%.	Below in fat. No oil meal present.
2465-17	Mfrs. Warehouse	Choice cotton seed meal, cotton seed hulls 50%.....	Above guaranty in fiber. Excess of hulls.
2694-18	Berea College ..... Berea.	Velvet bean meal, velvet bean hulls 40%	Below in protein, above in fiber. Excess of hulls.
1115-18	A. Koltinsky ..... Princeton.	Ground alfalfa, cotton seed meal (oat middlings, oat shorts and oat hulls), 20%; ground cotton seed hulls 10%, molasses.	
1113-15	Geo. H. Ratterman & Co.. Louisville.	Ground alfalfa, cracked corn, hominy feed, cotton seed meal (oat middlings, oat shorts and oat hulls), 15%.	
1114-16	The H. T. Hackney Grocery Co., Middlesboro.	Whole oats, cracked corn, ground alfalfa, cane molasses, cotton seed meal (oat middlings, oat shorts and oat hulls), 10%.	Below guaranty in fat.
1773-15	Ritter-Hennings Co. ..... Louisville.	Ground alfalfa, cracked corn (oat middlings, oat shorts and oat hulls) 20%, ground grain screenings 15%, molasses.	Above guaranty in fiber. Excess of hulls.

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
1773-16	Nutro Sweet Horse Feed	The Corno Mills Co. St. Louis, Mo.	10.13 9.00	2.80 2.50	17.93 15.00
1773-16	Same	Same	9.75	1.68	18.20
2154-17	Nutro Sweet Feed	Same	10.13	2.20	15.75
204-19	Same	Same	7.88 8.00	2.95 2.00	14.85 18.00
186-10	Crushed Feed	J. W. Davis & Co. Elkton, Ky.	7.75 7.81	4.40 4.26	7.57 .....
2779-18	Diamond Dairy Feed	Dixie Mills Co. E. St. Louis, Ill.	14.19 16.50	4.00 3.50	20.55 12.00
2779-18	Same	Same	17.00	4.11	18.69
60-19	Same	Same	14.44 16.50	4.55 3.50	15.21 17.00
2782-18	Holsum Dairy Feed	Same	12.31 12.00	4.38 2.00	19.99 17.00
2204-16	Clipco Molasses Feed	Same	9.50 6.00	2.40 0.50	12.57 12.00
1700-18	Polo Dairy Feed	Same	18.38 17.50	5.70 3.50	15.07 16.00
144-19	Queen City Horse Feed	Eikenberry-Fitzgerald Co. Cincinnati, Ohio.	11.56 9.00	3.78 3.00	10.60 12.00
144-19	Same	Same	10.88	3.24	9.56
143-19	"Nutritia" Horse Feed	Same	11.88 10.50	3.98 3.50	9.63 10.00
2940-18	Red Crown Dairy Feed	Fisher Bros. Evansville, Ind.	17.69 16.00	4.15 3.00	14.28 17.00
358-19	Same	Same	18.56 16.00	3.60 3.50	16.73 17.00
2831-18	Diamond Hog and Pig Meal	Same	19.00 20.00	5.60 5.00	9.79 12.00
8-19	Same	Same	20.06	4.97	9.67
1254-19	Big Gee Hog and Pig Meal	Edw. F. Goeke Co. Evansville, Ind.	19.69 17.50	5.86 5.00	9.31 12.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
1773-16	Ritter-Hennings Co. ..... Louisville.	Ground alfalfa, cracked corn (oat middlings, oat shorts and oat hulls), 20%; molasses, ground grain screenings 15%, ground cotton seed hulls 5%.	Above guaranty in fiber. Excess of hulls.
1773-16	The H. T. Hackney Grocery Co., Middlesboro.	Same	Below guaranty in fat, above in fiber. Excess of hulls.
2154-17	J. M. Cole..... Murray.	Ground alfalfa, cracked corn, molasses, ground grain screenings 10%, (oat middlings, oat shorts and oat hulls), 20%.	
204-19	Burg Kinner ..... Greenup.	Ground alfalfa, cracked corn, whole oats crushed (oat middlings, oat shorts and oat hulls), 20% molasses.	
186-10	Mfrs. Warehouse	Corn, cob 6%, corn bran 20%....	
2779-18	Boston Mills ..... Boston.	Cotton seed meal, clipped oat by-product, 30%, molasses, ground flaxseed screenings 20%.	Adulterated with cotton seed hulls. Below in protein, high in fiber.
2779-18	Louis Diemer ..... Buechel.	Same	Above guaranty in fiber. Excess screenings.
60-19	Oscar Farmer & Sons.... Louisville.	Cotton seed meal, clipped oat by-product 30%, ground flaxseed screenings 40%, molasses.	Below guaranty in protein.
2782-18	Star Roller Mills..... Cloverport.	Clipped oat by-product 30%, cotton-seed feed, ground flax seed screenings 20%, molasses.	Above guaranty in fiber.
2204-16	Oscar Farmer & Sons.... Louisville.	Corn, oats, clipped oat by-products 35%, molasses	
1700-18	J. A. Roam & Co. ..... Pembroke.	Cotton seed meal, dried brewer's grains, ground alfalfa, clipped oat by-product 20%, wheat bran, corn feed meal, ground flaxseed screenings 30%.	
144-19	Big Sandy Grocery Co. .. Catlettsburg.	Crushed corn, crushed oats, wheat bran, alfalfa meal, brewer's grains, cotton seed meal, cotton seed hulls 2%, molasses, salt.	
144-19	Hiner & Stricklett..... Vanceburg.	Same	
143-19	Geo. Keller ..... Newport.	Oats, cracked corn, wheat bran, alfalfa meal, brewer's grains, cotton-seed meal, cotton seed hulls 2%, molasses, salt.	No cotton seed meal present.
2940-18	Henderson Feed & Commission Co., Henderson.	Alfalfa meal, molasses, corn feed meal, wheat bran, wheat middlings, hominy feed, linseed oil meal, cotton seed meal, cotton seed hulls 15%, salt 1%.	
358-19	S. C. Jennings..... Madisonville.	Alfalfa meal, molasses, corn feed meal, wheat bran, wheat screenings, linseed oil meal, cotton seed meal, cotton seed hulls 10%, salt ½%.	
2831-18	Park City Feed Store.... Bowling Green.	Digester tankage, hominy feed, linseed oil meal, wheat middlings, cotton seed meal, corn feed meal, Velvet bean feed (Velvet meal and hulls), 20%, salt 1%.	Below guaranty in protein.
8-19	N. I. Toombs..... Madisonville.	Digester tankage, wheat middlings, linseed oil meal, cotton seed meal, corn feed meal, Velvet bean meal, Velvet bean hulls 10%, salt ½%.	
1254-19	Henderson Feed & Commission Co., Henderson.	Feeding tankage, linseed oil meal, corn feed meal, velvet bean meal, velvet bean hulls 10%, wheat middlings, salt ½%.	

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
112-17	Golden Grain Mills Dairy Feed....	Golden Grain Milling Co.	13.19	2.55	20.68
		E. St. Louis, Ill.	12.00	3.00	18.00
112-18	Same	Same	13.69	2.26	21.21
112-18	Same	Same	13.81	2.39	18.06
2909-18	Fat Back Hog Feed.....	Same	20.00	4.48	10.57
			18.00	4.00	10.00
2909-18	Same	Same	18.00	5.56	9.59
2909-18	Same	Same	16.19	5.15	11.18
1989-16	Red Mule Feed.....	Gordonsville Milling Co.	11.38	3.38	9.03
		Gordonsville.	10.63	2.99	9.70
2741-18	Competitor Brand	Grain Belt Mills Co.	9.90	1.97	14.72
		St. Joseph, Mo.	9.00	1.50	18.50
689-19	Gold Flake Dairy Feed.....	Hales & Edwards Co.	16.44	5.08	13.70
		Chicago, Ill.	16.00	3.50	15.00
36-12	Halliday's Special Feed.....	H. L. Halliday Milling Co.	12.56	2.77	14.20
		Cairo, Ill.	9.00	2.00	15.00
36-16	Same	Same	9.11	1.84	13.52
36-16	Same	Same	9.50	2.75	13.98
			9.00	2.00	12.00
471-15	Kentucky Star Dairy Feed.....	Henderson Grain Co.	21.25	4.00	13.53
		Henderson, Ky.	16.50	3.50	12.00
.....	International Dairy Feed.....	International Sugar Feed Co..	13.88	6.20	16.43
		Minneapolis, Minn.	12.50	4.00	15.00
2823-18	Same	Same	16.63	4.67	17.49
			15.00	4.50	15.00
1357-15	Ringleader Horse and Mule Feed..	Same	10.44	1.94	13.99
			9.00	1.75	16.00
1342-17	International Jewel Feed.....	Same	10.75	2.73	15.43
			9.00	2.00	12.50
.....	International Makemeat Hog Feed	International Sugar Feed No.	16.63	4.39	12.53
		2 Co., Memphis, Tenn.	15.00	5.00	12.50
2267-16	Success Horse and Mule Feed....	Kentucky Feed & Grain Co. ...	14.00	1.04	17.90
		Louisville, Ky.	9.00	1.50	18.00
1257-19	Badger Dairy Feed.....	Chas. A. Krause Milling Co. ..	16.88	4.85	21.68
		Milwaukee, Wis.	16.50	3.50	15.00
2683-18	Barley Screenings	Louisville Milling Co.	11.25	2.74	18.52
		Louisville, Ky.	6.00	1.00	25.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
112-17	O. G. Barrow..... Hopkinsville.	Alfalfa meal, brewers' grains, clipped oat by-product 20%, cotton seed meal, molasses, salt ½%.	Above guaranty in fiber. Excess of hulls.
112-18	O. N. Smith & Co..... Frankfort.	Same	Below guaranty in fat, above in fiber. Excess of hulls.
112-18	F. H. Gordon..... Richmond.	Same	
2909-18	Mitchell & Kenney..... Danville.	Wheat middlings, wheat bran, digester tankage (meat meal), linseed oil meal, corn oil cake meal, ground grain screenings 15%, molasses, charred peat, 5%, alfalfa leaf meal corn feed meal.	Above in fiber.
2909-18	Hurst & Fitch..... Winchester.	Same	
2909-18	F. H. Gordon..... Richmond.	Same	Below guaranty in protein, above in fiber.
1989-16	G. Cooksey ..... Russellville.	Wheat bran, corn, oats, ground wheat screenings 25%, cob 23%, salt.	
2741-18	H. P. Hawkins' Sons.... Paducah.	Corn, oats, alfalfa meal, sorghum bugasse, meal 15%, molasses, salt 1%	
689-19	Edw. M. Riedling..... Louisville.	Cotton seed meal, corn gluten feed, linseed oil meal, molasses, clipped oat by-product 25%, ground and bolted wheat, barley and kaffir corn, screenings 25%, salt.	
36-12	Browder Milling Co.... Fulton.	Corn, oats, alfalfa meal, molasses (oat middlings, oat shorts and oat hulls) 4%.	
36-16	R. D. Robertson..... Mayfield.	Same	
36-16	Browder Milling Co.... Fulton.	Same	Above guaranty in fiber. Excess of hulls.
471-15	Mfrs. Warehouse	Molasses, cotton seed meal, gluten feed ground and bolted grain screenings 35%, clipped oat by-product 20%. linseed meal, salt.	Above guaranty in fiber. Excess of hulls.
.....	Power & Williams..... Pikeville.	Cotton seed meal, molasses, ground clipped oat by-product 20%, ground cleaned grain screenings.	Above guaranty in fiber. Excess of hulls.
2823-18	Pikeville Grocery Co.... Pikeville.	Cotton seed meal, molasses, ground clipped oat by-product 10%, salt ground cleaned grain screenings 60%.	Above guaranty in fiber. Excess of hulls.
1357-15	N. I. Toombs..... Madisonville.	Alfalfa meal, cane molasses, clipped oat by-products 4% maximum, salt.	
1342-17	J. A. Bush..... Hickman.	Corn, alfalfa meal, clipped oat by-product 50%, cane molasses, salt	Above guaranty in fiber. Excess of hulls.
.....	W. L. Kimbrough & Son.. Guthrie.	Linseed oil meal, digester tankage, ground and bolted grain screenings from wheat, corn feed meal, wheat bran, velvet bean feed, rice bran, salt	
2267-16	Geo. H. Ratterman..... Louisville.	Corn, oats, alfalfa meal, molasses, palmo meal, palm oil, peanut meats and hulls), 5%, salt ½%.	Below in fat. Sample largely alfalfa.
1257-19	Burg Kinner..... Greenup.	Cotton seed meal, alfalfa, ground and bolted screenings 20%, flax plant by-product 20%, molasses, salt.	Excess flax plant by-product. Above guaranty in fiber.
2683-18	Kentucky Feed & Grain Co., Louisville.	Barley hulls, barley middlings, barley screenings	

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2929-18	"Pioneer" Velvet Bean Feed	Lyle & Lyle, Huntsville, Ala.	16.63	3.79	14.43
			16.00	4.00	17.00
2929-18	Same	Same	17.31	4.17	16.13
1341-14	Cyclone Cotton Seed Feed	Memphis Cotton Hull & Fiber Co., Memphis, Tenn.	21.13	3.75	28.28
			20.00	3.00	23.00
563-17	Same	Same	19.94	3.41	25.17
			20.00	3.00	26.00
563-17	Same	Same	21.00	3.45	26.23
2441-18	Lookout Dairy Feed	Monarch Mills, Chattanooga, Tenn.	14.88	3.23	27.10
			15.00	4.00	25.00
2441-17	Same	Same	17.13	2.95	27.10
3065-18	Milk Mor Dairy Feed	Same	14.25	3.15	28.60
			15.00	4.00	25.00
1768-15	Purity Feed	Newport Mill Co., Loudon, Tenn.	13.38	5.15	11.93
			13.00	4.00	8.00
1932-16	Tom Boy Dairy Feed	Same	16.63	5.12	13.33
			16.00	4.50	14.00
1893-16	Tom Boy Horse Feed	Purity Oats Co., Davenport, Iowa.	12.63	1.44	16.99
			9.00	2.00	18.00
1893-16	Same	Same	10.27	1.26	16.60
1893-16	Same	Same	10.00	1.44	15.88
			9.00	2.00	18.00
1893-16	Same	Same	10.50	1.57	16.70
1931-16	Tom Boy Stock Feed	Same	10.19	4.08	12.05
			10.00	4.00	12.75
1931-16	Same	Same	9.75	4.53	11.45
745-11	White Diamond Feed	The Quaker Oats Co., Chicago, Ill.	11.46	3.92	5.85
			8.00	3.25	9.00
604-17	Blue Ribbon Dairy Feed	Same	22.31	5.60	15.66
			25.00	5.00	14.00
2074-17	Quaker Dairy Feed	Same	16.19	4.95	16.59
			16.00	5.50	16.00
615-15	Schumacher Stock Feed	Same	10.31	3.92	11.57
			10.00	3.50	10.50

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2929-18	S. E. Welch..... Berea.	Velvet bean meal, velvet bean hulls 40%	
2929-18	Conrad J. Clausen..... Louisville.	Same	
1341-14	Wm. Addams ..... Cynthiana.	Cotton seed meal, cotton seed hulls 50%	Above guaranty in fiber. Excess of hulls.
563-17	Same	Same	
563-17	Same	Same	
2441-18	Lovett Fruit & Produce Co., Harlan.	Wheat shorts, cotton seed meal, alfalfa meal, velvet bean meal, velvet bean hulls 35%, salt.	Above in fiber, below in fat. No wheat product present. Excess hulls.
2441-17	Lovett Fruit & Produce Co., Middlesboro.	Wheat shorts, cotton seed meal, rice bran, velvet bean meal, velvet bean hulls 10%, cotton seed hull bran 35%, salt.	Above guaranty in fiber. Excess of hulls.
3065-18	O. N. Smith..... Frankfort.	Alfalfa meal, velvet bean meal, velvet bean hulls 10%, cotton seed hulls 35%, salt 1%.	Above guaranty in fiber. Excess of hulls.
1768-15	The H. T. Hackney Co.. Middlesboro.	Wheat bran, wheat shorts, corn meal, corn bran, corn screenings 5%, corn, cob 6%, wheat screenings 5%.	Above guaranty in fiber. Excess of screenings.
1932-16	Jellico Grocery Co..... Harlan.	Cotton seed meal, corn meal, hominy feed, brewers' dried grains, oat middlings, oat shorts, and oat hulls 15%, table salt 1%.	
1893-16	The Ratliff Bros. Co.... Carlisle.	Cracked corn, whole oats, alfalfa meal, oat middlings, cotton seed meal, molasses, oat shorts and oat hulls 25%.	Below in fat.
1893-16	White Grocery Co..... Williamsburg.	Same	Below in fat.
1893-16	Geo. Newbaur..... Owensboro.	Same	No cotton seed meal present. Below in fat.
1893-16	R. L. Eversole & Co..... London.	Same	No cotton seed meal present. Below in fat.
1931-16	Jellico Grocery Co..... Harlan.	Wheat middlings, corn meal, hominy feed, brewers' grains, (oat middlings, oat shorts and oat hulls) 20%, table salt 1%.	
1931-16	White Grocery Co..... Williamsburg.	Same	
745-11	Ashland Feed Co..... Ashland.	Corn, oat middlings, oat shorts and oat hulls 15%, ½% salt...	
604-17	J. H. Fedders & Sons.... Covington.	Hominy feed, corn feed meal, wheat bran, cotton seed meal (oat middlings, oat shorts and oat hulls) 28%, molasses, distillers' dried grains, new process linseed oil meal, salt ½%.	Below guaranty in protein, above in fiber. Inferior to guaranty.
2074-17	C. W. Meyers..... Florence.	Molasses, cotton seed meal, ground grain screenings 44% (oat middlings, oat shorts and oat hulls 30%), dried distillers' grains, salt ½%.	
615-15	Ratliff Bros. & Co..... Carlisle.	Ground corn, hominy feed, wheat flour, ground barley, wheat middlings (oat middlings, oat shorts and oat hulls 25%), ground puffed wheat, ground puffed rice, salt ½%, cotton seed meal.	Above guaranty in fiber. Excess of oat hulls.

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
615-16	Schumacher Feed	The Quaker Oats Co. Chicago, Ill.	10.50 10.00	3.23 3.25	11.80 10.00
615-16	Same	Same	11.88	4.00	10.85
615-18	Same	Same	10.75	3.85	12.62
615-18	Same	Same	10.75	2.92	8.52
615-18	Same	Same	10.25	3.18	8.14
615-18	Same	Same	11.56	4.45	11.61
606-17	Victor Feed	Same	10.63 8.00	4.53 3.00	10.64 12.00
1490-18	Golden Sweet Mule Feed	Same	10.38 9.00	1.75 2.00	17.29 15.00
2190-16	Purina Pig Chow	Ralston Purina Co. St. Louis, Mo.	14.00 12.00	2.18 1.75	10.50 9.00
2190-17	Same	Same	12.13	3.03	12.83
2190-17	Same	Same	13.36	2.93	9.97
2190-18	Same	Same	13.31 14.00	3.90 3.20	10.88 9.00
2190-18	Same	Purina Mills, Branch, Ralston Purina Co., St. Louis, Mo.	15.63	3.45	9.00
2190-18	Same	Same	14.00	2.83	9.63
849-14	Protena Dairy Feed	Same	19.50 16.50	3.12 3.50	9.90 12.00
849-14	Same	Same	17.00	3.62	12.20
2835-18	Star Stock Feed	Ralston Purina Co. St. Louis, Mo.	13.19 12.00	4.95 3.00	14.19 15.00
205-15	Rapier's Molasses Fat Maker	Rapier Sugar Feed Co. Owensboro, Ky.	11.56 9.60	2.17 3.30	15.80 12.00
205-16	Same	Same	15.75	3.58	15.45
205-16	Same	Same	15.25	3.19	21.36
205-16	Same	Same	15.50	4.05	17.43

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
615-16	Dickinson Bros. ..... Glasgow.	Ground corn, hominy feed, wheat flour, ground barley, wheat middlings, ground puffed wheat, ground kaffir corn, ground puffed rice, cotton seed meal, salt ½% (oat middlings, oat shorts and oat hulls 28¾%).	Above guaranty in fiber Excess of oat hulls.
615-16	J. H. Fedders & Sons.. Covington.	Same	
615-18	Same	Ground corn, hominy feed, corn feed meal, ground barley, wheat flour, wheat middlings, cotton seed meal, ground puffed rice, ground puffed wheat (oat middlings, oat shorts and oat hulls) 28%, salt ½ of 1%.	Above in fiber. Excess of hulls.
615-18	Qualls & Denus..... Olive Hill.	Same	
615-18	Bush & Prichard..... Ashland.	Same	
615-18	Berea College ..... Berea.	Same	Above guaranty in fiber. Excess of oat hulls.
606-17	M. J. Yopp Seed Co. ..... Paducah.	Ground corn, hominy feed, corn feed meal (oat middlings, oat shorts and oat hulls), 27½%, salt ½%.	
1490-18	Same	Cotton seed meal, alfalfa meal, ground corn, molasses (oat middlings, oat shorts and oat hulls), 42%.	Above guaranty in fiber. Excess of hulls.
2190-16	Danville Coal & Ice Co.. Danville.	Corn feed meal, alfalfa, molasses. peat 5%, salt 1%.....	Above in fiber. Excess of alfalfa.
2190-17	Same	Same	Same.
2190-17	McClure & Simms..... Springfield.	Same	Above guaranty in fiber. Contains screenings.
2190-18	Martin & Hodgkin Supply Co., Winchester.	Corn feed meal, alfalfa meal, molasses, peat 5%, salt 1%, digester tankage, hominy feed.	Below in protein, above in fiber. No appreciable amount of tankage.
2190-18	Oscar Farmer & Sons.... Louisville.	Same	
2190-18	Simpson County Hdw. Co. Franklin.	Same	Below guaranty in fat, above in fiber.
849-14	W. N. Watts..... Frankfort.	Cotton seed meal, brewers' dried grains, molasses, salt, clipped oat by-product 20%, ground wheat screenings 25%.	
849-14	McClellan Feed Co. ..... Henderson.	Same	Alfalfa meal present.
2835-18	Browder Milling Co. .... Fulton.	Hominy feed, wheat middlings, cotton seed meal, ground corn meal (oat middlings, oat shorts and oat hulls), 17%, salt.	
205-15	C. R. Barnes..... Bardstown.	Clipped oat by-products 50%, ground oats, barley, wheat, and flax seed screenings 30%, cane molasses, salt 1%.	Below guaranty in fat, above in fiber.
205-16	J. C. Coleman..... O'Bannon.	Clipped oat by-product 20%, ground and bolted wheat screenings 30%, cane molasses, alfalfa meal, salt.	Above guaranty in fiber. Excess of hulls.
205-16	Lagrange Flour and Feed Mills, Lagrange.	Clipped oat by-product 20%, ground and bolted wheat screenings 30%, cane molasses, alfalfa meal, salt 1%.	Above guaranty in fiber. Inferior materials used.
205-18	Forgy & Wells..... Pembroke.	Clipped oat by-product 20%, ground and bolted wheat screenings 30%, cane molasses, alfalfa meal, salt 1%.	Above guaranty in fiber. Unsound material used.

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
205-17	Rapier's Molasses Fat Maker.....	Rapier Sugar Feed Co.	12.81	2.65	27.24
		Owensboro, Ky.	9.60	3.30	12.00
205-17	Same	Same	13.00	2.80	24.28
217-15	Rapier's Otene Horse and Mule Feed.	Same	11.25	2.69	15.65
			9.00	2.00	12.00
.....	Sweet Papa Horse and Mule Feed	Rex Mill & Feed Co.	8.13	1.93	14.74
		Nashville, Tenn.	10.00	2.00	12.00
2797-18	Same	Same	9.25	2.20	15.40
107-19	King Dairy Feed.....	Same	14.88	3.35	17.15
			16.00	3.15	11.00
1567-15	Al-Mo Horse and Mule Feed.....	W. J. Riedling Alfalfa Products Co., Louisville, Ky.	10.13	2.05	12.08
			9.00	2.00	12.00
123-19	Old Maud Horse and Mule Feed...	Royal Feed & Milling Co.	10.44	2.13	20.38
		Memphis, Tenn.	9.00	1.50	20.00
2983-18	Sunrise Dairy Feed.....	Same	12.44	2.90	19.55
			10.00	2.50	18.00
2983-18	Same	Same	11.63	2.78	21.63
2972-18	Cow Bell Dairy Feed.....	Same	13.00	3.02	26.45
			14.00	3.00	25.00
125-19	Same	Same	14.94	3.52	24.68
.....	Butter Queen Dairy Feed.....	Same	15.13	2.64	31.64
			18.12	3.12	30.00
2724-18	Old Black Jack Horse and Mule Feed.	Same	11.06	2.35	19.68
			9.00	1.50	20.00
2724-18	Same	Same	9.75	2.00	19.26
2943-18	Eureka Hog Feed.....	Same	16.25	5.70	14.28
			15.00	4.00	12.00
2943-18	Same	Same	17.81	5.80	14.94
2943-18	Same	Same	15.31	5.70	14.36

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
205-17	Mfrs. Warehouse	Clipped oat by-product 20%, ground and bolted wheat screenings 30%, cane molasses, alfalfa meal, and salt.	Below guaranty in fat and above in fiber. Largely alfalfa and screenings.
205-17	First Kentucky Distillery Supply Co., Glasgow.	Same	Above guaranty in fiber. Feed is largely alfalfa and grain screenings.
217-15	E. M. Gish..... Central City.	Corn, alfalfa meal, oats, molasses, clipped oat by-product 5%, salt 1%.	Above guaranty in fiber. Excess of hulls.
.....	The Electric Mills Co.. Franklin.	Cracked corn, oats, alfalfa meal, (oat middlings, oat shorts and oat hulls), 10%; salt 1%.	Inferior to guaranty. Below guaranty in protein and above in fiber.
2797-18	Same	Same	Inferior to guaranty, Above guaranty in fiber and below in protein.
107-19	The Electric Mills Co.... Franklin.	Velvet bean feed (velvet bean meal and hulls) 10%, alfalfa, molasses, corn, cotton seed meal, brewers' dried grains, salt.	Same.
1567-15	W. H. Luesing & Co..... Louisville.	Alfalfa meal, cracked corn, oats, molasses, clipped oats by-product 20%, salt 1%.	
123-19	Herbert P. Hawkins..... Paducah.	Corn, alfalfa meal, clipped oat by-product 20%, clover meal, cotton seed meal, cotton seed hulls 10%, molasses, salt 1%.	
2983-18	H. P. Hawkins & Sons... Paducah.	Alfalfa meal, cotton seed meal (cotton seed meal and hulls) 10%, rice bran, corn bran (oat middlings, oat shorts and oat hulls) 10%, molasses, salt 1%.	Above guaranty in fiber. Excess of hulls.
2983-18	Same	Same	Above guaranty in fiber. Excess of hulls.
2972-18	Same	Alfalfa meal, cotton seed feed (cotton seed meal and hulls) 5%, wheat bran, rice bran, corn bran (oat middlings, oat shorts and oat hulls 5%, velvet bean feed (ground velvet beans and hulls) 10%.	Below in protein, above in fiber. Excess of hulls.
125-19	Same	Same	
.....	Same	Cotton seed meal, alfalfa meal, cotton seed hulls 35%.....	Adulterated with lint and hulls. Below guaranty in protein and fat and above in fiber.
2724-18	Same	Corn, alfalfa meal, clipped oat by-product 20%, clover meal, cotton seed meal, cotton seed hulls 10%, molasses, salt 1%.	No clover meal present.
2724-18	Same	Same	
2943-18	Walter Mathews ..... Paducah.	Unbolted corn meal, cotton seed meal, wheat shorts, rice polish, rice bran, peanut feed (peanut meal and peanut hulls) 10%, cocoanut meal, velvet bean feed.	Largely velvet bean feed. Above in fiber.
2943-18	A. B. Beale & Son..... Murray.	Same	Above guaranty in fiber. Excess of hulls.
2943-18	H. P. Hawkins & Son.... Paducah.	Velvet bean meal and velvet bean hulls 20%, unbolted corn meal, cotton seed meal, wheat shorts, rice polish, rice bran, peanut feed, peanut meal and peanut hulls) 10%, cocoanut meal, velvet bean feed (velvet bean meal and velvet hulls) 20%.	Above guaranty in fiber. Excess of hulls.

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2620-18	Eureka Hog Feed	Royal Feed & Milling Co.	11.13	2.65	13.85
		Memphis, Tenn.	9.00	2.00	15.00
1786-15	Eagle Horse and Mule Feed	Southern Seed Co.	10.31	3.09	12.22
		Louisville, Ky.	9.00	2.00	12.00
1786-17	Same	Same	11.44	2.80	20.85
1786-18	Same	Same	11.00	2.32	23.05
930-16	Economy Horse and Mule Feed	Same	10.94	3.19	13.55
			9.00	2.50	12.00
2376-17	Econo Horse and Mule Feed	Same	10.38	2.65	18.45
			9.00	2.50	20.00
931-16	Economy Dairy Feed	Same	17.38	3.97	18.54
			16.00	3.00	12.00
931-17	Same	Same	20.25	3.63	24.51
			16.00	3.00	22.00
2558-18	Atlas Cotton Seed Feed	Same	20.38	3.66	26.04
			20.00	3.00	26.00
2558-18	Same	Same	19.31	3.50	26.02
2558-18	Same	Same	19.00	3.34	25.68
550-19	Same	Same	22.81	3.72	24.53
554-19	Economy Cotton Seed Feed	Same	35.94	6.27	15.09
			36.00	5.00	14.00
554-19	Same	Same	35.94	6.22	14.92
1284-17	Velvet Molasses Feed	Southerland Flour Mills Co.	9.94	3.30	13.70
		Cairo, Ill.	9.00	2.00	12.00
2665-18	Daisy Dairy Feed	Same	11.19	3.20	17.90
			13.25	3.50	12.50
2665-18	Same	Same	8.56	1.54	18.41
2612-17	Taylor Brand Cotton Seed Feed	Taylor Commission Co.	32.13	5.41	16.06
		Atlanta, Ga.	36.00	5.50	14.00
2612-17	Same	Same	33.75	5.93	14.60
725-16	Creamo Brand Cotton Seed Feed	Tennessee Fiber Co.	22.00	3.80	26.10
		Memphis, Tenn.	20.00	4.50	22.00
725-17	Same	Same	19.38	3.50	28.37

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2620-18	Park City Feed Store.... Bowling Green.	Cracked shelled corn, oats (velvet bean, velvet bean hulls) 4%, cotton seed meal, molasses, salt.	
1786-15	Same	Corn, alfalfa, oats (oat middlings, oat shorts and oat hulls) 20%, molasses, salt ½ of 1%.	
1786-17	Hudson & Davis..... Danville.	Corn, oats, alfalfa meal, clover meal, cotton seed hulls 10%, flax plant, by-product 5%, clipped oat by-product 10%, cane molasses, salt ½%.	Above in fiber. No corn present.
1786-18	G. C. Shaw..... Frankfort.	Same	Largely alfalfa, cotton seed meal and hulls, and oats. Above guaranty in fiber.
930-16	Woodson Coal & Feed Co. Middlesboro.	Corn, oats, alfalfa, clover, wheat bran, (oat middlings, oat shorts and oat hulls) 15%, molasses, salt ½ of 1%.	Above guaranty in fiber. No wheat bran present.
2376-17	E. C. Fox..... Corbin.	Corn, oats, alfalfa meal, clover meal, cotton seed hulls 10%, flax plant by-product 10%, molasses, salt ½ of 1%.	
931-16	Woodson Coal & Feed Co. Middlesboro.	Corn meal, brewers' grains, distillers' dried grains, alfalfa, wheat bran, clover (oat middlings, oat shorts and oat hulls) 20%, cotton seed meal, molasses, salt ½ of 1%.	No wheat bran present. Above guaranty in fiber. Excess of hulls.
931-17	Combs & Baker..... Hazard.	Brewers' dried grains, alfalfa meal, clover meal, cotton seed meal, ground rice hulls 10%, clipped oat by-product 10%, salt ½ of 1%.	Above guaranty in fiber. Excess of hulls.
2558-18	W. N. Holt..... Irvington.	Cotton seed meal, cotton seed hulls 45%	
2558-18	Summers Coal Co..... Smith's Grove.	Same	
2558-18	G. C. Shaw..... Frankfort.	Same	
550-19	M. D. Lawson..... Brandenburg.	Same	
554-19	Hardinsburg Mill & Ele. Co., Hardinsburg.	Cotton seed meal, cotton seed hulls 20%	Above guaranty in fiber. Excess of hulls.
554-19	Irvington Mill & Elevator Irvington.	Same	Same.
1284-17	A. H. Bennett..... Fulton.	Cracked corn, alfalfa meal, ground grain screenings 10%, molasses (oat middlings, oat shorts and oat hulls) 10%.	Same.
2665-18	Covington Bros. & Co.... Mayfield.	Wheat bran, corn bran, ground grain screenings 10%, alfalfa meal, molasses (oat middlings, oat shorts and oat hulls) 10%.	Inferior to guaranty. Below guaranty in protein and fat and above in fiber.
2665-18	W. D. Roberts..... Mayfield .	Same	Below guaranty in protein and fat and above in fiber. Inferior to guaranty.
2612-17	J. H. Baughman & Co.. Stanford.	Cotton seed meal, cotton seed hulls 23%	Excess of hulls. Above guaranty in fiber and below in protein.
2612-17	The H. T. Hackney Co.. Middlesboro, Ky.	Same	Excess of hulls. Below guaranty in protein and above in fiber.
725-16	H. P. Hawkins & Sons... Paducah.	Cotton seed meal, cotton seed hulls 50%	Excess of hulls. Below guaranty in fat and above in fiber.
725-17	Ed Frost ..... Central City.	Same	Excess of hulls. Below guaranty in protein and above in fiber.

