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COMMERCIAL FEEDS AND THEIR USE IN KENTUCKY IN 1933

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Laws have as their basic principles right and justice, protection and service, and if properly administered are great educators. Successful administration depends largely upon the cooperation of those whose interests they affect. The active interest and degree of cooperation of those so affected depend also on adequate knowledge of the provisions of the law and the ends to be attained in its proper operation. The operation of a law, therefore, should not only properly regulate or control, but should be educative as well. In the administration of the feedstuffs control in Kentucky this two-fold purpose has always been kept in view.

The manufacture and distribution of commercial feeds have reached large proportions. Inasmuch as the feeders of Kentucky alone pay annually several million dollars for stock feed, exclusive of whole grains and roughages, it is very important that the feeder, as well as the manufacturer and distributor, understand the significance of the feedstuffs law and its operation, and the various terms relative to the manufacture and distribution of feedstuffs.

The State feedstuffs law requires each brand of commercial feed to be registered with the Feed Control Department of the Kentucky Agricultural Experiment Station and each bag of feed to be labeled with a Kentucky official tag giving the manufacturer's guaranty, before it can be lawfully sold or offered for sale in the State. Before an application for registration is accepted, it is examined carefully to see if the requirements of the law have been met, as to chemical standards and information given as to the nature of the materials used in making the feed, the amount of essential organic ingredients, and the limitation of fillers or materials of little or no feeding value as concentrates. Because of this close examination of registrations, many irregularities are eliminated before the feed appears on the market. After registrations are accepted and the feed appears on the market, inspections are made and samples taken and analyzed, to compare them with their registrations and guaranties. If a feed is found to be misbranded or adulterated, proper hearing is given the manufacturer and if the case merits, court action is entered against the offender and the registration is subject to cancellation.

To aid the manufacturer, dealer and feeder better to understand the terms and methods used in the feed control and how the law affords protection to both buyer and manufacturer, some of the important things relating to the manufacture and use of feeds are presented in this bulletin. The sources and relative values of nutrients, and conditions which may cause deficiency or excess of a nutrient in a feed are treated briefly. For fuller study and information, see standard textbooks on feeds and

feeding, or consult the Kentucky Agricultural Experiment Station and other experiment stations.

SOURCES OF MATERIALS

Human and stock foods are closely interdependent—the source of the one being the source, in the main, of the other, each being vitally affected by the manufacture and distribution of the other. Without the conservation and utilization in stock feeds of the various by-products and the unsuitable and rejected materials obtained in the manufacture of human foods, and the reconversion of these materials into human foods by feeding them to the animal and soil, the supply for human consumption would not be adequate and the price would be prohibitive. It is equally true that if we did not have by-products obtained in the manufacture of human food, to form the basis of animal rations, the supply of stock feed would be greatly reduced and the value materially lowered and the large class of high-protein by-products practically eliminated.

SCREENINGS

Under the name of screenings one may expect to find a mixture containing every form of waste and refuse from cleaning grain, seed and plants. They are composed of such materials as weed seeds, hulls, chaff, sweepings, elevator dust, joints, sticks, stems, trash and dirt. When grains are found they are inferior, immature and defective. Screenings are obtained in the process of cleaning grain or by combining varying amounts of the different cleanings of grain, seed or plants. They vary widely in chemical and physical composition. They are factory or hand mixed and are sold on sample to mixers to be used in mixed and special-purpose feeds. They may be of value as feed, or may be worthless or even dangerous on account of poisonous weed seeds and other foreign matter, such as dirt, they contain. Usually they are ground fine so that their identification is difficult or impossible.

Data received from the Federal Farm Board and other sources indicate that in normal times approximately five million tons of screenings, domestic and imported, are disposed of annually in the United States. One may ask, what becomes of all these screenings? The answer is, they are fed directly to livestock or used in the manufacture of commercial feeds. We are concerned with those used in commercial feeds. It is estimated that more than 75 percent of the violations of the feedstuffs law in Kentucky is thru the use of screenings. In an effort to minimize fraud practiced thru the use of screenings, the Feed Control Department has limited the use of fillers, including screenings, to 25 percent of the mixture. Feeders are urged to beware of feeds containing screenings.

STANDARDS

Many requests are received for formulas for making mixed and special-purpose feeds. The Department has no printed formulas, but renders service, when requested, by criticising formulas submitted and making such suggestions as may help those interested to understand and meet the requirements of the law. The attention of those interested in feeds is directed to the chemical standards and requirements established by the Department of Feed Control for special-purpose feeds and for most of the straight by-product feeds, on another page in this bulletin. Before any feed is accepted for registration and can be lawfully sold in Kentucky, it must meet these standards. This should be kept in mind when reference is made to them when studying and buying feeds.

A complete summary of the information required of the manufacturer is printed on the State tag or label. The feeder is urged to read and study this information. Enough is given to enable him to judge the quality of the feed. In addition to the minimum amounts of protein and fat and the maximum amount of fiber, the sources of these essential constituents are given. While the amounts of the chemical constituents are important to know, it is of as much importance, or more, to know their source.

Often feeds are made from highly fibrous and waste materials and enough high-protein concentrate is added to bring up the protein to a certain percentage. If the purchaser buys such feed on the amount of protein alone, without regard to its source, he overlooks the most important factor in feed requirements. He should not only consider the amount of protein but its quality also. Protein from highly fibrous and waste materials is regarded usually as poor in quality. The protein may be in sufficient amount but not of the proper kind and may not be in available form, as the digestibility of protein is retarded in highly fibrous materials. This being true the feed will not supply the needs of the animal. Protein varies in kind and quality. Different kinds serve different purposes in animal nutrition and the absence of one kind is not made up by the presence of another. The source of proteins is important, as certain kinds of proteins are found only in certain materials. In order, therefore, to insure the presence of required proteins in a feed, a variety of protein-furnishing materials should be included in the ration.

If materials of little or no feeding value, such as oat hulls, cottonseed hulls, clipped oat by-product, cob meal, screenings waste or refuse and materials that cannot be classed as concentrates, are used, the kinds and amounts of such materials must be stated. No feed is permitted to be sold on the market that contains a filler in excess of 25 percent of the mixture. It is urged again that those who are interested in feeds, especially the feeder, should keep in mind the standard requirements and carefully read and study the State official tag when purchasing feeds.

CHEMICAL STANDARDS

NAME OF FEED	Minimum Protein Percent	Minimum Fat Percent	Maximum Fiber Percent
1. **Standard By-Products:**			
Alfalfa Leaf Meal	.....	.....	18.00
Alfalfa Meal	13.00	1.50	32.00
Barley, Ground	.....	.....	6.00
Buttermilk, Dried	.....	5.00	.....
Corn, Chopped, Cracked (Screened)	8.00	3.50	3.00
Corn, Chopped, Cracked, Ground	9.00	3.75	2.50
Corn Feed Meal	8.00	3.75	4.00
Hominy Meal, Hominy Feed	10.00	7.00	6.00
Oats, Ground	11.00	4.50	12.00
Rye Middlings or Shorts	15.50	3.50	6.00
Wheat Bran	14.50	3.75	10.00
Wheat Brown Middlings or Shorts	16.00	4.00	7.50
Wheat Flour Middlings	16.00	3.50	3.50
Wheat Gray Middlings or Shorts	16.00	4.00	6.00
Wheat Mixed Feed	15.50	4.00	8.50
Wheat White Middlings or Shorts	16.00	3.50	3.50
2. **Special-Purpose Mixed Feeds:**			
Dairy Feed	16.00	3.50	15.00
Hog Feed (Fattening)	13.00	3.50	7.00
Hog Feed (Growing)	16.00	3.50	7.00
Horse and Mule Feed	9.00	2.50	15.00
Poultry:			
All-Mash Growing Ration	15.00	4.00	6.00
All-Mash Laying Ration	15.00	4.00	7.00
All-Mash Poultry Ration	15.00	4.00	6.00
All-Mash Starting Ration	14.00	3.50	5.00
Chick Grains	9.00	2.50	3.50
Scratch Grains	9.00	3.00	5.00
Fattening Mash	13.00	4.00	6.00
Growing Mash	17.00	3.50	6.00
Laying Mash	18.00	3.50	8.00
Starting Mash	16.00	3.50	5.00
Turkey Growing Mash	17.00	3.50	7.00
Turkey Laying Mash	18.00	3.50	8.00
Turkey Starting Mash	18.00	3.50	6.00

REGISTRATION REQUIREMENTS

3. **General Requirements:**

(a) In making registrations, care should be exercised to make the chemical guaranties reasonably close to the actual content of the feed. In other words, arbitrary guaranties will not be accepted.

(b) If a material change is made in the guaranty of a feed, in effect lowering the value of the feed, the name of the feed must be changed also.

(c) For oil-mill by-products and digester tankages, the percentage of protein must form part of the name. For example, 41% Cottonseed Meal, 34% Old Process Linseed Oil Meal, 60% Digester Tankage, etc.

(d) Oil-mill by-products containing hulls, screenings and similar materials, thus materially lowering the percentage of crude protein, cannot be called meals, but may be called meal and hulls, or meal and screenings, or feed, or by some proprietary name.

(e) Any feed containing less than 9% protein must be called by the name of its ingredients.

(f) In naming feeds, the terms "feed" and "ration" should be distinguished. A feed may or may not be a ration. A ration is a complete feed and does not require other feed to be fed in addition to it.

4. Essential Organic Ingredients:

A feedstuff must not contain less than 3% of any essential organic food ingredient stated in the guaranty. If an ingredient so stated is found to be less than 3%, the feed will be classed as misbranded.

5. Mineral Ingredients:

Mineral ingredients, generally regarded as dietary factors essential for the normal nutrition of animals, when added to a feed, must not exceed 3%.

6. Salt:

The amount of salt in any stock feed, including poultry feeds, should not exceed 1%.

7. Screenings:

(a) Percentage of screenings in wheat feeds and statement whether ground or unground, must be given.

(b) When screenings are used in mixed or special-purpose feeds, the percentage must be stated, and the minimum amounts of protein and fat and the maximum amounts of fiber and ash for such screenings must be stated in the registration. Samples of such screenings may be required to be furnished on request by the Department.

(c) If all or part of the immature, broken and light grains and other seeds of commercial value have been removed from screenings, the material must be called "screenings refuse" or "screenings waste."

8. Materials of Little or No Feeding Value:

(a) Percentage of material of little or no feeding value must be stated.

(b) When organic materials of little or no feeding value as concentrates are used in mixed or special-purpose feeds, the open formula must be given in the registration. The open formula will not be printed on the tag unless there is a good reason why it should. The Department reserves the right.

(c) In mixed feeds, the amount of a material or materials of little or no feeding value as a concentrate, must not exceed 25% of the mixture.

9. False Registration and Cancellation:

Improper registration, adulteration or misbranding of a feed not only renders the offender liable to prosecution, but the registration may be cancelled by the Department.

THE STATE TAG

The official tag or label not only informs the buyer that sale of the feed in question is authorized under the State law, but also gives information as to the character of the feed, which the purchaser should know, that he may buy intelligently. Therefore the purchaser should read carefully that part of the printed matter which tells what materials are contained in the feed, and the chemical analysis. The information given is sufficient to enable a feeder to select the feed that best suits his purpose, in quality and cost. The tragedy is that a feeder too often neglects to consider the statements on the tag, and buys a low-priced feed, with the inevitable result that he gets a trashy feed, of low feeding value. Such practice is false economy. In reality, he pays more for the nutritious part than if he bought a good, clean feed at a somewhat higher price. The Department is striving to impress upon feeders the importance of reading and studying the information given on the official tags, when selecting feeds.

To mark more conspicuously certain important differences in the character of feeds, thereby making easier the selection by the purchaser, the Department issues tags according to a three-color scheme, as follows:

A manila tag printed with black ink designates a "straight" feed, that is, a feed made from only one grain or plant. Examples: wheat bran; wheat middlings; cottonseed meal; linseed oil meal; corn feed meal.

A manila tag printed with red ink designates a feed made of the products or by-products of two or more grains or plants, that is, a "straight mixed" feed. Examples: wheat bran and corn bran; wheat bran, corn feed meal and cottonseed meal; corn, oats and alfalfa meal. The tag plainly tells what the materials are.

A yellow tag printed with black ink designates a feed containing a material of little or no nutritive value. Such are commonly known as *"yellow tag"* or *"adulterated"* feeds or *"junk"* feeds. Examples: oat hulls; cottonseed hulls; screenings; screenings waste or refuse; or other material containing an excessive percentage of fiber.

If a feeder wants to buy a trashy feed, it is his privilege to do so. Such materials may be useful as "roughage" tho containing little nutriment. But it is important that he consider make-up of the feed, as stated on the tag, in making a selection. Usually the nutrients in such feeds are more costly, even at the lower price, than they would be if purchased in feeds of better grade.

SUGGESTIONS TO FEEDERS

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 nutrients which an animal can digest, under ordinary conditions, and take into its system, to keep up heat and energy, produce growth, and repair the natural waste of the body. It will be of much value to a feeder if he will observe the following suggestions, when buying commercial feeds:

Read and study carefully the information given on the official tag. The information on the tag is sufficient to give the purchaser adequate knowledge of the character of the feed.

Buy no feed that is not registered and tagged with a Kentucky official tag. If the feed is not labeled with a Kentucky official tag, it is being sold in violation of the law. Besides, the purchaser has no way of knowing what is in the feed.