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
725-17	Creamo Cotton Seed Feed.....	Tennessee Fiber Co.....	20.38	3.71	26.07
		Memphis, Tenn.	20.00	4.50	22.00
725-17	Same	Same	19.38	3.43	25.25
157-19	Latonia Feed	Latonia Hay & Grain Co.....	13.56	11.16	18.09
		Latonia, Ky.	12.00	7.00	13.00
2033-16	No. 4 Cotton Seed Feed.....	Union Seed & Fertilizer Co...	21.25	3.95	24.83
		New York, N. Y.	20.56	3.00	25.00
2033-16	Same	Same	21.50	3.45	25.20
2033-16	Same	Union Seed & Fertilizer Co...	20.56	4.39	26.08
		Memphis, Tenn.			
2034-16	Number 7 Cotton Seed Feed.....	Union Seed & Fertilizer Co...	36.00	6.74	16.19
		New York, N. Y.	36.00	5.50	14.00
2034-16	Same	Same	36.38	7.40	12.88
2034-16	Same	Same	37.88	5.92	15.07
2033-16	Columbia Cotton Seed Feed.....	Same	21.31	4.89	24.93
			20.56	3.00	25.00
2033-16	Same	Same	23.88	4.40	24.50
2033-17	Same	Same	23.81	4.60	23.74
2033-17	Same	Same	22.00	4.98	23.52
2338-17	Surety Brand Cotton Seed Feed...	Same	37.38	7.00	12.22
			36.00	5.50	14.00
2338-18	Same	Same	37.75	6.26	14.65
2338-18	Same	Same	36.38	7.16	11.85
2338-18	Same	Same	37.69	7.28	10.95
2338-18	Same	Same	37.06	7.33	13.13
2338-18	Same	Same	38.06	7.08	13.39
2338-18	Same	Same	36.50	6.93	14.27
2338-18	Same	Same	37.75	7.53	13.88
2338-18	Same	Same	36.44	7.46	14.09
2338-18	Same	Same	36.50	6.51	14.31
2338-18	Same	Same	36.69	7.43	14.46
2338-18	Same	Same	36.38	7.30	12.20

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
725-17	Irvine Ice Co. ..... Irvine, Ky.	Cotton seed meal, cotton seed hulls 50%	Excess of hulls. Below guaranty in fat and above in fiber.
725-18	M. C. Marion & Son..... Elizabethtown.	Same	Excess of hulls. Below guaranty in fat and above in fiber.
157-19	Latonia Hay & Grain Co. Latonia.	Wheat middlings, reground cotton seed hulls 15%, palm oil.....	Above guaranty in fiber. Excess of hulls.
2033-16	Ruef Bros. ..... Covington.	Cotton seed meal, cotton seed hulls 43%	
2033-16	J. H. Fedders & Sons..... Covington.	Same	
2033-16	Pruitt Feed Company.... Henderson.	Same	Above guaranty in fiber. Excess of hulls.
2034-16	A. N. Jones..... Williamsburg.	Cotton seed meal, cotton seed hulls 23%	Same.
2034-16	Edward M. Riedling..... Louisville.	Same	
2034-16	Pikeville Grocery Co. ... Pikeville.	Same	Above guaranty in fiber. Excess of hull.
2033-16	A. N. Jones..... Williamsburg.	Cotton seed meal, cotton seed hulls 43%	
2033-16	Fulton Flour-Feed Dealers & Mfg Co., Fulton.	Same	
2033-17	M. J. Yopp Seed Co.... Paducah.	Same	
2033-17	T. M. Wooldridge..... Hopkinsville.	Same	
2338-17	Geo. Keller ..... Newport.	Cotton seed meal, cotton seed hulls 23%	
2338-18	Clarence Howard..... Russellville.	Same	
2338-18	Shelby County Feed & Gr. Co., Shelbyville.	Same	
2338-18	W. L. Kimbrough & Son.. Guthrie.	Same	
2338-18	Drake Thompson ..... Paris.	Same	
2338-18	B. E. Allen..... Lexington.	Same	
2338-18	M. J. Yopp Seed Co. .... Paducah.	Same	
2338-18	R. B. Hutcheraft & Co. .. Paris.	Same	
2338-18	Charles Nuckols ..... Midway.	Same	
2338-18	C. H. McLemore..... Midway.	Same	
2338-18	Horace Gay ..... Versailles.	Same	
2338-18	W. L .Kimbrough & Son.. Guthrie.	Same	

TABLE VIII.—MISCELLANEOUS MIXED FEEDS—LITTLE OR NO VALUE.

Reg. No.	NAME OF FEED	MANUFACTURER	Analysis		
			Prot.	Fat	Fiber
2338-18	Surety Brand Cotton Seed Meal...	Union Seed & Fertilizer Co... New York, N. Y.	37.38	7.00	12.22
			36.00	5.50	14.00
2338-18	Same	Same	37.69	7.28	10.95
2338-18	Same	Same	37.06	7.33	13.13
.....	Cotton Seed Feed.....	Union Cotton Oil Co. ..... Birmingham, Ala.	22.13	4.25	25.35
			20.00	5.00	25.00
759-17	Blue Grass Feed.....	A. Waller & Co. ..... Henderson, Ky.	10.38	2.40	19.66
			10.00	2.00	17.00
2731-18	Velvet Bean Feed.....	The Wiley Feed Co. ..... Troy, Ala.	16.75	4.30	14.10
			16.50	4.00	15.00

ANALYSES OF INSPECTORS' SAMPLES.

Reg. No.	SAMPLE TAKEN FROM	INGREDIENTS GUARANTEED	REMARKS—VARIANCE FROM GUARANTY
2338-18	Geo. Keller..... Newport.	Cotton seed meal, cotton seed hulls, 23%	
2338-18	W. L. Kimbrough & Son.. Guthrie.	Same	
2338-18	Drake Thompson ..... Paris.	Same	
.....	Wilson & Son..... Russellville.	Cotton seed meal and cotton seed hulls	Below guaranty in fat.
759-17	Covington Bros. ..... Paducah.	Corn cob 25%, wheat bran.....	Above guaranty in fiber. Excess of cob.
2731-18	Harris & Crowder..... Franklin.	Ground velvet bran hulls 40%...	

Kentucky
Agricultural Experiment Station

University of Kentucky, Lexington, Ky.

BULLETIN NO. 224

Commercial Fertilizers

BY

H. E. CURTIS, WM. RODES
AND H. R. ALLEN

DECEMBER 31, 1919

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BULLETIN No. 224

COMMERCIAL FERTILIZERS

By H. E. Curtis, William Rodes and H. R. Allen.

The year 1919 was one of uncertainty, so far as the fertilizer trade was concerned. Inadequate transportation facilities, scarcity of labor, strikes, and uncertainty as to the requirements of the trade, all conspired to render the market unstable. Large exportations of sulfate of ammonia made a scarcity of that product, as well as unprecedented prices. During the early part of the year the trade was slow in Chilean Nitrate of Soda on account of the surplus stock which was being disposed of by the Government and later, on account of the scarcity of tonnage. The domestic manufacturers of potash expected such an increase in the importation of potash at the end of the war that they would not be able to compete with the foreign trade, and many plants were shut down. However, this was not the case, and many of the plants began operations during the latter part of the year. This uncertainty caused a 40 per cent. decrease in production for the year. The principal cause of the shortage of acid phosphate was labor troubles, especially in the Florida and Tennessee fields. The Florida field was tied up for several months by strikes, and just at the time these were adjusted, there was a long period of car shortage.

The present state of transportation and labor conditions renders it more necessary than ever before to use the most concentrated forms of fertilizers and to buy only those elements which a particular soil requires. The results of the field experiments carried on by the Experiment Station will be useful in this connection and helpful suggestions may be had by application to the Director and from county agents.* We may make the general statement that on all soils, except the highly phosphatic ones of the Bluegrass Region, the best returns are to be expected from phosphatic fertilizers used after an application of ground limestone.

*Bulletin 228, containing a report on the soil experiment fields and suggestions as to the maintenance of fertility is now available. It may be had by application to the Director.

For the reason that the plant food elements in fertilizers are, necessarily, in combination with other elements a fertilizer can never contain 100 per cent. of actual plant food. However, the cost of mixing, sacking, handling and freighting is the same for a low grade fertilizer as it is for a high grade fertilizer. Therefore, it is evident that the manufacturer can sell the plant food in a high grade fertilizer cheaper, per pound, than he can the plant food in a low grade fertilizer. So farmers are advised to purchase only high grade fertilizers; that is, those containing high percentages of the elements which are desired. In other words, it is much cheaper to buy a 14 or 16 per cent. acid phosphate than a 10 or 12 per cent. grade.

Samples Analyzed During 1919.

There were 780 different brands of fertilizer registered during the year 1919. Of these, 351 were complete fertilizers, or fertilizers containing all three of the essential ingredients, namely: phosphoric acid, nitrogen and potash (non-acidulated bone and potash mixtures are not counted in this item), 117 acid phosphates or superphosphates, 175 nitrogenous superphosphates, 68 acid phosphate and potash mixtures, 68 bones, tankage and non-acidulated bone and potash mixtures, and 1 sample of sulfate of ammonia. Samples sent by manufacturers, representing the various brands registered, have been analyzed, as well as samples collected by our inspectors from fertilizers found on sale in the State and those sent in by farmers. These results are given in the tables which follow.

Method of Reporting Results.

In the statement of our analyses, nitrogen is separated into the various forms in which it occurs, namely, nitrogen in nitrates, nitrogen in ammonia salts and nitrogen in organic matter. In bones, the bone phosphate of lime equivalent is given and the percentage of fineness is shown also, fine bone being that which passes thru a sieve with meshes one twenty-fifth inch square, and medium bone that which passes thru a sieve with meshes one-sixth inch square, but not including the fine bone. The analyses are grouped in tables, the classification being based upon the nature of the fertilizer, as follows:

Table 1. Complete fertilizers.
Table 2. Bones, tankage and mixtures of bone and potash.
Table 3. Acid phosphates.
Table 4. Acid phosphates with potash.
Table 5. Acid phosphates with nitrogen.
Table 6. Sulfate of ammonia.

Free Analysis of Fertilizers

The fertilizer law provides that the Experiment Station shall make free analyses of fertilizers for farmers who purchase them for their own use. It is hoped that those who purchase fertilizers in quantity, at least, will take advantage of this provision (section 8 of the fertilizer law) and send samples from the fertilizer sold them, to the Station for free analysis.

Essentials in Taking a Sample for Analysis

1. Take it at the time of purchase and, if possible, in the presence of the agent or seller. 2. Take a portion from not less than two bags, and from one additional bag for every ten purchased; mix these portions together and take at least a pint of this mixed sample, put it into a glass jar or a can, seal, label, box and forward by parcel post or express to the Experiment Station, Lexington, Ky. 3. Take the sample in the presence of at least one witness, and have the witness sign the required certificate. 4. The certificate required with a sample for free analysis should not be put into the package with the sample, but is to be sent to the Experiment Station separately, *by mail*. It should be made out in accordance with the provisions of section 8 of the fertilizer law. 5. The label put on the sample by the sender should be such as to identify the sample and show by whom it was sent, without giving the name of the fertilizer or of the person from whom it was bought. 6. Be sure to save a license tag from one of the packages sampled, to be sent to the Director after the report of the analysis has been received from him.

Blank certificates will be sent free, upon application to the Station. The section of the fertilizer law describing the manner in which samples for free analysis are to be taken, is printed on the back of our blanks.

Index of Relative Value

The fertilizer law, in providing for the publication in a bulletin of the analyses of fertilizers made each year, requires that the "relative value" of each fertilizer be published with its analysis. Because of fluctuations in the market prices of the materials used in the manufacture of commercial fertilizers and especially on account of the abnormally high cost of potash salts brought about by war conditions, it would seem impractical and inexpedient, at this time, to attempt to compute money values from the analyses of fertilizers. Accordingly, to comply with the requirement of the law referred to, we have adopted a system of relative values, based upon what we may term an "index of relative value" computed from the analysis by multiplying the percentage of each essential ingredient found in the analysis by a certain factor or "index," the sum of these products being taken as the "index of relative value." This "index" will not stand in any necessary relation to the present market price of the fertilizer, but does give an expression of its relative value, under normal conditions.

The following are the factors for computing the relative value indexes given in the tables of analyses:

Available phosphoric acid in mixed fertilizers	1.5
Available phosphoric acid in acid phosphates	1.2
Insoluble phosphoric acid in mixed fertilizers	0.4
Insoluble phosphoric acid in acid phosphates	nothing
Phosphoric acid in bone	0.8
Nitrogen in all fertilizers	7.0
Potash in all fertilizers	6.0

As an example of how to make the calculation, suppose the analysis shows that a fertilizer contains:

8.40 per cent. of available phosphoric acid.
4.75 per cent. of insoluble phosphoric acid.
1.58 per cent. of nitrogen.
1.34 per cent. of potash.

The index of relative value will be calculated as follows:

1.5 times 8.40 is	12.6
0.4 times 4.75 is	1.9
7.0 times 1.58 is	11.0
6.0 times 1.34 is	8.0
Sum	33.5

Therefore, the index of relative value for this fertilizer is 33.5.

The term "potash from muriate" does not necessarily indicate that the manufacturers used muriate of potash in making their mixture; they may have used sulfate of potash, or other salts of potash; but in all fertilizers where the term "potash from muriate" is used and the potash so classified, there is enough chlorin present to combine with all the potash. This chlorin may come either from salt in the tankage used or from such potash salts as muriate, kainit, carnallite, etc. As the objection to the use of muriate of potash arises from the chlorin present in this salt, it likewise follows that chlorin in a fertilizer is objectionable, whether put in as muriate of potash or in some other form. The use of sulfate of potash, where there is much chlorin present in other ingredients of the fertilizer, will not obviate the injurious effect of the chlorin; therefore we take this method of showing chlorin present by designating the potash as "from muriate."

Explanation of the Tables

In the tables of analyses, following the name of each brand, will be found the analysis of the sample, sent by the manufacturer at the time the fertilizer was entered for sale. In some instances, the manufacturer failed to furnish samples, in which case nothing is shown in this space. Our analysis of this sample is the one marked "manufacturer" in the column headed "From Whom Obtained." If any other analyses of the same brand have been made, they will be found following this analysis. Such samples have been collected by our inspectors or sent in by farmers. The manufacturers' guaranty is printed last in *italic* figures.

The figures set in bold faced type in the table, are those results which, in the judgment of the Director, were too low to be acceptable.

The names of the manufacturers are arranged in alphabetical order and all the analyses of the same brand have been grouped together.

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	The American Agr'l. Chem. Co., Inc., Cin. Sales Dept., Cincinnati, O.	
57178	A. A. C. Co. Kentucky Tob. Grower	
57623		A. B. Sellers, Sebree
57189	Bowker's Complete Manure	
57633		J. B. Hatcher, Glasgow Junction
57634		F. C. Nash, Providence
57190	Bowker's Harvest Bone	
58059		T. E. Richardson, Campbellsville
57191	Bowker's Crop and Cereal Grower	
57192	Bowker's Grain and Grass Grower	
58060		T. E. Richardson, Campbellsville
57193	Bowker's General Crop	
58061		T. E. Richardson, Campbellsville
57194	Bowker's Corn and Wheat Phosphate	
57635		T. D. Flanagan, Humble
57636		E. L. Goodrich, Walton
58062		E. L. Goodrich, Walton
57195	Bowker's Tobacco and Truck Grower, 1916	
57637		J. C. Van Arsdell & Co., Lawrenceburg
57206	Bradley's Complete Manure	
57207	Bradley's Potato and Root Fertilizer, 1916	
58063		Cooper-Craycroft Co., Vine Grove
57208	Bradley's Crop and Cereal Grower	
57209	Bradley's General Crop	
57210	Bradley's Grain and Grass Grower	
57211	Bradley's Corn and Wheat Phosphate	
57212	Bradley's Tobacco and Truck Grower	

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN					POTASH			
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	From Muriate	From Sulfate	Index of Relative Value	Station Number.
											57178
8.50	3.90	12.40		0.52	1.17	1.69	2.05	2.33		40.1	57623
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	
											57189
7.70	4.40	12.10				0.95	1.15	1.13		26.7	57633
7.80	5.00	12.80				1.00	1.21	1.25		28.2	57634
7.00	*4.00*	*11.00*				*0.82*	*1.00*	*1.00*		*23.8*	
											57190
8.45	2.10	10.55				0.91	1.10	1.20		27.1	58059
8.00	*4.00*	*12.00*				*0.82*	*1.00*	*1.00*		*25.3*	
											57191
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	
											57192
9.05	1.15	10.20		0.90	0.79	1.69	2.05	2.02		38.0	58060
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	
											57193
7.60	2.80	10.40		0.94	1.27	2.21	2.68	1.04		34.2	58061
8.00	*4.00*	*12.00*				*2.06*	*2.50*	*1.00*		*34.0*	
											57194
10.80	4.70	15.50				0.91	1.10	1.02		30.6	57635
10.70	4.30	15.00				0.82	1.00	1.17		30.5	57636
11.25	1.25	12.50				1.00	1.21	0.58	0.58	31.3	58062
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*1.00*		*28.3*	
											57195
11.20	3.40	14.60				2.58	3.13	1.09		42.8	57637
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*1.00*		*39.9*	
											57206
7.00	*4.00*	*11.00*				*0.82*	*1.00*	*1.00*		*23.8*	
											57207
8.50	1.80	10.30				1.02	1.24	1.04		26.9	58063
8.00	*4.00*	*12.00*				*0.82*	*1.00*	*1.00*		*25.3*	
											57208
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	
											57209
8.00	*4.00*	*12.00*				*2.06*	*2.50*	*1.00*		*34.0*	
											57210
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	
											57211
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*1.00*		*28.3*	
											57212
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*1.00*		*39.9*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	The American Agr'l Chem. Co.	
57222	Cleveland Dryer Wks. Complete Manure	
57223	Cleveland Dryer Wks. Potato and Tobacco Fertilizer, 1916	
57225	Cleveland Dryer Wks. Crop and Cereal Grower	
57226	Cleveland Dryer Wks. General Crop	
57227	Cleveland Dryer Wks. Grain and Grass Grower	
57228	Cleveland Dryer Wks. Phospho Bone	
57229	Cleveland Dryer Wks. Tobacco and Truck Grower	
57240	Michigan Carbon Wks. Red Line Complete Manure	
57667		C. P. Clark, Owensboro
57668		P. K. Hubbard, Munfordville
58074		I. K. Miller & Son, Campbellsville
58075		Skaggs & Nunn, Horse Cave
57241	Homestead A-1 Potash Fertilizer, 1916	
57669		Bedford & Tuttle, Winchester
57670		Mrs. E. G. Aldridge & Son, Dixon
57242	Michigan Carbon Wks. Crop and Cereal Grower	
57243	Homestead Bone Black Fertilizer, 1916	
57671		Nunn & Adcock, Horse Cave
57672		Woodson Lewis, Greensburg
58076		O. A. Lutes & Co., Shepherdsville
58077		Fordsville Planing Mill Co., Fordsville
57244	Michigan Carbon Wks. Red Line Crop Grower	
58078		J. J. Smith, Brodhead
58079		Sherman Scaggs, Clarkson

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
											57222
7.00	*4.00*	*11.00*				*0.82*	*1.00*	*1.00*		*23.8*	
											57223
8.00	*4.00*	*12.00*				*0.82*	*1.00*	*1.00*		*25.3*	
											57225
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	
											57226
8.00	*4.00*	*12.00*				*2.06*	*2.50*	*1.00*		*34.0*	
											57227
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	
											57228
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*1.00*		*28.3*	
											57229
10.00	*4.60*	*14.00*				*2.47*	*3.00*	*1.00*		*39.9*	
											57240
7.70	3.80	11.50				0.89	1.08	1.25		26.8	57667
7.70	4.10	11.80				0.95	1.15	1.32		27.8	57668
7.95	0.80	8.75		0.31	0.77	1.08	1.31	1.28		27.5	58074
7.85	0.90	8.75				0.92	1.12	0.99		24.5	58075
7.00	*4.00*	*11.00*				*0.82*	*1.00*	*1.00*		*23.8*	
											57241
8.50	4.50	13.00				1.02	1.24	0.99		27.6	57669
9.10	4.20	13.30				1.01	1.23	1.25		29.9	57670
8.00	*4.00*	*12.00*				*0.82*	*1.00*	*1.00*		*25.3*	
											57242
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	
											57243
8.20	4.30	12.50		1.07	1.13	2.20	2.67	1.44		38.1	57671
8.20	4.00	12.20		1.00	1.31	2.31	2.80	1.37		38.3	57672
7.85	2.85	10.70		1.04	1.16	2.20	2.67	1.06		34.7	58076
8.15	2.85	11.00		1.01	1.12	2.13	2.59	1.34		36.3	58077
8.00	*4.00*	*12.00*				*2.06*	*2.50*	*1.00*		*34.0*	
											57244
8.45	2.40	10.85		0.76	1.10	1.86	2.26	2.23		40.0	58078
9.10	2.25	11.35		0.81	1.09	1.90	2.31	1.24		35.3	58079
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	The American Agr'l Chem. Co.	
57245	Michigan Carbon Wks. Corn and Wheat Phosphate	
57673		H. B. Ringo, Mt. Sterling
57674		E. S. Ferrill, Buffalo
58080		C. P. Clark, Owensboro
57246	Homestead Tobacco Grower, 1916	
57675		Lebanon Carriage and Implement Co., Lebanon
57676		Nunn & Adcock, Horse Cave
58081		P. K. Hubbard, Munfordville
57257	N. W. Horseshoe Brand Dark Tobacco Grower	
57684		Woodson Lewis, Greensburg
57685		A. B. Sellers, Sebree
57258	N. W. Horseshoe Brand Potash Manure, 1916	
58087		Sherman Scaggs, Clarkson
57259	N. W. Horseshoe Brand Crop and Cereal Grower	
57260	N. W. Horseshoe Brand Challenge Corn Grower, 1916	
57686		Grayson County Supply Co., Leitchfield
57261	N. W. Horseshoe Brand Corn and Wheat Grower	
58088		T. J. Whittinghill, Fordsville
57262	N. W. Horseshoe Brand Complete Fertilizer	
57263	N. W. Horseshoe Brand Tobacco and Truck Grower	
57687		A. B. Sellers, Sebree
57837	N. W. Horseshoe Brand Corn and Wheat Grower, 1916	
57274	Packers Boar's Head Brand Complete Manure	
57275	Packers Boar's Head Brand Sure Growth Potash Manure, 1916	

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
											57245
10.60	4.40	15.00				0.93	1.13	1.14		31.0	57673
10.80	3.90	14.70				0.85	1.03	1.13		30.5	57674
11.05	1.05	12.10				0.87	1.06	1.10		29.7	58080
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*1.00*		*28.3*	
											57246
10.70	4.20	14.90		0.88	1.70	2.58	3.13	0.80	0.45	43.3	57675
10.40	4.30	14.70		0.81	1.86	2.67	3.24	0.94	0.38	43.9	57676
11.45	2.25	13.70		1.17	1.63	2.80	3.40	1.13		44.5	58081
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*1.00*		*39.9*	
											57257
8.20	3.80	12.00				0.92	1.12	1.25		27.8	57684
8.40	4.00	12.40				1.02	1.24	1.14		28.2	57685
7.00	*4.00*	*11.00*				*0.82*	*1.00*	*1.00*		*23.8*	
											57258
9.30	1.15	10.45				0.86	1.04	1.43		29.0	58087
8.00	*4.00*	*12.00*				*0.82*	*1.00*	*1.00*		*25.3*	
											57259
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	
											57260
8.90	4.10	13.00		1.14	1.06	2.20	2.67	1.17		37.4	57686
8.00	*4.00*	*12.00*				*2.06*	*2.50*	*1.00*		*34.0*	
											57261
9.80	1.45	11.25		0.25	1.60	1.85	2.25	2.04		40.5	58088
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	
											57262
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*1.00*		*28.3*	
											57263
10.60	4.20	14.80		1.07	1.56	2.63	3.19	1.09		42.5	57687
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*1.00*		*39.9*	
											57837
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	
											57274
7.00	*4.00*	*11.00*				*0.82*	*1.00*	*1.00*		*23.8*	
											57275
8.00	*4.00*	*12.00*				*0.82*	*1.00*	*1.00*		*25.3*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	The American Agr'l Chem. Co.	
57276	Packers Boar's Head Brand Crop and Cereal Grower	
57277	Packers Boar's Head Brand General Crop	
57278	Packers Boar's Head Brand Corn and Wheat Grower	
57279	Packers Boar's Head Brand Complete Fertilizer	
57280	Packers Boar's Head Brand Tobacco and Truck Grower, 1916	
	Armour Fertilizer Works, Nashville, Tenn.	
55932	Armour's Wheat, Corn and Oats Special	Manufacturer
58093		S. D. Holland & Co., Glasgow
55939	Armour's Dark Tobacco Grower	Manufacturer
57718		I. K. Miller & Sons, Campbellsville
57719		Jackson Hardware and Grocery Co., Dixon
55940	Armour's Corn and Tobacco Grower	Manufacturer
57720		Merrifield & Humphrey, Bloomfield
57721		W. L. Amburgey, Spider
55942	Armour's Record Brand	Manufacturer
57724		T. W. Miller, Elkton
57725		Simpson County Hardware Co., Franklin
58100		Fischer Bros. Hardware Co., Newport.
55944	Armour's Tobacco and Potato Grower	Manufacturer
57728		W. B. Broaddus & Co., Richmond
55945	Armour's Golden Grain Grower	Manufacturer
57729		E. L. and A. T. Byron, Owingsville
58101		J. T. Lawson, Greenup
55946	Armour's Tobacco Guano	Manufacturer
57730		Shelby County Feed and Grain Co., Shelbyville

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	57276
8.00	*4.00*	*12.00*				*2.06*	*2.50*	*1.00*		*34.0*	57277
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	57278
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*1.00*		*28.3*	57279
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*1.00*		*39.9*	57280
8.00	3.50	11.50				1.09	1.32	0.79		25.8	55932
7.55	3.60	11.15		0.32	0.56	0.88	1.07	1.19		26.1	58093
7.00	*4.00*	*11.00*				*0.82*	*1.00*	*1.00*		*23.8*	
11.30	2.70	14.00		0.53	0.86	1.39	1.69	0.43		30.3	55939
11.50	2.50	14.00	0.44		1.06	1.50	1.82	0.79		33.5	57718
10.70	2.90	13.60	0.35		0.98	1.33	1.61	0.51		29.6	57719
10.00	*4.00*	*14.00*				*1.23*	*1.50*		*0.50*	*28.2*	
11.70	4.10	15.80				0.65	0.79	0.52	0.28	28.6	55940
11.60	4.40	16.00		0.42		0.42	0.51	0.48	0.62	28.7	57720
12.30	4.00	16.30		0.51		0.51	0.62	0.46	0.60	30.0	57721
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
13.40	4.80	18.20		0.37	0.71	1.08	1.31	0.56	0.27	34.6	55942
12.50	3.00	15.50				1.01	1.23	0.56	0.48	33.9	57724
11.90	3.10	15.00				0.88	1.07	0.60	0.78	33.5	57725
10.10	0.50	**10.60**				0.90	1.09	1.31		29.5	58100
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*1.00*		*28.3*	
10.30	3.50	13.80		0.72	1.09	1.81	2.20	0.58	1.13	39.8	55944
11.00	4.00	15.00		0.37	0.93	1.30	1.58		2.35	41.3	57728
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	
10.20	3.40	13.60		0.87	0.84	1.71	2.08	0.46	0.37	33.6	55945
8.50	4.30	12.80		0.31	1.40	1.71	2.08	0.52	0.89	34.9	57729
10.10	0.65	10.75		0.28	1.07	1.35	1.64	0.54	0.79	32.8	58101
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	
10.90	4.00	14.90		0.72	1.08	1.80	2.19	0.52	0.42	36.2	55946
9.00	4.00	13.00		0.24	1.45	1.69	2.05	0.54	0.61	33.8	57730
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*1.00*	*31.2*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Armour Fertilizer Works	
55947	Armour's Tobacco Grower	Manufacturer
57731		L. A. Collins, Lebanon
57732		Jackson Hardware and Grocery Co., Dixon
55949	Armour's Dark Tobacco Special	Manufacturer
57167	Ideal High Grade Blood and Bone	Manufacturer
57736		The T. J. Turley Co., Owensboro
57168	Ideal Tobacco Grower	Manufacturer
57169	Ideal Grain Grower	Manufacturer
58103		The T. J. Turley Co., Owensboro
57640	Armour's Champion	Manufacturer
57641	Armour's Kentucky Wheat Special	Manufacturer
57642	Armour's Wheat Grower	Manufacturer
58106		Jenkins-Essex Co., Elizabethtown
58107		Fischer Brothers Hardware Co., Newport
57643	Armour's Wheat Maker	Manufacturer
57646	Armour's Hemp Grower	Manufacturer
57647	Armour's Special Grain Grower Formula	
55950	Tuscarora Tobacco Guano	Manufacturer
55952	Tuscarora Tobacco Grower	Manufacturer
55953	Tuscarora Golden Grain Grower	Manufacturer
55954	Tuscarora Ammoniated Phosphate	Manufacturer
55961	Tuscarora Corn and Tobacco Grower	Manufacturer
57689	Tuscarora Wheat Grower	Manufacturer
57690	Tuscarora Wheat Special	

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN					POTASH			
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	From Muriate	From Sulfate	Index of Relative Value	Station Number.
10.10	4.30	14.40		0.76	1.07	1.83	2.22	0.54	0.44	35.6	55947
11.10	3.00	14.10		0.21	1.56	1.77	2.15	0.52	0.70	37.6	57731
10.60	3.30	13.90		0.39	1.21	1.60	1.94	0.48	0.45	34.0	57732
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*1.00*	*34.2*	
7.40	3.60	11.00		0.44	1.37	1.81	2.20	0.80	2.05	42.3	55949
7.00	*4.00*	*11.00*				*1.65*	*2.00*		*3.00*	*41.7*	
10.20	3.50	13.70		1.07	1.52	2.59	3.14	0.95		40.6	57167
10.80	4.20	15.00		0.52	1.98	2.50	3.04	0.62	0.77	43.7	57736
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*1.00*		*39.9*	
10.90	3.90	14.80		0.72	1.12	1.84	2.23	0.74	0.25	36.7	57168
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*1.00*	*34.2*	
8.90	7.00	15.90		0.34	0.63	0.97	1.18	0.64	0.25	28.3	57169
8.40	7.30	15.70		0.29	0.73	1.02	1.24	1.33		30.6	58103
8.00	*4.00*	*12.00*				*0.82*	*1.00*	*1.00*		*25.3*	
11.65	1.60	13.25		0.69	1.10	1.79	2.17		2.78	47.4	57640
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*2.00*		*40.2*	
9.75	1.90	11.65		0.65	1.19	1.84	2.23		2.54	43.5	57641
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	
13.90	0.70	14.60				0.55	0.67		0.99	30.9	57642
12.30	0.60	12.90				0.57	0.69	1.38		31.0	58106
12.50	0.85	13.35				0.49	0.59	2.06		34.9	58107
11.00	*4.00*	*15.00*				*0.41*	*0.50*	*1.00*		*27.0*	
14.20	3.10	17.30				0.52	0.63		2.68	42.3	57643
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*2.00*		*34.5*	
7.38	9.42	16.80		0.94	1.48	2.42	2.94	0.94	0.58	40.9	57646
6.00	*4.00*	*10.00*				*2.47*	*3.00*	*1.00*		*33.9*	
											57647
8.00	*4.00*	*12.00*				*0.41*	*0.50*	*2.00*		*28.5*	
10.30	4.00	14.30		0.69	0.98	1.67	2.03	0.58	1.32	40.1	55950
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	
8.80	7.00	15.80		0.93	0.94	1.87	2.27	0.66	1.17	40.1	55952
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	
10.80	2.90	13.70		0.79	1.04	1.83	2.22	0.54	0.40	35.8	55953
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*1.00*		*31.2*	
7.50	3.70	11.20				1.04	1.26	0.78		24.7	55954
7.00	*4.00*	*11.00*				*0.82*	*1.00*	*1.00*		*23.8*	
11.70	4.00	15.70				0.60	0.73	0.48	0.46	29.0	55961
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
13.50	0.75	14.25				0.42	0.51	1.24		30.9	57689
11.00	*4.00*	*15.00*				*0.41*	*0.50*	*1.00*		*27.0*	
											57690
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*1.00*		*28.3*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Armour Fertilizer Works	
57692	Tuscarora Champion	
57693	Tuscarora Standard	Manufacturer
	C. S. Brent Seed Co., Inc., Lexington, Ky.	
57359	Brent's Tobacco Grower	Manufacturer
57360	Brent's Grain Grower	Manufacturer
57741		Manufacturer's Warehouse
58108		Manufacturer's Warehouse
	Calumet Fertilizer Co., New Albany, Ind.	
57364	Calumet Brand High Grade Manure	
57365	Calumet Brand Kentucky Corn and Wheat Grower	P. C. Nicholas, Hodgenville
57742		Salsman & New, Clarkson
57743		Ashby & Daugherty Bros., Shepherdsville
58109		
57366	Calumet Brand Bone Phosphate and Potash Mixture	Salsman & New, Clarkson
57744		
57367	Calumet Brand Black Soil Special	Salsman & New, Clarkson
57745		
57368	Calumet Brand Special Tobacco and Truck Grower	Salsman & New, Clarkson
57746		
57369	Calumet Brand Half-Six-Three	Salsman & New, Clarkson
57749		
57554	Calumet Brand Two-Eight-Two	
57555	Calumet Brand Half-Eight-Three	
57556	Calumet Brand Half-Ten-Two	

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN					POTASH			
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	From Muriate	From Sulfate	Index of Relative Value	Station Number.
											57692
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*2.00*		*40.2*	
10.50	1.35	11.85		0.66	1.17	1.83	2.22	0.62	1.84	43.9	57693
8.00	*4.00*	*12.00*				*1.65*	*2.00*	*2.00*		*37.2*	
10.40	1.20	11.60	0.35		1.16	1.51	1.83	1.20	1.76	44.4	57359
8.00						*1.65*	*2.00*	*2.00*		*35.6*	
9.70	0.70	10.40				0.91	1.10		0.58	24.7	57360
9.10	3.90	13.00	0.24		0.59	0.83	1.01	0.87		26.2	57741
9.70	0.60	10.30				0.97	1.18	1.13		28.4	58108
8.00						*0.82*	*1.00*	*1.00*		*23.7*	
											57364
9.00	*1.00*	*10.00*				*1.23*	*1.50*		*1.00*	*28.5*	
											57365
9.50	2.00	11.50				0.69	0.84	0.64		23.7	57742
9.90	0.80	10.70				0.71	0.86	0.53		23.3	57743
10.50	1.95	12.45				0.68	0.83	0.60		24.9	58109
8.50	*1.00*	*9.50*				*0.62*	*0.75*		*0.50*	*20.5*	
											57366
12.15	0.95	13.10				0.49	0.59	0.79		26.8	57744
10.00	*1.00*	*11.00*				*0.41*	*0.50*		*1.00*	*24.3*	
											57367
6.40	1.05	7.45				0.59	0.72	1.12	2.52	36.0	57745
5.00	*0.50*	*5.50*				*0.41*	*0.50*		*5.00*	*40.6*	
											57368
7.50	1.20	8.70		0.97	0.80	1.77	2.15	0.98	0.75	34.5	57746
6.00	*1.00*	*7.00*				*1.65*	*2.00*		*2.00*	*33.0*	
											57369
7.95	1.20	9.15				0.55	0.67	1.18	1.59	32.9	57749
6.00	*1.00*	*7.00*				*0.41*	*0.50*		*3.00*	*30.3*	
											57554
8.00	*1.00*	*9.00*				*1.65*	*2.00*	*2.00*		*36.0*	
											57555
8.00	*1.00*	*9.00*				*0.41*	*0.50*	*3.00*		*33.3*	
											57556
10.00	*1.00*	*11.00*				*0.41*	*0.50*	*2.00*		*30.3*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Calumet Fertilizer Co.	
57557 58110	Calumet Brand Half-Thirteen-One	Ashby & Daugherty Bros., Shepherdsville
57561 58114	Calumet Brand Half and Half	Cooper-Craycroft Co., Vine Grove
	Cincinnati Phosphate Co., Cincinnati, Ohio.	
57408 57749 57750 58115	High Grade Manure	Manufacturer A. H. Dawson, Owingsville Hiner & Stricklett, Vanceburg G. S. Patterson, Shepherdsville
57409 57751 58116	Tobacco Potato and Beet Grower	Manufacturer A. H. Dawson, Owingsville G. S. Patterson, Shepherdsville
57410	Crop Booster	Manufacturer
57411 58117	Bone and Phosphate Mixture Wheat Special	Manufacturer G. S. Patterson, Shepherdsville
57545	Conservation Brand	
	Duncan & Shirley, LaGrange, Ky.	
57480 57766	Tiger Brand Tobacco Grower	Manufacturers Warehouse
57481 57767	Tiger Brand Special Tobacco Grower	Manufacturers Warehouse
	The Empire Guano Co., Nashville, Tenn.	
57152	Climax Grain Grower	Manufacturer
57153 57768	Climax Tobacco Grower	Manufacturer J. L. Durham, Greensburg
57154	Wheat and Corn Grower	Manufacturer
57155	Red Banner Tobacco Grower	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
											57557
14.55	2.60	17.15				0.51	0.62	1.21		33.7	58110
13.00	*1.00*	*14.00*				*0.41*	*0.50*	*1.00*		*28.8*	
											57561
8.95	6.25	15.20				1.75	2.12	1.11		34.8	58114
6.00	*6.00*	*12.00*				*2.06*	*2.50*	*1.00*		*31.8*	
13.30	1.45	14.75		0.44	0.64	1.08	1.31	1.23		35.5	57408
11.90	2.30	14.20		0.32	0.74	1.06	1.29	1.10		32.8	57749
11.95	2.30	14.25		0.35	0.64	0.99	1.20	1.12		32.5	57750
12.05	2.15	14.20				0.90	1.09	1.16		32.2	58115
11.00	*1.00*	*12.00*				*0.82*	*1.00*	*1.00*		*28.6*	
9.05	2.85	11.90		0.27	0.63	0.90	1.09	2.55		36.3	57409
9.30	2.05	11.35		0.27	0.64	0.91	1.10	2.28		34.8	57751
8.65	2.65	11.30		0.37	0.59	0.96	1.17	2.17		33.8	58116
8.00	*1.00*	*9.00*				*0.82*	*1.00*	*2.00*		*30.1*	
11.65	2.50	14.15	0.23		0.32	0.55	0.67	0.54	1.02	31.7	57410
10.00	*1.00*	*11.00*				*0.41*	*0.50*	*1.00*		*24.3*	
9.75	9.25	19.00		0.32	0.72	1.04	1.26	1.22		32.9	57411
9.55	10.70	20.25				1.05	1.27	1.12		32.7	58117
8.00	*8.00*	*16.00*				*0.82*	*1.00*	*1.00*		*26.9*	
											57545
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*2.00*		*42.0*	
											57480
8.40	0.60	9.00	0.21	0.41	1.18	1.80	2.19	0.79		30.2	57766
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*1.00*	*31.2*	
											57481
8.95	0.85	9.80	0.39	0.77	0.40	1.56	1.89	1.00	1.01	36.8	57767
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	
11.40	5.20	16.60		0.39	1.10	1.50	1.82	2.50		44.7	57152
10.00	*5.00*	*15.00*				*0.82*	*1.00*		*1.00*	*28.7*	
9.20	7.10	16.30		0.28	1.23	1.51	1.83	2.01		39.3	57153
7.65	8.95	16.60	0.42		0.47	0.89	1.08	0.95		27.0	57768
8.00	*7.00*	*15.00*				*0.82*	*1.00*		*1.00*	*26.5*	
12.50	5.30	17.80		0.25	0.85	1.10	1.34	2.15		41.5	57154
11.00	*5.00*	*16.00*				*0.41*	*0.50*		*1.00*	*27.4*	
9.30	4.30	13.60	0.31	0.35	1.54	2.20	2.67	2.87		50.3	57155
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*2.00*	*37.6*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	The Empire Guano Co.	
57156	Blood, Bone and Potash	Manufacturer
57159	Magic Grain Grower	Manufacturer
57495	High Grade Tobacco Grower	Manufacturer
57496	Red Banner Special	Manufacturer
57497	Red Banner Manure	Manufacturer
57498	Clover and Wheat Special	Manufacturer
57499	Premium Grain Guano	Manufacturer
57500	Wheat, Oat and Corn Grower	Manufacturer
57503	Farmers Favorite	Manufacturer
57505	Special Grain Manure	Manufacturer
	The Evansville Packing Co., Evansville, Ind.	
57470	Bone Phosphate and Potash	
57471	Harvest King	
57472 57772	Three "B"	Eldred Hardware Co., Princeton
57473	Corn and Wheat Special	
57474 57773	Half and Half Mixture	Atherton-Kidd Co., Livermore
57476	Leader	
57478 58127	Farmers Pride	J. H. Barnhill, Providence
	Falls City Fertilizer Co., New Albany, Ind.	
57857	Falls City Brand Two-Eight-Two	
57858	Falls City Brand Half-Thirteen-One	