Ascertain the need of the animal and what will supply it, for no animal can give good results without proper feed. The kind of feed an animal requires depends largely upon the character of work performed. If in doubt as to the kind of feed the animal needs, consult the Experiment Station or an authority on feeding.

High-grade feeds are most economical. Too many feeders buy on price rather than on quality. Many commercial feeds sold in Kentucky are cheap, inferior and unbalanced, and often do not supply the animal with proper nourishment, thus resulting not only in hardship to the animal but loss to the owner as well.

The percentages of crude protein, fat and fiber serve only as a general guide in selecting a feedstuff. It is important that the source of these be known and they ought to be from a sufficient number of materials of known quality to assure variety and proper amounts of digestible nutrients.

An excessive amount of nutrients not only overtaxes the digestive organs and invites disease, but is an actual waste, as well. On the other hand, an insufficient amount causes loss for lack of necessary nutrients and diminishes the ability of the animal for performing the desired amount of work. Unless feed is properly balanced one set of tissues of the body may not receive sufficient nourishment, and the equilibrium of the nutrients required by the animal system for maintenance and growth, is destroyed.

CHEMICAL ANALYSIS AND EXPLANATION OF TERMS

The law of the State requires a statement of the percentages of protein, fat and fiber in all feeds, the idea being that this information with other data concerning the ingredients, would protect the purchaser and enable him to buy his feed intelligently. However, the careful preparation of a ration requires a more complete knowledge of the composition of feedstuffs. Besides protein, fat and fiber, the ordinary "complete" analysis includes the determination of water, ash and nitrogen-free extract.

Sometimes special determinations must be made. For example, in molasses feeds, it is often desirable to know the sugar and water content. In feeding materials such as silage, it is desirable to know the acidity, since this determination is an index to the palatability of the material. In animal materials, the percentage of phosphate is determined in order to ascertain whether the material should be classified as a meat material, or a meat and bone mixture. In feeds containing screenings, sweepings, dust and refuse from mills and elevators, it is very desirable to determine the percentage of sand.

The chemical analysis, besides giving information of the food value, aids in determining whether or not a feed is misbranded or adulterated. In straight feeds such as cottonseed meal and wheat by-products the chemical analysis serves as an index for classification. Six kinds of wheat by-products and three grades of cottonseed meal are recognized by the trade according to their chemical analyses. As a means for standardization of feedstuffs, the value of the chemical analysis increases each year. An analysis shows whether a manufacturer is varying the percentages of ingredients from time to time. A variation in ingredients affects feed value and works a hardship on the feeder who expects a repetition of former results when he obtains the same feed again.

The methods of chemical analysis used by this Department are those adopted by the Association of Official Agricultural Chemists as required by the State law.

Protein is the name given to organic nitrogenous substances essential to plant and animal life. It contains about 16 percent of the element, nitrogen. The percentage is obtained simply by multiplying the percent of organic nitrogen found from analysis, by the factor, 6.25. Plants have the power during growth of building up protein from substances that exist in the soil and the air, whereas animals build their protein from that of plants, grains and seeds. Different proteins contain different amounts of essential amino acids, and it is therefore important to select feeding materials whose protein contains sufficient amounts of the essential amino acids. Protein builds and repairs worn-out

tissues. It enters largely into the composition of the white of eggs, lean meat, blood, curd of milk, gelatin, etc. It is found in all parts of the animal body, occurring in quantity in hair, hoof, hide and bones. It is the most important as well as the most costly nutrient in feedstuffs; their value depends very largely on the amount of protein. This differs greatly in different feeding materials. Feeds containing more than 20 per cent of protein are referred to as protein concentrates and are high in price. Usually, farm-grown feeds are low in protein. However, we cannot estimate the relative values of all feedstuffs from their percentages of protein, alone. Cottonseed meal contains 41 percent of protein whereas crushed corn contains about 10 percent. This is not an indication that cottonseed meal is four times as valuable as corn. Corn has much the larger amount of digestible carbohydrate which is a valuable nutrient in a feedstuff.

Fat is that part of a feedstuff soluble in ether. It is composed, for the most part, of fats and oils, but in fodders and hays it contains wax, resin and chlorophyl. The last three are of no known feed value. Fat occurs generally in relatively small percentage and, since the requirements of livestock for fat, as such, in feeds, is small, a feed seldom is valued for its fat content. Fats have feed value, however, and, like carbohydrates, produce heat and energy, their value for such being 2¼ times that of either carbohydrates or protein. They serve to prevent undue waste of protein in the body, and as a protection to the tissues of the body. It is important that an analysis contain a statement of fat content, for the amount of fat is an index in classifying unknown feeding materials, and aids in the standardization of feedstuffs valuable for their protein, carbohydrate and mineral matter tho differing considerably in fat content. Too much fat endangers the keeping quality of feeds—they soon become rancid. This usually occcurs in by-product feeds rather than in natural products.

Carbohydrate is the name given to compounds of carbon, hydrogen, and oxygen in which the hydrogen and oxygen are present in the same ratio as in water. The carbohydrates constitute a large class of naturally occurring compounds in which

are starches and sugars, important in the valuation of feedstuffs. Other carbohydrate compounds less digestible than sugars and starches occur in certain feedstuffs in predominating amounts. The amounts vary in different feedstuffs. The carbohydrate of a feedstuff may be digestible or only partly digestible. In order to distinguish the digestible and the more or less indigestible carbohydrate, the chemical process for determination of fiber was devised. Carbohydrate, therefore, is divided into two parts, one called fiber, and the other, nitrogren-free extract which is the difference between the fiber and the total carbohydrate.

Fiber, the indigestible carbohydrate, is the woody portion or structural part of plants and the outer coatings of grain. When present in large quantity it exerts a retarding influence on the digestibility of nutrients in feedstuffs, and is itself only slightly digested by animals. Especially is this so with poultry and swine. For animals having small stomachs much fibrous material in a feed is undesirable. A high percentage of fiber is a general indication that the percentages of essential nutrients are low and that digestibility is impaired. High fiber is not always objectionable. In fact, for ruminants, roughages, that is, materials that contain a large percentage of fiber, are essential. Its chief value appears to lie in its mechancal effect in the intestinal tract. But the price of a feed that contains a filler, such as hulls, sweepings, dust, refuse and screenings, is likely to be about the same as for a material of good quality. As the feeder usually has an abundance of such materials as hay, fodder and grasses on his farm, he suffers a financial loss if he buys fibrous materials, for his livestock is likely to suffer for lack of nourishment. So a feedstuff having a high content of fiber is classed as a low-grade feed. Cottonseed hulls, oat hulls, peanut hulls, rice hulls, corncobs and materials of a similar nature contain high percentages of fiber. The determination fiber is of great assistance to the chemist in the detection of adulteration.

Nitrogen-free Extract, the digestible carbohydrate, is determined by the chemist by subtracting from 100 percent the sum of the percentages of water, ash, protein, fat and fiber, found by analysis. This amount plus the percentage of fiber consti-

tutes the carbohydrate. Nitrogen-free extract is composed chiefly of starch and sugar, which are readily digestible. These, with the fat present in the feed, are oxidized to maintain heat and furnish energy for the production of work. While nitrogen-free extract does not have as great a power in this respect as fat, it is present in so much larger quantities than is fat, that its importance is far greater. Nitrogen-free extract may be converted into fat in the animal body and any excess over the immediate needs of the body is stored as fat in the tissues. It, therefore, may take the place of fat in a feed deficient in fat. Where the amount of nitrogen-free extract is not given in the statement of analysis, nor the water and ash, these may be computed with reasonable accuracy. An ample number of analyses of straight feeds or standard by-products are available, the averages of which give the feeder reasonably accurate information of the composition of the feeds under consideration. The average percentage of water may be taken as 10, the percentage of ash in whole grains, 2.5, and in their by-products, 4.50. For example, the approximate percentage of nitrogen-free extract in a mixed feed composed of corn feed meal, wheat bran, wheat shorts, cottonseed meal and alfalfa meal, with an analysis given as 16.5 percent protein, 4.50 percent fat and 12.5 percent fiber, can be obtained as follows: Taking 10 percent as the average moisture and 4.5 percent as the average ash, add together 16.5, 4.5, 12.5, 10.0 and 4.5 which amounts to 48.0; subtract this from 100 and we have 52 percent as the amount of nitrogen-free extract.

Ash, the mineral matter, is the residue obtained when a feedstuff is burned, and is so determined by the chemist. Hence the name, Ash. The percentage is relatively small compared with protein or carbohydrate. The ash of clean vegetable material contains mineral substances which the plant has taken up from the soil. The ash of feeds, however, may contain other substances such as salt, limestone from phosphate earth, and sand. It consists for the most part of calcium, magnesium, sodium and potassium combined with phosphate, chlorine, carbonate and sulfate. These mineral constituents, especially calcium and phos-

phate, form the bony structures, and are found in all vital tissues and secretions of the animal body.

Grains, seeds and tubers are deficient in calcium, sodium and chlorine. Legumes and hay from them, corn stover and the leafy parts of plants generally, contain sufficient quantities of these substances. Sometimes, however, it is necessary to add certain mineral substances to a feed. Calcium and phosphate are the mineral constituents most often deficient. The common practice of giving salt to livestock is for the purpose of supplying their need of this substance, very little of which is present in most vegetation. An excessive amount of ash in a feed generally indicates adulteration with dirt, sand or other mineral matter. For this reason the determination is a very important one and the chemist uses it as an index of quality.

Considerable research has been done in recent years on other more or less abundant mineral constituents not mentioned in the foregoing and considerable progress has been made towards establishing their possible importance in the animal metabolism.

Water is present in all feedstuffs. A feed may seem to be dry, but it contains some water. The natural amount present is usually near ten percent, and is not very variable, under ordinary conditions. An excessive amount of water may cause the feed to heat and spoil, and a feed may become so dry that its quality is impaired. It is therefore important to have proper storage conditions. By-product feeding materials have had their natural water content altered. The percentage of water in sweet feeds depends mainly on the proportion of molasses present and the water content of the molasses. If the water content is not excessive, under proper storage, these products maintain a more or less uniform water content and, as a general rule, its presence is of little importance in valuation of feedstuffs. In comparing analyses it should be kept in mind, however, that the comparison must be made on the basis of the same water content. Any amount of water other than that necessary to keep the feedstuff in proper condition, reduces the value of the feed by reducing the percentages of the other substances.

COMPOSITION AND NUTRITIVE VALUE

It is because feeding materials vary in composition and nutritive value that the chemical analysis constitutes an index for comparison and valuation. Without knowledge of the chemical composition of the materials the feed manufacturer cannot buy wisely and he cannot intelligently make up his mixed feeds; nor can the feeder assure himself of balanced rations. A number of factors influence the variation in composition and nutritive value of feeding materials. With grains, hays, etc., the climate, the season, the variety, and the stage of maturity are important factors; and the amount of available plant food in the soil on which the plants are grown influences the composition and therefore the nutritive value. Roughages are more variable than grains because their composition is more influenced by stage of maturity, manner of curing, and moisture content. Mill by-products vary according to milling methods, and variation in animal by-products is caused by different methods of preparation. Thus manufactured feeds may have their nutritive value or quality influenced by factors which may be described as man-made to distinguish them from the natural forces which influence individual materials.

The chemical analysis, while furnishing a partial index for comparison of feedstuffs values, is not sufficient. Different feedstuffs may have the same chemical composition but a very different nutritive value. This is because one feedstuff may be more digestible than another, tho the chemical analysis does not indicate it. Therefore, it is very important to know the source of protein, fat, carbohydrate, etc. The ingredients generally used in feedstuffs have known digestibility and can be compared readily by referring to tables arranged for this purpose.

NECESSITY OF MICROSCOPICAL ANALYSIS

As mentioned, chemical analysis does not indicate the digestibility of feeding materials. So to be sure that desirable materials were used which supply the correct amounts of protein, fat, carbohydrate and mineral matter, it is necessary to

identify them. This is not always simple. In modern milling methods, materials are so finely ground as to obscure the original character of certain inferior materials, and identification becomes difficult. An experienced microscopist is necessary to identify the ingredients of feeds. Identification is possible because practically all feeding materials are composed of cells, characteristic of each product. In a ground feed the various cells and tissues can be seen and identified with the aid of the microscope. Every sample of feed received is subjected to a microscopical examination. A record is made of the nature of the ingredients that make up the feed. The various grains, grain products, by-products, and roughages may be sold unmixed or in mixtures of from two to a dozen or more materials. Molasses and small amounts of salt and other mineral substances frequently are added to these mixtures.

By means of microscopical examination one is able to judge: First, whether the feed contains the guaranteed ingredients, and the quality of each. Second, whether it contains other ingredients and whether or not they are adulterants. Third, whether any of the ingredients are present in such small proportions that their presence does not materially affect the nature of the feed. Previous to the 3-percent ruling, guaranteed ingredients were added in very small amounts merely to meet the guaranty in name only and not in fact.

The products of which feeds are made vary not only in chemical analysis and digestibility, but in palatability, purity and physical condition. Hence, it is not only desirable to know how much protein, fat and fiber are present in a feed and their digestibility but the quality of these materials as well. It is desirable to know whether excessive fiber is due to the presence of alfalfa meal or to oat hulls, and whether the protein comes from linseed oil meal or poor quality tankage. Again, if a feed is shown by analysis to be low in protein, the question arises as to whether this low protein is due to an inferior low-protein adulterant or to wheat flour, a product low in protein, but highly digestible, and therefore relatively desirable. The microscopical examination shows what products are present.

If a feed diverges widely from the guaranty as to chemical constituents, it is a strong indication that some desirable ingredient has been left out, something added, or the proportions of the ingredients materially changed. The microscopical examination shows the nature of these changes.

Too much importance has been given in the past to the guaranteed chemical analysis and not enough to the guaranteed ingredients. Because of this, unscrupulous manufacturers have met their chemical guaranties, but not with the ingredients guaranteed.

The importance of the microscopical examination becomes more pronounced each year. There are hardly as many as fifty materials in general use as feedstuffs and the products from them are becoming more standardized each year. The better standardized the products, the easier it is for the microscopist to classify them. It becomes increasingly pronounced that when only relatively well-standardized products are used in mixed feeds the microscopist can tell with the aid of the chemist, within reasonable bounds, the percentage composition of the ingredients. If he goes far wrong it is generally because of the presence of some product which has a widely variable composition. The 3-percent ruling on the essential organic ingredients has helped the microscopist greatly, and it is not a difficult matter to tell if an ingredient is left out, an inferior one added, or a substitution made.

The definitions adopted by the Association of American Feed Control Officials are a great help to both chemist and microscopist. Quite frequently samples of "feed" with absolutely no data, are received for analysis. If it were not for the experience of the present-day feedstuffs microscopist these samples would be very difficult to handle; yet today we are able to get a fairly clear idea of the amounts of ingredients present if they are materials classified in the definitions of the American Feed Control Officials. Another very important feature of microscopical examination is that it serves as a check on the chemical analysis. It is safe to say that hundreds of duplicate analyses have been avoided thru the microscopical examinations.

Definite procedure in microscopical technic varies according to composition of feedstuffs. Technical procedure depends upon the materials present, the difficulty of identifying them and the readiness with which the percentage of each ingredient can be estimated with reasonable accuracy. The procedure is based on experience obtained on prepared samples of more or less standardized products. The presence of screenings and waste materials of extremely variable composition makes the microscopical examination more difficult.

It is desirable to obtain all information possible about the sample before analysis. This, of course, is essential in any analytical work whether in the field of chemistry, microscopy, medicine or law.

Only a microscopist with experience in this work can estimate the percentage amount of ingredients present with proper degree of accuracy. As a check on his examination he approximates the chemical composition of the feed in question based on average composition of each ingredient and the estimated amount of each. A comparison is made with the actual chemical analysis. As already mentioned we have found this procedure to serve as a check of the work of the chemist, also, and a great deal of duplication is avoided.

As the work has to do for the most part with feedstuffs guaranteed to contain certain ingredients and to have a definite chemical composition, we are not looking for a needle in a haystack, and procedure is greatly simplified. When no information is at hand to guide the microscopist, necessarily valuable time is consumed that might be saved if something were known about the sample. Under such circumstances the time required for analysis depends upon the nature of the material. The value of such analysis is problematical and depends on whether or not the analysis gives the specific information desired.

The microscopists technic is based on both miscroscopical and macroscopical general and special methods. Association of American Feed Control Official methods are used as far as possible.

NUTRITIVE RATIO

The meaning of the term, nutritive ratio, should be understood by all feeders. It is frequently used in discussing feeds and writing of their use, but is not always understood by feeders. It is the ratio between the amount of digestible protein and the amount of digestible carbohydrates (nitrogen-free extract plus fiber) and fat (ether extract) combined, 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. In calculating the nutritive ratio of a feed, therefore, 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. Example: Take a dairy feed containing 18 percent of digestible protein, 3.50 percent of digestible fat and 50.00 percent of digestible carbohydrates, we have, by completing the conditions: Carbohydrates, 50.00, plus 7.87 (fat 3.50 x 2.25) divided by protein, 18, or 57.87÷18=3.21, or a nutritive ratio of 1:3.21. In this way the nutritive ratio of any feed in which the digestible nutrients are known can be calculated.

A feed having a large percentage of digestible protein in proportion to the digestible crude carbohydrates and fat combined, is considered as having a narrow nutritive ratio. Example: Highly concentrated feeds such as cottonseed meal, linseed oil meal, corn gluten feed and meal, wheat shorts, etc., or any mixture of such materials, have a very narrow nutritive ratio; while the less concentrated materials such as hays, straws, roughages, grains and meals, etc., have wide nutritive ratios.

BALANCED RATION

A ration is the quantity of feed given an animal during a day. A balanced ration is one in which the nutritive ratio is correct; that is, it furnishes digestible proteins, carbohydrates and fats, in such amounts and proportions as are necessary to nourish a given animal in a day. The correct nutritive ratio, formerly thought all that was necessary to know in proper

nutrition, is now with our present knowledge, only one of the essentials to proper nutrition. Besides the proportions of digestible nutrients, other things must be considered. Digestible proteins from different materials are not equally nutritious and certain other food factors such as vitamins and mineral substances, are necessary to the nutrition and well-being of animals. Investigators are actively engaged in study along these new lines and data in regard to animal nutrition and the properties of feedstuffs are being modified as new discoveries are made.

The study of the science of animal nutrition is steadily increasing in interest and importance and is greatly influencing the scientific preparation of feeds and their use. Great as has been the advancement of the scientific preparation of feeds and knowledge in the feeding of animals, most scientists of today agree that much is yet to be learned. A chemical analysis alone is not a true index or measure of the value of a feed. It has been definitely determined that the different kinds of proteins are more or less different in character and digestibility. The same is true of fats, fiber and carbohydrates.

Intelligent preparation of a proper feed or a ration for animals requires a very complete knowledge of feedstuffs and their use, including their chemical analysis, the sources of the materials and nutritional factors. This knowledge must be sufficient to permit the planning of a ration that meets the following conditions, if satisfactory results are to be obtained. First, the ration must contain sufficient digestible, complete protein and digestible energy-producing substances in right proportions to meet the needs of the animal. Second, it must contain the proper amount of indigestible fibrous materials, such as is found in the fibrous parts of plants. Third, it must contain the vitamins in adequate amounts. Fourth, it must contain the right kind of mineral matter in sufficient amount. Fifth, it must be free from injurious substances such as poisons, especially cumulative poisons, disease germs or anything that produces mechanical injury.

PROTEIN

In the explanation of terms used in the discussion of feeds in this bulletin, protein is described as the most important as well as the most costly nutrient in feedstuffs. It produces flesh, muscle, ligament, glandular secretions, tissue, milk, blood, tendon, hair, hoof, hide and all portions of the animal body which have strength, including the bones which contain 25 to 30 percent. No other substance can take the place of protein but, under certain circumstances, in emergencies, as in starvation, protein may serve as a source of heat and energy. It may be used to form fat, thereby taking the place of the nutrients, fat and carbohydrates. But fat and carbohydrates, or any other constituents of feed, cannot perform the function of protein, because none contain the element, nitrogen. While fats and carbohydrates are essential and important in feeds, usually they are abundant and can be had in a cheap form.

The value of a feed depends very largely upon the kind and amount of digestible protein it contains. Protein, regardless of its source, contains approximately 16 per cent of nitrogen, the very important chemical element that is essential to plant and animal life.

Plants have the power during growth of taking in protein-producing substances and storing up protein made from these substances of the air and soil, whereas animals get their protein from plants, grains and seeds, or from other animals. Many farm crops such as corn, wheat, oats, barley and timothy hay, are low in protein, contain fair amounts of fat, but are very rich in carbohydrates. However, the by-products of grain and oil mills and slaughterhouses are rich in protein and furnish practically all the high protein-carrying materials for stock feeds.

In these protein-carrying feedstuffs materials are found the different kinds of protein. These proteins are built up differently during growth, from chemical compounds known as amino acids. There are about twenty known amino acids. These amino acids are linked together to form the different kinds of protein. They differ in importance towards stimulating growth, their

availability for such probably affecting the digestibility of the protein. Not all of these amino acids are found in any single protein. And not all of them are necessary for animal nutrition. However, it is established that certain ones such as tryptophane, cystine, lysine and histidine are essential and necessary in proper nutrition and without them animals fail of proper nourishment. For this reason it is desirable that a variety of suitable protein-carrying materials be included in the ration, to make sure that it contains the necessary kinds of amino acids or protein in a digestible form, in adequate amount.

Milk, eggs, meat and animal by-product materials, and certain varieties of soybeans, contain all the essential amino acids of digestible protein. The amino acids in cereals are low in efficiency and quality. The legumes are deficient in cystine, one of the essential amino acids. Corn contains zein, but no tryptophane or lysine, two important and essential amino acids.

SPECIAL-PURPOSE FEEDS

Owing to the changing economic conditions, the economist is put to his wits to meet the exigencies of the times. In industry, in agriculture, and especially in sciences related thereto, is this true. In the feed industry, special-purpose feeds are becoming more specialized to meet the needs of specific classes of animals. Until comparatively recently, the same feed mixture often was fed, more or less, to all classes of stock. A feed formula would be registered and labeled a dairy feed, horse feed or sheep feed and often the mixture was not a suitable feed for either class of animals. With the advance in the science of animal nutrition and stock feeding, the scientific methods of mixing rations has followed, without which the results of feeding would have been financially disastrous. Investigators are constantly discovering new facts in animal nutrition and manufacturers are endeavoring to adapt their products to meet these new conditions.

Feeders are confronted with varying conditions. Some produce many of their feeds on their own farms, others only produce certain kinds and amounts, and many depend entirely

on buying their feeds. If the legumes and corn and oats can be raised and fed on the farm, the feeder's problem is largely solved, as he needs very little, if any, protein-carrying material to use with them. If, however, only such crops as corn, oats, barley and timothy hay are produced they must be supplemented by concentrates high in protein to give desired results. Special-purpose supplements are prepared for use with home-grown feed materials, but such mixtures are not generally used by feeders. Attention, therefore, is directed largely to mixtures represented as balanced feeds and rations.

In the discussion in this bulletin under the head of Ration, it is pointed out that a variety of protein-carrying materials should be used in a feed to ensure certain factors and conditions, if satisfactory results are to be obtained. Those conditions should be met as far as possible in all special-purpose feeds, if the feeder expects to get desired results. In this connection the Department has made it possible for the feeder to protect himself against fraudulent feeds, by furnishing him with information, if he will only apply it intelligently. In addition to the regular information, in special-purpose feeds it is required that no essential organic ingredient used shall be less than 3 percent, before it can be listed, and that the maximum amount of inorganic mineral material or materials must not exceed 3 percent of the mixture.

Minimum standards have been set up for the more important special-purpose feeds. The requirements of these minimum standards, when met by the manufacturer or dealer, give the purchaser a reasonable assurance that the feed he is buying, whether a straight feed or a mixed feed, is at least of a certain quality.

Dairy Feed. There are many materials that can be used economically in a dairy feed. In fact, most all sound feedstuff materials from vegetable sources are suitable to include in a dairy feed or ration, if proper proportions are observed. However, only enough well-chosen materials, say four, to give variety and palatability, need be selected, in order to give satisfactory results in production and maintenance of the well-being of the

animals. The basic materials commonly used in dairy feeds are corn feed meal, hominy feed, wheat bran, wheat middlings, cottonseed meal, soybean oil meal, linseed oil meal, corn gluten feed and meal, distillers dried grains, brewers dried grains and alfalfa meal, and many others of less use. The cheaper dairy feeds contain fillers such as oat hulls, cottonseed hulls, flax plant by-product, grain screenings, screenings refuse and waste. It has been pointed out in other sections of this bulletin that filler feeds are generally the costliest feeds a feeder can buy. In this discussion of dairy feeds, filler feeds are not considered.

In order to minimize fraud in the manufacture of dairy feeds and assure the feeders of dairy cattle in Kentucky a reasonable grade of feed, the Department has established a minimum standard of 16 percent of protein, 3.50 percent of fat and not more than 15 percent of fiber. If the feed contains a filler, the amount must not exceed 25 percent of the mixture.

The minerals commonly used in dairy feeds, when used at all, are salt or iodized salt, bone meal and calcium carbonate. If corn stover and legume hays are fed, no mineral usually is needed except salt. (See mineral requirements under the head of Mineral Matter, in this bulletin.)

Dairy feeds are classified with reference to the amount of protein they contain under three groups: 16 percent protein, 20 percent protein and 24 percent protein dairy feeds.

The 16 percent protein dairy feed group usually contains with few exceptions, the maximum amount of filler or fillers permitted by the Department, which is 25 percent of the total mixture. It is estimated that 90 percent, or more, of the 16 percent protein dairy feeds contain fillers, varying from little to no feeding value, in some cases worthless and in others dangerous to the health of the animals. Dairymen feeding high-grade cows and desirous to maintain their health and to keep up an average flow of good milk containing ample amounts of vitamins, should not feed cheap and trashy filler feeds. Purchasers of the 16 percent protein dairy filler feeds generally feed low-grade roughages, with the inevitable result of poor production and, in all probability, low quality of milk. Legumes

or a good grade of mixed hay should be fed with 16 percent protein dairy feeds, especially those containing fillers.

The 20 percent protein dairy feed group is made usually of very high class feed materials. Very few of the feeds of this group contain fillers and when they do they are usually in small amounts. This group of dairy feeds seems to be about the protein level most suitable to the average dairy needs in Kentucky. The lower grades of roughage such as corn stover, mixed hay, and silage, can be fed with this group of dairy feeds, with fair results, but roughages of average grade at least should be fed, if the best results are to be obtained.