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
9.80	4.20	14.00		0.48	1.63	2.11	2.56	2.79		47.9	57156
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*2.00*	*37.6*	
17.10	4.30	21.40		0.29	0.86	1.15	1.40	1.50		44.4	57159
14.00	*5.00*	*19.00*				*0.50*	*0.61*		*0.50*	*29.5*	
8.90	6.40	15.30	0.38	0.70	0.83	1.91	2.32	2.74	1.72	56.0	57495
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*4.00*	*49.6*	
10.20	4.50	14.70	0.40	0.69	0.76	1.85	2.25	1.76	1.50	49.6	57496
10.00	*5.00*	*15.00*				*1.65*	*2.00*		*2.00*	*40.6*	
10.90	6.40	17.30	0.31	0.45	0.42	1.18	1.43	1.88	1.74	48.9	57497
10.00	*6.00*	*16.00*				*0.82*	*1.00*		*3.00*	*41.1*	
12.40	4.00	16.40	0.32	0.42	0.46	1.20	1.46	1.74	0.82	44.0	57498
12.00	*3.00*	*15.00*				*0.82*	*1.00*		*2.00*	*36.9*	
12.10	5.10	17.20	0.30	0.39	0.47	1.16	1.41	1.18	0.81	40.3	57499
12.00	*4.00*	*16.00*				*0.82*	*1.00*		*1.00*	*31.3*	
8.30	14.00	22.30	0.27	0.39	0.51	1.17	1.42	1.37		34.5	57500
7.00	*10.00*	*17.00*				*0.82*	*1.00*		*1.00*	*26.2*	
10.50	9.30	19.80	0.33	0.37	0.50	1.20	1.46	1.68	1.03	44.1	57503
9.00	*7.00*	*16.00*				*0.82*	*1.00*		*2.00*	*34.0*	
13.60	4.00	17.60	0.28	0.21	0.33	0.82	1.00	1.22	0.38	37.3	57505
13.00	*4.00*	*17.00*				*0.41*	*0.50*		*1.00*	*30.0*	
											57470
7.00						*0.82*	*1.00*	*1.00*		*22.2*	
											57471
8.00						*1.00*	*1.21*	*2.00*		*31.0*	
											57472
9.10	0.20	9.30				1.63	1.98	1.50	0.63	37.9	57772
8.00						*1.65*	*2.00*	*2.00*		*35.6*	
											57473
12.00						*0.82*	*1.00*	*3.00*		*41.7*	
											57474
9.70	0.80	10.50		0.20	1.91	2.11	2.56	1.77		40.3	57773
10.00						*2.47*	*3.00*	*1.00*		*38.3*	
											57476
9.00						*2.47*	*3.00*	*1.00*		*36.8*	
											57478
13.60	1.10	14.70				0.94	1.14	1.12		34.1	58127
12.00						*0.82*	*1.00*	*1.00*		*29.7*	
											57857
8.00	*1.00*	*9.00*				*1.65*	*2.00*	*2.00*		*36.0*	
											57858
13.00	*2.50*	*15.50*				*0.41*	*0.50*	*1.00*		*29.4*	

TABLE 1.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Federal Chemical Co., Inc., Louisville, Ky.	
55983	Liberty Wheat and Corn Grower	Manufacturer
57779		E. L. and A. T. Byron, Owingsville
55984	A-1 Clay Land Fertilizer	Manufacturer
55986	Blue Grass Tobacco Grower	Manufacturer
57782		Dick Duncan, Olive Hill
57783		Pierson & Breedlove, Franklin
55987	Tobacco, Truck and Tomato Fertilizer	Manufacturer
57784		H. W. McCandless, Munfordville
57785		Watkins & Crum Co., Inc., Smithfield.
55988	Potato Maker and Tobacco Fertilizer	Manufacturer
55999	Daybreak Champion Grain Grower	Manufacturer
56000	Daybreak Tobacco Formula	Manufacturer
57001	Daybreak Special Tobacco Grower	Manufacturer
57797		Owen Hulett, Williamstown
57798		Lake Brothers, Springfield
57004	Daybreak A-1 Champion	Manufacturer
57800		Watkins & Crum Co., Inc., Smithfield.
58134		Ratcliff Hardware Co., Princeton
57005	Standard Crop Maker	Manufacturer
57006	Standard Tobacco Fertilizer	Manufacturer
57801		Birk & Price Co., Owensboro
57007	Standard Wheat and Corn Maker	Manufacturer
57802		Lawrenceburg Supply Co., Lawrenceburg
57008	Daybreak Wheat and Corn Special	Manufacturer
57803		Hugh Martin, Corbin
57804		Johnson & Biers Co., Elizabethtown
58135		Hugh Martin, Corbin

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
8.97	15.30	24.27		0.73		0.73	0.89	1.10		31.3	55983
9.40	13.50	22.90				0.63	0.76	0.71		28.2	57779
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
10.20	10.60	20.80		1.42		1.42	1.72	2.40		43.9	55984
8.00	*8.00*	*16.00*				*0.82*	*1.00*		*0.50*	*23.9*	
13.70	9.00	22.70		0.88		0.88	1.07	0.50	1.49	42.3	55986
11.00	8.20	19.20				0.44	0.53	1.64		32.7	57782
11.30	6.70	18.00	0.30		0.39	0.69	0.84	1.68		34.5	57783
10.00	*4.00*	*14.00*				*0.41*	*0.50*		*1.50*	*28.5*	
12.47	10.93	23.40		1.95	0.30	2.25	2.73	1.20	1.05	52.3	55987
9.20	9.10	18.30	1.24		0.45	1.69	2.05	1.24		36.7	57784
11.80	3.70	15.50	1.11		0.54	1.65	2.00	0.54	0.54	37.2	57785
9.00	*4.00*	*13.00*				*1.65*	*2.00*		*1.00*	*32.7*	
13.64	5.10	18.74		2.72	0.35	3.07	3.73	3.69		66.1	55988
9.00	*4.00*	*13.00*				*1.65*	*2.00*		*1.00*	*32.7*	
10.27	13.40	23.67		0.41	0.30	0.71	0.86	0.90		31.1	55999
9.00	*9.00*	*18.00*				*0.41*	*0.50*		*0.50*	*23.0*	
8.50	15.24	23.74		0.28	0.45	0.73	0.89	0.99		29.9	56000
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
8.40	15.67	24.07		0.73		0.73	0.89	0.76	0.38	30.2	57001
9.75	11.50	21.25				0.49	0.59	0.87		27.9	57797
8.20	9.20	17.40				0.60	0.73	1.23		27.6	57798
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
12.03	11.14	23.17		0.22	0.33	0.55	0.67	0.46		29.1	57004
12.30	7.20	19.50		0.37	0.39	0.76	0.92	0.99		32.6	57800
11.90	5.00	16.90				0.43	0.52	0.60		26.5	58134
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.20	10.90	23.10		0.52		0.52	0.63	0.57		29.7	57005
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.00	11.00	23.00		0.54		0.54	0.66	0.58		29.7	57006
11.30	6.00	17.30				0.56	0.68	0.80		28.1	57801
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
13.30	10.30	23.60		0.29	0.26	0.55	0.67	0.62		31.6	57007
12.15	4.60	16.75				0.60	0.73	0.52		27.4	57802
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.00	11.10	23.10		0.39	0.26	0.65	0.79	0.64	0.61	34.5	57008
12.30	2.05	14.35	0.21		0.48	0.69	0.84	0.76		28.7	57803
12.10	7.25	19.35				0.60	0.73	1.11		31.9	57804
11.50	4.95	16.45				0.47	0.57	1.16		29.5	58135
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Federal Chemical Co., Inc.	
57009	Daybreak Cracker Jack	Manufacturer
57010	Royal Tobacco Compound	Manufacturer
57011	Royal Wheat and Grain Special	Manufacturer
58136		Grigsby & Co., Bardstown
57308	High Grade Special	Manufacturer
57811		Chiles-Thompson Grocery Co., Mt. Sterling
57309	Special High Grade Tobacco Grower	Manufacturer
57812		Chiles-Thompson Grocery Co., Mt. Sterling
57395	Daybreak Cotton Seed Meal	Manufacturer
57435	Kentucky Special Tobacco Fertilizer	Manufacturer
57447	Beef, Blood and Bone	Manufacturer
57813		Watkins & Crum Co., Inc., Smithfield.
57448	Special Two-Eight-Three	Manufacturer
57587	Daybreak Special Manure	Manufacturer
57588	Daybreak Favorite	Manufacturer
57589	Standard Crop and Tobacco Grower	Manufacturer
57590	Standard Corn and Wheat Grower	Manufacturer
57591	Daybreak High Grade Fertilizer	Manufacturer
57597	Standard Grain Grower	Manufacturer
58142		Grigsby & Co., Bardstown
58143		Jno. Harned, Big Clifty
57598	Loam Land Fertilizer	Manufacturer
57599	Mid-West High Grade Mixture	Manufacturer
57024	Mogul Grain Grower	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
15.90	6.40	23.30		0.42	0.21	0.63	0.76	0.54	0.80	38.9	57009
13.00	*4.00*	*17.00*				*0.41*	*0.50*		*1.00*	*30.0*	
13.97	8.23	22.20		0.52	0.23	0.75	0.91	0.68	1.26	41.1	57010
10.00	*4.00*	*14.00*				*0.41*	*0.50*		*1.50*	*28.5*	
14.00	8.50	22.50		0.91	0.21	1.12	1.36	0.66	0.68	40.3	57011
13.10	2.45	15.55	0.40		0.55	0.95	1.15	0.88		32.6	58136
12.00	*4.00*	*16.00*				*0.82*	*1.00*		*1.00*	*31.3*	
15.60	5.70	21.30		1.23		1.23	1.49	0.60	1.76	48.5	57308
14.95	1.95	16.90		0.74	0.30	1.04	1.26	0.96	0.59	39.8	57811
14.00	*4.00*	*18.00*				*0.82*	*1.00*		*1.00*	*34.3*	
11.95	7.20	19.15		3.36	0.54	3.90	4.73	1.34	0.72	60.5	57309
11.50	2.00	13.50		1.53	1.05	2.58	3.13	0.96	0.78	46.6	57812
10.00	*4.00*	*14.00*				*2.47*	*3.00*		*1.00*	*39.9*	
1.60	0.10	1.70				5.89	7.15	0.72	1.03	54.2	57395
1.50						*5.77*	*7.00*		*1.50*	*51.6*	
13.30	6.70	20.00		0.66	1.74	2.40	2.91	0.64	1.31	51.1	57435
11.50	*4.00*	*15.50*				*1.65*	*2.00*		*0.50*	*33.4*	
12.25	7.30	19.55		1.98	0.31	2.29	2.78	0.86	1.16	49.5	57447
13.40	3.45	16.85	0.30	0.93	0.36	1.59	1.93	1.72	0.67	47.0	57813
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	
10.40	9.15	19.55		1.64	0.30	1.94	2.36	1.10	2.26	53.0	57448
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*3.00*	*43.2*	
12.20	9.25	21.45		1.01	0.24	1.25	1.52	0.58	2.28	47.9	57587
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*2.00*	*34.3*	
13.60	5.40	19.00		1.05	0.27	1.32	1.60		3.52	52.9	57588
11.00	*4.00*	*15.00*				*0.82*	*1.00*		*3.00*	*41.8*	
11.05	8.55	19.60		1.09	0.20	1.29	1.57	0.66	3.78	55.7	57589
8.00	*4.00*	*12.00*				*0.82*	*1.00*		*4.00*	*43.3*	
10.50	10.30	20.80		1.83	0.33	2.16	2.62	0.84	2.08	52.5	57590
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	
12.65	6.50	19.15		1.95	0.35	2.30	2.79	0.92	1.83	54.2	57591
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	
13.75	8.60	22.35		1.47		1.47	1.78	0.52	1.02	43.6	57597
11.30	2.25	13.55	0.45		0.52	0.97	1.18	0.92		30.2	58142
10.45	0.90	11.35	0.59		0.43	1.02	1.24	1.85		34.3	58143
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*1.00*	*28.3*	
14.45	4.50	18.95		2.39	0.26	2.65	3.22	0.94	0.98	53.6	57598
12.00	*4.00*	*16.00*				*1.65*	*2.00*		*2.00*	*43.2*	
13.10	5.60	18.70		2.50	0.26	2.76	3.35	1.26	3.83	71.8	57599
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*4.00*	*52.2*	
10.50	13.20	23.70		0.46	0.21	0.67	0.81	0.60	0.42	31.8	57024
9.00	*9.00*	*18.00*				*0.41*	*0.50*		*0.50*	*23.0*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Federal Chem. Co., Inc.	
57025	Blue Ribbon Tobacco Formula	Manufacturer
57026	1st Prize Special Tobacco Grower	Manufacturer
57029	1st Prize Corn and Wheat Champion	Manufacturer
57030	Mogul Tobacco Fertilizer	Manufacturer
57031	Mogul Mixture	Manufacturer
57032	1st Prize Corn, Wheat and Oats Grower	Manufacturer
57033	1st Prize Grain Maker	Manufacturer
57034	1st Prize Tobacco Compound	Manufacturer
57035	1st Prize Wheat and Grain Special	Manufacturer
57612	Blue Ribbon Corn and Wheat Grower	Manufacturer
57613	1st Prize Formula	Manufacturer
57614	1st Prize Crop and Tobacco Grower	Manufacturer
57615	Premium High Grade Fertilizer	
	Fox Chemical Co., Br. Federal Chem. Co., Inc., Louisville, Ky.	
57048	Fox Ideal Grain Grower	Manufacturer
57049	Fox Tobacco Formula	Manufacturer
57050	Fox Special Tobacco Grower	Manufacturer
57826		M. L. Spurling, Campbellsville
57053	Fox Ideal Fertilizer	Manufacturer
57828		Hill Congleton & Sons, Beattyville
57054	Fox Crop Maker	Manufacturer
57055	Fox Ideal Tobacco Fertilizer	Manufacturer
57829		A. R. Blakey, Esto

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN					POTASH			
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	From Muriate	From Sulfate	Index of Relative Value	Station Number.
8.90	15.20	24.10		0.57		0.57	0.69	0.62	0.48	30.0	57025
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
8.70	15.20	23.90		0.51	0.25	0.76	0.92	0.70	0.37	30.9	57026
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
12.10	11.00	23.10				0.54	0.66	0.56		29.7	57029
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.70	10.80	23.50		0.34	0.24	0.58	0.70	0.54		30.7	57030
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.20	11.20	23.40		0.31	0.25	0.56	0.68	0.74		31.1	57031
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.00	11.40	23.40		0.44	0.21	0.65	0.79	0.50	0.96	35.9	57032
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
15.50	6.60	22.10		0.58		0.58	0.70		1.57	39.4	57033
13.00	*4.00*	*17.00*				*0.41*	*0.50*		*1.00*	*30.0*	
14.40	8.00	22.40		0.63	0.21	0.84	1.02		2.17	43.7	57034
10.00	*4.00*	*14.00*				*0.41*	*0.50*		*1.50*	*28.5*	
14.50	8.00	22.50		0.93	0.21	1.14	1.38	0.50	0.92	41.5	57035
12.00	*4.00*	*16.00*				*0.82*	*1.00*		*1.00*	*31.3*	
12.85	8.05	20.90		1.31	0.24	1.55	1.88	0.88	1.45	47.3	57612
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*2.00*	*34.3*	
13.95	5.45	19.40		0.98	0.24	1.22	1.48		3.38	52.0	57613
11.00	*4.00*	*15.00*				*0.82*	*1.00*		*3.00*	*41.8*	
14.25	5.80	20.05		1.16		1.16	1.41	0.90	3.78	60.0	57614
8.00	*4.00*	*12.00*				*0.82*	*1.00*		*4.00*	*43.3*	
13.75	5.45	19.20		2.12	0.27	2.39	2.90	0.68	1.84	54.7	57615
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	
10.00	13.60	23.60		0.49	0.23	0.72	0.87	0.58	0.42	31.5	57048
9.00	*9.00*	*18.00*				*0.41*	*0.50*		*0.50*	*23.0*	
8.80	15.60	24.40		0.51	0.23	0.74	0.90	0.56	0.57	31.4	57049
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
9.60	15.00	24.60		0.55	0.24	0.79	0.96	0.48	0.42	31.3	57050
10.95	10.10	21.05				0.59	0.72	1.02		30.7	57826
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
12.50	11.00	23.50		0.60		0.60	0.73		0.91	32.8	57053
13.75	1.90	15.65				0.48	0.58	0.66		28.7	57828
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.20	11.20	23.40		0.37	0.24	0.61	0.74	0.54		30.3	57054
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.80	10.80	23.60		0.35	0.24	0.59	0.72		0.53	30.8	57055
11.70	1.85	13.55				0.64	0.78	0.63		26.6	57829
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Fox Chemical Co., Br. Federal Chem. Co., Inc.	
57056	Early Harvest Wheat and Corn Maker	Manufacturer
57830		O. A. Lutes & Co., Shepherdsville
57831		J. L. Shadoin & Co., Frazer
57057	Fox Blood, Bone Phosphate and Potash	Manufacturer
57832		G. McMullin & Son, Eubank
58153		J. N. Murrell & Co., Craycraft
58154		J. F. Rogers, Elizabethtown
57058	Red Fox Grain and Grass Grower	Manufacturer
57059	Fox Soil Builder	Manufacturer
57060	Red Fox Tobacco Compound	Manufacturer
57061	Fox Wheat and Grain Special	Manufacturer
58155		Jno. Roberts, Haldeman
57648	Fox Early Harvest	Manufacturer
58161		J. N. Murrell & Co., Craycraft
57649	Fox Formula	Manufacturer
57650	Fox Crop and Tobacco Grower	Manufacturer
58163		O. A. Lutes & Co., Shepherdsville
57651	Fox Wheat and Corn Manure	Manufacturer
57652	Fox Wheat and Corn Grower	Manufacturer
	Globe Fertilizer Co., Br. Federal Chem. Co., Inc., Louisville, Ky.	
57075	Globe Tip Top Grain Grower	Manufacturer
57843		F. T. Burke, Junction City
57076	Braden Tobacco Formula	Manufacturer
57077	Kentucky Standard Tobacco Grower	Manufacturer
57844		Moss & Gibson, Crestwood
57845		J. M. Reynolds, Waynesburg

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN					POTASH			
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	From Muriate	From Sulfate	Index of Relative Value	Station Number.
12.50	11.00	23.50		0.35	0.37	0.72	0.87		0.70	32.4	57056
13.70	4.95	18.65				0.64	0.78	0.59		30.6	57830
13.00	1.90	14.90				0.56	0.68	0.69		28.3	57831
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
11.70	11.10	22.80		0.44	0.21	0.65	0.79	0.60	0.59	33.7	57057
12.70	5.60	18.30				0.63	0.76	0.92		31.2	57832
10.90	3.40	14.30				0.63	0.76	0.63		25.9	58153
12.25	4.10	16.35				0.41	0.50	0.90		28.3	58154
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
11.30	11.70	23.00		0.49	0.23	0.72	0.87	0.48	0.84	34.6	57058
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
15.90	6.10	22.00		0.45	0.63	1.08	1.31	0.46	0.95	42.3	57059
13.00	*4.00*	*17.00*				*0.41*	*0.50*		*1.00*	*30.0*	
14.10	8.70	22.80		0.75		0.75	0.91	0.52	1.49	41.9	57060
10.00	*4.00*	*14.00*				*0.41*	*0.50*		*1.50*	*28.5*	
14.20	8.30	22.50		0.98	0.23	1.21	1.47	0.64	0.75	41.4	57061
12.05	1.30	13.35	0.50		0.48	0.98	1.19	1.40		33.9	58155
12.00	*4.00*	*16.00*				*0.82*	*1.00*		*1.00*	*31.3*	
12.30	9.40	21.70		1.10	0.24	1.34	1.63		3.03	49.8	57648
10.05	3.70	13.75	0.29		0.55	0.84	1.02	1.78		33.1	58161
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*2.00*	*34.3*	
12.90	5.85	18.75		1.12	0.28	1.40	1.70		3.39	51.8	57649
11.00	*4.00*	*15.00*				*0.82*	*1.00*		*3.00*	*41.8*	
11.30	8.90	20.20		1.08	0.35	1.43	1.74	0.90	3.40	56.3	57650
7.95	2.10	10.05	0.23	0.20	0.50	0.93	1.13	4.22		44.6	58163
8.00	*4.00*	*12.00*				*0.82*	*1.00*		*4.00*	*43.3*	
11.15	10.25	21.40		1.91	0.38	2.29	2.78	0.78	2.05	53.8	57651
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	
12.50	6.45	18.95		1.99	0.27	2.26	2.74	0.82	0.91	47.5	57652
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	
10.90	13.00	23.90		0.51	0.30	0.81	0.98	0.54	0.39	32.8	57075
10.85	10.55	21.40				0.50	0.61	0.72		28.3	57843
9.00	*9.00*	*18.00*				*0.41*	*0.50*		*0.50*	*23.0*	
8.60	15.00	23.60		0.76		0.76	0.92	0.50	0.72	31.5	57076
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
8.80	15.20	24.00		0.79		0.79	0.96	0.52	0.50	30.9	57077
10.25	10.80	21.05				0.68	0.83	1.17		31.5	57844
10.20	12.45	22.65				0.58	0.70	1.18		31.4	57845
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Globe Fertilizer Co.	
57080	Globe Good Luck Fertilizer	Manufacturer
57081	Progress Fertilizer	Manufacturer
57082	Progress Tobacco Fertilizer	Manufacturer
57846		Jeffries Hardware Store, Columbia.
57847		Pierson & Breedlove, Franklin
57083	Eagle Fertilizer	Manufacturer
57848		Moss & Gibson, Crestwood
57084	Globe Blood, Bone Phosphate and Potash	Manufacturer
57849		S. Owsley & Sons, Middlesboro
57850		Hazard Hardware Co., Hazard
58167		M. G. Parman, London
57085	Globe Grain and Grass Grower	Manufacturer
58168		Hafendorfer-Thornton Co., Owensboro.
58169		J. M. Tindall, Ekron
57086	Globe Money Maker	Manufacturer
57851		R. L. Whitley, Eveleigh
58170		Jno. Harned, Big Clifty
57087	Old Cap's Tobacco Compound	Manufacturer
57088	Globe Wheat and Grain Special	Manufacturer
58171		Cooper-Crayeroft Co., Vine Grove
57696	Progress Corn and Wheat Grower	Manufacturer
57697	Braden Formula	Manufacturer
58176		W. H. Lyon, Loretto
57698	Universal Crop and Tobacco Grower	Manufacturer
57699	Eagle Wheat and Corn Grower	Manufacturer
57700	Globe Wheat Grower	Manufacturer
57704	Globe Good Grower Fertilizer	Manufacturer
58178		Jno. Harned, Big Clifty

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
12.60	10.80	23.40		0.34	0.22	0.56	0.68	0.72		31.5	57080
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.50	10.50	23.00		0.52		0.52	0.63	0.55		29.9	57081
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.80	10.90	23.70		0.42		0.42	0.51		0.67	29.5	57082
11.30	6.25	17.55				0.55	0.67	0.82		28.2	57846
12.25	7.40	19.65				0.60	0.73	0.77		30.2	57847
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.00	11.00	23.00		0.22	0.31	0.53	0.64		0.62	29.8	57083
12.45	2.05	14.50				0.52	0.63	0.93		28.7	57848
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
11.80	11.20	23.00		0.37	0.26	0.63	0.76	0.46	0.69	33.5	57084
13.95	0.75	14.70				0.38	0.46	1.08		30.4	57849
11.35	9.10	20.45				0.48	0.58	0.95		29.7	57850
12.05	3.60	15.65	0.26		0.30	0.56	0.68	1.20		30.6	58167
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
12.20	10.90	23.10		0.44	0.29	0.73	0.89		1.22	35.1	57085
12.45	3.50	15.95				0.57	0.69	1.10		30.7	58168
12.70	1.50	14.20				0.47	0.57	0.92		28.5	58169
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
16.10	7.10	23.20		0.34	0.26	0.60	0.73	0.48	0.93	39.7	57086
12.85	1.30	14.15				0.63	0.76	1.56		33.6	57851
12.70	1.05	13.75				0.52	0.63	1.85		34.2	58170
13.00	*4.00*	*17.00*				*0.41*	*0.50*		*1.00*	*30.0*	
13.30	9.00	22.30		0.49	0.20	0.69	0.84	0.52	1.42	40.0	57087
10.00	*4.00*	*14.00*				*0.41*	*0.50*		*1.50*	*28.5*	
13.60	8.80	22.40		0.86	0.26	1.12	1.36	0.50	0.88	40.0	57088
13.00	2.00	15.00	0.46		0.51	0.97	1.18	1.08		33.6	58171
12.00	*4.00*	*16.00*				*0.82*	*1.00*		*1.00*	*31.3*	
13.60	8.60	22.20		1.22		1.22	1.48	0.72	2.16	49.7	57696
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*2.00*	*34.3*	
13.40	5.45	18.85		1.07	0.22	1.29	1.57	0.92	2.76	53.4	57697
10.35	4.55	14.90	0.74		0.39	1.13	1.37	3.19		44.4	58176
11.00	*4.00*	*15.00*				*0.82*	*1.00*		*3.00*	*41.8*	
11.70	8.35	20.05		1.30		1.30	1.58	0.86	3.69	57.3	57698
8.00	*4.00*	*12.00*				*0.82*	*1.00*		*4.00*	*43.3*	
11.00	10.30	21.30		1.90	0.20	2.10	2.55	0.96	1.84	52.1	57699
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	
12.45	6.55	19.00		1.92	0.28	2.20	2.67	0.72	2.10	53.6	57700
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	
14.70	7.75	22.45		0.74		0.74	0.90		1.18	37.4	57704
10.50	1.20	11.70				0.54	0.66	1.21		27.3	58178
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Groves Fertilizer Works, Cincinnati, Ohio.	
57127	Harvest King	Manufacturer
57864		Minges Hardware Co., Newport
57128	Economy Brand	Manufacturer
57865		Troutman Bros., Shepherdsville
57133	Groves' Half and Half	Manufacturer
57871		A. L. Moore, Leitchfield
57872		Troutman Bros., Shepherdsville
57584	Groves' Standard	Manufacturer
57585	Half and Half	Manufacturer
	Hopkins Fertilizer Co., New Albany, Ind.	
57377	Kentucky Tobacco Grower	Manufacturer
57378	Potato and Tobacco Grower No. 1	Manufacturer
57875		J. D. Ashcraft, Irvington
57876		A. W. Pickerell, Hodgenville
57384	Half and Half No. 1	Manufacturer
57884		A. L. Moore, Leitchfield
57385	Potato and Tobacco Grower	Manufacturer
57885		A. W. Pickerell, Hodgenville
57886		J. D. Ashcraft, Irvington
57386	Wheat and Corn Grower No. 2	Manufacturer
57887		J. D. Ashcraft, Irvington
57888		A. W. Pickerell, Hodgenville
57387	High Grade Tobacco Grower	Manufacturer
57889		The Taylor County Supply Co., Campbellsville
57890		Salsman & New, Clarkson
57388	Tobacco Special	Manufacturer
57891		J. D. Ashcraft, Irvington

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN					POTASH			
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	From Muriate	From Sulfate	Index of Relative Value	Station Number.
9.80	1.70	11.50				1.02	1.24	1.17		29.5	57127
10.70	1.90	12.60				0.95	1.15	0.93		29.0	57864
8.00	*1.00*	*9.00*				*0.82*	*1.00*	*1.00*		*24.1*	
11.90	2.50	14.40				1.06	1.29	1.09		32.8	57128
11.00	1.10	12.10				0.83	1.01	1.04		29.0	57865
10.00	*1.00*	*11.00*				*0.82*	*1.00*	*1.00*		*27.1*	
11.10	7.20	18.30				1.03	1.25	0.96		32.7	57133
12.30	5.80	18.10				0.78	0.95	1.43		34.8	57871
11.40	6.10	17.50				0.77	0.93	1.26		32.5	57872
10.00	*6.00*	*16.00*				*0.82*	*1.00*	*1.00*		*29.1*	
11.35	0.85	12.20		0.51	1.21	1.72	2.09	2.36		43.6	57584
10.00	*1.00*	*11.00*				*1.65*	*2.00*	*2.00*		*39.0*	
10.65	8.25	18.90				1.99	2.42	2.14		46.1	57585
10.00	*6.00*	*16.00*				*1.65*	*2.00*	*2.00*		*41.0*	
7.40	0.20	7.60	2.62			2.62	3.18	1.08	3.70	58.2	57377
6.00	*2.00*	*8.00*				*1.65*	*2.00*		*2.00*	*33.4*	
12.40	0.10	12.50	1.35			1.35	1.64	0.94	1.33	41.7	57378
12.40	1.20	13.60		0.48	0.54	1.02	1.24	1.32	0.89	39.5	57875
12.50	1.40	13.90	0.24		0.44	0.68	0.83	1.70	0.80	39.1	57876
11.00	*2.00*	*13.00*				*0.82*	*1.00*		*2.00*	*35.0*	
8.60	4.60	13.20	0.99		1.25	2.24	2.72	0.62	0.28	35.8	57384
9.20	6.50	15.70		0.69	0.84	1.53	1.86	1.06		33.5	57884
6.00	*7.00*	*13.00*				*1.65*	*2.00*		*1.00*	*29.4*	
12.40	0.20	12.60	0.81		0.22	1.03	1.25	0.66	0.36	32.0	57385
11.40	1.00	12.40				0.45	0.55	1.07		27.1	57885
11.80	0.70	12.50		0.52	0.46	0.98	1.19	1.27		32.5	57886
11.00	*2.00*	*13.00*				*0.82*	*1.00*		*1.00*	*29.0*	
10.90	0.10	11.00	1.14			1.14	1.38	0.68	0.63	32.2	57386
11.00	0.80	11.80				0.55	0.67	0.82		25.6	57887
10.80	0.70	11.50				0.54	0.66	0.89		25.6	57888
10.00	*2.00*	*12.00*				*0.41*	*0.50*		*1.00*	*24.7*	
8.80	0.10	8.90	1.91			1.91	2.32	0.76	0.84	36.2	57387
8.80	0.40	9.20				0.72	0.87	0.66	0.41	24.8	57889
9.40	0.20	9.60				1.01	1.23	0.77		25.9	57890
8.00	*2.00*	*10.00*				*0.82*	*1.00*		*1.00*	*24.5*	
9.60	0.10	9.70	2.10			2.10	2.55	1.26	1.95	48.4	57388
9.60	0.20	9.80				1.06	1.29	0.78	1.17	33.6	57891
8.00						*0.82*	*1.00*		*3.00*	*35.7*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	International Agricultural Corporation, Montgomery, Ala.	
57427	International Blood and Bone	
57428	International Fertilizer	
	The Jarecki Chemical Co., Cincinnati, Ohio.	
57396	Lake Erie Guano with Phosphate and Potash	Manufacturer
57397	Tobacco and Truck Grower	Manufacturer
57894		McDonald Bros., Mt. Sterling
57398	Little Giant	Manufacturer
57895		Stuart & O'Brien, Paris
57399	Raw Bone and Phosphate Mixture	Manufacturer
57404	Fish, Phosphate and Potash Tobacco and Potato Food	Manufacturer
57405	Gilead Phosphate	Manufacturer
57898		Staggs Brothers Co., Vanceburg
57407	Indian Brand Tobacco and Potato Fertilizer	Manufacturer
57899		Fremd Grocery Co., Eminence
57542	Middle West Formula	
	The Kaufman Fertilizer Co., Cincinnati,, Ohio.	
57417	Corn, Wheat and Oats Grower	Manufacturer
57418	Special Potato and Tobacco Fertilizer	Manufacturer
57902		Fred G. Jones Lumber Co., N. Pleasureville
57419	Banner Crop Grower	Manufacturer
57420	Half and Half	Manufacturer
57548	Complete Ration	