The 24 percent protein dairy feed group contains more of the high protein-carrying materials than the lower groups. This group of feeds is usually made to be fed with home-grown materials of low protein content such as corn, oats and corn stover, to bring the protein down to the 18 or 20 perecent level. If fed at its full strength, a low-grade roughage such as corn stover, mixed hay or silage, should be used with it.

Horse and Mule Feeds. Horse and mule feeds usually are made up of some combination of corn, oats, barley, alfalfa meal, wheat bran. Molasses sometimes is included in the ration. Salt or iodized salt is usually the only mineral included. A minimum standard of 9 percent of protein, 2.50 percent of fat and not over 15 percent of fiber has been established. The roughages usually used are timothy, alfalfa and mixed hay.

Hog Feed. Two kinds of hog feed commonly are registered and used in Kentucky—growing and fattening feeds. The materials generally included in hog feeds are corn meal, hominy feed, wheat middlings or shorts, corn gluten feed, alfalfa meal, linseed oil meal, soybean oil meal and tankage. The mineral materials usually are salt or iodized salt and calcium carbonate. A minimum standard of 16 percent of protein 3.50 percent of fat and not more than 7 percent of fiber has been established for growing hogs; for fattening hogs, not less than 13 percent of protein, 3.50 percent of fat and not more than 7 percent of fiber.

Laying Mash. The materials commonly used in laying mashes are corn meal, wheat bran, wheat shorts or middlings,

ground oats, alfalfa meal, alfalfa leaf meal, corn germ meal, corn gluten feed, soybean oil meal, linseed oil meal, meat scrap and fish meal. Other materials are used also but these form the main list. Cod liver oil is included in breeder stock mashes. The mineral materials commonly used are salt or iodized salt, bone meal and calcium carbonate.

As in all classes of special-purpose feeds, a variety of good protein-carrying materials should be included in order to assure the required conditions under which proper results may be obtained. A minimum standard of 18 percent of protein, 3.50 percent of fat and not over 8 percent of fiber has been established. It is required also that at least 20 percent of the protein in the laying mash must be from an animal source.

Starting Mash. For starting and growing chicks, special care should be taken in selecting good, sound protein-carrying materials of high digestibility to be used in the feeds and rations. This is especially true of the starting feeds. Highly fibrous materials should be avoided and only materials of high digestibility should be used. The materials should be well mixed and reduced to a uniform fineness. The materials commonly used in chick mashes are yellow corn meal, wheat middlings or wheat shorts, wheat bran, corn germ meal, wheat germ, alfalfa leaf meal, meat scrap, fish meal, rolled oats, ground oat groats, dried buttermilk and cod liver oil or vitamin D-carrying material. The mineral materials usually are salt or idodized salt, bone meal and calcium carbonate. A minimum standard of 16 percent protein, 3.50 percent of fat and not over 5 percent of fiber has been established.

Growing Mash. Growing mashes are made from the same materials as starting mashes. The birds at this stage of growth and development can take coarser mashes, more protein and fiber. Often the same formulas are used for starting and growing mashes. It seems better, however, to have a modified formula for growing birds and when they have the privilege of range and sunshine, cod liver oil or its equivalent may be omitted from the feed. A minimum standard of 17 percent of protein, 3.50

percent of fat and not over 6 percent of fiber has been established.

Fattening Mash. Birds being prepared for market need a highly digestible carbohydrate mash ration. The materials used in a fattening ration are corn meal, corn germ meal, ground oats, rolled oats, wheat flour, ground barley, linseed oil meal, meat scrap, dried buttermilk, flour middlings. The mineral materials usually are salt and bone meal. A minimum standard of 13 percent of protein, 4 percent of fat and not over 5 percent of fiber has been established.

Poultry Grains (Scratch). Scratch grain formulas for laying hens and for growing stock usually are made from the same grains and in about the same proportion. The grains are corn, wheat, kaffir, milo, barley, buckwheat and oats. The grains should be sound and free from mold. A minimum standard of 9 percent of protein, 3 percent of fat and not more than 5 percent of fiber has been established.

Chick Grains. Chick grain formulas are made from such grains as yellow corn, wheat, millet, kaffir, milo, buckwheat and oat groats. The grains should be sound, free of mold and reduced to a uniform fineness. A minimum standard of 9 percent of protein, 2.50 percent of fat and not over 3.50 percent of fiber has been established.

Turkey Laying Mash. Turkey laying mashes are made from the same materials generally used in hen mash. In fact, hen mashes are used pretty generally in feeding laying turkeys. Very few turkey laying mashes are registered for this reason. The minimum standard for turkey laying mashes is the same as for hen laying mashes; 18 percent of protein, 3.50 percent of fat and not over 8 percent of fiber.

Turkey Starting Mash. Turkey starting mashes are made up of about the same materials used in baby chick mashes. The same care should be exercised in seeing that the materials are sound, free from mold and high in digestibility. Many feeders use starting mash for chick to feed baby turkeys. Baby turkeys can utilize to advantage more protein and fiber than baby chicks and require much more vitamin D-carrying materials. A min-

imum standard of 18 percent of protein, 3.50 percent of fat and not over 6 percent of fiber has been established.

Turkey Growing Mash. Growing turkeys require about the same amount of nutrients as growing chicks. The same mashes as used for growing chicks often are used for growing turkeys. Turkeys can take a mash somewhat higher in fiber than growing chicks. A minimum standard of 17 percent of protein, 3.50 percent of fat and not over 7 percent of fiber has been established.

All-Mash for Poultry and Turkeys. Like most fads, and we have fads in feeds and feeding, the all-mash feeds and rations have reached their peak and are declining in use. The all-mash feeds and rations are so formed as to make a complete ration. They are made up on the principle of combining a regular mash feed with the amount of grain feed to balance the ration. Example: To a laying mash containing 20 per cent of protein, 4 percent of fat and 7 percent of fiber, add 40 to 50 percent of a grain scratch feed containing 9 per cent of protein, 3 percent of fat and 5 percent of fiber, reduced to the same fineness. This is true of starting and growing mashes of poultry and turkeys. The usual amount of mineral materials are included in a ration as in a feed, but the total amount of inorganic minerals must not exceed 3 percent of the mixture. The following standards have been established for all-mash feeds.

NAME OF FEED	Minimum Protein Percent	Minimum Fat Percent	Maximum Fiber Percent
All-Mash Laying Ration	15.00	4.00	7.00
All-Mash Turkey Laying Ration	15.00	4.00	7.00
All-Mash Starting Ration	14.00	3.50	5.00
All-Mash Turkey Starting Ration	15.00	3.50	6.00
All-Mash Growing Ration	15.00	4.00	6.00
All-Mash Turkey Growing Ration	15.00	4.00	6.00
All-Mash Poultry and Turkey Ration	15.00	4.00	6.00

MINERAL MATTER

Mineral matter is of vital importance to animals. It has been shown by experimenters that animals fed rations free from mineral matter, so far as it is possible to eliminate it, die of mineral starvation. It is found that animals thus fed generally perish sooner than when no feed is given. Certain mineral substances are necessary in every ration, and most feedstuffs contain the necessary substances, tho they may be in small amounts. In some localities where feed materials are grown, mineral deficiencies may occur, because of deficiency in the soil, but this is not generally the case. Modern methods of milling may also affect by-product materials and cause slight mineral deficiencies in feeds when such products form the basis of a ration.

The roughages are richer in mineral substances than grains or their by-products. This is especially true of leguminous plants. If suitable roughages are not available and the rations are deficient in mineral substances, a mineral supplement should be added to the concentrates. Fluorine, a chemical element found in combination in certain mineral substances used in feeds, is considered harmful to stock and minerals containing it, such as ground rock phosphate, should not be used in a feed. Investigators describe the mineral requirements of animals to be simple, that the general need of a mineral supplement under normal conditions is usually exaggerated, and that where there is need of mineral nutrients other than salt, such requirements are commonly limited to calcium, phosphorus or iodine.

The rules for classifying and labeling mineral feeds approved by the Association of American Feed Control Officials are followed as closely as conditions will permit, in the control and inspection of these products in Kentucky. These rules are:

"(a) That mixed feeds containing both feed and more than 5 percent of mineral ingredients require, in addition to the usual declaration of chemical feed analysis, a declaration of each ingredient contained therein and the minimum percentages of calcium (Ca), phosphorus (P), iodine (I), and the maximum percentage of salt (NaCl) if same be present. If minerals pre-

dominate in the mixture, the usual declaration of the chemical feed analysis, with the exception of protein, may be omitted.

(b) That mineral feeds containing no organic ingredient, the usual chemical feed guarantee need not be made. A declaration should be made of each ingredient contained therein and the minimum percentage of calcium (Ca), phosphorus (P), and iodine (I), and the maximum percentage of salt (NaCl) if the same be present.

(c) That the mineral ingredients be stated in the common English terms, if any such terms exist.

(d) It being impossible to classify separately the drug ingredients and the mineral ingredients, be it resolved:

1. That all mixtures containing mineral ingredients generally regarded as dietary factors essential for the normal nutrition of animals and which are sold or represented for the primary purpose of supplying these minerals as additions to rations in which these same mineral factors may be deficient, be classified as mineral feeds.

2. That all other preparations which are sold or represented primarily for the cure, mitigation or prevention of disease be classified by this Association as drugs, medicines or specifics."

The common names of materials often used in mineral mixtures, and their chemical names, are given below.

Name in Use	Chemical Name
1. Bone ash or bone phosphate	Tricalcium phosphate
2. Bone black	Tricalcium phosphate and carbon
3. Calcite	Calcium carbonate
4. Chile saltpeter	Sodium nitrate
5. Copperas or iron sulfate	Ferrous sulfate, crystallized
6. Copper sulfate	Cupric sulfate, crystallized
7. Cream of tartar	Potassium bitartrate
8. Dolomite	Calcium carbonate and magnesium carbonate
9. Epsom salt	Magnesium sulfate, crystallized
10. Glauber's salt	Sodium sulfate, crystallized
11. Iron oxide	Ferric oxide
12. Limestone	Calcium carbonate (crude)

13. Milk sugar	Lactose (a kind of sugar)
14. Oyster shells	Calcium carbonate (crude)
15. Phosphatic limestone	Calcium carbonate and tricalcium phosphate
16. Rock phosphate	Tricalcium phosphate with fluoride
17. Salt	Sodium chloride
18. Saltpeter	Potassium nitrate
19. Soda (cooking)	Sodium bicarbonate
20. Sodium sulfate	Sodium sulfate, anhydrous
21. Sodium thiosulfate	Sodium thiosulfate, crystallized
22. Superphosphate	Monocalcium phosphate (crude)

VITAMINS

For a long time it was common knowledge that fresh vegetables or fruits in the human diet prevented scurvy. Eventually, this property was traced to the presence of a small quantity of a certain vegetable substance. This and certain other organic substances of similar function, were named, vitamins.

Besides green vegetables, fruits, and seed-coats, germs of cereal grains, and certain animal products such as milk, eggs, and cod liver oil, contain them. Several are known. Vitamins are essential to the normal nutrition and well-being of animals. The lack of a specific vitamin results in a specific deficiency disease. Inasmuch as they are not present in all materials used in feeding livestock, the presence of the right vitamins, in proper quantity, should be provided for in compounding rations.

Modern milling has changed the composition and quality of by-product feeds in many respects. One of the changes is in the vitamin content of some product. Usually, the germ of grains, which is the part richest in vitamins, is removed, partly or wholly, and used for some other purpose than for feed, or is put into some special-purpose feed. This may diminish greatly the vitamin content of some by-product. If this by-product is used as the basis of a feed, that feed may be deficient in vitamins.

Because vitamins are important in nutrition, manufacturers of commercial feeds endeavor to include in their formulas

materials supposed to be relatively high in vitamins, and emphasize the fact in their advertising matter, sometimes too strongly. Most natural food materials contain vitamins but in very different amounts. Data as to the sources of vitamins have been compiled with a view of furnishing information for compounding rations of suitable vitamin content. The principal sources of protein, fat, carbohydrates and mineral matter are generally known, but less is known of the sources of vitamins. A short review of our knowledge of the vitamins and their sources is given here.*

Vitamin A. This sometimes is called the growth-promoting vitamin, tho other vitamins stimulate or promote growth of animals. It is one of the most important of the vitamins and must be present in all foods in adequate amount to ensure proper health, growth and resistance to infection. The activity of vitamin A decreases somewhat with length of time of storage of feeds. It is present in green leaves, butter, egg-yolk, whole fresh milk and in large proportion in liver oils, especially cod liver oil.

Vitamin B. This is known as the antineuritic vitamin. It stimulates appetite, digestion and growth. It prevents nervous disorder and aids lactation. Vitamin B is stable to moderate dry heat but is destroyed by cooking foods at high temperature, especially if the water is alkaline. It is found in adequate amount in many natural feedstuffs, such as green leaves and growing parts of plants; grain and seeds, especially in the germ; unpolished rice and rice bran; in some animal foods and especially in yeast. The richest and most available source of this vitamin for stock feeds is yeast; the next, the cereal grains, especially their germs.

Vitamin C. This is the antiscorbutic vitamin, so-called because it prevents scurvy. It aids the metabolism of the bones and the normal formation and maintenance of the teeth. It is found in fresh oranges and other citrus fruits, tomatoes, green leaves and vegetables, and in sprouting grains. The best form

* For more detail, see recent textbooks on nutrition.

for use for domestic animals is the sprouting grains and green leaves. Vitamin C is partially destroyed by cooking and by drying by exposure to the air.

Vitamin D. This is known as the antirachitic vitamin, because it prevents rickets. It promotes growth and is required for proper formation and maintenance of the bone. It regulates the assimilation of calcium and phosphorus and the content of calcium in the blood. Vitamin D is present in the livers of fish and other animals, butter, and eggs. So abundant is it in cod liver oil and some other fish-liver oils that they are regarded as specifics for rickets. Certain fat-containing food substances acquire the properties of Vitamin D by exposure to ultraviolet light, and much importance is attached to the effects of direct sunlight and ultra-violet radiation on animals. Vitamin D is stable to moderate heat and is not destroyed by ordinary cooking.

Vitamin E. This is called the reproductive vitamin or the anti-sterility vitamin. Without it, the reproductive function is lost. It is present in most vegetable and animal oils, especially oils from wheat germs and, naturally, wheat germs themselves. It is present in lettuce, yeast and various seeds. Vitamin E is the most stable vitamin. It is not destroyed by ordinary cooking.

Vitamin G. This is known as the anti-pellagra vitamin. It stimulates appetite and growth. Its main sources are yeast, milk, dried milk, lean meat, eggs, vegetables, carrots, and butter.

DEFINITIONS

It is important that those who are interested in feedstuffs, whether feeders or mixers, become familiar with the names and descriptions as well as the food values of materials used in the feed industry. Many of the leading products 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. The director of the Kentucky Agri-

cultural Experiment Station is empowered by law to adopt standards and definitions of feedstuffs.

The Association of American Feed Control Officials has formulated definitions for most of the terms in general use in relation to feeds. These definitions are followed as closely as possible where conditions in Kentucky will permit. They are published here for the general information they contain.

ALFALFA PRODUCTS

1. Chopped Alfalfa is the entire alfalfa hay chopped and not ground finely enough to become a meal. It must not contain an admixture of alfalfa straw or other foreign material.

2. Alfalfa Meal is the product obtained from the grinding of the entire alfalfa hay, without the addition of any alfalfa stems, alfalfa straw or foreign material, or the abstraction of leaves. It must be reasonably free from other crop plants and weeds, and must not contain more than 33 per cent of crude fiber.

3. Alfalfa Leaf Meal is the ground product consisting chiefly of leafy materials separated from alfalfa hay. It must be reasonably free from other crop plants and weeds and must not contain more than 18 per cent of crude fiber.

4. Alfalfa Stem Meal is the ground product remaining after the separation of the leafy material from alfalfa hay or meal. It must be reasonably free from other crop plants and weeds.

ANIMAL PRODUCTS

5. Blood Meal is ground, dried blood.

6. Blood Flour is dried blood, prepared by special processes and reduced to a fine powder.

7. Digester Tankage, Meat Meal Tankage or Feeding Tankage is the residue from animal tissues, exclusive of hoof, horn, manure and stomach contents, except in such traces as might occur unavoidably in good factory practice, especially prepared for feeding purposes by tanking under live steam, or

by dry rendering or a mixture of the products made suitable by drying and grinding. It must not contain more than 10% of phosphoric acid (expressed as P_2O_5). If it bears a name descriptive of its kind, composition or origin, the material must correspond thereto.

8. Digester Tankage with Bone, Meat and Bone Meal Digester Tankage, Meat and Bone Meal Tankage, or Feeding Tankage with Bone is the residue from animal tissues exclusive of hoof, horn, manure and stomach contents, except in such traces as might occur unavoidably in good factory practice, especially prepared for feeding purposes by tanking under live steam or by dry rendering or a mixture of the products made suitable by drying and grinding, and containing more than 10% of phosphoric acid (expressed as P_2O_5). If it bears a name descriptive of its kind, composition or origin, it must correspond thereto.

9. Meat Scrap is the ground, dry-rendered residue from animal tissues exclusive of hoof, horn, manure and stomach contents, except in such traces as might occur unavoidably in good factory practice. When this product contains more than 10 per cent of phosphoric acid (expressed as P_2O_5), it shall be designated Meat and Bone Scrap. If it bears a name descriptive of its kind, composition or origin it must correspond thereto.

10. Raw Bone Meal is the dried, ground product suitable for animal feeding, obtained by cooking in water at atmospheric pressure, undecomposed bone, just enough to remove excess fat and meat. It must not contain less than 23 per cent of protein.

11. Steamed Bone Meal is the dried, ground product suitable for animal feeding obtained by cooking bones with steam under pressure.

12. Special Steamed Bone Meal is the dried, ground product suitable for animal feeding obtained by cooking dried bone after the removal of grease and meat fiber with steam under pressure in the process of obtaining gelatin or glue.

APPLE PRODUCTS

13. Dried Apple Pomace is the sound, dried residue obtained by the removal of cider from apples.

14. Dried Apple Pectin Pulp is the sound, dried residue obtained by the removal of pectin from apple products.

BARLEY PRODUCTS

15. Barley Hulls is the product consisting of the outer coverings of the barley.

16. Barley Feed is the entire by-product resulting from the manufacture of pearl barley from clean barley.

17. Barley Mixed Feed is the entire offal from the milling of barley flour from clean barley and is composed of barley hulls and barley middlings.

18. Ground Barley is the entire product obtained by grinding clean, sound barley, containing not less than 90 per cent of pure barley and not more than 10 per cent of other grains, weed seeds and other foreign material and not more than 6 percent of crude fiber; provided that no portion of this stated 10 percent of other grains, weed seeds or other foreign material shall be intentionally added.

19. Mixed Feed Barley is the entire product obtained by grinding country run barley containing not less than 75 percent of pure barley and not more than 25 per cent of other grains, weed seeds and other foreign material; provided that no portion of this stated 25 percent of other grains, weed seeds or foreign material shall be intentionally added. The ingredients must be stated as barley, other grains, weed seeds and foreign material.

BEET PRODUCTS

20. Dried Beet Pulp is the dried residue from sugar beets which have been cleaned and freed from crowns, leaves and sand, and from which the sugar has been extracted.

BREWERS' AND DISTILLERS' PRODUCTS

21. Brewers' Dried Grains is the dried residue obtained in the manufacture of beer.

22. Distillers' Corn Dried Grains or Distillers' Rye Dried Grains is the dried residue obtained in the manufacture of alcohol and distilled liquors. The product must bear the designation indicating the cereal predominating.

23. Distillers' Corn Solubles is a by-product from the manufacture of alcohol from corn solids obtained by the evaporation of mash liquor after the removal of the alcohol and wet grains.

24. Distillers' Rye Solubles is a by-product from the manufacture of alcohol from rye solids obtained by the evaporation of mash liquor after the removal of the alcohol and wet grains.

25. Distillers' Corn and Rye Solubles is a by-product from the manufacture of alcohol from corn and rye solids obtained by the evaporation of mash liquor after the removal of the alcohol and wet grains.

26. Malt Sprouts are the sprouts of the barley grain obtained from malted barley. Sprouts derived from any other malted cereal must be designated by the name of that cereal.

27. Yeast Dried Grains or Vinegar Dried Grains is the properly dried residue from the mixture of cereals, malt and malt sprouts (sometimes cottonseed meal) obtained in the manufacture of yeast or vinegar, and consists of corn or corn and rye from which most of the starch has been extracted, together with malt added during the manufacturing process to change the starch to sugars and malt sprouts (sometimes cottonseed meal) added during the manufacturing process to aid in filtering the residue from the wort and to serve as a source of food supply for the yeast.

BUCKWHEAT PRODUCTS

28. Buckwheat Shorts or Buckwheat Middlings are the portions of the buckwheat grain immediately inside the hull secured after separation from the flour.

CHOP

29. Chop is a ground or chopped feed composed of one or more different cereals or by-products thereof. If it bears a name descriptive of the kind of cereals, it must be made exclusively of the entire grains of those cereals.

COCOANUT PRODUCTS

30. ..... Percent Protein Cocoanut Oil Meal or ..... Percent Protein Copra Oil Meal is the ground residue from the extraction of part of the oil from the dried meat of the cocoanut.

CORN PRODUCTS

31. Corn Meal (Feeding) is finely ground, unbolted corn.

32. Corn Bran is the outer coating of the corn kernel, with little or none of the starchy part or germ.

33. Corn Feed Meal is the fine siftings obtained in the manufacture of screened corn chop, screened ground corn or screened cracked corn, with or without its aspiration products added.

34. Corn Chop, Ground Corn or Cracked Corn is the entire product made by grinding, cutting or chopping the grains of sound Indian corn, and may be fine, medium or coarse, and must not contain more than 4 percent of foreign material.

35. Screened Corn Chop, Screened Ground Corn, or Screened Cracked Corn is the coarse portion of corn chop, ground corn or cracked corn from which most of the fine particles have been removed and must not contain more than 4 percent of foreign material.

36. Corn Grits or Hominy Grits is the product consisting of the fine or medium sized, hard, flinty portion of sound Indian corn, containing little or none of the bran or germ.

37. Ear Corn Chops is corn and cob chopped, without the husk, with no greater proportion of cob than occurs in the ear corn in its natural state.

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

39. Corn Gluten Feed is that part of commercial shelled corn that remains after the separation of the larger part of the starch and the germ by the processes employed in the manufacture of corn starch. It may or may not contain corn solubles.

40. Maltose Process Corn Gluten Feed is the dried residue from degermed corn, after removal of starch in the manufacture of malt syrup.

41. Hominy Feed, Hominy Meal or Hominy Chop is the 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 cornmeal by the degerming process.

42. Yellow Hominy Feed, Yellow Hominy Meal or Yellow Hominy Chop is the 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 yellow corn kernel obtained in the manufacture of yellow hominy grits and yellow corn meal by the degerming process.

43. Corn Oil Cake consists of the corn germ from which part of the oil has been pressed and is the product obtained in the wet milling process of manufacture of corn starch, corn syrup, and other corn products.

44. Corn Oil Meal is ground corn oil cake.

45. Corn Germ Cake consists of corn germ with other parts of the corn kernel from which part of the oil has been pressed, and is the product obtained in the dry milling process of manufacture of corn meal, corn grits, hominy feed, and other corn products.

46. Corn Germ Meal is ground corn germ cake.

47. Corn Screenings is the product consisting of the small light grains of corn, parts of grains of corn and/or other cereals, and other materials having feeding value, obtained by screening shelled corn, excluding sand, dirt and other similar inert materials.

COTTONSEED PRODUCTS

48. Cottonseed Meal is a product of the cottonseed only, composed principally of the kernel with such portion of the hull as is necessary in the manufacture of oil; provided that nothing shall be recognized as cottonseed meal that does not conform to the foregoing definition and that does not contain at least 34 per cent of protein. Cottonseed meal shall be graded and classed as follows:

49. .....Percent Protein Cottonseed Meal, Prime Quality. Cottonseed meal, prime quality, must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellowish, not brown or reddish, free from excesive lint, and shall contain not less than 36 per cent of protein. It must be designated and sold according to its protein content. Cottonseed meal with 36 percent of protein must be termed "36 percent Protein Cottonseed Meal, Prime Quality", and higher grades similarly designated as ("43 per cent Protein Cottonseed Meal, Prime Quality"), etc.

50. .....Percent Protein Cottonseed Meal, Off Quality. Cottonseed meal not fulfilling the above requirement as to color, odor and texture must be graded "36 percent Protein Cottonseed Meal, Off Quality", and higher grades similar designated.

51. Cottonseed Feed is a mixture of cottonseed meal and cottonseed hulls, containing less than 36 percent of protein.

52. .....Percent Protein Whole Pressed Cottonseed, Prime Quality, is the product resulting from subjecting the whole, sound, mature, clean undecorticated cottonseed to pressure for the extraction of oil, and includes the entire cottonseed less the oil extracted and the lint removed. It must be designated and sold according to its protein content.

53. .....Percent Protein Ground Whole Pressed Cottonseed, Prime Quality, is whole pressed cottonseed, ground. It must be designated and sold according to its protein content.

GARBAGE

54. Processed Garbage is composed of dried animal and vegetable waste from garbage collected sufficiently often that harmful decomposition has not set in, and separated from materials such as crockery and glass. Its odor must not be suggestive of the presence of decomposition and it must contain less than one percent of glass. None of it shall contain knife-like or needle-like particles, and the maximum percentage of glass should be stated on the label when present in excess of one-fifth of one percent.

IVORY NUT PRODUCTS

55. Ivory Nut Meal is the ground waste material resulting from the manufacture of buttons and similar articles from the vegetable ivory nut.

LINSEED AND FLAX PRODUCTS

56. .....Percent Protein Linseed Cake or Linseed Meal is the product obtained in the removal of the oil from flaxseed; provided that the final product contains less than 6 percent of weed seeds and other foreign materials; and provided, further, that no portion of the stated 6 percent of weed seeds and other foreign materials shall be deliberately added. It shall not contain more than 0.5 percent of acid-insoluble ash.

57. .....Percent Protein Old Process Oil Meal or .....Percent Protein Old Process Linseed Meal is oil meal as defined below, produced by crushing, cooking and hydraulic pressure.

58. .....Percent Protein New Process Oil Meal or .....Percent Protein New Process Linseed Meal is oil meal as defined below, produced by crushing, heating and the use of solvents.

59. 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 seeds, and the cortical tissues of the stem.