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN					POTASH			
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	From Muriate	From Sulfate	Index of Relative Value	Station Number.
											57427
10.00	*1.00*	*11.00*				*0.82*	*1.00*	*1.00*		*27.1*	
											57428
8.00	*1.00*	*9.00*				*1.65*	*2.00*	*2.00*		*36.0*	
13.30	1.45	14.75		0.44	0.64	1.08	1.31	1.23		35.5	57396
11.00	*1.00*	*12.00*				*0.82*	*1.00*	*1.00*		*28.6*	
9.05	2.85	11.90		0.27	0.63	0.90	1.09	2.55		36.3	57397
8.30	2.10	10.40		0.29	0.68	0.97	1.18	1.56	0.54	32.9	57894
8.00	*1.00*	*9.00*				*0.82*	*1.00*	*2.00*		*30.1*	
11.65	2.50	14.15	0.23		0.32	0.55	0.67	0.54	1.02	31.7	57398
10.30	2.40	12.70				0.62	0.75	1.42		29.3	57895
10.00	*1.00*	*11.00*				*0.41*	*0.50*	*1.00*		*24.3*	
9.75	9.25	19.00		0.32	0.72	1.04	1.26	1.22		32.9	57399
8.00	*8.00*	*16.00*				*0.82*	*1.00*	*1.00*		*26.9*	
8.30	2.15	10.45		0.56	0.61	1.17	1.42	1.24		28.9	57404
8.00	*1.00*	*9.00*				*0.82*	*1.00*	*1.00*		*24.1*	
8.30	2.15	10.45		0.56	0.61	1.17	1.42	1.24		28.9	57405
8.50	1.80	10.30		0.29	0.74	1.03	1.25	1.13		27.5	57898
8.00	*1.00*	*9.00*				*0.82*	*1.00*	*1.00*		*24.1*	
8.15	3.00	11.15		2.84	1.07	3.91	4.75	3.30		60.6	57407
9.60	1.50	11.10		1.41	0.90	2.31	2.80	0.64	2.46	49.8	57899
9.00	*1.00*	*10.00*				*2.47*	*3.00*	*3.00*		*49.2*	
											57542
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*2.00*		*42.0*	
13.30	1.45	14.75		0.44	0.64	1.08	1.31	1.23		35.5	57417
11.00	*1.00*	*12.00*				*0.82*	*1.00*	*1.00*		*28.6*	
9.05	2.85	11.90		0.27	0.63	0.90	1.09	2.55		36.3	57418
9.10	1.80	10.90		0.22	0.78	1.00	1.21	2.15		34.3	57902
8.00	*1.00*	*9.00*				*0.82*	*1.00*	*2.00*		*30.1*	
11.65	2.50	14.15	0.23		0.32	0.55	0.67	0.54	1.02	31.7	57419
10.00	*1.00*	*11.00*				*0.41*	*0.50*	*1.00*		*24.3*	
9.75	9.25	19.00		0.32	0.72	1.04	1.26	1.22		32.9	57420
8.00	*8.00*	*16.00*				*0.82*	*1.00*	*1.00*		*26.9*	
											57548
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*2.00*		*42.0*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Kentucky Fertilizer Co., Br. Federal Chemical Co., Inc., Louisville, Ky.	
57101	O. K. Gold Medal Grain Grower	Manufacturer
57102	O. K. Tobacco Formula	Manufacturer
57103	O. K. Special Tobacco Grower	Manufacturer
57907		J. W. Nall, Clay
57106	O. K. Special Mixture	Manufacturer
58181		J. W. Nall, Clay
57107	O. K. Crop Maker	Manufacturer
57909		W. L. Kimbrough & Son, Guthrie
57108	Old Reliable Tobacco Fertilizer	Manufacturer
57910		J. W. Nall, Clay
57109	Gold Medal Wheat and Corn Maker	Manufacturer
57911		D. B. Shackelford & Co., Richmond
57110	O. K. Grain Grower	Manufacturer
57111	O. K. Corn, Wheat and Oats Grower	Manufacturer
57112	O. K. Old Reliable	Manufacturer
57912		W. L. Kimbrough & Son, Guthrie
57113	O. K. Level Best Tobacco Compound	Manufacturer
57114	O. K. Wheat and Grain Special	Manufacturer
57705	O. K. Corn and Wheat Grower	Manufacturer
57706	O. K. High Grade Mixture	Manufacturer
57707	O. K. Crop and Tobacco Grower	Manufacturer
57708	Golden Leaf Tobacco Grower	Manufacturer
57709	O. K. High Grade Fertilizer	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station. Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
10.50	13.00	23.50		0.73		0.73	0.89	0.54	0.55	32.6	57101
9.00	*9.00*	*18.00*				*0.41*	*0.50*		*0.50*	*23.0*	
9.20	15.00	24.20		0.53	0.28	0.81	0.98	0.60	0.46	31.8	57102
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
8.70	15.30	24.00		0.66		0.66	0.80	0.68	0.34	29.9	57103
9.40	11.20	20.60	0.26		0.42	0.68	0.83	0.85		28.4	57907
8.00	*8.00*	*16.00*				*0.41*	*0.50*		*1.00*	*24.1*	
11.90	11.10	23.00		0.27	0.30	0.57	0.69	0.54		29.5	57106
10.85	4.00	14.85				0.47	0.57	0.79		25.9	58181
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.50	11.30	23.80		0.31	0.24	0.55	0.67	0.64		31.0	57107
13.10	4.50	17.60				0.55	0.67	0.70		29.5	57909
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.60	11.00	23.60		0.51		0.51	0.62	0.71		31.1	57108
11.70	7.30	19.00				0.58	0.70	0.80		29.3	57910
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.60	10.90	23.50		0.56		0.56	0.68	0.58	0.28	32.3	57109
12.90	3.30	16.20				0.57	0.69	0.79		29.4	57911
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
12.30	10.90	23.20		0.49	0.24	0.73	0.89	0.52	0.57	34.5	57110
11.00	*4.00*	*15.00*				0.41	0.50		1.00	27.0	
12.20	10.80	23.00		0.44	0.22	0.66	0.80	0.62	0.91	36.4	57111
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
16.40	6.20	22.60		0.63		0.63	0.76	0.50	0.87	39.7	57112
14.60	2.10	16.70				0.63	0.76	1.21		34.4	57912
13.00	*4.00*	*17.00*				*0.41*	*0.50*		*1.00*	*30.0*	
14.10	8.40	22.50		0.76		0.76	0.92	0.66	1.28	41.5	57113
10.00	*4.00*	*14.00*				*0.41*	*0.50*		*1.50*	*28.5*	
14.10	8.00	22.10		1.02	0.23	1.25	1.52	0.60	0.83	41.7	57114
12.00	*4.00*	*16.00*				*0.82*	*1.00*		*1.00*	*31.3*	
12.85	9.00	21.85		1.24		1.24	1.51	0.72	1.76	46.4	57705
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*2.00*	*34.3*	
13.80	5.40	19.20		1.29		1.29	1.57	0.58	2.56	50.7	57706
11.00	*4.00*	*15.00*				*0.82*	*1.00*		*3.00*	*41.8*	
10.50	9.25	19.75		1.07	0.22	1.29	1.57	0.90	3.34	53.9	57707
8.00	*4.00*	*12.00*				*0.82*	*1.00*		*4.00*	*43.3*	
10.55	10.80	21.35		1.81	0.38	2.19	2.66	1.18	1.52	51.7	57708
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	
12.65	6.70	19.35		1.95	0.32	2.27	2.76	0.76	1.84	53.2	57709
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Louisville Fertilizer Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.	
55897	Louisville Tobacco Grower	Manufacturer
57915		Jas. Wilson & Bro., Paris
57916		C. L. Thomas Carriage and Implement Co., Bowling Green
55898	Louisville Tobacco Grower Special	Manufacturer
57917		N. F. Hill, Bowling Green
57918		W. E. Ellis & Bro., Hartford
55899	Special Crop Grower	Manufacturer
58183		W. T. Kirkman, Elkton
58184		W. P. Ray, New Haven
55900	Louisville Standard	Manufacturer
57919		Irvington Hardware and Implement Co., Irvington
55901	Special Corn and Wheat Grower	Manufacturer
57920		Langdon & Co., Manchester
57921		Henry & Harvey, Carlisle
58185		W. T. Kirkman, Elkton
55902	Truck Grower	Manufacturer
57922		C. S. Griffith, Carrollton
55903	Potato and Tobacco Grower	Manufacturer
57923		Langdon & Co., Manchester
57924		Grayson County Supply Co., Leithfield
55910	Blue Grass Tobacco	Manufacturer
57935		Irvington Hardware and Implement Co., Irvington
57936		M. C. Marion & Son, Elizabethtown
55965	Tobacco and Potato Grower	Manufacturer
55966	Slaughter House Bone	Manufacturer
58192		Sherman Scaggs, Clarkson

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
11.45	1.25	12.70	0.41		0.86	1.27	1.54	0.54	1.75	42.3	55897
13.00	0.10	13.10		0.29	0.73	1.02	1.24	0.64	1.40	38.9	57915
9.40	0.10	9.50		0.46	0.88	1.34	1.63	0.78	1.35	36.3	57916
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*2.00*	*34.3*	
12.45	0.95	13.40	0.33		1.85	2.18	2.65	0.50	0.98	43.2	55898
11.50	1.10	12.60				1.50	1.82	0.67		32.2	57917
12.30	0.50	12.80		1.00	0.91	1.91	2.32	0.98		37.9	57918
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*1.00*	*34.2*	
10.60	2.10	12.70	0.25		0.91	1.16	1.41		1.17	31.9	55899
9.90	3.05	12.95	0.20		0.51	0.71	0.86	1.64		30.9	58183
11.80	0.75	12.55				0.87	1.06	0.19		25.2	58184
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*1.00*	*28.3*	
10.60	0.65	11.25				0.98	1.19		1.07	29.4	55900
8.70	0.20	8.90				0.86	1.04	0.78		23.8	57919
8.00	*4.00*	*12.00*				*0.82*	*1.00*		*1.00*	*25.3*	
7.75	0.60	8.35				1.10	1.34	0.48	0.74	26.9	55901
8.00	0.60	8.60				0.79	0.96	0.85		22.9	57920
13.00	1.20	14.20				1.08	1.31	0.64		31.4	57921
8.70	3.30	12.00	0.20	0.25	0.53	0.98	1.19	1.38		29.5	58185
7.00	*4.00*	*11.00*				*0.82*	*1.00*		*1.00*	*23.8*	
9.20	0.45	9.65	0.38		0.43	0.81	0.98	0.60	1.55	32.6	55902
8.80	0.30	9.10				0.60	0.73	0.62	1.71	31.5	57922
8.00	*4.00*	*12.00*				*0.41*	*0.50*		*2.00*	*28.5*	
7.15	0.55	7.70	0.27		0.72	0.99	1.20	0.54	0.89	26.5	55903
7.90	0.70	8.60				0.59	0.72	0.68		20.3	57923
9.20	0.40	9.60				0.59	0.72	0.92		23.6	57924
8.00	*4.00*	*12.00*				*0.41*	*0.50*		*1.00*	*22.5*	
9.50	0.50	10.00				0.65	0.79		3.93	42.6	55910
8.75	0.50	9.25				0.55	0.67	0.62	2.19	34.0	57935
9.00	0.55	9.55				0.58	0.70	0.68	2.02	34.1	57936
8.00	*4.00*	*12.00*				*0.41*	*0.50*		*3.00*	*34.5*	
11.90	2.70	14.60				1.77	2.15	0.50	0.64	38.2	55965
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*1.00*	*31.2*	
9.80	2.40	12.20	0.49		1.69	2.18	2.65	0.64	1.48	43.6	55966
8.70	1.85	10.55				1.27	1.54	0.58	0.82	31.1	58192
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Louisville Fertilizer Co.	
57550	Wheat King	Manufacturer
58193		H. E. Woodson, Brandenburg
58194		W. P. Ray, New Haven
57573	Wheat Grower	Manufacturer
58196		W. E. Ellis & Bro., Hartford
57575	Wheat Special	Manufacturer
57579	Grain Grower	Manufacturer
	Morris & Co., Chicago, Ill.	
57338	Special Big Three	Manufacturer
57953		Hatter Hardware Co., Franklin
57340	Big Five—Bone, Tankage and Potash	Manufacturer
57342	Big Eight—Phosphate and Potash	Manufacturer
57343	Special Big Nine — Manure and Potash	Manufacturer
57344	Big Ten—Manure and Potash	Manufacturer
58204		J. H. Wyan, London
	Rasin-Monumental Co. (Subsidiary of Va.-Car. Chem. Co., Inc., (Cincinnati, Ohio.	
57301	Rasin's Farmers' Success	Manufacturer
57302	Rasin's Reliable Wheat and Corn Fertilizer	Manufacturer
57303	Rasin's Big Giant Phosphate	Manufacturer
57304	Rasin's General Favorite	Manufacturer
57760	Rasin's Sweepstakes Fertilizer	Manufacturer
	Read Phosphate Co., Nashville, Tenn.	
57135	Read's Kentucky Tobacco Grower	Manufacturer
57963		J. W. Bratcher, Berea
57964		J. C. Cowherd & Co., Greensburg
57136	Read's Blood and Bone No. 1	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
9.70	0.75	10.45	0.20		0.42	0.62	0.75		1.11	25.8	57550
8.05	0.80	8.85				0.49	0.59	0.58	0.60	22.9	58193
8.15	0.75	8.90				0.49	0.59	0.78	0.63	24.4	58194
8.00	*4.00*	*12.00*				*0.41*	*0.50*		*1.00*	*22.5*	
13.50	2.20	15.70				0.56	0.68	1.18		32.1	57573
10.65	6.95	17.60				0.33	0.40	1.18		28.2	58196
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
13.90	3.20	17.10				0.50	0.61	2.62		41.4	57575
12.00	*4.00*	*16.00*				*0.41*	*0.50*		*2.00*	*34.5*	
9.10	2.10	11.20		0.65	1.19	1.84	2.23		1.52	36.5	57579
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	
11.10	1.00	12.10				0.65	0.79		3.15	40.5	57338
10.95	5.10	16.05				0.81	0.98		2.82	41.1	57953
11.00	*2.00*	*13.00*				*0.41*	*0.50*		*3.00*	*38.2*	
8.00	4.00	12.00				2.89	3.51	1.25		41.3	57340
7.00	*3.00*	*10.00*				*2.47*	*3.00*		*1.00*	*35.0*	
7.70	0.90	8.60				0.98	1.19		1.13	25.6	57342
7.00	*1.00*	*8.00*				*0.82*	*1.00*		*1.00*	*22.6*	
13.60	0.90	14.50				0.68	0.83	0.90	0.65	34.8	57343
11.00	*2.00*	*13.00*				*0.41*	*0.50*		*1.00*	*26.2*	
8.20	2.30	10.50				1.93	2.34	0.52	1.63	39.6	57344
10.35	3.55	13.90				1.78	2.16	1.74		39.9	58204
8.00	*2.00*	*10.00*				*1.65*	*2.00*		*2.00*	*36.4*	
10.40	0.90	11.30	0.31		0.77	1.08	1.31	1.14		30.4	57301
8.00	*1.50*	*9.50*				*0.82*	*1.00*	*1.00*		*24.3*	
9.80	1.20	11.00				1.00	1.21	1.04	1.64	38.3	57302
8.00	*1.50*	*9.50*				*0.82*	*1.00*	*2.00*		*30.3*	
9.10	1.30	10.40				1.22	1.48	1.60	2.21	45.6	57303
8.00	*1.50*	*9.50*				*0.82*	*1.00*	*3.00*		*36.3*	
9.40	3.00	12.40		0.87	1.63	2.50	3.04	3.15		51.7	57304
8.00	*1.50*	*9.50*				*1.65*	*2.00*	*2.00*		*36.2*	
12.95	1.95	14.90	0.26	1.46	0.30	2.02	2.45	0.70	2.05	50.9	57760
12.00	*1.50*	*13.50*				*1.65*	*2.00*	*2.00*		*42.2*	
9.50	6.90	16.40				1.48	1.80	2.13		40.2	57135
12.10	4.60	16.70	0.47		0.60	1.07	1.30	0.72		31.8	57963
8.40	7.50	15.90	0.35		0.51	0.86	1.04	0.66	0.33	27.6	57964
8.00	*7.00*	*15.00*				*0.82*	*1.00*		*1.60*	*26.5*	
9.40	4.10	13.50	0.33	0.35	1.39	2.07	2.51	2.75		46.7	57136
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*2.00*	*37.6*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Read Phosphate Co.	
57137	Read's Standard Tobacco Grower	Manufacturer
57138	Read's Blood and Bone Special	Manufacturer
57139	Read's Corn and Wheat Grower	Manufacturer
57144	Read's Standard Grain Manure	Manufacturer
57150	Read's Matchless Grain Grower	Manufacturer
57974		U. L. Antle, Columbia
57482	Read's Red Diamond Special	Manufacturer
57483	Read's Farmers' Special Manure	Manufacturer
57484	Read's High Grade Tobacco Grower	Manufacturer
57485	Read's Farmers' Friend	Manufacturer
57486	Read's Magic Plant Food	Manufacturer
57489	Read's Corn, Wheat and Oat Grower	Manufacturer
57491	Read's Premium Grain Grower	Manufacturer
57492	Read's Wheat and Clover Grower	Manufacturer
57493	Read's High Grade Ammoniated Dissolved Bone	Manufacturer
	St. Bernard Fertilizer Co., Nashville, Tenn.	
57507	Wheat Grower	Manufacturer
57508	High Grade Special Manure	Manufacturer
57509	Standard Tobacco Fertilizer	Manufacturer
57510	High Grade Tobacco Fertilizer	Manufacturer
57511	Wheat, Oat and Corn Special	Manufacturer
57512	Farmers' Favorite Manure	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
9.60	4.10	13.70	0.46	0.32	1.46	2.24	2.72	2.75		48.2	57137
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*2.00*	*37.6*	
11.30	5.50	16.80		0.20	1.25	1.45	1.76	2.39		43.6	57138
10.00	*5.00*	*15.00*				*0.82*	*1.00*		*1.00*	*28.7*	
12.70	5.10	17.80		0.21	0.85	1.06	1.27	1.98		40.4	57139
11.00	*5.00*	*16.00*				*0.41*	*0.50*		*1.00*	*27.4*	
9.50	3.50	13.00		0.38	1.63	2.01	2.44	2.72		46.0	57144
9.00	*5.00*	*14.00*				*1.65*	*2.00*		*1.00*	*33.1*	
17.10	4.60	21.70		0.41	0.86	1.27	1.54	1.70		46.6	57150
9.50	8.80	18.30	0.36		0.58	0.94	1.14	0.88		29.6	57974
14.00	*5.00*	*19.00*				*0.50*	*0.61*		*0.50*	*29.5*	
10.90	1.80	12.70	1.52	0.55	0.60	2.67	3.24	2.10	1.27	56.0	57482
10.00	*3.00*	*13.00*				*2.47*	*3.00*		*3.00*	*51.5*	
10.10	7.00	17.10		0.57	0.57	1.14	1.38	1.76	1.59	46.0	57483
10.00	*6.00*	*16.00*				*0.82*	*1.00*		*3.00*	*41.1*	
8.90	6.20	15.10	0.32	0.72	0.76	1.80	2.19	2.80	1.79	56.0	57484
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*4.00*	*49.6*	
10.80	9.00	19.80		0.62	0.50	1.12	1.36	1.46	0.95	42.1	57485
9.00	*7.00*	*16.00*				*0.82*	*1.00*		*2.00*	*34.0*	
13.20	4.20	17.40		0.26	0.40	0.66	0.80	1.14	0.75	37.4	57486
13.00	*4.00*	*17.00*				*0.41*	*0.50*		*1.00*	*30.0*	
7.90	14.30	22.20		0.47	0.52	0.99	1.20	1.40		32.9	57489
7.00	*10.00*	*17.00*				*0.82*	*1.00*		*1.00*	*26.2*	
12.50	4.90	17.40	0.33	0.38	0.50	1.21	1.47	1.12	0.94	41.5	57491
12.00	*4.00*	*16.00*				*0.82*	*1.00*		*1.00*	*31.3*	
13.00	3.70	16.70	0.27	0.46	0.51	1.24	1.51	1.46	0.95	44.1	57492
12.00	*3.00*	*15.00*				*0.82*	*1.00*		*2.00*	*36.9*	
10.00	5.00	15.00	0.26	0.79	0.71	1.76	2.14	1.78	0.75	44.5	57493
10.00	*5.00*	*15.00*				*1.65*	*2.00*		*2.00*	*40.6*	
11.10	9.60	20.70	0.29	0.37	0.38	1.04	1.26	0.94	0.85	38.5	57507
10.00	*7.00*	*17.00*				*0.82*	*1.00*		*1.00*	*29.5*	
10.50	4.30	14.80	0.48	0.70	0.68	1.86	2.26	1.60	1.11	46.8	57508
10.00	*5.00*	*15.00*				*1.65*	*2.00*		*2.00*	*40.6*	
10.60	8.20	18.80	0.43	0.69	0.73	1.85	2.25	2.35		46.2	57509
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*2.00*	*37.6*	
9.30	6.10	15.40	0.41	0.74	0.74	1.89	2.29	3.18	1.28	56.4	57510
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*4.00*	*49.6*	
12.80	9.00	21.80		0.37	0.34	0.71	0.86	1.26	0.40	37.7	57511
11.00	*5.00*	*16.00*				*0.41*	*0.50*		*1.00*	*27.4*	
12.80	4.00	16.80		0.63	0.51	1.14	1.38	1.68	0.91	44.3	57512
12.00	*3.00*	*15.00*				*0.82*	*1.00*		*2.00*	*36.9*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	St. Bernard Fertilizer Co.	
57513	Farmers' Special	Manufacturer
	The Smith Agricultural Chemical Co., Columbus, Ohio.	
57430	Smith's Tobacco Grower	Manufacturer
57976		R. M. Parker, Burtonville
	Smith Bros., Louisville, Ky.	
57609	Champion Crop Grower	
57610	Half and Half Mixture	
58215		Findley Hardware Co., Madisonville
58216		Sam Terry, Big Clifty
	Southern Fertilizer Co., Inc., Louisville, Ky.	
57432	Elk Special Tobacco Grower	Manufacturer
57977		Grigsby & Co., Bardstown
57978		Bush Coal Co., Winchester
57433	Elk Tobacco Grower	Manufacturer
57449	Elk General Crop Grower	
57979		Conrad, Payne & Co., Cloverport
57980		Corbin Supply Co., Corbin
57450	Elk Corn and Wheat Grower	Manufacturer
57753	Elk Special Grain Grower	
58219		Lawrence Whitton, Clarkson
	Swift & Co., Inc., National Stock Yards, Ill.	
57310	Swift's Ammoniated Bone Phosphate and Potash	
57311	Swift's Diamond "K" Grain Grower	Manufacturer
57982		P. F. Dykes, Somerset
58220		W. E. Burress, Greensburg
58221		Sam Terry, Big Clifty
57313	Swift's Complete Fertilizer	Manufacturer
57985		Courtney Brothers, Eminence
57986		W. E. Burress, Greensburg
58222		B. F. Beard & Co., Hardinsburg
58223		Young & Bishop, Providence

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
10.70	8.80	19.50	0.31	0.39	0.43	1.13	1.37	1.72	0.61	41.5	57513
9.00	*7.00*	*16.00*				*0.82*	*1.00*		*2.00*	*34.0*	
7.30	1.30	8.60				0.36	0.44	1.40	0.74	26.8	57430
7.50	0.90	8.40				0.43	0.52	2.31		28.5	57976
7.00						*0.41*	*0.50*		*2.00*	*25.4*	
											57609
12.00	*2.00*	*14.00*				*1.65*	*2.00*	*2.00*		*42.4*	
											57610
11.25	4.15	15.40				1.48	1.80	1.28		36.6	58215
8.30	4.05	12.35				1.46	1.77	1.10		30.9	58216
6.00	*6.00*	*12.00*				*1.65*	*2.00*	*1.00*		*29.0*	
9.47	1.55	11.02				0.41	0.50		1.03	23.9	57432
11.60	1.30	12.90	0.27		0.33	0.60	0.73	0.54	0.54	28.6	57977
12.30	1.60	13.90	0.23		0.38	0.61	0.74	0.50	0.34	28.4	57978
10.00	*1.00*	*11.00*				*0.41*	*0.50*		*1.00*	*24.3*	
12.47	0.60	13.07	0.48		0.90	1.38	1.68		1.17	35.6	57433
8.00	*1.00*	*9.00*				*1.65*	*2.00*		*1.00*	*30.0*	
											57449
10.00	1.70	11.70	0.27		0.30	0.57	0.69	0.50	0.51	25.7	57979
11.30	1.00	12.30				0.32	0.39	0.50	0.59	26.1	57980
10.00	*1.00*	*11.00*				*0.41*	*0.50*		*1.00*	*24.3*	
8.73	1.05	9.78		0.69	0.36	1.05	1.27		1.12	27.6	57450
7.00	*1.00*	*8.00*				*0.82*	*1.00*		*1.00*	*22.6*	
											57753
11.35	1.05	12.40	0.74			0.74	0.90		2.23	36.0	58219
11.00	*1.00*	*12.00*				*0.41*	*0.50*		*2.00*	*31.8*	
11.40	2.95	14.35				1.84	2.23	0.70		35.4	57310
10.00	*3.00*	*13.00*				1.65	2.00	0.50		30.8	
13.50	2.65	16.15				0.83	1.01	1.14		34.0	57311
11.70	2.50	14.20				1.07	1.30	0.62	0.49	32.7	57982
13.50	3.50	17.00	0.44		0.45	0.89	1.08	0.85		33.0	58220
12.40	3.65	16.05				0.83	1.01	0.31		27.7	58221
12.00	*3.00*	*15.00*				*0.82*	*1.00*	*1.00*		*30.9*	
8.45	2.80	11.25		0.70	0.40	1.10	1.34	0.92		27.0	57313
8.50	4.50	13.00		0.29	1.30	1.59	1.93	0.98		31.6	57985
9.90	2.50	12.40				0.63	0.76	1.00		26.3	57986
9.45	3.35	12.80				0.76	0.92	1.01		26.9	58222
9.65	3.25	12.90				0.87	1.06	0.79		26.6	58223
8.00	*3.00*	*11.00*				*0.82*	*1.00*	*1.00*		*24.9*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Swift & Co., Inc.	
57320	Swift's Diamond "W" Vegetable and Tobacco Grower	Manufacturer
57994		B. F. Beard & Co., Hardinsburg
57995		Anderson & Spilman, Danville
57321	Swift's Champion Wheat and Corn Grower	Manufacturer
57322	Swift's Special Grain Fertilizer	Manufacturer
57323	Swift's Superphosphate	Manufacturer
57996		Courtney Brothers, Eminence
57324	Swift's Diamond "A" Potato and Tobacco Fertilizer	Manufacturer
57325	Swift's Special Grain and Grass Grower	Manufacturer
57326	Swift's Diamond "M" Grain Grower	Manufacturer
57327	Swift's Tomato and Vegetable Fertilizer	Manufacturer
57328	Swift's Diamond "N" Grain Grower	Manufacturer
57997		I. F. Tabb, Mt. Sterling
57329	Swift's Special Superphosphate	Manufacturer
57330	Swift's Diamond "W" Tobacco Grower	Manufacturer
57998		M. D. Jordan, Olive Hill
57999		W. E. Burress, Greensburg
	Tennessee Chemical Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.	
55915	Ox Special Crop Grower	Manufacturer
55916	Ox Special Corn and Wheat Grower	Manufacturer
58002		N. D. Tabor, Olive Hill
58239		Vine Grove Lumber Co., Vine Grove
55917	Ox Truck Grower	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
8.90	3.45	12.35				1.78	2.16	2.10	0.86	45.0	57320
10.70	2.30	13.00		0.38	1.19	1.57	1.91	1.00	0.49	36.9	57994
11.50	2.30	13.80		0.32	1.25	1.57	1.91	1.18	0.65	40.1	57995
8.00	*3.00*	*11.00*				*1.65*	*2.00*		*3.00*	*42.8*	
14.65	2.15	16.80				1.73	2.10	0.84	1.30	47.8	57321
12.00	*3.00*	*15.00*				*1.65*	*2.00*	*2.00*		*42.8*	
10.35	3.40	13.75				2.00	2.43	0.66	1.18	46.0	57322
10.00	*3.00*	*13.00*				*1.65*	*2.00*	*2.00*		*39.8*	
8.15	3.25	11.40		0.21	1.45	1.66	2.02	0.94	1.16	37.2	57323
10.30	2.30	12.60		0.32	1.41	1.73	2.10	1.53		37.7	57996
8.00	*3.00*	*11.00*				*1.65*	*2.00*	*2.00*		*36.8*	
8.05	3.30	11.35				2.28	2.77	0.80	0.52	37.3	57324
8.00	*3.00*	*11.00*				*2.47*	*3.00*		*1.00*	*36.5*	
10.75	2.65	13.40				1.73	2.10	1.42	0.76	42.4	57325
10.00	*3.00*	*13.00*				*1.65*	*2.00*	*1.50*		*36.8*	
13.50	2.25	15.75				1.72	2.09	0.52	0.52	39.4	57326
11.00	*3.00*	*14.00*				*1.65*	*2.00*	*1.00*		*35.3*	
9.60	2.75	12.35				3.03	3.68		0.62	40.4	57327
8.00	*3.00*	*11.00*				*2.47*	*3.00*		*0.50*	*33.5*	
9.70	4.35	14.05				1.69	2.05	1.22		35.5	57328
11.80	3.70	15.50		0.34	1.19	1.53	1.86	1.01		36.0	57997
9.00	*3.00*	*12.00*				*1.65*	*2.00*	*1.00*		*32.3*	
8.55	2.05	10.60				2.19	2.66	1.22		36.5	57329
8.00	*3.00*	*11.00*				*1.65*	*2.00*	*1.00*		*30.8*	
8.70	2.40	11.10				1.90	2.31	1.32		35.2	57330
9.35	4.20	13.55				1.30	1.58	1.02		30.9	57998
8.95	1.60	10.55		0.28	1.27	1.55	1.88	0.83		29.9	57999
8.00	*3.00*	*11.00*				*1.65*	*2.00*		*1.00*	*30.8*	
11.30	1.70	13.00				1.07	1.30		1.09	31.7	55915
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*1.00*	*28.3*	
8.80	0.60	9.40				0.96	1.17		1.07	26.6	55916
8.90	1.15	10.05				0.67	0.81		0.74	22.9	58002
9.30	0.55	9.85	0.22		0.48	0.70	0.85	0.68		23.2	58239
7.00	*4.00*	*11.00*				*0.82*	*1.00*		*1.00*	*23.8*	
9.35	0.30	9.65	0.25		0.44	0.69	0.84		2.03	31.2	55917
8.00	*4.00*	*12.00*				*0.41*	*0.50*		*2.00*	*28.5*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Tennessee Chemical Co.	
55925	Louisville Tobacco Grower	Manufacturer
55926	Louisville Standard	Manufacturer
58012		Earl P. Withers, Stanford
55927	Potato and Tobacco Grower	Manufacturer
58013		W. C. Grainger, Franklin
58014		Sexton Brothers, Murray
55969	Louisville Tobacco Grower Special	Manufacturer
58016		Lebanon Carriage and Implement Co., Lebanon
55972	Ox Tobacco and Potato Grower	Manufacturer
55973	Ox Slaughter House Bone	Manufacturer
58245		Grayson County Supply Co., Leitchfield
55974	Ox Dark Tobacco Grower	Manufacturer
55976	Ox Tankage Phosphate and Potash	Manufacturer
55977	Ox Tobacco Special	Manufacturer
58019		The T. J. Turley Co., Owensboro
55978	Ox McChesney's Tobacco Grower	Manufacturer
57437	Ox Special Tobacco Grower	Manufacturer
58020		J. J. Shaver & Co., Mayfield
57438	Ox Special Tobacco Fertilizer	Manufacturer
58021		Sexton Brothers, Murray
57552	Ox Wheat King	Manufacturer
58249		Vine Grove Lumber Co., Vine Grove
57580	Ox Grain Grower	Manufacturer
57656	Ox Guano	Manufacturer
58251		G. W. Richardson, Somerset
57856	Ox Wheat Maker	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
12.60	1.10	13.70	0.43		1.02	1.45	1.76		2.21	42.8	55925
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*2.00*	*34.3*	
10.40	0.60	11.00				0.97	1.18		1.10	29.2	55926
8.95	1.15	10.10				0.62	0.75	0.72		22.6	58012
8.00	*4.00*	*12.00*				*0.82*	*1.00*		*1.00*	*25.3*	
7.30	0.40	7.70	0.27		0.68	0.95	1.15		1.37	26.0	55927
8.10	2.25	10.35	0.20		0.41	0.61	0.86	0.54	0.41	23.0	58013
8.05	1.75	9.80	0.26		0.35	0.61	0.86		0.86	22.2	58014
8.00	*4.00*	*12.00*				*0.41*	*0.50*		*1.00*	*22.5*	
11.80	2.80	14.60	0.29		1.73	2.02	2.45	0.52	0.86	41.2	55969
10.95	1.90	12.85	0.29		1.10	1.39	1.69	0.58	0.58	33.9	58016
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*1.00*	*34.2*	
8.90	2.20	11.10	0.33		1.70	2.03	2.46	0.84	0.66	37.4	55972
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*1.00*	*31.2*	
9.50	2.00	11.50	0.59		1.56	2.15	2.61	1.08	1.37	44.8	55973
9.20	0.55	9.75	0.27	0.48	0.95	1.70	2.06	0.78	1.25	38.1	58245
8.00	*4.00*	*12.00*				*1.65*	*2.00*		*2.00*	*37.2*	
11.20	2.50	13.70				2.04	2.48	0.48	0.31	36.8	55974
10.00	*4.00*	*14.00*				*1.23*	*1.50*		*0.50*	*28.2*	
13.20	0.60	13.80				0.71	0.86	0.52	0.54	31.4	55976
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
11.20	2.20	13.40				2.20	2.67	0.68	0.83	42.1	55977
9.35	2.20	11.55	0.29	0.69	0.87	1.85	2.25	0.66	0.48	34.7	58019
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*1.00*	*34.2*	
12.70	0.70	13.40	0.29		0.54	0.83	1.01	0.50	0.71	32.4	55978
11.00	*4.00*	*15.00*				*0.41*	*0.50*		*1.00*	*27.0*	
9.15	3.20	12.35		0.32	0.79	1.11	1.35	0.52	0.73	30.3	57437
12.30	2.15	14.45				0.73	0.89	0.85		29.5	58020
8.00	*4.00*	*12.00*				*0.82*	*1.00*		*1.00*	*25.3*	
10.10	3.30	13.40		0.20	0.89	1.09	1.32	0.50	1.02	43.2	57438
11.20	2.10	13.30	0.42		0.53	0.95	1.15	0.52	0.33	29.4	58021
10.00	*4.00*	*14.00*				*0.82*	*1.00*		*1.00*	*28.3*	
9.70	0.80	10.50				0.62	0.75		1.20	26.4	57552
8.20	0.80	9.00				0.45	0.55		1.20	23.0	58249
8.00	*4.00*	*12.00*				*0.41*	*0.50*		*1.00*	*22.5*	
13.72	2.95	16.67				0.54	0.66		1.62	35.3	57580
12.00	*4.00*	*16.00*				*0.41*	*0.50*		*2.00*	*34.5*	
11.47	2.40	13.87		0.59	1.19	1.78	2.16		2.10	43.2	57656
11.10	0.90	12.00				1.62	1.97		1.66	38.3	58251
10.00	*4.00*	*14.00*				*1.65*	*2.00*		*2.00*	*40.2*	
12.60	2.40	15.00				0.51	0.62		1.62	33.2	57856
12.00	*4.00*	*16.00*				*0.41*	*0.50*		*2.00*	*34.5*	