60. Ground Flaxseed or Flaxseed Meal is the product obtained by grinding flaxseed which has been screened and cleaned of weed seeds and other foreign materials by the most improved commercial process; the final product must contain less than 4 percent of weed seeds and other foreign materials, and no portion of the stated 4 percent of weed seeds and other foreign materials shall be intentionally added.

61. Unscreened Flaxseed Oil Feed Cake is the product obtained by extraction of part of the oil from unscreened flaxseed by crushing, cooking and hydraulic pressure, or by crushing, heating and the use of solvents. The ingredients must be stated as "partially extracted flaxseed and foreign seeds (wheat, wild buckwheat, pigeon grass, wild mustard, etc.)".

62. Ground Unscreened Flaxseed Oil Feed is the ground unscreened flaxseed oil feed cake.

63. Screenings Oil Feed is the ground product obtained after extraction of part of the oil by crushing, cooking and hydraulic pressure, or by crushing, heating and the use of solvents, from the smaller imperfect flaxseed, weed seeds and other foreign materials having feeding value, separated in cleaning flaxseed. The name of the grain from which the screenings are separated must be prefixed to "screenings oil feed."

64. .....Percent Protein Oil Cake is the product obtained after the extraction of part of the oil by crushing, cooking, and hydraulic pressure, or by crushing, heating and the use of solvents, from flaxseed which have been screened and cleaned of weed seeds and other foreign materials by the most improved commercial process. When used alone the term "Oil Cake" shall be understood to designate linseed cake as defined. When used to cover any other products the name of the seed from which it is obtained must be prefixed to the words "Oil Cake."

65. .....Percent Protein Oil Meal or..... Percent Protein Ground Oil Cake is oil cake ground to a meal.

MARINE PRODUCTS

66. Fish Meal (Feeding) is clean, dried, ground tissues of undecomposed whole fish and/or fish cuttings with or without the extraction of part of the oil, and contains not more than 3 percent of salt (NaCl). If it contains more than 3 percent of salt (NaCl) the amount of salt must constitute a part of the brand name, provided that in no case shall the salt content of this product exceed 7 percent.

67. Fish Residue Meal (Feeding) is the clean, dried, undecomposed residue from the manufacture of glue from non-oily fish, and contains not more than 3 percent of salt (NaCl). If it contains more than 3 percent of salt (NaCl) the amount of salt must constitute a part of the brand name, provided that in no case shall the salt content of this product exceed 7 percent.

68. Crab Meal (Feeding) is prepared from the undecomposed dried waste of the crab industry and contains the shell, viscera and part or all of the flesh. It contains not less than 25 percent of protein and not more than 3 percent of salt (NaCl). If it contains more than 3 percent of salt (NaCl) the amount of salt must constitute a part of the brand name, provided that in no case shall the salt content of this product exceed 7 percent.

69. Shrimp Meal (Feeding) is prepared from the undecomposed dried waste of the shrimp industry and contains the heads, hull and/or the whole shrimp and not more than 3 percent of salt (NaCl). If it contains more than 3 percent of salt (NaCl) the amount of salt must constitute a part of the brand name, provided that in no case shall the salt content of this product exceed 7 percent.

70. Whale Meal (Feeding) is prepared from the clean, dried undecomposed flesh of the whale, after part of the oil has been extracted. It contains not more than 3 percent of salt (NaCl). If it contains more than 3 percent of salt (NaCl)

the amount of salt must constitute a part of the brand name, provided that in no case shall the salt content of this product exceed 7 percent.

71. Cod Liver Oil is the product obtained by extraction of part of the oil from cod livers.

72. Sardine Oil or Pilchard Oil is the product obtained by extraction of part of the oil from the whole Pacific sardine or pilchard or from cannery refuse of this species of fish.

73. Salmon Oil is the product obtained by extraction of part of the oil from the cannery refuse of salmon.

74. Tuna Oil is the product obtained by extraction of part of the oil from the cannery refuse of tuna.

75. Menhaden Oil is the product obtained by extraction of part of the oil from the whole Menhaden.

76. Herring Oil is the product obtained by extraction of part of the oil from the whole herring or part of the herring.

77. Salmon Liver Oil is the product obtained by extraction of part of the oil from Salmon livers.

MILK PRODUCTS

78. Dried Buttermilk (Feeding) is the product resulting from the removal of water from clean, sound buttermilk derived from natural cream to which no foreign substances have been added, excepting such as are necessary and permitted in the manufacture of butter. It contains not more than 8 percent of moisture, not more than 13 percent of mineral matter (ash) and not less than 5 percent of butterfat as determined by the Roese-Gottlieb method.

79. Evaporated Buttermilk (Feeding), Concentrated Buttermilk (Feeding) or Condensed Buttermilk (Feeding) is the product resulting from the removal of a considerable portion of water from clean, sound buttermilk derived from natural cream to which no foreign substances have been added excepting such as are permitted and necessary in the manufacture of butter. It contains not less than 27 percent of total solids, not less than 2 percent of butterfat, and not more than .14 percent of ash

for each percent of solids. This definition does not prohibit the use of a distinctive trade name, provided it is followed by one of the names given.

80. Dried Skimmed Milk (Feeding) is the product resulting from the removal of water from clean, sound skimmed milk. It contains not more than 8 percent of moisture.

81. Dried Soured Skimmed Milk (Feeding) is the product resulting from the removal of water from clean, sound skimmed milk which has been soured by a suitable culture of lactic bacteria. It contains not more than 8 percent of moisture.

82. Evaporated Soured Skimmed Milk (Feeding), Concentrated Soured Skimmed Milk (Feeding) or Condensed Soured Skimmed Milk (Feeding) is the product resulting from the removal of a considerable portion of water from clean, sound skimmed milk which has been soured by a suitable culture of lactic bacteria. It contains not less than 27 percent of total solids.

83. Condensed Skimmed Milk (Feeding) is the product resulting from the removal of a considerable portion of water from clean, sound skimmed milk. It contains not less than 27 percent of total solids.

84. Milk Sugar Feed or Dried Whey (Feeding) is the by-product from the manufacture of cheese and should contain at least 70 percent of lactose (milk sugar).

OAT PRODUCTS

86. Oat Hulls is the product consisting of the outer covering of the oat.

87. Oat Middlings is the product consisting of the floury portions of the oat groat obtained in the milling of rolled oats.

88. Oat Shorts is the product consisting of the covering of the oat grain lying immediately inside the hull, being a fuzzy material carrying with it considerable portions of the fine, floury part of the groat, obtained in the milling of rolled oats.

89. Oat Chop, Ground Oats, Pulverized Oats, Crushed Oats, or Crimped Oats consists of the entire product made by chopping, cutting, grinding, crushing, or crimping whole oats.

90. Oat Groats are the kernels produced from cleaned and dried oats in the process of manufacturing oat meal.

91. Hulled Oats, or Undried Oat Groats are the kernels produced from the undried grain in the process of hulling oats.

92. Oat Meal, or Ground Oat Groats is the product produced by cutting, cracking or grinding oat groats.

93. Rolled Oat Groats or Rolled Oats is the product obtained in the process of rolling oat groats.

94. Clipped Oat By-Product is the by-product obtained in the manufacture of clipped oats. It may contain the light, chaffy material broken from the end of the hulls, empty hulls, light immature oats and dust. It must not contain an excessive amount of oat hulls.

95. Oat Mill Feed (Oat Hulls, Oat Shorts and Oat Middlings) is the entire by-product produced in the manufacture of Oat Groats and consists of oat hulls, oat shorts and oat middlings. If used in a mixed feed, it shall be called Oat Mill Feed (Oat Hulls, Oat Shorts and Oat Middlings).

PALM PRODUCTS

96. Palm Kernel Oil Meal is the ground residue from the extraction of part of the oil by pressure or solvents from the kernel of the fruit of Elaeis guineensis or Elaeis melanococca.

PEANUT PRODUCTS

97. .....Percent Protein Peanut Oil Cake is the residue after the extraction of part of the oil by pressure or solvents from peanut kernels.

98. .....Percent Protein Peanut Oil Meal is ground peanut oil cake.

99. Unhulled Peanut Oil Feed is the ground residue obtained after extraction of part of the oil from whole peanuts, and the ingredients must be designated as Peanut Meal and Hulls.

RICE PRODUCTS

100. Rice Bran is the pericarp or bran layer of the rice, with only such quantity of hull fragments as is unavoidable in the regular milling of rice.

101. Rice Hulls is the product consisting of the outer coverings of the rice.

102. Rice Polish is the finely powdered material obtained in polishing the kernel.

103. Rice meal is ground brown rice or ground rice after the hull has been removed.

104. Ground Rough Rice is ground rice from which the hull has not been removed, or ground paddy rice.

105. Rice Stone Bran is the siftings from the materials secured in removing hulls from rice and contains rice germs, broken rice and some rice hulls.

106. Rice Huller Bran is a product secured by the huller and cones from brown rice and consists mostly of the bran and germs.

RYE PRODUCTS

107. Rye Bran is the coarse outer covering of the rye kernel as separated from the cleaned and scoured rye.

108. Rye Feed is a by-product obtained in the usual process of the milling of rye flour from cleaned and scoured rye grain, consisting principally of the mill-run of the outer covering of the rye grain and the germ, with small quantities of flour and aleurone.

109. Rye Red Dog is a by-product obtained in the usual process of the milling of rye flour, consisting principally of aleurone with small quantities of flour and fine bran particles and must not contain more than 3.5 percent of crude fiber.

110. Rye Low-Grade Feed Flour consists principally of dark rye flour and small quantities of aleurone and fine bran particles and must not contain more than 1.5 percent of crude fiber.

111. Rye Middlings consists of rye feed and rye red dog combined in the proportions obtained in the usual process of milling rye flour.

112. Rye Flour Middlings consist of rye feed, rye red dog and pure dark rye flour combined in the proportions obtained in the milling of rye flour and must not contain more than 5 per-cent of crude fiber.

SORGHUM PRODUCTS

113. Head Chops is the product consisting of the entire heads of the grain sorghums chopped, and should bear the name of the sorghum from which it is made. This includes, among others, kaffir head chops, milo head chops, feterita head chops, and sorghum head chops.

114. Head Stems is the product consisting of the stems from the heads of the grain sorghums after the grain has been removed, and should bear the name of the sorghum from which it is made.

SOYBEAN PRODUCTS

115. Ground Soybeans is the product obtained by grinding whole soybeans without cooking or removing any of the oil.

116. .....Percent Protein Soybean Oil Cake or Soybean Oil Chips is the product obtained by crushing, cooking and removing part of the oil from soybeans.

117. .....Percent Protein Soybean Oil Meal is ground soybean oil cake or ground soybean oil chips.

VELVET BEAN PRODUCTS

118. Velvet Bean Meal is ground velvet beans containing only an unavoidable trace of hulls or pods.

119. Ground Velvet Bean and Pod is the product derived by grinding velvet beans with the pod. It contains no additional pods or other materials.

WHEAT PRODUCTS

120. Wheat Bran is the coarse outer covering of the wheat knernel as separated from cleaned and scoured wheat in the usual process of commercial milling.

121. Standard Middlings consists mostly of fine particles of bran, germ, and very little of the fibrous offal obtained from the "tail of the mill." This product must be obtained in the usual commercial process of milling and must not contain more than 9.5 percent of crude fiber.

122. Flour Middlings shall consist of standard middlings and red dog flour combined in the proportions obtained in the usual process of milling and must not contain more than 6.0 percent of crude fiber.

123. Wheat Red Dog is a by-product obtained in the usual commercial process of flour milling, consisting principally of aleurone with small quantities of flour and fine bran particles and must not contain more than 4.0 percent of crude fiber.

124. Wheat Low-Grade Feed Flour is a by-product obtained in the usual commercial process of flour milling, consisting principally of flour with small quantities of aleurone and fine bran particles and must not contain more than 1.5 percent of crude fiber.

125. Wheat Bran and Standard Middlings consists of the two commodities as defined above, mixed in the proportions obtained in the usual process of commercial milling.

126. Hard Wheat Mixed Feed (mill-run wheat feed) consists of pure wheat bran and flour middlings combined in the proportions obtained in the usual process of commercial milling. This product must not contain more than 9.5 percent of crude fiber.

127. Brown Shorts (Red Shorts) consists mostly of the fine particles of bran, germ and very little of the fibrous offal obtained from the "tail of the mill." This product must be obtained in the usual commercial process of milling and must not contain more than 7.5 per cent of crude fiber.

128. Gray Shorts (Gray Middlings or Total Shorts) consists of the fine particles of the outer bran, the inner bran or bee-wing bran, the germ and the offal or fibrous materials obtained from the "tail of the mill." This product must be obtained in the usual process of commercial milling and must not contain more than 6.0 percent of crude fiber.

129. White Shorts or White Middlings consists of a small portion of the fine bran particles and the germ and a large portion of the fibrous offal obtained from the "tail of the mill." This product must be obtained in the usual process of flour milling and must not contain more than 3.5 percent of crude fiber.

130. Wheat Mixed Feed (Mill-run wheat feed) consists of pure wheat bran and the gray or total shorts combined in the proportions obtained in the usual process of commercial milling. This product must not contain more than 8.5 percent of crude fiber.

131. Screenings consists of the smaller imperfect grains, weed seeds, and other foreign materials, having feed value, separated in cleaning the grain.

132. Scouring consists of such portions of the cuticle, brush, white caps, dust, smut and other materials as are separated from the grain in the usual commercial process of scouring.

(NOTE) If to any of the wheat or rye by-product feeds there should be added screenings or scourings—as above defined either ground or unground, bolted or unbolted, such brand shall be so registered, labeled and sold as clearly to indicate this fact. The word "Screenings" or "Scourings" as the case may be, shall appear as part of the name or brand and shall be printed in the same size and face type as the remainder of the brand name. When the word "Screenings" appears it is not necesary to show also on the labeling the word "Scourings."

TABLE 1. Average Composition of the More Common Feedstuffs.

FEEDSTUFF	Pounds in 100					
	Water	Ash	Protein	Fat	Carbohydrates	
					Fiber	N. F. Extract
Alfalfa leaf meal	6.5	12.0	21.0	3.5	16.0	40.5
Alfalfa meal	8.8	9.0	14.3	2.0	30.1	35.8
Barley	9.3	2.7	11.5	2.1	4.6	69.8
Beet pulp, dried	8.0	3.5	8.9	0.9	18.9	59.8
Blood, dried	9.7	3.3	82.3	0.9	.....	3.8
Bone meal, raw	7.3	61.7	24.3	3.1	.....	3.6
Brewers' dried grains	8.2	3.8	25.0	6.4	15.0	41.5
Buckwheat	12.1	2.1	10.8	2.5	10.3	62.2
Buttermilk, dried	4.5	8.1	34.6	5.5	.....	52.7
Buttermilk, semi-solid	65.0	2.7	13.4	3.0	.....	15.9
Corn	10.8	1.5	9.5	4.1	2.0	71.7
Corn-and-cob meal	10.4	1.5	8.5	4.1	7.9	67.6
Crushed ear corn with husks	11.0	1.8	7.5	3.0	7.8	68.9
Corn chop	10.5	1.5	8.3	3.5	1.4	75.5
Corn feed meal	10.5	1.5	9.4	4.5	2.7	71.1
Corn gluten feed	8.7	2.1	25.4	3.8	7.1	52.9
Corn gluten meal	9.1	1.1	35.5	4.7	2.1	47.5
Cottonseed meal 43%	7.5	6.2	43.0	7.2	9.7	26.4
Cottonseed meal 41%	7.5	6.2	41.0	7.3	10.7	27.1
Cottonseed meal 38½%	7.5	6.4	38.5	7.7	13.4	26.3
Cottonseed feed 36%	7.5	6.6	36.0	7.4	15.3	26.6
Cowpeas (seed)	11.6	3.4	23.6	1.5	4.1	55.8
Distillers' dried grains (chiefly corn)	6.6	2.6	30.7	12.2	11.6	36.3
Flaxseed	9.2	4.3	22.6	33.7	7.1	23.2
Hominy meal, feed or chop	10.1	2.6	11.3	9.3	5.5	61.2
Kafir corn	11.8	1.7	11.1	3.0	2.3	70.1
Lespedeza (seed)	8.9	4.9	41.0	7.4	8.9	28.9
Linseed oil meal (new process)	9.6	5.6	36.9	2.9	8.7	36.3
Linseed oil meal (old process) 34%	9.1	5.4	34.0	7.5	8.4	35.7
Malt sprouts	7.6	6.1	26.4	1.5	12.6	45.6
Meat scrap 50%	8.0	6.5	50.0	10.5	7.5	2.6
Meat and bone meal	7.0	35.4	45.0	4.1	8.5	.....
Millet seed	9.1	3.3	11.8	3.3	7.8	64.7
Molasses (beet)	22.0	7.0	9.0	.....	.....	62.0
Molasses (cane)	25.7	6.1	3.2	.....	.....	65.0
Oats	10.4	3.4	11.5	4.6	11.0	60.9
Oat kernels	6.9	2.2	14.3	8.1	1.4	67.1
Peanut oil meal	6.6	4.8	44.8	10.2	7.6	26.0
Rice bran	10.0	9.5	12.0	10.0	12.0	47.5
Rye	9.4	2.0	11.8	1.8	1.8	73.2
Skimmilk, dried	4.0	8.1	35.0	1.3	.....	51.6
Sorghum grains	12.7	1.9	9.2	3.4	2.0	70.8
Soybeans (seed)	9.9	5.3	36.5	17.5	4.3	26.5

TABLE 1.—Continued.

FEEDSTUFF	Pounds in 100					
	Water	Ash	Protein	Fat	Carbohydrates	
					Fiber	N. F. Extract
Soybean meal 43%	10.5	4.9	43.0	6.6	5.3	29.5
Sunflower seed	6.9	3.1	16.1	24.7	27.9	21.3
Tankage 60%	7.9	15.3	60.0	7.0	1.4	6.8
Tankage 50%	8.3	21.8	50.0	11.7	1.5	6.8
Wheat	10.2	1.9	12.4	2.1	2.2	71.2
Wheat bran	10.1	6.3	15.4	4.7	9.1	54.4
Mixed wheat feed	10.1	5.2	16.2	4.4	8.3	56.9
Wheat middlings, brown	10.3	5.4	16.9	4.5	7.3	56.1
Wheat middlings, gray	10.5	4.4	16.7	4.6	5.8	58.4
Wheat flour middlings	10.7	3.7	17.8	5.0	4.0	58.1
Wheat flour, red dog	11.0	1.5	14.1	3.2	2.0	68.2
Wheat flour, patent	12.3	0.5	10.9	1.3	0.4	74.6
Roughages						
Alfalfa hay	8.6	8.6	13.5	2.3	29.7	37.3
Clover, red	12.9	7.1	12.8	3.1	25.5	38.7
Corn stover (ears removed)	9.4	5.8	5.9	1.6	30.7	46.6
Cowpea hay	9.9	11.9	19.3	2.6	22.5	34.0
Lespedeza	7.9	7.1	13.7	2.1	27.8	41.4
Soybean hay	8.6	8.6	16.0	2.8	24.9	39.1
Timothy hay	11.6	4.9	6.2	2.5	29.8	45.0
Fillers						
Alfalfa stem meal	5.6	4.9	6.3	0.9	54.4	27.9
Buckwheat hulls	10.3	2.1	4.4	1.0	43.7	38.5
Corn bran	10.0	2.4	9.7	5.7	9.8	62.4
Corn cob	10.0	1.5	2.0	0.4	31.8	54.3
Cottonseed hulls	9.7	2.7	4.6	1.9	43.8	37.3
Flax screenings	8.8	8.2	15.4	11.8	15.5	40.5
Grain screenings*	.....	.....	.....	.....	.....	.....
Oat hulls and oat shorts	7.5	5.0	6.0	2.1	26.5	52.9
Oat hulls	6.8	6.0	4.0	1.7	29.2	52.3
Peanut hulls	9.1	5.5	7.3	2.6	56.6	18.9
Rice hulls	9.3	16.9	3.3	1.1	35.4	34.0
Screenings, refuse, floor sweepings, grain dust**	.....	.....	.....	.....	.....	.....
Velvet-bean hulls	13.2	6.1	11.6	1.9	24.5	42.7
Wheat chaff	14.4	7.2	4.2	1.4	28.0	44.8
Wheat screenings	10.2	3.9	13.3	4.1	7.4	61.1

* Varies in quality from fair to poor.
** Vary in quality from poor to worthless and even dangerous.

TABLE 2. Average Digestibility of the Nutrients in Common Feedstuffs.

(Taken from "Feeds and Feeding," by Henry and Morrison. This table is copyrighted and is quoted by permission of the publishers.)

FEEDSTUFF	Crude Protein Percent	Fat Percent	Carbohydrates	
			Fiber Percent	Nitrogen-free Extract Percent
Alfalfa	71	38	43	72
Barley	78	78	56	92
Beet pulp, dried	52	.....	83	83
Blood, dried	84	.....	.....	.....
Blood meal, raw	92	97	.....	.....
Brewers' grain, dried	81	89	49	57
Buckwheat	75	100	24	76
Buttermilk, dried	85	49	.....	81
Clover, red	59	57	54	66
Corn, whole, ground	74	93	57	94
Corn-and-cob meal	52	84	45	88
Corn gluten feed	85	85	76	88
Corn gluten meal	85	93	55	90
Corn stover	37	62	66	59
Cottonseed feed	58	90	45	61
Cottonseed meal, choice and prime	84	95	37	75
Cowpea seed	87	74	64	93
Cowpea hay	68	39	47	68
Distillers' dried grains	73	95	95	81
Flaxseed	91	86	60	55
Hominy feed or meal	66	91	76	90
Kafir corn	81	77	55	92
Linseed meal (new process)	86	95	73	87
Linseed meal (old process)	89	89	57	78
Malt sprouts	77	85	87	80
Meat scrap	93	98	.....	.....
Meat and bone meal	85	.....	.....	.....
Millet seed	59	80	41	84
Molasses, cane	32	.....	.....	90
Oats	78	87	35	81
Peanut cake from hulled nuts	90	90	9	84
Rice bran	65	77	25	79
Rye, ground	84	64	.....	92
Skimmilk, dried	94	98	.....	98
Soybeans, ground	91	92	75	81
Soybean oil meal	92	68	99	100
Sunflower seed	84	82	.....	.....
Tankage (with swine)	71	100	.....	100
Wheat, ground	74	72	59	93
Wheat bran	78	68	31	72
Wheat mixed feed	77	87	36	76
Wheat middlings or shorts	88	86	36	88
Wheat red dog flour	80	70	60	83
Wheat flour, patent	74	69	.....	.....

TABLE 2.—Continued.

FEEDSTUFF	Crude Protein Percent	Fat Percent	Carbohydrates	
			Fiber Percent	Nitrogen-free Extract Percent
Roughages				
Alfalfa	71	38	43	72
Clover, red	59	57	54	66
Corn stover	37	62	66	59
Cowpea hay	68	39	47	68
Lespedeza hay	63	55	.....	.....
Soybean hay	73	44	57	64
Timothy hay	48	50	50	62
Fillers				
Alfalfa stems*	.....	.....	.....	.....
Buckwheat hulls	9	10	.....	62
Corn bran	60	80	71	80
Corn cob	19	50	60	52
Cottonseed hulls	6	79	47	34
Grain screenings*	.....	.....	.....	.....
Oat hulls and oat middlings	75	78	42	46
Peanut hulls	6	80	.....	.....
Rice hulls	10	67	1	35
Screenings refuse, floor sweepings, grain dust*	.....	.....	.....	.....
Wheat chaff	26	43	39	33

* Low in digestibility.

TABLE 3. Average Digestible Nutrients of Feedstuffs.

FEEDSTUFF	Pounds in 100					
	Protein	Fat	Carbohydrates: Fiber	Carbohydrates: Nitrogen-free Extract	Nutritive Ratio	Net energy per 100 lbs. for ruminants. Therms.
Alfalfa leaf meal	17.3	3.0	10.0	25.9	1: 2.4	.....
Alfalfa meal	9.9	0.6	12.9	28.4	1: 4.3	34.2
Barley meal	10.1	1.5	3.4	64.0	1: 7.0	89.9
Barley feed	8.5	2.2	4.1	54.3	1: 7.4	.....
Blood, dried	59.0	.....	.....	3.5	1: 0.1	68.1
Brewers' dried grains	23.1	5.2	6.7	12.2	1: 1.8	53.4
Buckwheat	8.1	2.5	3.0	45.3	1: 6.6	59.7
Buckwheat feed	9.9	3.1	7.8	31.0	1: 4.6	.....
Buckwheat middlings	23.4	6.2	1.9	35.7	1: 2.0	72.2
Cocoanut meal	18.5	9.0	2.0	42.9	1: 3.5	83.5
Corn, ground	7.1	4.0	1.1	70.4	1: 10.4	85.5
Corn bran	6.0	4.4	8.1	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	16.5	10.1	5.6	37.8	1: 3.9	83.9
Corn gluten feed	21.2	3.0	5.4	46.6	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	21.3	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
Cowpea seed	18.0	1.1	2.6	51.1	1: 3.2	79.5
Flaxseed	20.6	29.0	4.3	13.0	1: 3.7	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)	30.3	6.7	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	3.8	3.9	48.8	1: 7.3	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	6.7	0.4	17.5	1: 0.1	93.6
Peanut oil meal, 38½%	34.6	7.1	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

TABLE 3.—Continued.

FEEDSTUFF	Pounds in 100					
	Protein	Fat	Carbohydrates: Fiber	Carbohydrates: Nitrogen-free Extract	Nutritive Ratio	Net energy per 100 lbs. for ruminants. Therms.
Rice polish	8.0	7.0	0.5	56.3	1: 9.1	77.7
Rye	9.5	1.3	.....	60.7	1: 7.2	93.7
Rye mixed feed	11.7	4.2	.....	55.9	1: 5.4	.....
Rye middlings	12.6	3.1	.....	55.5	1: 4.5	.....
Soybean meal	40.0	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%	42.6	9.2	.....	.....	1: 0.4	93.0
Tankage, digester, 50%	35.5	9.0	.....	.....	1: 0.4	73.0
Velvet-bean feed	14.9	3.8	13.0	34.5	1: 3.8	.....
Wheat	8.8	1.5	1.6	66.5	1: 7.8	91.8
Wheat bran	11.7	2.6	2.5	40.4	1: 4.0	53.0
Wheat middlings and shorts	14.5	3.9	1.8	51.8	1: 4.4	59.1
Wheat mixed feed	12.5	3.9	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	1.9	.....	46.3	1: 6.1	.....
Hays						
Alfalfa hay	10.3	0.6	12.9	27.4	1: 4.3	34.2
Alfalfa stem meal	1.8	0.4	8.5	38.4	1: 26.6	.....
Clover hay (red)	7.6	1.8	13.8	25.4	1: 5.7	38.7
Cowpea hay	13.1	1.0	8.9	24.8	1: 2.7	.....
Soybean 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

SUMMARY OF RESULTS OF INSPECTION AND ANALYSIS

Acme-Evans Co., Indianapolis, Ind. Inspection samples analyzed, 6.