TABLE I.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Victor Guano Co., Nashville, Tenn.	
57530	Complete Grain Guano	Manufacturer
57531	Standard Tobacco Grower	Manufacturer
57532	Farmers' Special Guano	Manufacturer
57533	High Grade Tobacco Guano	Manufacturer
57534	Wheat, Oat and Corn Grower	Manufacturer
57535	High Grade Grain Guano	Manufacturer
57536	Standard Grade Complete Guano	Manufacturer
57537	Special Corn and Wheat Grower	Manufacturer
	Virginia-Carolina Chemical Co., Inc., Cincinnati Sales Division, Cincinnati, Ohio.	
57288	V-C Complete Manure	Manufacturer
58038		Rubel-Abell Hardware Co., Lebanon
58039		Bush & Prichard, Ashland
57289	V-C Champion Corn and Wheat Grower	Manufacturer
58040		Barnett Brothers, London
57290	V-C Farmers' Friend	Manufacturer
57291	V-C Beef, Blood and Bone B. B. B.	Manufacturer
58041		The Taylor County Supply Co., Campbellsville
57293	V-C Gem Fertilizer for Tobacco	Manufacturer
58043		Guenther Hardware Co., Owensboro
58044		R. H. Chrisman, Berea
57425	V-C Plant Food for Vegetables, Lawns and Flowers	Manufacturer
57759	V-C Spring-fall Fertilizer	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total		From Muriate	From Sulfate		
12.90	3.90	16.80	0.32	0.39	0.40	1.11	1.35	1.40	1.46	45.8	57530
12.00	*3.00*	*15.00*				*0.82*	*1.00*		*2.00*	*36.9*	
9.80	8.60	18.40	0.49	0.67	0.58	1.74	2.11	1.56	1.08	46.2	57531
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*2.00*	*37.6*	
10.90	9.50	20.40	0.30	0.38	0.43	1.11	1.35	1.34	1.01	42.0	57532
9.00	*7.00*	*16.00*				*0.82*	*1.00*		*2.00*	*34.0*	
9.40	6.50	15.90	0.54	0.58	0.64	1.76	2.14	2.56	2.66	60.3	57533
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*4.00*	*49.6*	
12.70	9.30	22.00		0.40	0.31	0.71	0.86	0.88	0.76	37.6	57534
11.00	*5.00*	*16.00*				*0.41*	*0.50*		*1.00*	*27.4*	
10.90	4.50	15.40	0.45	0.69	0.64	1.78	2.16	1.58	1.16	47.1	57535
10.00	*5.00*	*15.00*				*1.65*	*2.00*		*2.00*	*40.6*	
9.40	8.10	17.50	0.55	0.65	0.56	1.76	2.14	1.78	0.96	46.1	57536
8.00	*5.00*	*13.00*				*1.65*	*2.00*		*2.00*	*37.6*	
11.90	8.70	20.60	0.30	0.37	0.40	1.07	1.30	1.00	0.76	39.4	57537
10.00	*7.00*	*17.00*				*0.82*	*1.00*		*1.00*	*29.5*	
9.55	2.50	12.05				1.01	1.23	1.13		29.2	57288
8.55	2.05	10.60				0.92	1.12	1.20		27.3	58038
9.60	2.45	12.05	0.30		0.77	1.07	1.30	1.26		30.4	58039
8.00	*1.50*	*9.50*				*0.82*	*1.00*	*1.00*		*24.3*	
8.85	1.70	10.55				1.22	1.48	1.06	1.56	38.2	57289
8.70	1.55	10.25		0.39	0.89	1.28	1.55	1.16	0.99	35.5	58040
8.00	*1.50*	*9.50*				*0.82*	*1.00*	*2.00*		*30.3*	
9.05	1.60	10.65				1.11	1.35	1.34	2.26	43.6	57290
8.00	*1.50*	*9.50*				*0.82*	*1.00*	*3.00*		*36.3*	
8.95	3.25	12.20		0.79	1.75	2.54	3.08	1.76	1.25	50.6	57291
8.60	1.25	9.85		0.32	1.28	1.60	1.94	0.96	0.76	35.5	58041
8.00	*1.50*	*9.50*				*1.65*	*2.00*	*2.00*		*36.2*	
11.80	1.80	13.60				2.01	2.44	1.30	0.56	43.7	57293
9.60	1.45	11.05		0.41	1.22	1.63	1.98	0.86	0.69	35.7	58043
10.10	1.20	11.30	0.29	0.41	1.02	1.72	2.09	0.78	0.59	35.9	58044
9.00	*1.50*	*10.50*				*1.65*	*2.00*		*1.00*	*31.7*	
10.00	1.00	11.00	2.90		2.14	5.04	6.12	1.38	0.95	64.7	57425
8.00	*1.50*	*9.50*				*4.94*	*6.00*	*2.00*		*59.2*	
13.05	1.65	14.70		1.64	0.30	1.94	2.36	0.76	1.91	49.9	57759
12.00	*1.50*	*13.50*				*1.65*	*2.00*	*2.00*		*42.2*	

TABLE 1.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Virginia-Carolina Chemical Co., Inc., Mt. Pleasant Br., Mt. Pleasant, Tenn.	
57353	Mt. Pleasant Black Patch Tobacco Grower	
58049		C. L. Ringo, Blackford
58050		T. E. Richardson, Campbellsville
57354	Mt. Pleasant Burley Special Tobacco Grower	
58051		Plain Hardware Co., Madisonville
57355	Mt. Pleasant Truck Grower's Choice	
57357	Mt. Pleasant Burley Tobacco Grower	
58053		T. E. Richardson, Campbellsville
57570	Mt. Pleasant Wheat Grower	
	Wood-Stubbs & Co., Inc., Louisville, Ky.	
57374	Acme Wheat and Corn Grower	
57375	Acme Potato Grower	
57376	Acme Special Potato Grower	
57391	Acme Wneat and Corn Fertilizer	Manufacturer
57392	Acme A-1 Bone, Blood and Potash	Manufacturer
57393	Acme Potato and Tobacco Grower	Manufacturer

Complete Fertilizers.

PHOSPHORIC ACID			NITROGEN					POTASH			
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	From Muriate	From Sulfate	Index of Relative Value	Station Number
											57353
7.90	12.05	19.95				0.65	0.79	1.11		27.9	58049
9.85	10.40	20.25				0.66	0.80	0.78	0.54	31.5	58050
7.00	*2.00*	*9.00*				*0.41*	*0.50*		*1.00*	*20.2*	
											57354
9.80	9.90	19.70		0.74	0.54	1.28	1.55	1.57		37.0	58051
8.00	*2.00*	*10.00*				*1.23*	*1.50*		*1.50*	*30.4*	
											57355
8.00	*2.00*	*10.00*				*0.82*	*1.00*		*3.00*	*36.5*	
											57357
10.30	5.95	16.25		0.63	0.82	1.45	1.76	2.20	1.33	49.2	58053
8.00	*2.00*	*10.00*				*1.65*	*2.00*		*3.00*	*42.4*	
											57570
8.00	*2.00*	*10.00*				*1.23*	*1.50*		*1.50*	*30.4*	
											57374
10.00	*2.00*	*12.00*				*0.41*	*0.50*		*1.00*	*24.7*	
											57375
10.00	*2.00*	*12.00*				*0.82*	*1.00*		*2.00*	*33.5*	
											57376
8.00	*2.00*	*10.00*				*1.65*	*2.00*		*3.00*	*42.4*	
12.70	10.80	23.50		0.28	0.24	0.52	0.63	0.52	0.22	31.5	57391
11.50	*4.00*	*15.50*				*0.41*	*0.50*		*0.50*	*24.7*	
13.35	9.20	22.55		0.52	0.21	0.73	0.89	0.64	1.37	40.9	57392
10.00	*4.00*	*14.00*				*0.41*	*0.50*		*1.50*	*27.0*	
12.10	11.10	23.20		1.88	0.41	2.29	2.78	1.20	0.92	51.3	57393
9.00	*4.00*	*13.00*				*1.65*	*2.00*		*1.00*	*32.7*	

TABLE II.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	The American Agricultural Chemical Co., Inc., Cincinnati Sales Department, Cincinnati, O.	
57179	A. A. C. Co. Raw Bone	
57196	Bowker's Ground Bone	
57213	Bradley's Ground Bone	
58064		Cooper-Craycraft Co., Vine Grove.....
57230	Cleveland Dryer Works, Ground Bone	
57247	Michigan Carbon Works Ground Bone	
57677		V. D. Roberts, Somerset.....
57678		T. W. Miller, Elkton.....
58082		E. P. Barnes & Bro., Beaver Dam.....
58083		C. M. Langdon, Science Hill.....
57264	N. W. Horseshoe Brand Ground Bone	
58089		T. J. Whittinghill, Fordsville.....
57281	Packers Boar's Head Brand Ground Bone	
	Armour Fertilizer Works, Nashville, Tenn.	
55936	Armour's Bone Meal	Manufacturer .....
57715		Simpson County Hardware Co., Franklin .....
57716		C. M. Langdon, Science Hill.....
58097		G. W. Miller, Elkton.....
55937	Armour's Bone Meal Special	Manufacturer .....
57717		L. A. Collins, Lebanon.....
55938	Armour's Raw Bone Meal	Manufacturer .....
58098		G. W. Miller, Elkton.....
55956	Tuscarora Bone Meal	Manufacturer .....
55957	Tuscarora Raw Bone Meal	Manufacturer .....
	Calumet Fertilizer Co., New Albany, Ind.	
57558	Calumet Br. Bone Meal, Tankage and Potash	
58111		Ashby & Daugherty Bros., Shepherdsville .....

Bones, Tankage, &c.

PERCENTAGE OF FINENESS		Total Phosphoric Acid.	Equivalent to Bone Phosphate	Nitrogen	Equivalent to Ammonia	Potash		Index of Relative Value	Station Number.
Fine Bone	Medium Bone					From Muriate	From Sulfate		
									57179
		20.00	*43.67*	*3.29*	*4.00*			*39.0*	
									57196
		20.00	*43.67*	*2.47*	*3.00*			*33.3*	
									57213
80.00	20.00	23.20	50.67	2.67	3.24			37.3	58064
		20.00	*43.67*	*2.47*	*3.00*			*33.3*	
									57230
		20.00	*43.67*	*2.47*	*3.00*			*33.3*	
									57247
79.00	21.00	20.80	45.43	2.81	3.41			36.3	57677
78.00	22.00	20.40	44.56	2.74	3.33			35.5	57678
70.00	30.00	24.35	53.17	2.87	3.48			39.6	58082
75.00	25.00	24.50	53.51	2.47	3.00			36.9	58083
		20.00	*43.67*	*2.47*	*3.00*			*33.3*	
									57264
78.00	22.00	23.30	50.88	3.01	3.65			39.7	58089
		20.00	*43.67*	*2.47*	*3.00*			*33.3*	
									57281
		20.00	*43.67*	*2.47*	*3.00*			*33.3*	
100.00		28.20	61.58	2.18	2.65			37.8	55936
77.00	23.00	27.60	60.28	1.89	2.29			35.3	57715
71.00	29.00	28.00	61.16	1.70	2.06			34.3	57716
69.00	31.00	31.05	67.81	2.23	2.71			40.5	58097
		27.00	*58.96*	*1.65*	*2.00*			*33.2*	
100.00		25.60	55.91	2.60	3.16			38.7	55937
69.00	31.00	24.50	53.51	2.59	3.14			37.7	57717
		24.00	*52.42*	*2.47*	*3.00*			*36.5*	
70.00	30.00	26.10	57.00	4.03	4.89			49.1	55938
100.00		24.00	52.42	4.04	4.90			47.5	58098
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
100.00		29.70	64.86	2.22	2.70			39.3	55956
		27.00	*58.96*	*1.65*	*2.00*			*33.2*	
66.00	34.00	25.00	54.59	4.08	4.95			48.6	55957
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
									57558
72.00	28.00	18.85	41.17	1.25	1.52	1.20		30.9	58111
		16.00	*34.95*	*1.23*	*1.50*	*1.00*		*27.4*	

TABLE II.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Calumet Fertilizer Co.	
57560	Calumet Br. Special Pure Bone Meal	
57562	Calumet Br. Extra Am. Bone Meal	
	Duncan & Sherley, Lagrange, Ky.	
57362	Tiger Brand Raw Bone	Manufacturer
57761		Manufacturers' Warehouse
57363	Tiger Brand Bone Meal	
57762		Manufacturers' Warehouse
57901	Tiger Brand Pure Bone Meal	
	The Empire Guano Co., Nashville, Tenn.	
57166	Climax Bone Meal Mixture	Manufacturer
57506	Animal Bone Mixture	Manufacturer
	The Evansville Packing Co., Evansville, Ind.	
57475	Pure Raw Bone Meal	
58126		W. S. Overstreet, Lagrange
	Falls City Fertilizer Co., New Albany, Ind.	
57817	Falls City Brand Raw Bone Meal	
57818	Falls City Brand Extra Ammoniated Bone Meal	
57859	Falls City Brand Special Pure Bone Meal	
	Federal Chemical Co., Inc., Louisville, Ky.	
55992	Pure Bone	Manufacturer
57789		J. H. Bustle, Crab Orchard
57790		J. A. Shaver, Greenville
58132		Cooper-Craycroft Co., Vine Grove
57015	Daybreak Raw Bone	Manufacturer
57809		J. A. Shaver, Greenville

Bones, Tankage, &c.

PERCENTAGE OF FINENESS		Total Phosphoric Acid.	Equivalent to Bone Phosphate	Nitrogen	Equivalent to Ammonia	Potash		Index of Relative Value	Station Number.
Fine Bone	Medium Bone					From Muriate	From Sulfate		
									57560
		30.00	*65.52*	*0.82*	*1.00*			*29.7*	
									57562
		28.00	*61.16*	*2.00*	*2.43*			*36.4*	
42.00	58.00	23.00	50.24	4.03	4.89			46.6	57362
48.00	52.00	22.30	48.70	4.03	4.89			46.1	57761
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
									57363
63.00	37.00	26.20	57.22	1.41	1.71			30.8	57762
		24.00	*52.42*	*1.65*	*2.00*			*30.8*	
									57901
		28.00	*61.16*	*1.23*	*1.50*			*31.0*	
64.00	36.00	19.30	42.16	2.20	2.67			30.8	57166
		17.00	*37.13*	*1.65*	*2.00*			*25.2*	
73.00	27.00	23.30	50.88	0.97	1.18			25.4	57506
		23.00	*50.24*	*0.82*	1.00			24.1	
									57475
50.00	50.00	27.20	59.40	3.86	4.69			48.8	58126
		23.00	*50.24*	*3.71*	*4.50*			*44.4*	
									57817
		20.00	*43.67*	*3.71*	*4.50*			*42.0*	
									57818
		28.00	*61.16*	*2.00*	*2.43*			*36.4*	
									57859
		30.00	*65.52*	*0.82*	*1.00*			*29.7*	
									55992
100.00		30.30	66.15	1.38	1.68			33.9	57789
100.00		30.20	65.97	1.71	2.08			36.1	57790
73.00	27.00	30.10	65.74	1.69	2.05			35.9	58132
		30.00	*65.52*	*1.03*	*1.25*			*31.2*	
43.00	57.00	23.60	51.55	4.44	5.39			50.0	57015
56.00	44.00	22.50	49.15	2.19	2.66			33.3	57809
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	

TABLE II.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Federal Chemical Co.	
57019	Daybreak Fine Raw Bone	
57041	1st Prize Fine Raw Bone	
57042	1st Prize Raw Bone	Manufacturer
58147		Murrey & Penick, Elkton
	Fox Chemical Co., Br. Federal Chemical Co., Inc., Louisville, Ky.	
57065	Fox Raw Bone	Manufacturer
58158		O. A. Lutes & Co., Shepherdsville
57069	Fox Ground Raw Bone	
	Globe Fertilizer Co., Br. Federal Chemical Co., Inc., Louisville, Ky.	
57092	Globe Raw Bone	Manufacturer
58175		G. R. Holt, Campbellsville
57096	Acorn Raw Bone	Manufacturer
	Groves Fertilizer Works, Cincinnati, Ohio.	
57657	Raw Bone	
	Hopkins Fertilizer Co., New Albany, Ind.	
57383	Pure Raw Bone	Manufacturer
57882		A. L. Moore, Leitchfield
57883		A. W. Pickerell, Hodgenville
	International Agricultural Corporation, Montgomery, Ala.	
57753	Pure Raw Bone Meal	
	The Jarecki Chemical Co., Cincinnati, Ohio.	
57406	Ground Bone	Manufacturer
	Kentucky Fertilizer Co., Br. Federal Chemical Co., Inc., Louisville, Ky.	
57118	O. K. Raw Bone	Manufacturer

Bones, Tankage, &c.

PERCENTAGE OF FINENESS		Total Phosphoric Acid.	Equivalent to Bone Phosphate	Nitrogen	Equivalent to Ammonia	POTASH		Index of Relative Value	Station Number.
Fine Bone	Medium Bone					From Muriate	From Sulfate		
									57019
		24.00	*52.42*	*2.88*	*3.50*			*39.4*	
									57041
		24.00	*52.42*	*2.88*	*3.50*			*39.4*	
45.00	55.00	22.90	50.01	4.30	5.22			48.4	57042
100.00		26.20	57.22	3.93	4.77			48.5	58147
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
41.00	59.00	24.00	52.42	4.46	5.41			50.4	57065
70.00	30.00	21.50	46.95	3.00	3.64			38.2	58158
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
									57069
		24.00	*52.42*	*2.88*	*3.50*			*39.4*	
43.00	57.00	23.50	51.33	4.30	5.22			48.9	57092
100.00		23.40	51.10	3.82	4.64			45.5	58175
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
									57096
		24.00	*52.42*	*2.88*	*3.50*			*39.4*	
									57657
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
48.00	52.00	23.10	50.46	3.63	4.41			43.9	57383
35.00	65.00	23.80	51.98	3.87	4.70			46.1	57882
47.00	53.00	22.10	48.26	3.69	4.48			43.5	57883
		21.50	*46.95*	*3.50*	*4.25*			*41.7*	
									57753
		24.00	*52.42*	*3.71*	*4.50*			*45.2*	
77.00	23.00	30.15	65.85	1.62	1.97			35.5	57406
		27.00	*58.96*	*1.65*	*2.00*			*33.2*	
43.00	57.00	24.10	52.64	4.47	5.43			50.6	57118
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	

TABLE II.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Kentucky Fertilizer Co.	
57122	O. K. Fine Raw Bone	
	Louisville Fertilizer Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.	
55908	Raw Bone	Manufacturer
57931		J. L. Shadoin & Co., Frazer
57932		W. E. Ellis & Bro., Hartford
55909	Bone Meal	Manufacturer
57933		C. L. Thomas' Carriage and Implement Co., Bowling Green
57934		L. B. Smith & Co., Campbellsville
58186		Peoples' Store, Loretto
58187		M. C. Marion & Son, Elizabethtown
55964	Kentucky Bone Meal	Manufacturer
57572	Raw Bone Mixture	Manufacturer
	Morris & Co., Chicago, Ill.	
57336	Big One—Ground Raw Bone	Manufacturer
57337	Big Two—Pure Bone Meal	Manufacturer
57952		Cayce-Yost Co., Hopkinsville
58199		J. H. Wyan, London
58200		Farmers' Union Supply Co., Franklin
57341	Special Big Seven—Bone Meal	Manufacturer
57956		Hatter Hardware Co., Franklin
58203		Farmers' Union Supply Co., Franklin
	Pero & Stoecker, Louisville, Ky.	
57455	Pure Animal Matter Corn and Wheat Grower	
57456	Pure Bone Meal	
	Read Phosphate Co., Nashville, Tenn.	
57151	Read's Bone Meal Mixture	Manufacturer
57494	Read's Animal Bone Grain Grower	Manufacturer
58213		M. J. Yopp Seed Co., Paducah

Bones, Tankage, &c.

PERCENTAGE OF FINENESS		Total Phosphoric Acid.	Equivalent to Bone Phosphate	Nitrogen	Equivalent to Ammonia	Potash		Index of Relative Value	Station Number.
Fine Bone	Medium Bone					From Muriate	From Sulfate		
									57122
		24.00	*52.42*	*2.88*	*3.50*			*39.4*	
100.00		25.50	55.68	3.90	4.73			47.7	55908
100.00		25.20	55.04	3.96	4.81			47.9	57931
100.00		23.05	50.35	3.78	4.59			44.9	57932
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
71.00	29.00	24.45	53.39	3.11	3.78			41.3	55909
83.00	17.00	27.05	59.06	2.77	3.36			41.0	57933
76.00	24.00	27.80	60.71	2.68	3.25			41.0	57934
71.00	29.00	28.85	63.00	2.46	2.99			40.3	58186
74.00	26.00	27.55	60.16	2.89	3.51			42.3	58187
		24.00	*52.42*	*2.47*	*3.00*			*36.5*	
100.00		28.40	62.03	2.25	2.73			38.5	55964
		27.00	*58.96*	*1.65*	*2.00*			*33.2*	
81.00	19.00	20.25	44.23	1.33	1.61		1.03	31.7	57572
		15.00	*32.76*	*1.65*	*2.00*		*1.00*	*29.6*	
70.00	30.00	24.40	53.28	3.51	4.26			44.1	57336
		24.00	*52.42*	*3.29*	*4.00*			*42.2*	
66.00	34.00	28.80	62.89	2.50	3.04			40.5	57337
50.00	50.00	29.40	64.21	2.03	2.46			37.7	57952
71.00	29.00	28.65	62.58	2.13	2.59			37.8	58199
69.00	31.00	29.20	63.77	1.88	2.28			36.5	58200
		28.00	*61.16*	*2.06*	*2.50*			*36.8*	
78.00	22.00	23.50	51.33	1.15	1.40			26.9	57341
72.00	28.00	19.80	43.25	0.76	0.92			21.2	57956
76.00	24.00	25.30	55.27	1.09	1.32			27.9	58203
		22.00	*48.06*	*0.82*	*1.00*			*23.3*	
100.00		9.50	20.74	6.33	7.68			51.9	57455
		10.00	*21.85*	*4.00*	*4.86*			*36.0*	
62.00	38.00	26.20	57.22	3.50	4.25			45.5	57456
		22.00	*48.06*	*3.50*	*4.25*			*42.10*	
63.00	37.00	19.70	43.03	2.05	2.49			30.1	57151
		17.00	*37.13*	*1.65*	*2.00*			*25.2*	
67.00	33.00	23.00	50.24	0.96	1.17			25.1	57494
65.00	35.00	22.45	49.03	1.01	1.23			25.0	58213
		23.00	*50.24*	*0.82*	*1.00*			*24.1*	

TABLE II.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	St. Bernard Fertilizer Co., Nashville, Tenn.	
57519	Bone Meal Mixture	Manufacturer
57522	Animal Bone Special	Manufacturer
	Smith Brothers, Louisville, Ky.	
57611	Pure Raw Bone	Sam Terry, Big Clifty
58217		
	Swift & Co., Inc., National Stock Yards, Ill.	
57331	Swift's Raw Bone Meal Fertilizer	Temperance Mercantile Co., Franklin.
58230		
57332	Swift's Ground Beef Bone Fertilizer	Manufacturer
58000		J. L. Shadoin & Co., Frazer
57333	Swift's Bone Meal Fertilizer	Young & Bishop, Providence
58231		Thacker & Gilbert, Franklin
58232		
57334	Swift's ½-30 Bone Meal Fertilizer	
57335	Swift's 1½-20 Bone Meal Fertilizer	W. S. Overstreet, Lagrange
58001		Cooper-Craycroft Co., Vine Grove
58233		
57755	Swift's 2¼-29 Bone Meal Fertilizer	Manufacturer
57756	Swift's Special Bone Meal Fertilizer	Manufacturer
58234		Thacker & Gilbert, Franklin
58235		Owen Hardware Co., Madisonville
57945	Swift's Ground Steam Bone Fertilizer	Manufacturer
	Taylor & Powell Fertilizer Co., Inc., Springfield, Tenn.	
57452	Pure Raw Bone Meal	Manufacturer
	Tennessee Chemical Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.	
55921	Ox Raw Bone	Manufacturer

Bones, Tankage, &c.

PERCENTAGE OF FINENESS		Total Phosphoric Acid.	Equivalent to Bone Phosphate	Nitrogen	Equivalent to Ammonia	Potash		Index of Relative Value	Station Number.
Fine Bone	Medium Bone					From Muriate	From Sulfate		
70.00	30.00	23.50	51.33	1.75	2.12			31.1	57519
		17.00	*37.13*	*1.65*	*2.00*			*25.2*	
67.00	33.00	23.60	51.55	1.00	1.21			25.9	57522
		23.00	*50.24*	*0.82*	*1.00*			*24.1*	
									57611
56.00	44.00	24.40	53.28	4.01	4.87			47.6	58217
		21.50	*46.45*	*3.50*	*4.25*			*41.7*	
									57331
51.00	49.00	25.45	55.57	3.98	4.83			48.2	58230
		23.00	*50.24*	*3.71*	*4.50*			*44.4*	
100.00		27.90	60.94	2.05	2.49			36.7	57332
76.00	24.00	28.60	62.44	2.40	2.91			39.7	58000
		27.00	*58.96*	*2.06*	*2.50*			*36.0*	
									57333
84.00	16.00	19.65	42.92	3.30	4.01			38.8	58231
84.00	16.00	23.95	52.30	2.74	3.33			38.3	58232
		24.00	*52.42*	*2.47*	*3.00*			*36.5*	
									57334
		30.00	*65.52*	*1.23*	*1.50*			*32.6*	
									57335
76.00	24.00	20.25	44.23	1.45	1.76			26.4	58001
100.00		19.90	43.46	1.57	1.91			26.9	58233
		20.00	*43.67*	*1.23*	*1.50*			*24.6*	
76.00	24.00	28.95	63.23	1.82	2.21			35.9	57755
		29.00	*63.34*	*1.85*	*2.25*			*36.2*	
77.00	23.00	30.60	66.83	0.89	1.08			30.7	57756
83.00	17.00	33.45	73.06	0.85	1.03			32.7	58234
80.00	20.00	32.95	71.96	0.83	1.01			32.2	58235
		29.00	*63.34*	*0.82*	*1.00*			*28.9*	
84.00	16.00	21.80	47.61	1.70	2.06			29.3	57945
		20.00	*43.67*	*1.65*	*2.00*			*27.6*	
51.00	49.00	23.85	52.08	4.41	5.35			50.0	57452
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	
100.00		25.10	54.82	3.83	4.65			46.9	55921
		22.00	*48.06*	*3.71*	*4.50*			*43.6*	

TABLE II.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Tennessee Chemical Co.	
55922	Ox Bone Meal	Manufacturer
58006		W. C. Grainger, Franklin
58007		Lebanon Carriage and Implement Co., Lebanon
58240		Lebanon Carriage and Implement Co., Lebanon
55971	Ox Kentucky Bone Meal	Manufacturer
58017		W. T. Kirkman, Elkton
58244		W. F. Grainger, Franklin
	Victor Guano Co., Nashville, Tenn.	
57538	Animal Bone Guano	Manufacturer
57539	Bone Meal Mixture	Manufacturer
	Virginia-Carolina Chemical Co., Inc., Cincinnati Sales Department, Cincinnati, Ohio.	
57819	V-C Steamed Bone	Manufacturer

Bones, Tankage, &c.

PERCENTAGE OF FINENESS		Total Phosphoric Acid.	Equivalent to Bone Phosphate	Nitrogen	Equivalent to Ammonia	Potash		Index of Relative Value	Station Number.
Fine Bone	Medium Bone					From Muriate	From Sulfate		
73.00	27.00	25.30	55.27	2.74	3.33			39.4	55922
100.00		29.05	63.45	2.33	2.83			39.6	58006
100.00		27.60	60.26	3.01	3.65			43.2	58007
74.00	26.00	25.50	55.68	2.97	3.61			41.2	58240
		24.00	*52.42*	*2.47*	*3.00*			*36.5*	
100.00		28.20	61.58	1.16	1.41			30.7	55971
70.00	30.00	30.85	67.36	2.05	2.49			39.0	58017
80.00	20.00	29.75	64.97	2.19	2.66			39.1	58244
		27.00	*58.96*	*1.65*	*2.00*			*33.2*	
68.00	32.00	23.80	51.98	0.82	1.00			24.8	57538
		23.00	*50.24*	*0.82*	*1.00*			*24.1*	
65.00	35.00	24.30	53.07	1.66	2.02			31.1	57539
		17.00	*37.13*	*1.65*	*2.00*			*25.2*	
79.00	21.00	25.85	56.47	3.20	3.88			43.1	57819
		23.00	*50.24*	*2.47*	*3.00*			*35.7*	

Table III.—Acid Phosphates.

Station Number.	Name and Address of Manufacturer. and Name of Brand.	From Whom Obtained.	PHOSPHORIC ACID			Index of Relative Value	Station Number
			Available	Insoluble	Total		
	The American Agricultural Chemical Co., Inc., Cincinnati Sales Dept., Cincinnati, Ohio.						57180
57180	Bowker's 10% Acid Phosphate						
57624		Broadway Coal & Real Estate Co., Mayfield	9.80	2.30	12.10	11.8	57624
58055		F. C. Nash, Providence	11.30	1.40	12.70	13.6	58055
			10.00	*2.00*	*12.00*	*12.0*	
57181	Bowker's 12% Acid Phosphate						57181
57625		V. D. Roberts, Somerset	12.40	2.50	14.90	14.9	57625
58056		V. D. Roberts, Somerset	14.20	1.10	15.30	17.0	58056
			12.00	*2.00*	*14.00*	*14.4*	
57182	Bowker's Soluble Bone						57182
57626		W. P. Upchurch, Whitley City	14.20	1.90	16.10	17.0	57626
57627		McCarley & Room, Hopkinsville	14.60	1.60	16.20	17.5	57627
			14.00	*2.00*	*16.00*	*16.8*	
57183	Bowker's 16% Acid Phosphate						57183
57628		Claypool-Hendricks Hdw. Co., Bowling Green	16.10	2.10	18.20	19.3	57628
57629		Morell Supply Co., Prestonburg	16.60	1.80	18.40	19.9	57629
58057		V. D. Roberts, Somerset	18.80	0.55	19.35	22.6	58057
58058		Claypool-Hendricks Hdw. Co., Bowling Green	18.80	1.20	20.00	22.6	58058
			16.00	*2.00*	*18.00*	*19.2*	
57197	Bradley's 10% Acid Phosphate		*10.00*	*2.00*	*12.00*	*12.0*	57197
57198	Bradley's 12% Acid Phosphate		*12.00*	*2.00*	*14.00*	*14.4*	57198
57199	Bradley's Soluble Dissolved Bone		*14.00*	*2.00*	*16.00*	*16.8*	57199

57200	Bradley's 16% Acid Phosphate						57200
			16.00	*2.00*	*18.00*	*19.2*	
57214	Cleveland Dryer Wks., Horsehead Phosphate						57214
58065		O. A. Lutes & Co., Shepherdsville	10.70	2.00	12.70	12.8	58065
			10.00	*2.00*	*12.00*	*12.0*	
57215	Cleveland Dryer Wks. 12% Acid Phosphate						57215
			12.00	*2.00*	*14.00*	*14.4*	
57216	Cleveland Dryer Wks. XXX Superphosphate						57216
			14.00	*2.00*	*16.00*	*16.8*	
57224	Cleveland Dryer Wks. 16% Acid Phosphate						57224
58066		H. M. Tomes, Caneyville	17.85	0.60	18.45	21.4	58066
58067		H. T. Simpson, Caneyville	18.65	1.50	20.15	22.4	58067
			16.00	*2.00*	*18.00*	*19.2*	
57231	Michigan Carbon Wks. 10% Acid Phosphate						57231
58068		I. K. Miller & Sons, Campbellsville	10.00	1.85	11.85	12.0	58068
58069		Skaggs & Nunn, Horse Cave	10.95	1.90	12.85	13.1	58069
			10.00	*2.00*	*12.00*	*12.0*	
57232	Michigan Carbon Wks. 12% Acid Phosphate						57232
			12.00	*2.00*	*14.00*	*14.4*	
57233	Michigan Carbon Wks. Red Line Phosphate						57233
57660		C. M. Langdon, Science Hill	15.00	3.00	18.00	18.0	57660
57661		J. E. Bowie, Ghent	15.10	3.30	18.40	18.1	57661
			14.00	*2.00*	*16.00*	*16.8*	
57234	Michigan Carbon Wks. 16% Acid Phosphate						57234
57662		S. Caudill, Morehead	16.70	2.30	19.00	20.0	57662
57663		N. F. Hill, Bowling Green	16.30	2.50	18.80	19.6	57663
58070		Farmers' Union Supply Co., Franklin	17.90	1.30	19.20	21.5	58070
58071		Earl Moneymaker, Eddyville	19.90	0.35	20.25	23.9	58071
			16.00	*2.00*	*18.00*	*19.2*	
57248	N. W. Horseshoe Brand Quick Acting Phosphate						57248
57679		Woodson Lewis, Greensburg	10.60	2.40	13.00	12.7	57679
			10.00	*2.00*	*12.00*	*12.0*	
57249	N. W. Horseshoe Brand 12% Acid Phosphate						57249
			12.00	*2.00*	*14.00*	*14.4*	

Table III.—Acid Phosphates.

Station Number.	Name and Address of Manufacturer. and Name of Brand.	From Whom Obtained.	PHOSPHORIC ACID			Index of Relative Value	Station Number
			Available	Insoluble	Total		
	The American Agricultural Chemical Co.						
57250	N. W. Horseshoe Brand Square Deal Phosphate						57250
57680		Bryant Bros., Whitley City	14.50	3.00	17.50	17.4	57680
57681		Grayson County Supply Co., Leitchfield	14.60	2.50	17.10	17.5	57681
58084		T. J. Whittinghill, Fordsville	17.65	1.20	18.85	21.2	58084
			14.00	*2.00*	*16.00*	*16.8*	
57251	N. W. Horseshoe Brand 16% Acid Phosphate						57251
57682		Woodson Lewis, Greensburg	16.30	2.20	18.50	19.6	57682
57683		Dickey & Co., Glasgow	16.50	2.50	19.00	19.8	57683
58085		Dickey & Co., Glasgow	19.60	1.30	20.90	23.5	58085
			16.00	*2.00*	*18.00*	*19.2*	
57265	Packers Boar's Head Brand Soluble Phospnate						57265
58090		Fain, Lee & Wade, Murray	9.75	2.10	11.85	11.7	58090
			10.00	*2.00*	*12.00*	*12.0*	
57266	Packers Boar's Head Brand 12% Acid Phosphate						57266
			12.00	*2.00*	*14.00*	*14.4*	
57267	Packers Boar's Head Brand Gilt Edge Phosphate						57267
			14.00	*2.00*	*16.00*	*16.8*	
57268	Packers Boar's Head Brand 16% Acid Phosphate						57268
57688		D. W. Spurlock, Middle Creek	16.40	1.90	18.30	19.7	57688
58091		Fain, Lee & Wade, Murray	16.85	2.50	19.35	20.2	58091
			16.00	*2.00*	*18.00*	*19.2*	
	Armour Fertilizer Works, Nashville, Tenn.						
55933	Armour's High Grade Phosphate	Manufacturer	16.70	2.60	19.30	20.0	55933
57711		L. A. Collins, Lebanon	16.60	2.40	19.00	19.9	57711

57712		Merrifield & Humphrey, Bloomfield	16.50	2.40	18.90	19.8	57712
58094		L. M. Overbey & Son, Murray	18.75	2.55	21.30	22.5	58094
58095		Jenkins-Essex Co., Elizabethtown	18.50	0.25	18.75	22.2	58095
			16.00	*2.00*	*18.00*	*19.2*	
55934	Armour's Star Phosphate	Manufacturer	14.00	4.70	18.70	16.8	55934
			14.00	*2.00*	*16.00*	*16.8*	
55935	Armour's Cereal Phosphate	Manufacturer	11.00	7.20	18.20	13.2	55935
57713		I. K. Miller & Sons, Campbellsville	10.90	2.10	13.00	13.1	57713
57714		Jackson Hdw. & Grocery Co., Dixon	10.70	2.30	13.00	12.8	57714
58096		W. W. Durbin, Clarkson	13.50	3.65	17.15	16.2	58096
			10.00	*2.00*	*12.00*	*12.0*	
57171	Ideal Super Phosphate	Manufacturer	19.00	1.50	20.50	22.8	57171
57738		The T. J. Turley Co., Owensboro	16.30	3.00	19.30	19.6	57738
58104		The T. J. Turley Co., Owensboro	18.15	2.60	20.75	21.8	58104
			16.00	*2.00*	*18.00*	*19.2*	
55958	Tuscarora High Grade Acid Phosphate	Manufacturer	17.10	2.30	19.40	20.5	55958
57739		Dickinson Bros., Glasgow	16.70	2.80	19.50	20.0	57739
57740		Geo. W. Garner, Somerset	17.50	1.40	18.90	21.0	57740
			16.00	*2.00*	*18.00*	*19.2*	
55959	Tuscarora Acid Phosphate	Manufacturer	15.20	4.10	19.30	18.2	55959
			14.00	*2.00*	*16.00*	*16.8*	
55960	Tuscarora Phosphate	Manufacturer	13.60	7.50	21.10	16.3	55960
			12.00	*2.00*	*14.00*	*14.4*	
	C. S. Brent Seed Co., Inc., Lexington, Ky.						
57361	Acid Phosphate	Manufacturer	17.15	0.70	17.85	20.6	57361
	Calumet Fertilizer Co., New Albany, Ind.		*16.00*			*19.2*	
57373	Calumet Br. Acid Phosphate						57373
			14.00	*1.00*	*15.00*	*16.8*	
57462	Calumet Br. 16% Acid Phosphate						57462
			16.00			*19.2*	
	The Cincinnati Phosphate Co., Cincinnati, Ohio.						
57413	Wheat Grower	Manufacturer	17.00	2.30	19.30	20.4	57413
			14.00	*1.00*	*15.00*	*16.8*	
57414	Acid Phosphate	Manufacturer	18.15	2.85	21.00	21.8	57414
			16.00	*1.00*	*17.00*	*19.2*	

Table III.—Acid Phosphates.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	PHOSPHORIC ACID			Index of Relative Value	Station Number
			Available	Insoluble	Total		
	Duncan & Sherley, Lagrange, Ky.						57464
57464	Tiger Brand Phosphate	Manufacturer's warehouse	16.60	0.10	16.70	19.9	57764
57764		Manufacturer's warehouse	17.20	3.75	20.95	20.6	58119
58119			*16.00*	*2.00*	*18.00*	*19.2*	
	The Empire Guano Co., Nashville, Tenn.						
57162	Climax Phosphate	Manufacturer	12.00	10.00	22.00	14.4	57162
57769		J. L. Durham, Greensburg	10.55	11.50	22.05	12.7	57769
			10.00	*10.00*	*20.00*	*12.0*	
57163	Acid Phosphate	Manufacturer	13.60	7.40	21.00	16.3	57163
57770		J. L. Durham, Greensburg	12.10	8.75	20.85	14.5	57770
			12.00	*6.00*	*18.00*	*14.4*	
57164	High Grade Acid Phosphate	Manufacturer	15.50	5.60	21.10	18.6	57164
			14.00	*4.00*	*18.00*	*16.8*	
57165	Climax Acid Phosphate	Manufacturer	18.10	2.10	20.20	21.7	57165
			16.00	*2.00*	*18.00*	*19.2*	
	The Evansville Packing Co., Evansville, Ind.						57469
57469	High Grade Soluble Phosphate	Eldred Hardware Co., Princeton	18.30	0.45	18.75	22.0	57771
57771		Eldred Hardware Co., Princeton	19.20	0.75	19.95	23.0	58124
58124		J. H. Barnhill, Providence	18.00	0.95	18.95	21.6	58125
58125			*16.00*			*19.2*	
	Falls City Fertilizer Co., New Albany, Ind.						57816
57816	Falls City Brand 16% Acid Phosphate		*16.00*	*1.00*	*17.00*	*19.2*	
	Federal Chemical Co., Inc., Louisville, Ky.						
55980	400 Phosphate Mixture	Manufacturer	10.80	14.50	25.30	13.0	55980
57774		J. W. Nall, Clay	11.30	13.70	25.00	13.6	57774

57775		M. L. Spurling, Campbellsville	11.70	13.60	25.30	14.0
			10.00	*10.00*	*20.00*	*12.0*
55993	Daybreak Special Phosphate Mixture	Manufacturer	10.60	14.40	25.00	12.7
57791		Lake Bros., Springfield	12.40	12.70	25.10	14.9
57792		J. E. Bowie, Ghent	13.20	13.10	26.30	15.8
			10.00	*10.00*	*20.00*	*12.0*
57014	Daybreak High Grade Phosphate	Manufacturer	19.90	1.70	21.60	23.9
57807		St. Matthews Produce Exchange, St. Matthews	19.20	2.95	22.15	23.0
57808		A. W. Tarter, Columbia	20.10	1.40	21.50	24.1
58139		Ratcliff Hardware Co., Princeton	20.15	0.90	21.05	24.2
58140		A. W. Tarter, Columbia	17.85	0.95	18.80	21.4
			16.00	*2.00*	*18.00*	*19.2*
57016	Daybreak Star Phosphate	Manufacturer	11.60	6.50	18.10	13.9
			10.00	*2.00*	*12.00*	*12.0*
57017	Daybreak Standard Phosphate	Manufacturer	13.30	6.80	20.10	16.0
			12.00	*2.00*	*14.00*	*14.4*
57018	Daybreak Royal Phosphate	Manufacturer	15.80	5.80	21.60	19.0
57810		J. A. Shaver, Greenville	16.80	6.80	23.60	20.2
58141		Ratcliff Hardware Co., Princeton	17.80	2.55	20.35	21.4
			14.00	*2.00*	*16.00*	*16.8*
57020	1st Prize Special Phosphate Mixture	Manufacturer	10.70	14.10	24.84	12.9
			10.00	*10.00*	*20.00*	*12.0*
57038	1st Prize Standard Phosphate	Manufacturer	13.30	7.10	20.40	16.0
			12.00	*2.00*	*14.00*	*14.4*
57039	1st Prize Bone Phosphate	Manufacturer	14.20	5.90	20.10	17.0
			14.00	*2.00*	*16.00*	*16.8*
57040	1st Prize High Grade Phosphate	Manufacturer	20.10	2.00	22.10	24.1
			16.00	*2.00*	*18.00*	*19.2*
57043	1st Prize AA Phosphate		11.70	6.90	18.60	14.0
			10.00	*2.00*	*12.00*	*12.0*
	Fox Chemical Co., Br. Federal Chem. Co., Inc., Louisville, Ky.					
57044	Fox Special Phosphate Mixture	Manufacturer	11.00	14.00	25.00	13.2
57823		N. B. Triplet, Waynesburg	14.50	12.10	26.60	17.4
58148		Skaggs & Nunn, Horse Cave	13.60	9.95	23.55	16.3
			10.00	*10.00*	*20.00*	*12.0*
57064	Fox High Grade Phosphate	Manufacturer	19.30	1.90	21.20	23.2
57835		A. W. Tartar, Columbia	19.10	2.90	22.00	22.9
58156		M. L. Spurling, Campbellsville	17.65	1.45	19.10	21.2
58157		J. F. Rogers, Elizabethtown	17.90	1.70	19.60	21.5
			16.00	*2.00*	*18.00*	*19.2*

57775	
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Table III.—Acid Phosphates.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	PHOSPHORIC ACID			Index of Relative Value	Station Number
			Available	Insoluble	Total		
	Fox Chemical Co.						
57066	Fox AA Phosphate	Manufacturer	11.60	6.60	18.20	13.9	57066
58159		A. B. Beale & Son, Murray	9.75	3.90	13.65	11.7	58159
			10.00	*2.00*	*12.00*	*12.0*	
57067	Fox Standard Phosphate	Manufacturer	13.30	6.80	20.10	16.0	57067
57836		N. B. Triplett, Waynesburg	15.60	8.55	24.15	18.7	57836
			12.00	*2.00*	*14.00*	*14.4*	
57068	Fox Phosphate	Manufacturer	16.40	5.40	21.80	19.7	57068
58160		M. L. Spurling, Campbellsville	15.10	2.40	17.50	18.1	58160
			14.00	*2.00*	*16.00*	*16.8*	
	Globe Fertilizer Co., Br. Federal Chem. Co., Inc., Louisville, Ky.						
57070	Globe Special Phosphate Mixture	Manufacturer	11.20	14.00	25.20	13.4	57070
57838		H. S. Gregory, Slavens	11.15	15.30	26.45	13.4	57838
57839		Carson & Co., Hartford	13.05	12.25	25.30	15.7	57839
			10.00	*10.00*	*20.00*	*12.0*	
57091	Globe High Grade Phosphate	Manufacturer	19.50	2.10	21.60	23.4	57091
57854		Moss & Gibson, Crestwood	18.80	2.40	21.20	22.6	57854
57855		Carnes & Rogers, Sewellton	20.80	1.20	22.00	25.0	57855
58173		G. R. Holt, Campbellsville	17.00	1.60	18.60	20.4	58173
58174		Comer Brothers-Page Co., Glasgow	17.45	1.30	18.75	20.9	58174
			16.00	*2.00*	*18.00*	*19.2*	
57093	Globe AA Phosphate	Manufacturer	11.20	6.60	17.80	13.4	57093
			10.00	*2.00*	*12.00*	*12.0*	
57094	Globe Standard Phosphate	Manufacturer	12.90	6.90	19.80	15.5	57094
			12.00	*2.00*	*14.00*	*14.4*	
57095	Globe Phosphate	Manufacturer	15.90	5.70	21.60	19.1	57095
			14.00	*2.00*	*16.00*	*16.8*	

	Groves Fertilizer Works, Cincinnati, Ohio.						
57125	Monarch Brand	Manufacturer	15.50	1.10	16.60	18.6	57125
57861		Troutman Bros., Shepherdsville	15.10	0.60	15.70	18.1	57861
57862		A. L. Moore, Leitchfield	15.10	0.30	15.40	18.1	57862
			14.00	*1.00*	*15.00*	*16.8*	
57126	16% Acid Phosphate	Manufacturer	19.20	0.10	19.30	23.0	57126
57863		Minges Hardware Co., Newport	16.20	0.20	16.40	19.4	57863
			16.00	*1.00*	*17.00*	*19.2*	
	Hopkins Fertilizer Co., New Albany, Ind.						
57381	High Grade Acid Phosphate	Manufacturer	15.50	0.30	15.80	18.6	57381
			14.00	*1.00*	*15.00*	*16.8*	
57382	Climax Acid Phosphate	Manufacturer	17.80	0.20	18.00	21.4	57382
57880		The Taylor County Supply Co., Campbellsville	15.70	3.80	19.50	18.8	57880
57881		L. C. Goering, Hawesville	16.30	3.50	19.80	19.6	57881
			16.00	*1.00*	*17.00*	*19.2*	
	International Agricultural Corporation, Montgomery, Ala.						
57426	International Acid Phosphate						57426
57893		S. W. Morgan, Grayson	19.00	0.10	19.10	22.8	57893
			16.00	*1.00*	*17.00*	*19.2*	
	The Jarecki Chemical Co., Cincinnati, Ohio.						
57401	C. O. D. Phosphate	Manufacturer	17.00	2.30	19.30	20.4	57401
57897		J. C. Everett & Co., Maysville	16.00	2.90	18.90	19.2	57897
			14.00	*1.00*	*15.00*	*16.8*	
57402	Acid Phosphate	Manufacturer	18.15	2.85	21.00	21.8	57402
			16.00	*1.00*	*17.00*	*19.2*	
	Jefferson Fertilizer Co., Birmingham, Ala.						
57459	Jefferson Excelsior Acid Phosphate						57459
			16.00			*19.2*	
	The Kaufman Fertilizer Co., Cincinnati, Ohio.						
57422	Dissolved Phosphate	Manufacturer	17.00	2.30	19.30	20.4	57422
57903		Jno. Simmons, Irvington	14.40	1.20	15.60	17.3	57903
			14.00	*1.00*	*15.00*	*16.8*	
57423	Acid Phosphate	Manufacturer	18.15	2.85	21.00	21.8	57423
			16.00	*1.00*	*17.00*	*19.2*	

Table III.—Acid Phosphates.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	Phosphoric Acid: Available	Phosphoric Acid: Insoluble	Phosphoric Acid: Total	Index of Relative Value	Station Number
	Kentucky Fert. Co., Br. Federal Chem. Co., Inc., Louisville, Ky.						
		Manufacturer	14.00	14.00	28.00	16.8	57097
57097	O. K. Special Phosphate Mixture	J. W. Nall, Clay	11.00	14.50	25.50	13.2	57904
57904		J. W. Nall, Clay	9.60	11.20	20.80	11.5	58179
58179		T. J. Chelf, Casey's Creek	10.10	13.00	23.10	12.1	58180
58180			*10.00*	*10.00*	*20.00*	*12.00*	
		Manufacturer	20.10	2.00	22.10	24.1	57117
57117	O. K. High Grade Phosphate	S. M. Hart & Son	20.00	2.50	22.50	24.0	57914
57914		T. J. Chelf, Casey's Creek	15.30	2.90	18.20	18.4	58182
58182			*16.00*	*2.00*	*18.00*	*19.2*	
		Manufacturer	11.40	6.60	18.00	13.7	57119
57119	O. K. Good Luck Phosphate		*10.00*	*2.00*	*12.00*	*12.0*	
		Manufacturer	13.50	6.40	19.90	16.2	57120
57120	O. K. Standard Phosphate		*12.00*	*2.00*	*14.00*	*14.4*	
		Manufacturer	15.80	6.00	21.80	19.0	57121
57121	O. K. Phosphate		*14.00*	*2.00*	*16.00*	*16.8*	
	Louisville Fertilizer Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.						
		Manufacturer	15.70	0.60	16.30	18.8	55913
55913	High Grade Dissolved Bone	M. C. Marion & Son, Elizabethtown	14.85	1.85	16.70	17.8	57939
57939		T. J. Whittinghill, Fordsville	14.30	0.70	15.00	17.2	57940
57940		Cohen Brothers, Central City	14.95	3.30	18.25	17.9	58188
58188			*14.00*	*2.00*	*16.00*	*16.8*	
		Manufacturer	19.10	0.60	19.70	22.9	55914
55914	Tennessee Best Acid Phosphate	Cohen Bros., Greenville	16.20	3.55	19.75	19.4	57941
57941		W. T. Kirkman, Elkton	16.20	3.55	19.75	19.4	57942
57942		H. E. Woodson, Brandenburg	17.30	0.45	17.75	20.8	58189
58189		W. P. Ray, New Haven	18.20	0.15	18.35	21.8	58190
58190			*16.00*	*2.00*	*18.00*	*19.2*	

55967	Phosphate	Manufacturer	12.10	0.90	13.00	14.5	55967
57944		Sherman Skaggs, Clarkson	12.60	0.40	13.00	15.1	57944
			12.00	*2.00*	*14.00*	*14.4*	
	Meridian Fertilizer Factory, Meridian, Miss.						
57948	Union Special Acid Phosphate						57948
			16.00			*19.2*	
	Price Chemical Co., Inc., Louisville, Ky.						
57947	High Grade Acid Phosphate	Manufacturer	17.55	2.70	20.25	21.1	57947
			16.00	*2.00*	*18.00*	*19.2*	
	Rasin-Monumental Co. (Subsidiary of Virginia - Carolina Chem. Co., Inc., Cincinnati, O.						
57295	Rasin's 14% Acid Phosphate	Manufacturer	16.20	1.00	17.20	19.4	57295
			14.00	*1.50*	*15.50*	*16.8*	
57296	Rasin's 16% Acid Phosphate	Manufacturer	17.90	0.30	18.20	21.5	57296
57959		L. F. Wellman & Co., Louisa	17.25	0.35	17.60	20.7	57959
57960		Farmers' Union, Mintonville	17.30	0.80	18.10	26.0	57960
58207		Guenther Hardware Co., Owensboro	18.40	0.20	18.60	22.1	58207
			16.00	*1.50*	*17.50*	*19.2*	
57297	Rasin's 20% Acid Phosphate	Manufacturer	21.70	0.50	22.20	26.0	57297
57961		C. E. Miller, Fordsville	21.80	0.20	22.00	26.2	57961
			20.00	*1.50*	*21.50*	*24.0*	
	Read Phosphate Co., Nashville, Tenn.						
57145	Read's Special High Grade Acid Phosphate	Manufacturer	18.60	1.90	20.50	22.3	57145
57967		Marion Milling Co., Marion	16.80	2.10	18.90	20.2	57967
57968		Hollingsworth & Young, Bowling Green	16.40	3.00	19.40	19.7	57968
57969		J. C. Cowherd & Co., Greensburg	17.80	2.00	19.80	21.4	57969
58210		Scott & Glasgow Hdw. Co., Murray	16.95	3.00	19.95	20.3	58210
58211		Barren County Grocery & Hardware Co., Glasgow	17.50	2.65	20.15	21.0	58211
			16.00	*2.00*	*18.00*	*19.2*	
57146	Read's High Grade Acid Phosphate	Manufacturer	15.40	5.40	20.80	18.5	57146
57970		U. L. Antle, Columbia	15.00	4.40	19.40	18.0	57970
			14.00	*4.00*	*18.00*	*16.8*	
57147	Read's XXX Dissolved Bone	Manufacturer	15.20	6.40	21.60	18.2	57147
			13.00	*5.00*	*18.00*	*15.6*	

Table III.—Acid Phosphates.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	PHOSPHORIC ACID			Index of Relative Value	Station Number
			Available	Insoluble	Total		
	Read Phosphate Co.						
57148	Read's Matchless Acid Phosphate	Manufacturer	13.80	7.60	21.40	16.6	57148
57971		Baker & Glasgow, Murray	12.90	6.10	19.00	15.5	57971
			12.00	*6.00*	*18.00*	*14.4*	
57149	Read's 50-50 Phosphate	Manufacturer	12.50	9.70	22.20	15.0	57149
57972		Baker & Glasgow, Murray	10.60	14.10	24.70	12.7	57972
57973		J. C. Cowherd & Co., Greensburg	9.60	12.40	22.00	11.5	57973
			10.00	*10.00*	*20.00*	*12.0*	
	St. Bernard Fertilizer Co., Nashville, Tenn.						
57516	High Grade Acid Phosphate	Manufacturer	15.60	7.50	23.10	18.7	57516
			14.00	*4.00*	*18.00*	*16.8*	
57517	Special High Grade Acid Phosphate	Manufacturer	17.20	3.10	20.30	20.6	57517
			16.00	*2.00*	*18.00*	*19.2*	
	The Smith Agricultural Chemical Co., Columbus, Ohio.						
57431	Smith's 16% Acid Phosphate	Manufacturer	17.00	0.65	17.65	20.4	57431
			16.00			*19.2*	
	Smith Brothers, Louisville, Ky.						57605
57605	Acid Phosphate		*16.00*	*2.00*	*18.00*	*19.2*	
	Southern Fertilizer Co., Inc., Louisville, Ky.						
57434	Elk Phosphate	Manufacturer	16.83	1.05	17.88	20.2	57434
			14.00	*1.00*	*15.00*	*16.8*	
57451	Atlas Phosphate	Manufacturer	18.54	0.75	19.29	22.3	57451
57981		Conrad, Payne & Co., Cloverport	18.40	1.30	19.70	22.1	57981
58218		Conrad, Payne & Co., Cloverport	17.25	1.05	18.30	20.7	58218
			16.00	*1.00*	*17.00*	*19.2*	
	Swift & Co., Inc., National Stock Yards, Ill.						
57319	Swift's High Gr. Acid Phosphate		17.85	0.00	17.85	21.4	57319

57992		B. F. Beard & Co., Hardinsburg	19.30	1.30	20.60	23.2	57992
57993		W. E. Burress, Greensburg	17.30	1.10	18.40	20.8	57993
58228		E. T. Ford, Cave City	13.70	6.45	20.15	16.4	58228
58229		Benton Supply Co., Benton	18.10	0.30	18.40	21.7	58229
			16.00	*1.00*	*17.00*	*19.2*	
	Tennessee Chemical Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.						
55923	Ox Tennessee Best Acid Phosphate	Manufacturer	18.45	0.40	18.85	22.1	55923
58008		W. C. Grainger, Franklin	18.30	2.30	20.60	22.0	58008
58009		Lebanon Carriage & Implement Co., Lebanon	16.35	0.80	17.15	19.6	58009
58241		J. J. Shaver & Co., Mayfield	17.20	1.50	18.70	20.6	58241
58242		Wilson & Wayne, Russellville	17.60	1.65	19.25	21.1	58242
			16.00	*2.00*	*18.00*	*19.2*	
55924	Ox High Grade Dissolved Bone	Manufacturer	15.30	0.50	15.80	18.4	55924
58010		I. K. Miller & Sons, Campbellsville	14.05	0.80	14.85	16.9	58010
58011		G. W. Richardson, Somerset	10.25	0.65	10.90	12.3	58011
			14.00	*2.00*	*16.00*	*16.8*	
55979	Ox Phosphate	Manufacturer	12.90	0.40	13.30	15.5	55979
58246		Sexton Bros., Murray	11.50	4.35	15.85	13.8	58246
58247		J. M. Johnson & Son, Benton	12.75	3.20	15.95	15.3	58247
			12.00	*2.00*	*14.00*	*14.4*	
	Tennessee Coal, Iron and Railroad Co., Birmingham, Ala.						
57172	Duplex Basic Phosphate	Manufacturer			18.65	22.38	57172
58024		Barnett Brothers, London			19.20	23.0	58024
58254		First Ky. District Supply Co., Glasgow			17.65	21.2	58254
58255		City Coal Co., Fulton			18.35	22.0	58255
					18.00	*21.6*	
57173	14% Duplex Basic Phosphate						57173
58025		Joe D. Davis, Fulton			15.85	19.0	58025
58026		B. D. McFarland, Jamestown			15.30	18.4	58026
58256		J. C. Everett & Co., Maysville			15.15	18.2	58256
					14.00	*16.8*	
57174	11% Duplex Basic Phosphate	Manufacturer			12.85	15.4	57174
58027		N. F. Hill, Bowling Green			11.10	13.3	58027
					11.00	*13.2*	
	Tupelo Fert. Fact., Tupelo, Miss.						
57900	Cotton Belt High Grade Acid Phosphate	Manufacturer	20.00	0.70	20.70	24.0	57900
			16.00			*19.2*	

Table III.—Acid Phosphates.

Station Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	PHOSPHORIC ACID			Index of Relative Value	Station Number
			Available	Insoluble	Total		
	Victor Guano Co., Nashville, Tenn.						
57525	Special High Gr. Acid Phosphate	Manufacturer	17.80	2.90	20.70	21.4	57525
58257		Lambert, Grisham Hdw. Co., Henderson	16.55	3.25	19.80	19.9	58257
			16.00	*2.00*	*18.00*	*19.2*	
57526	High Grade Acid Phosphate	Manufacturer	15.30	7.90	23.20	18.4	57526
			14.00	*4.00*	*18.00*	*16.8*	
	Virginia-Carolina Chem. Co., Inc., Cincinnati Sales Div., Cincinnati, Ohio.						
57282	V-C Red Cross 14%	Manufacturer	16.00	1.10	17.10	19.2	57282
58028		Chas. Mason, Fordsville	15.35	0.10	15.45	18.4	58028
58029		Bush & Prichard, Ashland	16.45	0.40	16.85	19.7	58029
58258		E. S. Diuguid & Son, Murray	15.65	5.05	20.70	18.8	58258
			14.00	*1.50*	*15.50*	*16.8*	
57283	V-C 16% Acid Phosphate	Manufacturer	17.80	0.55	18.35	21.4	57283
58030		Barnett Bros., London	17.60	0.30	17.90	21.1	58030
58031		Bush & Prichard, Ashland	17.60	0.35	17.95	21.1	58031
58164		R. M. Miller, Millport	17.85	0.45	18.30	21.4	58164
58259		Jack Hysinger, Mt. Vernon	18.05	0.85	18.90	21.7	58259
58260		E. S. Diuguid & Son, Murray	17.30	0.60	17.90	20.8	58260
			16.00	*1.50*	*17.50*	*19.2*	
57284	V-C 20% Acid Phosphate	Manufacturer	21.20	0.80	22.00	25.4	57284
58032		Guenther Hdw. Co., Owensboro	19.65	0.30	19.95	23.6	58032
58033		R. H. Chrisman, Berea	20.55	0.25	20.80	24.7	58033
58261		R. H. Chrisman, Berea	21.65	0.55	22.20	26.0	58261
			20.00	*1.50*	*21.50*	*24.0*	

	Virginia-Carolina Chem. Co., Inc., Mt. Pleasant Branch, Mt. Pleasant, Tenn.							57347
57347	Mt. Pleasant Big Winner Acid Phosphate		18.35	0.25	18.60		22.0	58046
58046		Am. Co-operative Ass'n., Owensboro...	18.55	0.50	19.05		22.3	58047
58047		Grigsby & Co., Bardstown.....	15.90	3.80	19.70		19.1	58265
58265		Plain Hdw. Co., Madisonville.....						
58266		The Am. Co-operative Ass'n., Fordsville	17.85	1.75	19.60		21.4	58266
			16.00	*2.00*	*18.00*		*19.2*	
57348	Black Patch Mt. Pleasant Special Acid Phosphate		*14.00*	*2.00*	*16.00*		*16.8*	57348
57349	Black Patch Mt. Pleasant Soluble Bone		*12.00*	*2.00*	*14.00*		*14.4*	57349
57350	Mt. Pleasant Acid Phosphate		*10.00*	*2.00*	*12.00*		*12.0*	57350
57568	Mt. Pleasant Acid Phosphate		*20.00*	*2.00*	*22.00*		*24.0*	57568
57569	Mt. Pleasant Acid Phosphate		*18.00*	*2.00*	*20.00*		*21.6*	57569

Table IV.—Acid Phosphates with Potash.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	PHOSPHORIC ACID			POTASH		Index of Relative Value	Station Number
			Available	Insoluble	Total	From Muriate	From Sulfate		
	The American Agricultural Chemical Co., Inc., Cincinnati Sales Department, Cincinnati, Ohio.								
57188	Bowker's Acid Phosphate with Potash		12.00	2.00	14.00	1.00		24.8	57188
57205	Bradley's Acid Phosphate with Potash		12.00	2.00	14.00	1.00		24.8	57205
57221	Cleveland Dryer Wks. Acid Phosphate with Potash		12.00	2.00	14.00	1.00		24.8	57221
57239	Michigan Carbon Wks. Acid Phosphate with Potash								57239
57666		J. E. Bowie, Ghent	13.00	2.10	15.10	1.14		27.2	57666
			12.00	2.00	14.00	1.00		24.8	
57256	N-W Horseshoe Brand Acid Phosphate with Potash		12.00	2.00	14.00	1.00		24.8	57256
57273	Packers Boar's Head Brand Acid Phosphate with Potash		12.00	2.00	14.00	1.00		24.8	57273
	Armour Fertilizer Works, Nashville, Tenn.								
55962	Armour's Potash Mixture	Manufacturer	11.20	6.10	17.30	1.79		30.0	55962
57735		W. C. Grainger, Franklin	11.30	3.70	15.00	2.01		30.5	57735
58102		S. D. Holland & Co., Glasgow	11.70	3.25	14.95	0.74	0.63	27.1	58102
			10.00	4.00	14.00	2.00		28.6	
57644	Armour's Alkaline Bone	Manufacturer	11.65	0.70	12.35	1.08	2.03	36.4	57644
			12.00	4.00	16.00	2.00		31.6	
57645	Armour's Potash Formula	Manufacturer	12.70	1.70	14.40		4.74	48.2	57645
			10.00	4.00	14.00	4.00		40.6	
57691	Tuscarora Kentucky Wheat Grower	Manufacturer	12.35	2.05	14.40		2.54	34.6	57691
			10.00	4.00	14.00	2.00		28.6	

57694	Tuscarora Kentucky Wheat Special	Manufacturer	14.35	1.40	15.75		2.85	39.2	57694
			12.00	*4.00*	*16.00*	*2.00*		*31.6*	
	Calumet Fertilizer Co., New Albany, Ind.								
57371	Calumet Brand Phosphate and Potash								57371
			10.00	*1.00*	*11.00*		*2.00*	*27.4*	
57372	Calumet Brand Special Dissolved Bone and Potash								57372
57748		A. L. Moore, Leitchfield	13.90	3.00	16.90	1.21		29.3	57748
			13.00	*2.50*	*15.50*		*1.00*	*26.5*	
	The Cincinnati Phosphate Co., Cincinnati, Ohio.								
57415	Alkaline Phosphate	Manufacturer	10.90	3.90	14.80	1.70		28.1	57415
			10.00	*1.00*	*11.00*	*2.00*		*27.4*	
57543	Dissolved Phosphate and Potash								57543
			10.00	*1.00*	*11.00*	*4.00*		*39.4*	
	The Empire Guano Co., Nashville, Tenn.								
57161	Bone and Potash	Manufacturer	15.20	4.30	19.50	2.15		37.4	57161
			10.00	*6.00*	*16.00*		*2.00*	*29.4*	
57501	High Grade Bone and Potash								57501
			10.00	*7.00*	*17.00*		*4.00*	*41.8*	
57502	Standard Potash Mixture	Manufacturer	11.20	12.00	23.20	1.04	0.60	31.4	57502
			11.00	*8.00*	*19.00*		*1.00*	*25.7*	
	Federal Chemical Co., Inc., Louisville, Ky.								
55985	Potash Tobacco Grower	Manufacturer	9.33	13.37	22.70	0.64	3.16	42.2	55985
57780		O. A. Lutes & Co., Shepherdsville	8.80	12.30	21.10	2.84		35.2	57780
57781		Birk & Price Co., Owensboro	10.20	10.20	20.40	0.88	1.16	31.6	57781
			8.00	*8.00*	*16.00*		*3.00*	*33.2*	
57002	Daybreak Champion Potash Fertilizer	Manufacturer	8.13	15.97	24.10	0.70	1.30	30.6	57002
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
57003	Imperial Tobacco Special	Manufacturer	7.77	16.07	23.84	0.54	1.55	30.6	57003
57799		McGlothlan & Son, Irvington	10.05	12.30	22.35	1.75		30.5	57799
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
57592	Daybreak Potash Special	Manufacturer	11.95	10.65	22.60		2.58	37.7	57592
			10.00	*2.00*	*12.00*		*2.00*	*27.8*	
57593	Daybreak Potash Mixture	Manufacturer	11.60	9.75	21.35		4.70	49.5	57593
			10.00	*2.00*	*12.00*		*4.00*	*39.8*	

Table IV.—Acid Phosphates with Potash.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	PHOSPHORIC ACID			POTASH		Index of Relative Value	Station Number
			Available	Insoluble	Total	From Muriate	From Sulfate		
	Federal Chemical Co., Inc.								
57594	Daybreak Phosphate and Potash	Manufacturer	16.05	5.25	21.30		3.00	44.2	57594
			12.00	*2.00*	*14.00*		*2.00*	*30.8*	
57596	Double Phosphate and Potash Formula	Manufacturer	11.70	11.35	23.05		3.58	43.6	57596
			8.00	*8.00*	*16.00*		*4.00*	*39.2*	
57602	Black Land Special	Manufacturer	15.60	6.10	21.70		4.81	54.7	57602
			12.00	*2.00*	*14.00*		*4.00*	*42.8*	
57603	Potash Special	Manufacturer	11.25	10.95	22.20		2.52	36.4	57603
			10.00	*2.00*	*12.00*		*2.00*	*27.8*	
57604	Potash Compound	Manufacturer							57604
			12.00	*2.00*	*14.00*		*2.00*	*30.8*	
57027	Mogul Potash Fertilizer	Manufacturer	8.70	15.40	24.10	0.56	1.47	31.4	57027
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
57028	Union Tobacco Special	Manufacturer	8.60	15.10	23.70	0.54	1.60	31.8	57028
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
	Fox Chemical Co., Br., Federal Chemical Co., Inc., Louisville, Ky.								
57051	Fox Ideal Potash Fertilizer	Manufacturer	8.70	15.40	24.10		1.92	30.7	57051
58152		J. N. Murrell & Co., Craycroft	9.00	8.20	17.20	0.48		19.7	58152
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
57052	Sterling Tobacco Special	Manufacturer	9.10	15.20	24.30		2.19	32.9	57052
57827		Dick Duncan, Olive Hill	9.15	13.70	22.85	2.45		33.9	57827
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
57653	Fox Potash Special	Manufacturer	11.95	10.25	22.20		2.55	37.3	57653
			10.00	*2.00*	*12.00*		*2.00*	*27.8*	
57654	Fox Bone Phosphate and Potash	Manufacturer	11.50	9.35	20.85		4.53	48.2	57654
			10.00	*2.00*	*12.00*		*4.00*	*39.8*	
57655	Fox Bone Phosphate	Manufacturer	15.25	5.50	20.75		2.99	42.9	57655
			12.00	*2.00*	*14.00*		*2.00*	*30.8*	

	Globe Fertilizer Co., Branch Federal Chemical Co., Inc., Louisville, Ky.							
57078	Globe Tip Top Potash Fertilizer	Manufacturer	8.40	15.80	24.20	0.52	1.50	31.0	57078
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
57079	Globe Top Notch Tobacco Special	Manufacturer	8.10	15.90	24.00	0.56	1.48	30.8	57079
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
57701	Globe Potash Special	Manufacturer	12.10	10.50	22.60		2.55	37.7	57701
58177		Pearson & Breedlove, Franklin	12.80	3.05	15.85	2.59		36.0	58177
			10.00	*2.00*	*12.00*		*2.00*	*27.8*	
57702	Globe Bone Phosphate and Potash	Manufacturer	11.35	10.00	21.35		4.85	50.1	57702
			10.00	*2.00*	*12.00*		*4.00*	*39.8*	
57703	Globe Potash Compound	Manufacturer	16.00	5.40	21.40		2.95	43.9	57703
			12.00	*2.00*	*14.00*		*2.00*	*30.8*	
	Groves Fertilizer Works, Cincinnati, Ohio.								
57134	Corn and Tobacco	Manufacturer	10.10	0.40	10.50	2.28		29.0	57134
57873		A. L. Moore, Leitchfield	10.80	0.10	10.90	1.42	0.61	28.4	57873
57874		Troutman Bros., Shepherdsville	10.80	0.10	10.90	1.56	0.55	28.9	57874
			10.00	*1.00*	*11.00*	*2.00*		*27.4*	
57583	Phosphate and Potash	Manufacturer	11.55	1.70	13.25	4.31		43.2	57583
			10.00	*1.00*	*11.00*	*4.00*		*39.4*	
	The Jarecki Chemical Co., Cincinnati, Ohio.								
57403	Square Brand Phosphate and Potash	Manufacturer	10.90	3.90	14.80	1.70		28.1	57403
			10.00	*1.00*	*11.00*	*2.00*		*27.4*	
57540	Super Phosphate and Potash								57540
			10.00	*1.00*	*11.00*	*4.00*		*39.4*	
	The Kaufman Fertilizer Co., Cincinnati, Ohio.								
57424	Alkaline Phosphate and Potash	Manufacturer	10.90	3.90	14.80	1.70		28.1	57424
			10.00	*1.00*	*11.00*	*2.00*		*27.4*	
57546	Dissolved Bone and Potash								57546
			10.00	*1.00*	*11.00*	*4.00*		*39.4*	
	Kentucky Fertilizer Co., Br. Federal Chemical Co., Inc., Louisville, Ky.								
57104	Gold Medal Potash Fertilizer	Manufacturer	9.20	15.00	24.20	0.58	1.56	32.6	57104
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	

Table IV.—Acid Phosphates with Potash.

Station. Number.	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	Phosphoric Acid: Available	Phosphoric Acid: Insoluble	Phosphoric Acid: Total	Potash: From Muriate	Potash: From Sulfate	Index of Relative Value	Station Number
	Kentucky Fertilizer Co.								
57105	Gold Medal Tobacco Special	Manufacturer	8.70	15.20	23.90		2.34	33.2	57105
57908		S. Y. Cutshaw, Bedford	9.80	13.10	22.90	0.76	1.12	31.2	57908
			8.00	*8.00*	*16.00*		*2.00*	*27.2*	
57710	O. K. Potash Special		12.30	11.00	23.30		2.52	39.0	57710
			10.00	*2.00*	*12.00*		*2.00*	*27.8*	
	Louisville Fertilizer Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.								
57576	Potash Mixture	Manufacturer	12.30	2.70	15.00		2.32	33.5	57576
58197		W. T. Kirkman, Elkton	11.80	2.85	14.65	0.70	0.60	**26.6**	58197
			10.00	*4.00*	*14.00*		*2.00*	*28.6*	
57577	Alkaline Bone	Manufacturer	13.90	1.60	15.50	2.28		35.2	57577
			12.00	*4.00*	*16.00*		*2.00*	*31.6*	
57578	Potash Formula	Manufacturer	11.50	2.40	13.90	5.42		50.7	57578
			10.00	*4.00*	*14.00*		*4.00*	*40.6*	
	Read Phosphate Co., Nashville, Tenn.								
57143	Read's Alkaline Bone	Manufacturer	**15.70**	4.00	19.70	0.74	1.21	38.8	57143
57966		J. C. Dunavent, Eminence	9.90	11.60	21.50	1.60		29.1	57966
58209		Sturgis Impl'm't Co., Sturgis	11.95	9.70	21.65	1.77		32.4	58209
			10.00	*6.00*	*16.00*		*2.00*	*29.4*	
57487	Read's High Grade Special Potash Mixture	Manufacturer							57487
			10.00	*7.00*	*17.00*		*4.00*	*41.8*	
57490	Read's Standard Potash Phosphate	Manufacturer	11.30	11.70	23.00	1.02	0.83	32.7	57490
			11.00	*8.00*	*19.00*		*1.00*	*25.7*	
	St. Bernard Fertilizer Co., Nashville, Tenn.								
57518	Special Potash Acid	Manufacturer	11.80	11.70	23.50	1.10	0.52	32.1	57518
			11.00	*8.00*	*19.00*		*1.00*	*25.7*	

57520	Standard Potash Acid	Manufacturer	11.60	12.00	23.60	1.52	1.22	38.6
			10.00	*8.00*	*18.00*		*2.00*	*30.2*
57521	High Grade Potash Acid	Manufacturer	*10.00*	*7.00*	*17.00*		*4.00*	*41.8*
	Smith Bros., Louisville, Ky.							
57606	Bone and Potash		*10.00*	*1.50*	*11.50*	*2.00*		*27.6*
	Swift & Co., Inc., National Stock Yards, Ill.							
57757	Swift's 12-4 Phosphate and Potash		*12.00*	*1.00*	*13.00*	*4.00*		*42.4*
57758	Swift's 14-2 Phosphate and Potash	Manufacturer	14.85	0.85	15.70	0.42	1.55	34.4
58236		Sam Terry, Big Clifty	15.90	1.25	17.15	1.72		34.8
			14.00	*1.00*	*15.00*	*2.00*		*33.4*
	Tennessee Chemical Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.							
55968	Ox Potash Mixture	Manufacturer	11.43	4.25	15.68		1.98	30.7
			10.00	*4.00*	*14.00*		*2.00*	*28.60*
57581	Ox Alkaline Bone	Manufacturer	13.81	1.70	15.51		1.92	32.9
			12.00	*4.00*	*16.00*		*2.00*	*31.6*
57582	Ox Potash Formula	Manufacturer	11.87	1.85	13.72		5.06	48.9
			10.00	*4.00*	*14.00*		*4.00*	*40.6*
	Victor Guano Co., Nashville, Tenn.							
57523	Special Bone and Potash	Manufacturer	11.70	12.20	23.90	1.58	1.25	42.2
			10.00	*8.00*	*18.00*		*2.00*	*30.2*
57524	Standard Bone and Potash	Manufacturer	11.80	11.60	23.40	1.06	0.38	31.0
			11.00	*8.00*	*19.00*		*1.00*	*25.7*
57529	High Grade Bone and Potash	Manufacturer	*10.00*	*7.00*	*17.00*		*4.00*	*41.8*
	Va.-Car. Chemical Co., Inc., Mt. Pleasant Branch, Mt. Pleasant, Tenn.							
57571	Mt. Pleasant Bone and Potash		*10.00*	*2.00*	*12.00*		*3.00*	*33.8*

57520	
57521	
57606	
57757	
57758	
58236	
55968	
57581	
57582	
57523	
57524	
57529	
57571	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	The American Agricultural Chemical Co., Inc., Cin. Sales Dept., Cincinnati, Ohio.	
57175	A. A. C. Co., Little Wonder	Manufacturer
57617		C. M. Langdon, Science Hill
57618		Browning-McReynolds Co., Lewisburg
58054		C. M. Langdon, Science Hill
57176	A. A. C. Co., Special Tobacco Grower	
57619		J. R. Davis & Co., Campbellsville
57620		T. J. Hook, Hardinsburg
57177	A. A. C. Co., Potato and Tobacco Special	
57621		Morell Supply Co., Prestonsburg
57622		J. H. Campbell, Salt Lick
57184	Bowker's 1-10 Ammoniated Acid Phosphate	
57630		I. C. Singleton, Waynesburg
57631		S. McKinley, Columbia
57185	Bowker's 2-10 Ammoniated Acid Phosphate	
57186	Bowker's 3-10 Ammoniated Acid Phosphate	
57187	Bowker's 2-12 Ammoniated Acid Phosphate	
57632		Jno. G. McBath, Caintown
57201	Bradley's 1-10 Ammoniated Acid Phosphate	
57638		Cooper-Craycroft Co., Vine Grove
57202	Bradley's 2-10 Ammoniated Acid Phosphate	
57203	Bradley's 3-10 Ammoniated Acid Phosphate	
57204	Bradley's 2-12 Ammoniated Acid Phosphate	
57217	Cleveland Dryer Wks. 1-10 Ammoniated Acid Phosphate	
57659		Taylor County Supply Co., Campbellsville

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total			
									57175
10.30	3.90	14.20				0.44	0.53	20.1	57617
10.40	4.10	14.50				0.51	0.62	20.8	57618
10.55	1.95	12.40				0.62	0.75	20.9	58054
10.00	*4.00*	*14.00*				*0.41*	*0.50*	*19.5*	
									57176
10.70	4.00	14.70				1.70	2.06	29.6	57619
10.60	3.80	14.40				1.67	2.03	29.1	57620
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
									57177
10.50	4.50	15.00		0.21	2.37	2.58	3.13	35.6	57621
10.10	4.20	14.30		0.25	2.37	2.62	3.18	35.2	57622
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*33.9*	
									57184
11.10	3.90	15.00				0.90	1.09	24.5	57630
10.50	4.00	14.50				0.87	1.06	23.4	57631
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*22.3*	
									57185
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
									57186
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*33.9*	
									57187
12.20	5.00	17.20				1.69	2.05	32.1	57632
12.00	*4.00*	*16.00*				*1.65*	*2.00*	*31.2*	
									57201
10.80	3.20	14.00				0.93	1.13	24.0	57638
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*22.3*	
									57202
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
									57203
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*33.9*	
									57204
12.00	*4.00*	*16.00*				*1.65*	*2.00*	*31.2*	
									57217
10.80	4.20	15.00				0.85	1.03	23.8	57659
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*22.3*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	The American Agr. Chemical Co.	
57218	Cleveland Dryer Wks. 2-10 Ammoniated Acid Phosphate	
57219	Cleveland Dryer Wks. 3-10 Ammoniate Acid Phosphate	
57220	Cleveland Dryer Wks. 2-12 Ammoniated Acid Phosphate	
57235	Michigan Carbon Wks. 1-10 Ammoniated Acid Phosphate	
57664		L. V. Price, Lewisburg
58072		P. K. Hubbard, Munfordville
57236	Michigan Carbon Wks. 2-10 Ammoniated Acid Phosphate	
57665		E. P. Barnes & Bro., Beaver Dam
57237	Michigan Carbon Wks. 3-10 Ammoniated Acid Phosphate	
57238	Michigan Carbon Wks. 2-12 Ammoniated Acid Phosphate	
58073		Lebanon Carriage and Implement Co., Lebanon
57252	N.-W. Horseshoe Brand 1-10 Ammoniated Acid Phosphate	
58086		V. D. Roberts, Somerset
57253	N.-W. Horseshoe Brand 2-10 Ammoniated Acid Phosphate	
57254	N.-W. Horseshoe Brand 3-10 Ammoniated Acid Phosphate	
57255	N. W. Horseshoe Brand 2-12 Ammoniated Acid Phosphate	
57269	Packers Boar's Head Brand 1-10 Ammoniated Acid Phosphate	
57270	Packers Boar's Head Brand 2-10 Ammoniated Acid Phosphate	
57271	Packers Boar's Head Brand 3-10 Ammoniated Acid Phosphate	
57272	Packers Boar's Head Brand 2-12 Ammoniated Acid Phosphate	
	Armour Fertilizer Works, Nashville, Tennessee.	
55941	Armour's Ammoniated Mixture	Manufacturer
57722		Jenkins-Essex Co., Elizabethtown
57723		G. M. Hedrick, Monticello
58099		Jenkins-Essex Co., Elizabethtown

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total			
									57218
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
									57219
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*33.9*	
									57220
12.00	*4.00*	*16.00*				*1.65*	*2.00*	*31.2*	
									57235
10.60	4.20	14.80				0.88	1.07	23.7	57664
12.00	1.30	13.30				1.41	1.71	28.4	58072
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*22.3*	
									57236
11.00	4.00	15.00				1.73	2.10	30.2	57665
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
									57237
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*33.9*	
									57238
13.20	1.25	14.45		0.49	1.64	2.13	2.59	34.7	58073
12.00	*4.00*	*16.00*				*1.65*	*2.00*	*31.2*	
									57252
12.40	1.20	13.60				1.16	1.41	27.2	58086
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*22.3*	
									57253
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
									57254
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*33.9*	
									57255
12.00	*4.00*	*16.00*				*1.65*	*2.00*	*31.2*	
									57269
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*22.3*	
									57270
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
									57271
10.00	*4.00*	*14.00*				*2.47*	*3.00*	*33.9*	
									57272
12.00	*4.00*	*16.00*				*1.65*	*2.00*	*31.2*	
9.90	2.40	12.30				0.48	0.58	19.2	55941
14.90	3.60	18.50				0.48	0.58	27.2	57722
14.90	3.00	17.90				0.57	0.69	27.5	57723
14.75	0.40	15.15				0.67	0.81	27.0	58099
14.00	*4.00*	*18.00*				*0.41*	*0.50*	*25.5*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Armour Fertilizer Works.	
55943	Armour's Phosphate and Tankage	Manufacturer
57726		J. T. Lawson, Greenup
57727		G. M. Hedrick, Monticello
55948	Miller's Tobacco Special	Manufacturer
57733		I. K. Miller & Sons, Campbellsville
57734		Jackson Hdw & Grocery Co., Dixon
57170	Ideal Corn Grower	Manufacturer
57737		The T. J. Turley Co., Owensboro
57549	Bone and Tankage	
57586	Armour's Wheat Special No. 1	Manufacturer
58105		Staggs Brothers Co., Vanceburg
55951	Tuscarora Ammoniated Acid	Manufacturer
55955	Tuscarora Acid and Ammonia	Manufacturer
	Calumet Fertilizer Co., New Albany, Indiana.	
57370	Calumet Brand Spl. Crop Grower	
57439	Calumet Brand Extra Am. Bone Phosphate	
57559	Calumet Brand Bone Meal Mixed with Pnosphate	
58112		Cooper-Craycroft & Co., Vine Grove
58113		Ashby & Daugherty Bros., Shepherdsville
	The Cincinnati Phosphate Co., Cincinnati, Ohio.	
57412	Favorite Grain Grower	Manufacturer
57416	Bonus A Humus Phosphate	Manufacturer
57752		Hiner & Stricklett, Vanceburg
57466	Ammoniated Super Phosphate	
57544	Clay Soil Special	

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total			
11.30	5.50	16.80		0.58	1.29	1.87	2.27	32.2	55943
11.00	3.00	14.00		0.35	1.37	1.72	2.09	29.7	57726
10.30	3.20	13.50		0.24	1.43	1.67	2.03	28.4	57727
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
11.80	3.90	15.70		0.24	0.42	0.66	0.80	23.9	55948
12.60	4.50	17.10				0.58	0.70	24.8	57733
13.00	4.00	17.00				0.47	0.57	24.4	57734
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
12.35	4.90	17.25		0.62	1.25	1.87	2.27	33.6	57170
10.10	3.80	13.90		0.25	1.50	1.75	2.12	28.9	57737
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
									57549
10.10	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
14.95	0.65	15.60				0.61	0.74	27.0	57586
14.65	0.40	15.05				0.54	0.66	25.9	58105
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
10.60	5.90	16.50		0.53	1.36	1.89	2.29	31.5	55951
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
16.10	2.85	18.95				0.48	0.58	28.7	55955
14.00	*4.00*	*18.00*				*0.41*	*0.50*	*25.5*	
									57370
12.00	*1.00*	*13.00*				*0.41*	*0.50*	*21.3*	
									57439
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*30.0*	
									57559
13.20	15.95	29.15				1.97	2.39	40.0	58112
14.15	14.70	28.85				1.65	2.00	38.7	58113
12.00	*8.00*	*20.00*				*1.23*	*1.50*	*29.8*	
11.00	2.60	13.60				0.91	1.10	23.9	57412
10.00	*1.00*	*11.00*				*0.82*	*1.00*	*21.1*	
12.80	1.55	14.35				0.52	0.63	23.5	57416
12.15	1.40	13.55				0.51	0.62	22.4	57752
12.00	*1.00*	*13.00*				*0.41*	*0.50*	*21.3*	
									57466
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*30.0*	
									57544
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*30.0*	

TABLE V.

Station Number	Name and Address of Manufacturer. and Name of Brand.	From Whom Obtained.
	Duncan & Sherley, Lagrange, Ky.	
57463	Tiger Brand Phosphate and Tankage	Manufacturer's warehouse
57763		Manufacturer's warehouse
58118		
57479	Tiger Brand Corn and Wheat Grower	Manufacturer's Warehouse
57765		
	The Empire Guano Co., Nashville, Tenn.	
57157	Red Banner Favorite	Manufacturer
57158	Premium Formula	Manufacturer
57160	High Grade Grain Grower	Manufacturer
57504	Red Banner Grain Special	Manufacturer
	The Evansville Packing Co., Evansville, Indiana.	
57389	Ammoniated Phosphate	W. S. Overstreet, LaGrange
58121		Eldred Hardware Co., Princeton
58122		
57390	Corn and Wheat Grower (without Potash)	J. H. Barnhill, Providence
58123		
57477	Wonder Groth	
	Falls City Fertilizer Co., New Albany, Indiana.	
57860	Falls City Brand Bone Meal Mixture with Phosphate	
	Federal Chemical Co., Inc., Louisville, Ky.	
55981	Liberty Grain Grower	Manufacturer
57776		Lake Bros., Springfield
57777		S. Y. Cutshaw, Bedford
55982	Standard Meal Mixture	Manufacturer
57778		H. W. McCandless, Munfordville
58129		O. A. Lutes & Co., Shepherdsville

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total			
									57463
13.15	2.50	15.65				0.90	1.09	27.0	57763
13.00	3.10	16.10				0.75	0.91	2.60	58118
12.00	*3.00*	*15.00*				*0.82*	*1.00*	*24.9*	
									57479
10.60	1.40	12.00				0.50	0.61	20.0	57765
10.00	*4.00*	*14.00*				*0.41*	*0.50*	*19.5*	
13.50	4.30	17.80		0.76	1.63	2.39	2.90	38.7	57157
12.00	*5.00*	*17.00*				*1.65*	*2.00*	*31.6*	
16.20	4.40	20.60		0.34	0.67	1.01	1.23	33.1	57158
13.00	*7.00*	*20.00*				*0.41*	*0.50*	*25.2*	
14.20	5.20	19.40		0.45	1.05	1.50	1.82	33.9	57160
13.00	*5.00*	*18.00*				*0.82*	*1.00*	*27.2*	
14.40	7.10	21.50		0.33	0.41	0.74	0.90	29.6	57504
12.00	*7.00*	*19.00*				*0.41*	*0.50*	*23.7*	
									57389
14.20	0.60	14.80				0.50	0.61	25.0	58121
13.85	0.90	14.75				0.55	0.67	25.0	58122
12.00						*0.41*	*0.50*	*20.9*	
									57390
11.50	0.60	12.10				0.89	1.08	23.7	58123
10.00						*0.82*	*1.00*	*20.7*	
									57477
10.00						*1.65*	*2.00*	*26.6*	
									57860
12.00	*8.00*	*20.00*				*1.23*	*1.50*	*29.8*	
11.60	11.40	23.00		0.73	0.29	1.02	1.24	29.1	55981
11.10	10.30	21.40				0.74	0.90	26.0	57776
11.10	10.60	21.70	0.29		0.39	0.68	0.83	25.7	57777
10.00	*10.00*	*20.00*				*0.41*	*0.50*	*21.9*	
11.00	13.10	24.10		0.76	0.28	1.04	1.26	29.0	55982
9.80	15.80	25.60		0.22	0.44	0.66	0.80	25.6	57778
11.50	9.20	20.70		0.65	0.77	1.42	1.72	30.9	58129
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Federal Chemical Co., Inc.	
55989	A-1 Fertilizer	Manufacturer
57786		Pierson & Breedlove, Franklin
57787		S. D. Foley, Humble
58130		M. G. Parman, London
55990	A-1 Soluble Vegetable Manure	Manufacturer
57788		C. L. Thomas Carriage & Implement Co., Bowling Green
58131		Murrey & Penick, Elkton
55991	High Grade Fertilizer	Manufacturer
55994	Royal Meal Mixture	Manufacturer
55995	Daybreak Double-Duty Corn and Wheat Grower	Manufacturer
55996	Standard Truck and Tobacco Grower	Manufacturer
57793		McGlothlan & Son, Irvington
57794		G. W. Maraman & Sons, Shepherdsville
57795		A. W. Tartar, Columbia
55997	Standard Beef Blood and Bone	Manufacturer
57796		G. W. Maraman & Sons, Shepherdsville
58133		Grayson County Supply Co., Leitchfield
55998	Daybreak Half and Half Meal Mixture	Manufacturer
57012	Red Rooster Mixture	Manufacturer
57013	Daybreak Nitro-Phosphate	Manufacturer
57805		J. A. Shaver, Greenville
57806		A. W. Tartar, Columbia
58137		Birk & Price Co., Owensboro
58138		A. W. Tartar, Columbia
57307	A-1 Extra Tobacco Special	Manufacturer
57441	A-1 Potato Grower	Manufacturer
57444	Daybreak Harvest Home	Manufacturer

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total			
14.40	9.37	23.77		1.31	1.24	2.55	3.10	43.2	55989
12.00	6.10	18.10	0.44		0.69	1.13	1.37	28.4	57786
13.60	0.80	14.40	0.32		0.63	0.95	1.15	27.4	57787
13.15	3.00	16.15				0.75	0.91	26.2	58130
12.00	*4.00*	*16.00*				*0.82*	*1.00*	*25.3*	
14.54	6.80	21.34		2.37	0.23	2.60	3.16	42.7	55990
14.00	5.00	19.00	0.77		0.58	1.35	1.64	32.5	57788
12.85	3.10	15.95	0.72	0.53	0.41	1.66	2.02	32.1	58131
12.00	*4.00*	*16.00*				*1.65*	*2.00*	*31.2*	
14.74	6.90	21.64		2.20	0.33	2.53	3.07	42.6	55991
12.00	*4.00*	*16.00*				*1.65*	*2.00*	*31.2*	
10.57	13.50	24.07		0.72	0.33	1.05	1.27	28.6	55994
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
10.90	13.00	23.90		0.55	0.46	1.01	1.23	28.6	55995
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
11.00	12.80	23.80		0.37	0.63	1.00	1.21	28.6	55996
11.60	11.90	23.50	0.66		0.53	1.19	1.44	27.0	57793
11.00	13.50	24.50				0.93	1.13	28.4	57794
13.00	9.10	22.10	0.51		0.57	1.08	1.31	30.7	57795
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
11.23	12.17	24.00		0.46	0.55	1.01	1.23	29.0	55997
10.00	12.90	22.90				1.00	1.21	27.2	57796
12.35	10.65	23.00		0.48	0.56	1.04	1.26	30.1	58133
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
11.93	10.87	22.80		1.18	0.43	1.61	1.95	33.5	55998
10.00	*10.00*	*20.00*				*1.65*	*2.00*	*30.6*	
14.20	9.40	23.60		0.49	0.23	0.72	0.87	30.1	57012
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
16.60	5.50	22.10		0.60	0.20	0.80	0.97	32.7	57013
17.60	1.95	19.55		0.21	0.32	0.53	0.64	30.9	57805
17.50	1.75	19.25				0.44	0.53	30.0	57806
15.80	3.30	19.10				0.47	0.57	28.3	58137
17.25	1.50	18.75				0.53	0.64	30.2	58138
15.00	*4.00*	*19.00*				*0.41*	*0.50*	*27.0*	
10.50	7.40	17.90		5.56	0.23	5.79	7.03	59.2	57307
10.00	*4.00*	*14.00*				*3.29*	*4.00*	*39.6*	
13.05	5.75	18.80		3.36	0.60	3.96	4.81	49.6	57441
10.00						*3.29*	*4.00*	*38.0*	
12.45	8.15	20.60		2.04	0.43	2.47	3.00	39.2	57444
10.00	*5.00*	*15.00*				*2.47*	*3.00*	*34.3*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Federal Chemical Co., Inc.	
57595	Liberty Potato Grower	Manufacturer
57600	A-1 Corn and Wheat Fertilizer	Manufacturer
58144		Murrey & Penick, Elkton
58145		A. W. Tarter, Columbia
57601	A-1 Formula	Manufacturer
57021	Sweepstakes Corn and Wheat Grower	Manufacturer
57022	Blue Ribbon Truck and Tobacco Grower	Manufacturer
57821		Gaines Cooksey, Russellville
57023	Blue Ribbon Meal Mixture	Manufacturer
57036	1st Prize Phosphate Mixture	Manufacturer
57037	1st Prize Ammoniated Bone Phosphate	Manufacturer
57822		Barren County Grocery & Hdw. Co., Glasgow
57446	1st Prize Ammoniated Meal Mixture	Manufacturer
57616	Mogul Corn and Wheat Fertilizer	Manufacturer
	Fox Chem. Co., Br. Federal Chem. Co., Inc., Louisville, Ky.	
57045	Fox Double-Quick Corn and Wheat Grower	Manufacturer
57824		J. H. Bustle, Crab Orchard
58149		Jno. Roberts, Haldeman
57046	Early Harvest Truck and Tobacco Grower	Manufacturer
57825		J. H. Bustle, Crab Orchard
57047	Fox Half and Half Meal Mixture	Manufacturer
58150		Skaggs & Nunn, Horse Cave
58151		O. A. Lutes & Co., Shepherdsville
57062	Red Fox Mixture	Manufacturer

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN						
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	Index of Relative Value	Station Number
13.30	8.65	21.95		2.36	0.31	2.67	3.24	39.4	57595
10.00	*10.00*	*20.00*				*1.65*	*2.00*	*30.6*	
17.85	4.25	22.10		1.18	0.25	1.43	1.74	38.6	57600
15.60	2.75	18.35		0.41	0.45	0.86	1.04	30.5	58144
15.70	2.80	18.50		0.35	0.43	0.78	0.95	30.0	58145
14.00	*4.00*	*18.00*				*0.82*	*1.00*	*28.3*	
13.35	6.65	20.00		2.05	0.59	2.64	3.20	41.2	57601
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
10.70	13.10	23.80		0.69	0.32	1.01	1.23	28.4	57021
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
10.80	13.20	24.00		0.67	0.32	0.99	1.20	28.4	57022
12.70	9.95	22.65	0.21	0.46	0.39	1.06	1.29	30.5	57821
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
11.60	11.60	23.20		1.07	0.50	1.57	1.91	33.0	57023
10.00	*10.00*	*20.00*				*1.65*	*2.00*	*30.6*	
13.80	9.30	23.10		0.46	0.32	0.78	0.95	29.9	57036
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
16.80	5.60	22.40		0.58	0.25	0.83	1.01	43.3	57037
16.75	3.40	20.15	0.33		0.27	0.60	0.73	30.7	57822
15.00	*4.00*	*19.00*				*0.41*	*0.50*	*27.0*	
12.95	8.10	21.05		2.02	0.42	2.44	2.96	39.8	57446
10.00	*5.00*	*15.00*				*2.47*	*3.00*	*34.3*	
14.80	5.40	20.20		1.22	0.27	1.49	1.81	34.8	57616
12.00	*4.00*	*16.00*				*0.82*	*1.00*	*25.3*	
11.30	12.90	24.20		0.73	0.22	0.95	1.15	28.8	57045
10.90	13.85	24.75				0.88	1.07	28.1	57824
12.15	10.20	22.35		0.41	0.67	1.08	1.31	29.9	58149
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
11.80	12.70	24.50		0.74	0.28	1.02	1.24	29.9	57046
11.35	10.00	21.35	0.23		0.48	0.71	0.86	26.0	57825
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
12.20	10.50	22.70		1.25	0.30	1.55	1.88	33.4	57047
9.00	8.95	17.95	1.46		0.34	1.80	2.19	29.7	58150
10.20	9.50	19.70		0.56	1.23	1.79	2.17	31.6	58151
10.00	*10.00*	*20.00*				*1.65*	*2.00*	*30.6*	
13.20	9.90	23.10		0.48	0.30	0.78	0.95	29.2	57062
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Fox Chemical Co.	
57063	Fox Ammoniated Phosphate	Manufacturer
57833		Sol Baston, Humphrey
57834		Welch & Metcalf, Welchburg
57443	Fox Ammoniated Fertilizer	Manufacturer
	Globe Fert. Co., Br. Federal Chem. Co., Inc., Louisville, Ky.	
57071	Globe Good Luck Meal Mixture	Manufacturer
57072	Globe Double-Value Corn and Wheat Grower	Manufacturer
57840		J. C. Day & Co., Whitesburg
58165		Cooper-Craycroft Co., Vine Grove
58166		W. H. Lyon, Loretto
57073	Big 4 Truck and Tobacco Grower	Manufacturer
57841		Hafendorfer & Thornton Co., Owensboro
57842		R. C. Hatter, Poplar Hill
57074	Globe Half and Half Meal Mixture	Manufacturer
57089	Globe Gold Medal Mixture	Manufacturer
57090	Globe Grain-O-Phosphate	Manufacturer
57852		A. E. Sullivan, Russell Springs
57853		D. S. Powers & Co., Monticello
58172		G. R. Holt, Campbellsville
57442	Globe Golden Harvest	Manufacturer
	Groves Fertilizer Works, Cincinnati, Ohio.	
57129	Ammoniated Phosphate	Manufacturer
57866		Troutman Bros., Shepherdsville
57130	Grain Grower	Manufacturer
57867		I. K. Miller & Sons, Campbellsville
57131	Perfect Driller	Manufacturer
57868		Troutman Bros., Shepherdsville
57869		J. W. & Vester Kissee, Ingle

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total			
20.15	0.20	20.35		0.79		0.79	0.96	36.6	57063
17.35	1.25	18.60				0.57	0.69	30.5	57833
18.05	1.15	19.20	0.23		0.32	0.55	0.67	31.4	57834
15.00	*4.00*	*19.00*				*0.41*	*0.50*	*27.0*	
13.10	7.90	21.00		2.02	0.46	2.48	3.01	40.2	57443
10.00	*5.00*	*15.00*				*2.47*	*3.00*	*34.3*	
10.40	13.60	24.00		0.77	0.24	1.01	1.23	28.1	57071
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
10.40	13.40	23.80		0.76	0.23	0.99	1.20	28.0	57072
12.30	10.55	22.85		0.53	0.52	1.05	1.27	30.0	57840
10.45	10.95	21.40		0.44	0.57	1.01	1.23	27.1	58165
9.75	9.20	18.95	0.65		0.31	0.96	1.17	25.0	58166
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
10.80	13.70	24.50		0.91		1.10		28.1	57073
11.60	9.85	21.45	0.70		0.32	1.02	1.24	28.5	57841
13.35	8.95	22.30		0.52	0.54	1.06	1.29	31.0	57842
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
12.00	11.10	23.10		1.24	0.45	1.69	2.05	34.3	57074
10.00	*10.00*	*20.00*				*1.65*	*2.00*	*30.6*	
13.20	9.00	22.20		0.29	0.39	0.68	0.83	28.2	57089
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
16.40	6.00	22.40		0.48	0.29	0.77	0.93	32.4	57090
16.60	1.30	17.90				0.61	0.74	29.7	57852
16.20	0.70	16.90				0.61	0.74	28.9	57853
14.75	2.20	16.95				0.38	0.46	25.7	58172
15.00	*4.00*	*19.00*				*0.41*	*0.50*	*27.0*	
13.30	7.35	20.65		2.11	0.39	2.50	3.04	40.4	57442
10.00	*5.00*	*15.00*				*2.47*	*3.00*	*34.3*	
14.20	1.50	15.70				1.89	2.29	35.1	57129
12.70	0.90	13.60				1.53	1.86	30.1	57866
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*30.0*	
14.80	0.80	15.60				1.02	1.24	29.7	57130
13.10	0.80	13.90				0.98	1.19	26.8	57867
12.00	*1.00*	*13.00*				*0.82*	*1.00*	*24.1*	
12.20	6.50	18.70				0.51	0.62	24.5	57131
10.70	5.40	16.10				0.47	0.57	21.5	57868
12.00	5.00	17.00				0.45	0.55	23.2	57869
10.00	*6.00*	*16.00*				*0.41*	*0.50*	*20.3*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Groves Fertilizer Works.	
57132	Bone and Phosphate	Manufacturer
57870		Minges Hardware Co., Newport
	Hopkins Fertilizer Co., New Albany, Indiana.	
57379	Favorite	Manufacturer
57877		A. W. Pickerell, Hodgenville
57380	Tankage and Phosphate Special	Manufacturer
57878		The Taylor County Supply Co., Campbellsville
57879		A. W. Pickerell, Hodgenville
57440	Hopkins Ammoniated Special	Manufacturer
57892		St. Matthews Produce Exchange, St. Matthews
	The Jarecki Chemical Co., Cincinnati, Ohio.	
57400	Ammoniated Phosphate	Manufacturer
57896		D. M. Carpenter, Flemingsburg
57541	Clay Soil Special	
57695	Bone and Phosphate Mixture	
	The Kaufman Fertilizer Co., Cincinnati, Ohio.	
57421	Phosphate and Ammonia	Manufacturer
57547	Clay Soil Special	
	Kentucky Fertilizer Co., Br. Federal Chem. Co., Inc., Louisville, Ky.	
57098	O. K. Double-Header Corn and Wheat Grower	Manufacturer
57099	Golden Leaf Truck and Tobacco Grower	Manufacturer
57905		D. B. Shackelford & Co., Richmond
57906		J. W. Nall, Clay
57100	O. K. Half and Half Meal Mixture	Manufacturer
57115	O. K. Mixture	Manufacturer

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			PHOSPHORIC ACID						
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	Index of Relative Value	Station Number
15.90	7.80	23.70				0.98	1.19	33.8	57132
13.40	8.70	22.10				0.91	1.10	30.0	57870
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
12.15	0.10	12.25	2.06			2.06	2.50	32.7	57379
13.40	1.70	15.10		1.02	0.72	1.74	2.11	33.0	57877
12.00	*2.00*	*14.00*				*1.65*	*2.00*	*30.4*	
11.90	0.10	12.00	1.80			1.80	2.19	30.5	57380
14.30	0.60	14.90				1.02	1.24	28.8	57878
18.00	0.90	18.90				0.57	0.69	31.4	57879
12.00	*2.00*	*14.00*				*0.82*	*1.00*	*24.5*	
10.70	0.10	10.80		1.49	1.66	3.15	3.82	38.1	57440
10.60	0.80	11.40		0.65	1.54	2.19	2.66	31.6	57892
10.00	*2.00*	*12.00*				*3.29*	*4.00*	*38.8*	
11.00	2.60	13.60				0.91	1.10	23.9	57400
10.20	2.50	12.70				0.93	1.13	22.8	57896
10.00	*1.00*	*11.00*				*0.82*	*1.00*	*21.1*	
									57541
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*30.0*	
									57695
11.00	*9.00*	*20.00*				*0.82*	*1.00*	*25.8*	
11.00	2.60	13.60				0.91	1.10	23.9	57421
10.00	*1.00*	*11.00*				*0.82*	*1.00*	*21.1*	
									57547
12.00	*1.00*	*13.00*				*1.65*	*2.00*	*30.0*	
10.30	13.40	23.70		0.70	0.32	1.02	1.24	28.0	57098
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
10.60	13.30	23.90		0.73	0.24	0.97	1.18	28.0	57099
11.70	10.50	22.20		0.46	0.59	1.05	1.27	29.1	57905
11.40	10.10	21.50	0.48		0.54	1.02	1.24	28.3	57906
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
11.60	11.50	23.10		1.28	0.35	1.63	1.98	33.4	57100
10.00	*10.00*	*20.00*				*1.65*	*2.00*	*30.6*	
13.70	9.60	23.30		0.56	0.20	0.76	0.92	29.7	57115
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Kentucky Fertilizer Co.	
57116	O. K. Ammoniated Phosphate	Manufacturer
57913		S. M. Hart & Son, Greasy Creek
57445	O. K. Special Meal Mixture	Manufacturer
	Louisville Fertilizer Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.	
55904	Ammoniated Phosphate	Manufacturer
55905	Special Corn and Tobacco Maker	Manufacturer
57925		Irvington Hdw. & Impl. Co., Irvington.
57926		Geo. M. King, Glasgow Junction
55906	Kentucky Corn and Wheat Maker	Manufacturer
57927		W. E. Ellis & Bro., Hartford
57928		J. S. Foley, Gano
55907	Winner	Manufacturer
57929		M. C. Marion & Son, Elizabethtown
57930		C. M. Langdon, Science Hill
55911	Kentucky Special	Manufacturer
57937		Durham Produce House, Columbia
55912	Half Bone and Phosphate	Manufacturer
57938		R. F. Rainwater, Somerset
55963	Thomas' Crop Grower	Manufacturer
57943		C. L. Thomas Carriage & Impl. Co., Co., Bowling Green
58191		C. L. Thomas Carriage & Impl. Co., Co., Bowling Green
57358	Hall's Potato Grower	Manufacturer
57551	Grain Maker	Manufacturer
58195		Peoples' Store, Loretto
57574	Ammoniated Mixture	Manufacturer

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN						
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	Index of Relative Value	Station Number
17.50	5.00	22.50		0.81		0.81	0.98	33.9	57116
19.20	0.50	19.70				0.55	0.67	32.9	57913
15.00	*4.00*	*19.00*				*0.41*	*0.50*	*27.0*	
12.05	8.80	20.85		2.06	0.37	2.43	2.95	38.5	57445
10.00	*5.00*	*15.00*				*2.47*	*3.00*	*34.3*	
12.80	1.50	14.30				1.87	2.27	32.9	55904
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
15.45	1.40	16.85				1.11	1.35	31.5	55905
11.90	0.30	12.20				1.01	1.23	25.0	57925
13.00	0.70	13.70		0.25	0.70	0.95	1.15	26.4	57926
12.00	*4.00*	*16.00*				*0.82*	*1.00*	*25.3*	
12.20	0.60	12.80				1.28	1.55	27.5	55906
11.60	0.50	12.10		0.38	0.69	1.07	1.30	25.1	57927
10.30	0.50	10.80		0.35	0.74	1.09	1.32	23.3	57928
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*22.3*	
14.00	0.60	14.60				0.76	0.92	26.6	55907
12.50	1.10	13.60				0.72	0.87	24.2	57929
12.60	0.90	13.50				0.62	0.75	23.6	57930
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
12.70	0.45	13.15				0.54	0.66	23.0	55911
11.70	0.80	12.50				0.70	0.85	22.8	57937
10.90	*4.00*	*14.00*				*0.41*	*0.50*	*19.5*	
16.25	7.80	24.05				1.25	1.52	36.3	55912
13.05	10.05	23.10				1.10	1.34	31.3	57938
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
16.60	2.10	18.70				0.73	0.89	30.9	55963
15.25	1.50	16.75				0.75	0.91	28.7	57943
16.45	0.60	17.05				0.48	0.58	28.3	58191
15.00	*4.00*	*19.00*				*0.41*	*0.50*	*27.0*	
10.45	2.50	12.95				1.98	2.40	30.5	57358
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
14.15	2.60	16.75				1.05	1.27	29.6	57551
14.30	0.90	15.20				0.72	0.87	26.9	58195
12.00	*4.00*	*16.00*				*0.82*	*1.00*	*25.3*	
16.30	2.80	19.10				0.50	0.61	29.1	57574
14.00	*4.00*	*18.00*				*0.41*	*0.50*	*25.5*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Morris & Co., Chicago, Ill.	Manufacturer
57339	Special Big Four	Dickey & Co., Glasgow
57954		Cooper, Craycroft & Co., Vine Grove
57955		Dickey & Co., Glasgow
58201		J. H. Wyan, London
58202		
57345	Special Big Eleven Phosphated Manure	Manufacturer
57957		Grayson County Supply Co., Leitchfield
57346	Special Big Twelve Phosphated Manure	Manufacturer
57958		Redmon & Burba Co., Hodgenville
58205		Farmers' Union Supply Co., Franklin
58206		J. H. Wyan, London
	Rasin-Monumental Co. (Subsidiary of Virginia-Carolina Chem Co., Inc., Cincinnati, Ohio.	
57298	Rasin's Fenhumus Fertilizer	Manufacturer
57299	Rasin's Grain Fertilizer	Manufacturer
58208		J. H. Wyan, London
57300	Rasin's Special Plant Food	Manufacturer
57305	Rasin's Truck and Tobacco Fertilizer	Manufacturer
57962		Martin-Hodgkin Supply Co., Winchester
57306	Rasin's Phosphate and Bone Meal	Manufacturer
	Read Phosphate Co., Nashville, Tenn.	
57140	Read's Challenge Formula	Manufacturer
57965		Ezra Moore, Greasy Creek
57141	Read's Special Formula	Manufacturer
57142	Read's Grain Special	Manufacturer
57488	Read's Standard Wheat Grower	Manufacturer
58212		Marcum, Gooch & Payne, Eubank

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total			
13.00	5.90	18.90				0.52	0.63	25.5	57339
10.30	7.65	17.95				0.68	0.83	23.3	57954
11.45	6.80	18.25				0.72	0.87	24.9	57955
15.05	6.10	21.15				0.39	0.47	27.8	58201
14.95	6.75	21.70				0.33	0.40	27.4	58202
13.00	*5.00*	*18.00*				*0.41*	*0.50*	*24.4*	
11.80	0.80	12.60				1.11	1.35	25.8	57345
11.25	1.85	13.10				0.82	1.00	23.4	57957
10.00	*1.00*	*11.00*				*0.82*	*1.00*	*21.1*	
12.60	1.60	14.20				1.72	2.09	31.6	57346
14.80	2.20	17.00				1.57	1.91	34.1	57958
10.40	3.35	13.75				1.88	2.28	30.1	58205
12.45	2.70	15.15				1.34	1.63	29.1	58206
12.00	*2.00*	*14.00*				*1.65*	*2.00*	*30.4*	
14.20	1.00	15.20				0.65	0.79	26.3	57298
12.00	*1.50*	*13.50*				*0.41*	*0.50*	*21.5*	
16.80	0.40	17.20				1.15	1.40	33.4	57299
13.75	0.50	14.25				1.06	1.29	28.3	58208
13.00	*1.50*	*14.50*				*0.82*	*1.00*	*25.8*	
12.80	1.40	14.20				1.93	2.34	33.3	57300
11.00	*1.50*	*12.50*				*1.65*	*2.00*	*28.7*	
11.50	1.30	12.80		1.08	1.75	2.83	3.44	37.6	57305
12.70	0.50	13.20		1.02	1.32	2.34	2.84	35.6	57962
9.00	*1.50*	*10.50*				*2.47*	*3.00*	*31.4*	
11.40	11.90	23.30				1.45	1.76	32.0	57306
10.00	*12.00*	*22.00*				*0.82*	*1.00*	*25.5*	
15.60	4.70	20.30		0.27	0.99	1.26	1.53	34.1	57140
13.40	6.00	19.40				0.46	0.56	25.7	57965
13.00	*7.00*	*20.00*				*0.41*	*0.50*	*25.2*	
13.70	4.20	17.90		0.55	1.76	2.31	2.80	38.4	57141
12.00	*5.00*	*17.00*				*1.65*	*2.00*	*31.6*	
14.60	5.00	19.60		0.41	1.17	1.58	1.92	35.0	57142
13.00	*5.00*	*18.00*				*0.82*	*1.00*	*27.2*	
14.70	6.90	21.60		0.20	0.45	0.65	0.79	29.4	57488
12.40	6.10	18.50	0.45			0.45	0.55	24.2	58212
12.00	*7.00*	*19.00*				*0.41*	*0.50*	*23.7*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	St. Bernard Fertilizer Co., Nashville, Tenn.	
57514	Special Grain Formula	Manufacturer
57515	Standard Grain Grower	Manufacturer
	St. Matthews Produce Exchange, St. Matthews, Ky.	
57465	St. Matthews Exchange Potato Grower	Manufacturer
57975		Manufacturer's warehouse
	The Smith Agricultural Chemical Co., Columbus, Ohio.	
57429	Smith's Wheat Maker and Seeding Down	Manufacturer
	Smith Brothers, Louisville, Ky.	
57607	Corn and Wheat Grower	Sam Terry, Big Clifty
58214		
57608	Ammoniated Phosphate	
	Swift & Co., Inc., National Stock Yards, Ill.	
57312	Swift's Blood and Phosphate	Manufacturer
57983		Dan Dupre, Benton
57984		W. G. Fields, Stanford
57314	Swift's Diamond "L" Grain Grower	Manufacturer
57987		W. E. Burress, Greensburg
58224		Sam Terry, Big Clifty
57315	Swift's Tankage and Bone Phosphate	I. K. Miller & Sons, Campbellsville
57988		Sam Terry, Big Clifty
58225		
57316	Swift's Ammoniated Bone Phosphate	W. S. Overstreet, LaGrange
57989		I. K. Miller & Sons, Campbellsville
58226		Sam Terry, Big Clifty
58227		
57317	Swift's Corn and Oats Special	Manufacturer
57990		Sherman Skaggs, Clarkson
57991		W. E. Burress, Greensburg

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN						
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	Index of Relative Value	Station Number
16.20	5.00	21.20		0.30	0.40	0.70	0.85	31.2	57514
13.00	*5.00*	*18.00*				*0.41*	*0.50*	*24.4*	
14.90	6.40	21.30		0.30	0.41	0.71	0.86	29.9	57515
12.00	*7.00*	*19.00*				*0.41*	*0.50*	*23.7*	
9.10	1.00	10.20	1.26	0.52	1.99	3.77	4.58	40.5	57465
9.70	2.70	12.40	1.10	0.95	1.50	3.55	4.31	40.5	57975
10.00	*2.00*	*12.00*				*3.29*	*4.00*	*38.8*	
13.30	1.85	15.15				0.39	0.47	23.4	57429
12.00						*0.41*	*0.50*	*20.9*	
									57607
12.05	1.40	13.45				1.00	1.21	25.6	58214
12.00	*2.00*	*14.00*				*0.82*	*1.00*	*24.5*	
									57608
12.00	*2.00*	*14.00*				*1.65*	*2.00*	*30.4*	
12.40	3.10	15.50		0.67	0.93	1.60	1.94	31.0	57312
12.30	3.40	15.70				1.52	1.85	30.5	57983
12.90	2.00	14.90				1.83	2.22	33.0	57984
12.00	*3.00*	*15.00*				*1.65*	*2.00*	*30.8*	
9.65	3.30	12.95		0.35	1.30	1.65	2.00	27.4	57314
12.20	2.00	14.20				1.31	1.59	28.3	57987
11.90	1.90	13.80	0.92	0.22	0.44	1.58	1.92	29.7	58224
9.00	*3.00*	*12.00*				*1.65*	*2.00*	*26.3*	
									57315
14.50	3.10	17.60				0.85	1.03	28.9	57988
13.75	2.90	16.65				0.82	1.00	27.5	58225
12.00	*3.00*	*15.00*				*0.82*	*1.00*	*24.9*	
									57316
13.80	0.20	14.00				1.13	1.37	28.7	57989
12.50	2.35	14.85				0.96	1.17	26.4	58226
11.15	3.80	14.95				0.81	0.98	23.9	58227
10.00	*3.00*	*13.00*				*0.82*	*1.00*	*21.9*	
12.35	9.15	21.50				1.60	1.94	33.4	57317
13.50	3.30	16.80				1.39	1.69	31.3	57990
13.40	0.10	13.50				1.37	1.66	29.7	57991
10.00	*3.00*	*13.00*				*1.65*	*2.00*	*27.8*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Swift & Co., Inc.	
57318	Swift's Early Vegetable and Fruit Grower	Manufacturer
57820	Swift's Bone Meal and Phosphate	
58237		W. H. Fields, Stanford
58238		E. T. Ford, Cave City
	Taylor & Powell Fertilizer Co., Inc., Springfield, Tenn.	
57453	Half and Half	Manufacturer
57454	No. 1 Corn Grower with Tankage Base	Manufacturer
57460	No. 4 Tobacco Grower without Potash	Manufacturer
57461	No. 2 Tobacco Grower without Potash	Manufacturer
57468	No. 3 Tobacco Grower	Manufacturer
57946	No. 1 Wheat Grower	Manufacturer
	Tennessee Chemical Co. (Armour owned), Louisville, Ky., and Nashville, Tenn.	
55918	Ox Ammoniated Phosphate	Manufacturer
55919	Ox Special Corn and Tobacco Maker	Manufacturer
58003		N. D. Tabor, Olive Hill
58004		Pineville Produce Co., Pineville
55920	Ox Winner	Manufacturer
58005		Wilson & Wyne, Russellville
55928	Kentucky Special	Manufacturer
58015		J. W. Hardyman, Flemingsburg
55929	Half Bone and Phosphate	Manufacturer
58243		Vine Grove Lumber Co., Vine Grove
55930	Miller's Corn and Tobacco Grower	Manufacturer
55931	Miller's Tobacco Grower	Manufacturer
55970	Allen County Tobacco Grower	Manufacturer

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN						
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	Index of Relative Value	Station Number
11.90	2.25	14.15	0.37	0.52	2.57	3.46	4.20	43.0	57318
10.00	*3.00*	*13.00*				*3.29*	*4.00*	*39.2*	
									57820
14.35	5.35	19.70				0.58	0.70	27.8	58237
13.40	8.60	22.00				0.85	1.03	29.5	58238
13.00	*7.00*	*20.00*				*0.82*	*1.00*	*28.0*	
10.25	8.60	18.85				2.09	2.54	33.5	57453
12.00	*4.50*	*16.50*				*1.85*	*2.25*	*32.8*	
12.30	6.15	18.45	1.87	0.45	0.44	2.76	3.35	40.2	57454
11.00						*1.23*	*1.50*	*25.1*	
7.15	4.85	12.00	1.05	0.51	1.84	3.40	4.13	36.5	57460
10.00						*2.47*	*3.00*	*32.3*	
13.05	4.20	17.25		0.73	0.76	1.49	1.81	31.7	57461
10.35						*1.65*	*2.00*	*27.1*	
13.05	5.90	18.95		0.79	0.67	1.46	1.77	32.2	57468
11.00						*1.23*	*1.50*	*25.1*	
12.90	6.65	19.55		0.76	0.84	1.60	1.94	33.2	57946
11.00						*1.23*	*1.50*	*25.1*	
12.70	1.80	14.50				1.77	2.15	32.2	55918
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	
15.65	1.20	16.85				1.13	1.37	31.9	55919
12.75	1.55	14.30				0.78	0.95	25.2	58003
12.95	1.20	14.15				0.66	0.80	24.5	58004
12.00	*4.00*	*16.00*				*0.82*	*1.00*	*25.3*	
14.50	0.40	14.90				0.62	0.75	26.3	55920
13.00	2.20	15.20	0.22		0.38	0.60	0.73	24.6	58005
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
11.40	0.50	11.90				0.56	0.68	21.2	55928
9.30	1.30	10.60				0.50	0.61	18.0	58015
10.00	*4.00*	*14.00*				*0.41*	*0.50*	*19.5*	
15.80	8.10	23.90				1.22	1.48	35.5	55929
13.30	7.65	20.95				1.15	1.40	31.1	58243
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
15.30	1.40	16.70				1.15	1.40	31.6	55930
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
14.60	0.90	15.50				0.81	0.98	27.9	55931
12.00	*4.00*	*16.00*				*0.82*	*1.00*	*25.3*	
12.80	0.60	13.40				1.24	1.51	28.1	55970
10.00	*4.00*	*14.00*				*0.82*	*1.00*	*22.3*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Tennessee Chemical Co.	
55975	Ox Animal Tankage and Phosphate	Manufacturer
58018		Dickinson Bros., Glasgow
57124	Half Bone and Phosphate	
57457	Ox Ky. Dark Tobacco Grower	Manufacturer
58022		Wilson & Wyne, Russellville
58023		The T. J. Turley Co., Owensboro
57458	Miller's Special Tobacco Grower	
58248		I. K. Miller & Sons, Campbellsville
57553	Ox Grain Maker	Manufacturer
58250		G. W. Richardson, Somerset
57814	Miller's Special Wheat Grower	Manufacturer
58252		I. K. Miller & Sons, Campbellsville
57815	Miller's Wheat Grower	Manufacturer
58253		I. K. Miller & Sons, Campbellsville
	Victor Guano Co., Nashville, Tenn.	
57527	Special Grain Formula	Manufacturer
57528	Standard Grain Guano	Manufacturer
	Virginia-Carolina Chemical Co., Inc., Cin. Sales Div., Cincinnati, O.	
57285	V.-C. Richumus Fertilizer	Manufacturer
58034		Barnett Bros., London
58035		Rector Bros., Lewisburg
58262		R. H. Chrisman, Berea
57286	V.-C. Sure Grain Producer	Manufacturer
58036		Rector Bros., Lewisburg
58263		Guenther Hdw. Co., Owensboro
57287	V.-C. Rescue Fertilizer	Manufacturer
58037		Patrick Dillon, Hardinsburg
57292	V.-C. Tobacco Plant Food	Manufacturer
58042		Silas Shelourne, Lexington

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN						
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total	Equivalent to Ammonia	Index of Relative Value	Station Number
16.80	0.80	17.60				0.69	0.84	30.4	55975
14.45	2.10	16.55				0.51	0.62	26.1	58018
14.00	*4.00*	*18.00*				*0.41*	*0.50*	*25.5*	
									57124
10.00	*10.00*	*20.00*				*0.82*	*1.00*	*24.7*	
10.50	3.50	14.00		0.52	0.98	1.50	1.82	27.7	57457
10.50	3.10	13.60	0.50		0.77	1.27	1.54	25.9	58022
10.40	5.90	16.30	0.44		0.79	1.23	1.49	26.6	58023
10.00	*4.00*	*14.00*				*1.23*	*1.50*	*25.2*	
									57458
14.50	0.70	15.20				0.56	0.68	26.0	58248
15.00	*4.00*	*19.00*				*0.41*	*0.50*	*27.0*	
14.55	2.40	16.95	0.44		0.77	1.21	1.47	31.3	57553
12.80	0.50	13.30				0.76	0.92	24.7	58250
12.00	*4.00*	*16.00*				*0.82*	*1.00*	*25.3*	
15.20	0.75	15.95				0.56	0.68	27.0	57814
13.20	0.75	13.95				0.48	0.58	23.5	58252
12.00	*4.00*	*16.00*				*0.41*	*0.50*	*22.5*	
13.85	1.90	15.75				1.03	1.25	28.8	57815
12.80	1.20	14.00				0.76	0.92	25.0	58253
12.00	*4.00*	*16.00*				*0.82*	*1.00*	*25.3*	
15.80	5.30	21.10	0.35		0.36	0.71	0.86	30.8	57527
13.00	*5.00*	*18.00*				*0.41*	*0.50*	*24.4*	
15.20	6.70	21.90	0.38		0.34	0.72	0.87	30.5	57528
12.00	*7.00*	*19.00*				*0.41*	*0.50*	*23.7*	
14.05	1.55	15.60				0.71	0.86	26.7	57285
13.95	3.85	17.80				0.56	0.68	26.4	58034
14.45	1.10	15.55				0.49	0.59	25.6	58035
13.80	4.10	17.90				0.57	0.69	26.3	58262
12.00	*1.50*	*13.50*				*0.41*	*0.50*	*21.5*	
15.80	1.20	17.00				1.28	1.55	33.1	57286
15.55	1.45	17.00				1.12	1.36	31.8	58036
16.00	0.55	16.55		0.27	0.62	0.89	1.08	30.5	58263
13.00	*1.50*	*14.50*				*0.82*	*1.00*	*25.8*	
11.05	3.05	14.10				1.94	2.36	31.4	57287
12.10	1.30	13.40		0.45	1.37	1.82	2.21	31.4	58037
11.00	*1.50*	*12.50*				*1.65*	*2.00*	*28.7*	
11.20	1.60	12.80		1.14	1.63	2.77	3.36	36.8	57292
10.05	0.50	10.55		0.53	2.10	2.63	3.19	33.7	58042
9.00	*1.50*	*10.50*				*2.47*	*3.00*	*31.4*	

TABLE V.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.
	Virginia-Carolina Chemical Co., Inc.	
57294	V.-C. Bone Meal and Phosphate	Manufacturer
58045		The Taylor County Supply Co., Campbellsville
58264		Guenther Hdw. Co., Owensboro
	Virginia-Carolina Chemical Co., Inc., Mt. Pleasant Br., Mt. Pleasant, Tenn.	
57351	Mt. Pleasant Grain Grower	
57352	Mt. Pleasant Corn Special	
58048		T. H. O'Bryan, Dawson Springs
57356	Black Patch Universal	
58052		T. E. Richardson, Campbellsville
	Wood-Stubbs & Co., Inc., Louisville, Ky.	
57394	Acme Special Potato Grower	Manufacturer

Acid Phosphates with Nitrogen.

PHOSPHORIC ACID			NITROGEN				Equivalent to Ammonia	Index of Relative Value	Station Number
Available	Insoluble	Total	In Nitrates	In Ammonia Salts	Organic	Total			
11.80	11.70	23.50				1.37	1.66	32.0	57294
10.60	13.65	24.25				1.07	1.30	28.9	58045
10.60	14.45	25.05				0.90	1.09	28.0	58264
10.00	*12.00*	*22.00*				*0.82*	*1.00*	*25.5*	
									57351
8.00	*2.00*	*10.00*				*1.23*	*1.50*	*21.4*	
									57352
12.05	8.10	20.15		0.56	0.38	0.94	1.14	27.9	58048
12.00	*2.00*	*14.00*				*0.82*	*1.00*	*24.5*	
									57356
11.50	6.75	18.25		0.62	1.15	1.77	2.15	32.3	58052
10.00	*2.00*	*12.00*				*1.65*	*2.00*	*27.4*	
11.15	11.00	22.15		2.07		2.07	2.51	35.6	57394
10.00	*4.00*	*14.00*				*1.65*	*2.00*	*28.2*	

TABLE VI. SULPHATE OF AMMONIA.

Station Number	Name and Address of Manufacturer and Name of Brand.	From Whom Obtained.	NITROGEN	Equivalent to Ammonia	Index of Relative Value	Station Number
57467	**The Barrett Co., New York, N. Y.** Arcadian Sulphate of Ammonia		*20.75*	*25.19*	*145.3*	57467

Kentucky
Agricultural Experiment Station
University of Kentucky, Lexington, Ky.
THOMAS P. COOPER, Director

CIRCULAR NO. 23

FEEDING TRIALS OF VELVET-BEAN FEED, PALM-KERNEL MEAL AND VARIOUS GRAIN MIXTURES, FOR DAIRY COWS.

By

J. J. HOOPER and J. W. NUTTER

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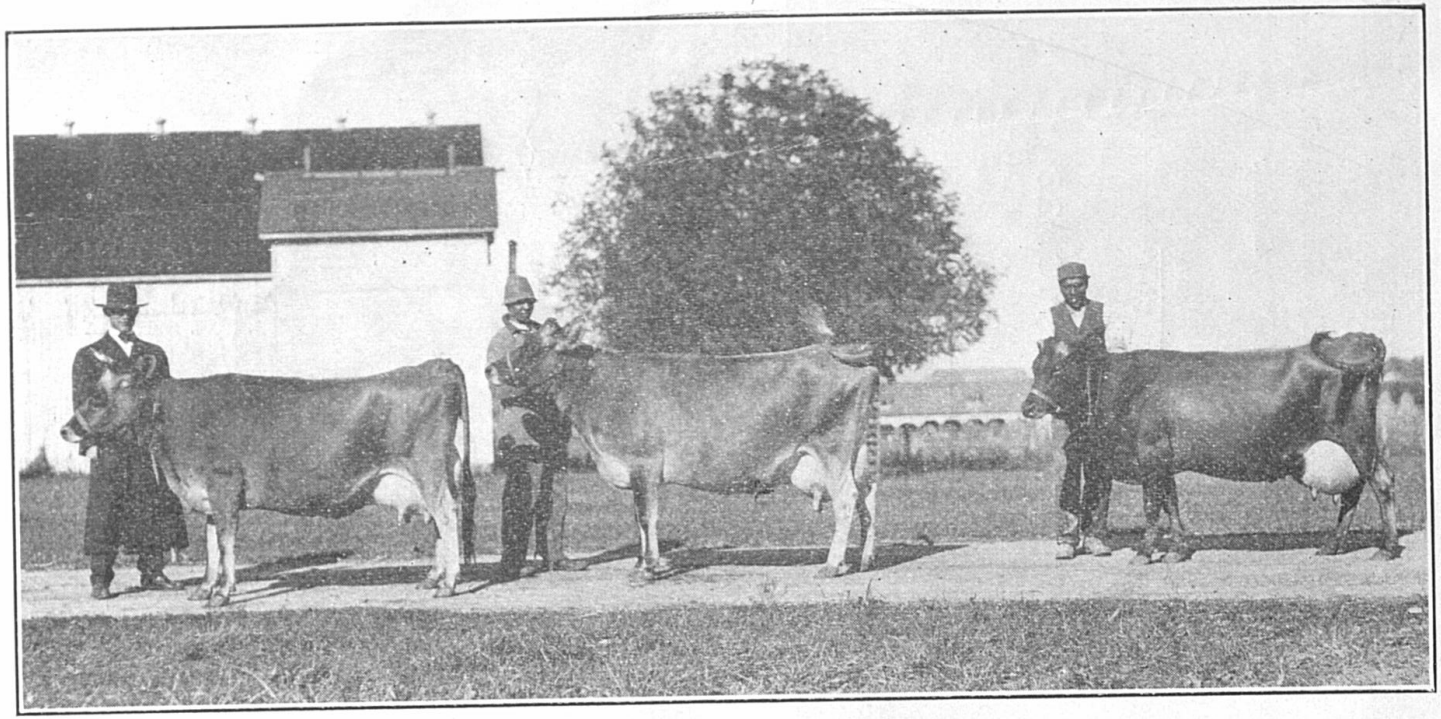

Three cows used in these trials. Left to right, Hebron's Lady, 303320, test, 6,355 lbs. milk, 352 lbs. fat in a year; Isabella's Golden Dollie, 249193, test, 7,267 lbs. milk, 391 lbs. fat in a year; Eminent's Countess, 242476, test, 1,100 lbs. milk and 57 lbs. fat in 31 days.

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Feeding Trials of Velvet-Bean Feed, Palm-Kernel Meal and Various Grain Mixtures, For Dairy Cows.

By J. J. HOOPER and J. W. NUTTER*

Beginning in the summer of 1917, the dairy cows in the herd of the Kentucky Agricultural Experiment Station were separated into several groups and fed different grain mixtures, in an effort to determine the relative efficiency of each mixture and whether the cost of grain rations for milk production may not be materially reduced by the use of certain new feeds. Many of the mixtures tried contained velvet-bean feed or palm-kernel meal, feeds new to this section. One of these, palm-kernel meal, has not been sold by feed dealers in the State. The purpose of these trials was to obtain information and experience in the use of these new feeds, and with new mixtures which have not been used by our dairymen. Altho the trials were of short duration and the number of cows in each was small, yet we consider the results obtained important and especially valuable to dairymen, at the present time. During the time when the cows were on bluegrass pasture the grain mixtures were prepared so that they did not contain as much protein as they did later in the fall and winter. It is necessary to feed grain to cows at this Experiment Station all summer because the available pasture is limited.

*Acknowledgment is due Mr. P. E. Bacon, Assistant in this Department, for the careful and painstaking work in helping to compile the data reported upon in this circular.

Velvet-Bean Feed

Velvet-bean feed is a material that has recently become available in the South. It consists of the velvet beans and pods ground together. This is a heavy, nutritious meal, containing about 15 per cent. of digestible protein. Velvet-bean feed weighs 1.2 pounds per quart and is, therefore, a heavy feed. Corn meal weighs 1.5 pounds per quart, and bran, 0.5 pound. Velvet-bean feed should be used in a mixture that contains palatable and light feeds, to make the cows eat and digest it readily.

Trial With Velvet-Bean Feed and Bran

Beginning the 20th of May, 1917, eight cows were fed alternately on the following rations: Ration A consisted of one part corn meal and one part bran; ration B contained two parts corn meal, one part bran and one part velvet-bean feed.

The bran-corn meal mixture might be termed a summer check ration here, as it is used frequently in summer by dairymen of this vicinity. Fed in connection with protein-rich grass, it supplies a balanced, palatable and, ordinarily, an economical mixture. The cows were fed the ration of corn meal and bran for two weeks, and then changed to a mixture of corn meal, bran and velvet-bean feed. This test ran from May 20 to December 30, 1917. The cows consumed both rations readily and seemed to thrive equally on each one.

For the entire period the two lots averaged in milk yields as follows:

Ration and Average Daily Milk Yield from Each Cow

Ration A—1 part corn meal and 1 part bran	26.72 lbs. milk
Ration B—2 parts corn meal, 1 part bran and 1 part velvet-bean feed	26.94 lbs. milk
Difference in favor of Ration B	.22 lbs. milk

Cost of Materials and Mixtures, per Ton

	Corn meal.	Bran.	Velvet-bean feed.	Mixture A 1 corn meal 1 bran.	Mixture B 2 corn meal 1 bran 1 velv.-bean feed.
May	$66.00	$46.00	$40.00	$56.00	$54.50
Aug.	80.00	46.00	40.00	63.00	61.50
Nov.	76.00	43.00	34.00	59.50	57.25

FIG. 1.—Some of the cows used in the feeding tests reported upon in this circular. All the cows pictured herein are daughters or granddaughters of Dollie's Valentine, 105049.

These cows consumed one pound of grain for each three and one-half pounds of milk produced, and in summer had scant pasture additional. In the fall and winter they had soy-bean hay and silage.

The results indicate that half the wheat bran in the customary corn-bran ration can be successfully replaced by velvet-bean feed, at a slightly reduced cost.

Velvet-Bean Feed Versus Bran

Beginning December 30, 1917, and continuing until February 24, 1918, three of the cows in the foregoing experiment were fed a ration containing half velvet-bean feed and half corn meal, in comparison with a ration of half corn meal and half bran. They received each ration for two weeks, and then were alternated to the other ration the next two weeks, each ration being fed four weeks, in all.

The amounts of milk produced during the several periods were almost identical, tho there was a slight increase in milk from the wheat-bran mixture, as indicated herewith:

Ration and Average Daily Milk Yield from Each Cow

Ration A—1 part corn meal and 1 part bran	16.94	lbs. milk
Ration B—1 part corn meal and 1 part valvet-bean feed	16.04	lbs. milk
Difference in favor of Ration A	.90	lbs. milk

Cost of the Materials and Mixtures, per Ton

Corn meal.	Bran.	Velvet-bean feed.	A Corn meal bran mixture.	B Corn meal Velvet-bean feed mixture.
$75.00	$39.00	$38.00	$57.00	$56.50

The cows received the same roughage as before. They ate both rations well, showing that velvet-bean feed can, if necessary, form half the grain mixture, but it is better to lighten up the heavy feed with a lighter one.

Velvet-Bean Feed Versus Bran and Cottonseed Meal

Four cows were fed alternately for periods of two weeks each, from February 24 to May 5, on mixtures given below.

Ration and Average Daily Milk Yield from Each Cow

Ration A—4 parts corn meal, 3 parts wheat bran, 1 part cottonseed meal	22.48 lbs. milk
Ration B—1 part corn meal, 1 part velvet-bean feed	22.12 lbs. milk
Difference in favor of Ration A	.36 lbs. milk

The cost of the first mixture was $60.87 per ton and of the second, $59.00 per ton.

Both grain mixtures gave satisfactory results, with a slight difference in favor of the corn-meal-bran-cottonseed meal mixture. The roughage fed with this grain ration was 30 pounds of corn silage and 6 pounds of barley straw per day, the barley straw being wet with molasses and water.

Palm-Kernel Meal

Palm-kernel meal is made from the ground palm-kernel in the process of extracting the palm oil. Before the war the kernels were shipped from Africa to Europe, especially to Germany. When shipment to those countries became impossible, this product was turned toward America, entering largely thru the port of New Orleans. Here, as had been the practis in Europe, the oil was extracted from the kernels in the oil mills of the South, and the meal was sold for feed. It seemed, for a time, that Southern farmers were to be offered an almost unlimited supply of it, hence this test to determine its feeding value here. Later the British government prohibited the export of the raw material to any country except England, so that palm-kernel meal is not now (1918) readily available in America.

An analysis made in the Feeding Stuffs Department, of a sample of the palm-kernel meal used in these experiments gave: Protein 18.75 per cent; fat 2.40 per cent; fiber 16.53 per cent; ash 4.67 per cent; water 9.39 per cent; nitrogen-free extract 48.26 per cent. It weighs one pound per quart.

Trial with Palm-Kernel Meal and Bran

Palm-kernel meal was used in this test to replace half of the wheat bran. From June 24 to December 9, 1917, seven cows were alternated every two weeks on the rations given below.

Ration and Average Daily Milk Yield from Each Cow

Ration A—1 part corn meal, 1 part bran	22.41 lbs. milk
Ration B—2 parts corn meal, 1 part palm-kernel meal, 1 part bran	22.77 lbs. milk
Difference in favor of Ration B	.36 lb. milk

Cost of Materials and Mixtures, per Ton

	Corn meal.	Wheat bran.	Palm-kernel meal.	A Corn-meal bran mixture.	B Palm-kernel bran-corn meal mixture.
June	$68.00	$46.00	$40.00	$57.00	$55.50
Sept.	84.00	46.00	40.00	65.00	63.50
Dec.	64.00	44.00	40.00	54.00	53.00

These cows had 30 pounds of corn silage and 8 pounds of soy-bean hay in addition to the above grain mixtures.

Trial with Palm-Kernel Meal, Bran and Cottonseed Meal

Beginning February 10 and ending May 5, 1918, four of the cows used in the foregoing test were fed a mixture containing four parts corn meal, three parts wheat bran and one part cottonseed meal, in comparison with a mixture composed of four parts corn meal, one part bran, one part cottonseed meal and two parts palm-kernel meal. As the palm-kernel meal cost only $35 per ton, the mixture containing it was the cheaper. That mixture cost only $58.06 a ton, in comparison with $63.94 for the other mixture.

Ration and Average Daily Milk Yield from Each Cow

Ration A—4 parts corn meal, 3 parts bran, 1 part cottonseed meal	20.94 lbs. milk
Ration B—4 parts corn meal, 1 part bran, 1 part cottonseed meal, 2 parts palm-kernel meal	20.75 lbs. milk
Difference in favor of Ration A	.19 lb. milk

For roughage these cows were fed 30 pounds silage and 6 pounds barley straw, per day, and 1 pound molasses on the straw.

From our tests it is evident that palm-kernel meal could be used to replace some of the wheat bran that is now being used in Kentucky, if this feed could be procured at the same price as bran, or cheaper, and if a regular and certain supply were available. It is not very palatable, but cows learn to eat palm-kernel meal if gradually accustomed to it. Some of the cows absolutely refused it at first, but finally were taught to eat it by kindly persuasion and patience. It was added to their ration, at first, at the rate of 1/5 pound per day. Palm-kernel meal must be mixed with some feed that is more palatable to the cows.

Oats, Barley, Velvet-Bean Feed Mixture

The customary cow-ration in this territory consists of corn, wheat bran and, often, cotton seed meal, linseed meal or brewers' or distillers' dried grains. At present it is necessary to utilize whatever feed is procurable, whether one is familiar with it or not.

There was a large crop of oats in the summer of 1917 and this led to a relatively low market price, rendering the oats available as a cow feed. Barley, also, was reasonable in price in the fall and we have already found, as indicated above, that velvet-bean feed, containing 14.9 per cent digestible protein, 51.7 per cent carbohydrates and 3.8 per cent fat, is a good cow feed, and one that is becoming more available each succeeding year.

Accordingly, a mixture composed of two parts of rolled barley, one part of crushed oats and one part of velvet-bean feed, was prepared and fed in comparison with a mixture composed of equal parts of corn meal and wheat bran. The test embraced eight cows and covered the period from August 5, 1917, to March 3, 1918. During the fall and winter the cows had ten pounds of excellent soy-bean hay and 30 pounds of corn silage, in addition to the grain. The cows were fed at the rate of one pound of grain for each three and a half pounds of

milk that they produced. Every two weeks the rations were alternated.

Ration and Average Daily Milk Yield from Each Cow

Ration A—2 parts barley, 1 part oats, 1 part velvet-bean feed	17.49 lbs. milk
Ration B—1 part corn meal, 1 part bran	16.61 lbs. milk
Difference in favor of Ration A	.88 lb. milk

From these data it will be seen that the mixture of barley, oats and velvet-bean feed was somewhat superior to the corn meal, wheat-bran mixture; in fact, it was one of the best grain mixtures that was used at this Experiment Station last winter.

Cost of the Materials and Mixtures, per Ton.

	Barley	Oats	Velvet-bean feed.	Corn meal.	Bran.	A Barley-oats-velvet-bean feed mixture.	B Corn meal bran mixture.
Aug.	$68	$56	$40	$80	$46	$58	$63.00
Nov.	66	54	34	76	43	55	59.50
Feb.	78	62	42	78	39	65	58.50

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