Acme Middlings and Screenings, 2; equaled guaranty.
Acme Feed, 2; equaled guaranty.
Acme Hominy Feed 1; equaled guaranty.
Acme 20% Pailfill Dairy Feed 1; equaled guaranty.

The Acme Mills, Hopkinsville, Ky. Inspection samples analyzed, 2.

Pure Wheat Shorts, 1; equaled guaranty.
Shanghi Scratch Feed, 1; equaled guaranty.

Alfocorn Milling Co., St. Louis, Mo. Inspection samples analyzed, 7.

Wishbone Laying Mash, 2; equaled guaranty.
Full Pail 16% Dairy Feed, 1; linseed oil meal, alfalfa meal and brewers dried grains present tho not guaranteed; misbranded.
Alfocorn Milk Maker 24% Protein Dairy Feed, 4; equaled guaranty.

E. T. Allen Co., Atlanta, Ga. Inspection samples of "Empire" 41% Protein Cottonseed Meal analyzed, 4; 3 too low in protein; 1 too high in fiber.

The Allen & Wheeler Co., Troy, O. Inspection samples analyzed, 3.

Trojan Spring Middlings and Screenings, 1; equaled guaranty.
Trojan A-1 Farm Feed, 1; equaled guaranty.
Trojan Egg Mash, 1; equaled guaranty.

Allied Mills, Chicago, Ill. Inspection samples analyzed, 16.

Wayne Broiler Ration, 1; equaled guaranty.
Wayne Poultry Fattener, 1; equaled guaranty.
Wayne All-Mash Chick Starter (With Cod Liver Oil), 1; equaled guaranty.
Wayne Egg Mash, 1; equaled guaranty.
Red Feather Egg Mash, 1; no salt found.
Wayne Turkey Mash, 1; equaled guaranty.
Wayne 26% Mash Supplement, 1; wheat bran present tho not guaranteed; no salt or potassium iodide found.
Sucrene Horse and Mule Feed; 1; equaled guaranty.
"Super Soy Brand" Feed (Supplement), 1; equaled guaranty.
Amco "Ideal Brand" 16% Dairy Ration, 2; 1 ground corn and brewers dried grains present tho not guaranteed.
Wayne "Ideal Brand" 16% Dairy Feed, 1; no potassium iodide found.

Wayne 16½% Dairy Feed, 1; no potassium iodide found.
Wayne 20% Dairy Feed, 1; equaled guaranty.
Wayne 24% Dairy Feed, 2; 1 ground oats present tho not guaranteed, no ground barley or potassium iodide found.

Always-A-Head Mills, E. St. Louis, Ill. Inspection samples analyzed, 2.

Always-A-Head 18% Protein Laying Mash, 1; equaled guaranty.
Do-Mor Horse and Mule Feed, 1; equaled guaranty.

Anderson & Spilman, Danville, Ky. Inspection samples analyzed, 5.

Anderson & Spilman Snowflake Feed, 2; too high in fiber; 1 no corn bran found; 1 only trace of ground barley found.
Economy Egg Mash, 1; equaled guaranty.
Economy 16% Dairy Feed, 1; equaled guaranty.
"Milk Maker" 24% Dairy Feed, 1; equaled guaranty.

Anheuser-Busch, Inc., St. Louis, Mo. Inspection samples analyzed, 2.

Brewers Dried Grains, 1; equaled guaranty.
Anheuser-Busch Brand Corn Gluten Feed, 1; equaled guaranty.

The Ansted & Burk Co., Springfield, O. Inspection samples analyzed, 3.

"William Tell" Middlings and Screenings, 2; 1 too low in protein.
"William Tell" Mixed Wheat Feed and Screenings, 1; too low in protein.

Arcady Farms Milling Co., Chicago, Ill. Inspection samples analyzed, 10.

Arcady All-Mash Chick Starter, 1; salt present tho not guaranteed.
Arcady Besbet Growing Mash, 1; too low in protein.
Wonderfat Station Feed, 1; salt present tho not guaranteed.
Economy Egg Mash, 1; too high in fiber.
Arcady Besbet Laying Mash, 1; no linseed oil meal found; ground oats substituted for oatmeal.
Arcady Dairy Feed, 3; equaled guaranty.
Arco 24% Dairy Ration, 1; equaled guaranty.
Wonder Dairy Ration, 1; equaled guaranty.

Archer-Daniels Midland Co., Minneapolis, Minn. Inspection sample of 34% Pure Old Process Linseed Meal analyzed, 1; equaled guaranty.

Armour & Co., Chicago, Ill., Inspection samples analyzed, 3.
Armour's 50% Meat and Bone Scraps, 2; equaled guaranty.
Armour's 60% Meat Meal Digester Tankage, 1; equaled guaranty.

Ashcraft-Wilkinson Co., Atlanta, Ga. Inspection samples of "Helmet Brand" 41% Cottonseed Meal analyzed, 2; 1 too low in protein.

The Great Atlantic & Pacific Tea Co., New York, N. Y. Inspection samples analyzed, 6.

Daily Growth Chick Starter, 1; equaled guaranty.
Daily Egg Scratch Feed, 1; equaled guaranty.
Special Daily Egg Mash Feed, 1; equaled guaranty.
Daily Milk Dairy Feed 16%, 1; equaled guaranty.
"Milky Way" 20% Dairy Feed, 1; equaled guaranty.
"Milky Way" 24% Dairy Feed, 1; equaled guaranty.

Aubrey & Co., Louisville, Ky. Inspection samples analyzed, 30.

Red "A" Wheat Red Dog, 1; equaled guaranty.
Red "A" Shorts, 1; equaled guaranty.
Red "A" Gray Shorts and Screenings, 2; equaled guaranty.
Aubrey's Wheat Bran and Screenings, 2; equaled guaranty.
Red "A" Wheat Feed and Screenings, 1; equaled guaranty.
Blackhawk Feed and Screenings, 1; equaled guaranty.
Blackhawk Mixed Wheat Feed and Screenings, 1; equaled guaranty.
Pure Soft Wheat Mixed Feed, 1; equaled guaranty.
Rainbow Feed, 1; equaled guaranty.
Rye Feed and Screenings, 1; equaled guaranty.
Feed Meal, 1; equaled guaranty.
Hominy Feed, 2; 1 too high in fiber.
Brewers Grains, 1; equaled guaranty.
Rainbow Poultry Fattening Feed, 1; equaled guaranty.
Rainbow All-Mash, 1; equaled guaranty.
Red Bird Baby Chick Starting Mash With Cod Liver Oil, 1; equaled guaranty.
Supreme Laying Mash With Cod Liver Oil, 2; equaled guaranty.
Supreme 95% Grain Horse Feed, 1; equaled guaranty.
Monarch 16½% Protein Dairy Feed, 4; equaled guaranty.
Dandy 20% Protein Dairy Feed, 1; too low in protein.
Ful-O-Cream Brand 24% Dairy Feed, 1; equaled guaranty.
Supreme 24% Dairy Feed, 2; equaled guaranty.

The Auburn Mills, Auburn, Ky. Inspection sample of Mill Run Feed analyzed, 1; too low in protein; excess corn bran and wheat screenings present.

Auburn Roller Mills, Auburn, Ky. Inspection sample of Mixed Feed analyzed, 1; much too low in protein; excess corn bran present.

J. J. Badenoch Co., Chicago, Ill. Inspection samples analyzed, 4.

Jay Bee Dairy Feed, 2; no linseed oil meal found; 1 too low in protein and fat.
Circle Bee Dairy Feed, 2; 1 no linseed oil meal or bone meal found.

Ballard & Ballard Co., Louisville, Ky. Inspection samples analyzed, 19.

Insurance All-Mash Starting and Growing Feed, 1; equaled guaranty.
Ballard's Insurance Starting Mash (With Cod Liver Oil), 1; equaled guaranty.
Insurance Station Feed, 2; equaled guaranty.
Insurance Egg Mash, 1; equaled guaranty.
Guardian Laying Mash, 1; equaled guaranty.
Insurance College Formula Egg Mash, 2; equaled guaranty.
Ballard's Corn Feed Meal, 1; equaled guaranty.
Ballard's Kentucky Farm Feed and Screenings, 2; equaled guaranty.
Ballard's Mixed Wheat Feed and Screenings, 1; equaled guaranty.
Guardian Horse and Mule Feed, 1; equaled guaranty.
Guardian 16% Sweet Dairy Feed, 2; equaled guaranty.
Insurance 20% Sweet Dairy Feed, 1; equaled guaranty.
Insurance 24% Cow Feed, 1; equaled guaranty.
Guardian 24% Sweet Dairy Feed, 1; equaled guaranty.
Insurance 34% Sweet Dairy Feed, 1; equaled guaranty.

Bardstown Mills, Bardstown, Ky. Inspection samples of Royal Mill Feed analyzed, 4; 1 too low in protein, excess corn bran present; 1 no corn bran found.

Baskett Grain Co., Henderson, Ky. Inspection sample of Baskett Egg Mash analyzed, 1; equaled guaranty.

Baughman Milling Co., Stanford, Ky. Inspection samples of Banner Mill Feed analyzed, 2; 1 too low in protein.

Beaty Bros., Science Hill, Ky. Inspection sample of Mixed Wheat Feed and Screenings analyzed, 1; too low in protein.

Benson Valley Milling Co., Frankfort, Ky. Inspection sample of "Benson Valley" 20% Laying Mash analyzed, 1; equaled guaranty.

W. C. Binns, Herndon, Ky. Inspection sample of Eclipse Hog Feed analyzed, 1; equaled guaranty.

Bisbee Linseed Co., Chicago Hts., Ill. Inspection samples of "Bisbee Brand" 34% Pure Old Process Linseed Meal analyzed, 4; 2 too low in protein.

Blish Milling Co., Seymour, Ind. Inspection samples analyzed, 3.
Woodstock Bran, 1; too low in protein.
Woodstock Shorts and Screenings, 2; equaled guaranty.

Blue Grass-Elmendorf Grain Corporation, Lexington, Ky. Inspection samples analyzed, 6.

"Blue Elm" 41% Cottonseed Meal, 1; equaled guaranty.
"Egg Maker" Laying Mash, 1; equaled guaranty.
"Blue Elm" Peerless Cow Feed, 1; equaled guaranty.
"Lexington" Cow Feed 2; 1 too low in protein and fat.
"Tucky" 24% Dairy Feed, 1; too low in protein.

Bowling Green Sweet Feed Mill Co., Bowling Green, Ky. Inspection sample of "Home Made" Laying Mash analyzed, 1; equaled guaranty.

Chas. Broeker & Co., Owensboro, Ky. Inspection samples analyzed, 2.
Hominy Feed, 1; equaled guaranty.
XX Mixed Feed, 1; equaled guaranty.

Browder Milling Co., Fulton, Ky. Inspection sample of Browder's Bulky Sweet Mixing Feed analyzed, 1; no salt found.

Cadick Milling Co., Grandview, Ind. Inspection sample of Mixed Wheat Feed analyzed, 1; equaled guaranty.

Cairo Meal & Cake Co., Cairo, Ill. Inspection sample of "Miss Cairo Brand" 41% Cottonseed Meal analyzed, 1; equaled guaranty.

Campbellsville Milling Co., Campbellsville, Ky. Inspection samples of Mixed Wheat Feed and Screenings analyzed, 2; 1 corn feed meal present.

Cape County Milling Co., Jackson, Mo. Inspection sample of Capco Soft Wheat Bran analyzed, 1; equaled guaranty.

Carey & Kays, Willisburg, Ky. Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

Carlisle Mill & Supply Co., Carlisle, Ky. Inspection sample of Old Kentucky Mill Feed analyzed, 1; corn bran present tho not guaranteed.

The Carr Milling Co., Hamilton, O. Inspection samples analyzed, 2.

"Bon Ton" Middlings, 1; equaled guaranty.
"Bon Ton' Bran, 1; equaled guaranty.

Cecilian Milling Co., Cecilia, Ky. Inspection samples analyzed, 4.

Clifton Laying Mash, 1; too low in protein.
"Purity Brand" Mixed Wheat Feed and Screenings, 1; equaled guaranty.
Gray Wheat Shorts and Rye Middlings, 2; 1 too low in protein, corn bran and wheat screenings present.

The Chapman-Doake Co., Decatur, Ill. Inspection samples analyzed, 4.
Hominy Feed, 2; equaled guaranty.
Diamond "F" Feed Meal, 1; equaled guaranty.
Diamond Mill Feed, 1; equaled guaranty.

Charleston Milling & Produce Co., Charleston, W. Va. Inspection samples analyzed, 4.

Wheat Middlings and Screenings, 1; equaled guaranty.
Rye Middlings, 1; too high in fiber.
Blue Bar White Feed, 1; no ground barley found.
Charmco 24% Dairy Feed, 1; too low in fat; linseed oil meal present tho not guaranteed.

Cherokee Mills, Nashville, Tenn. Inspection sample of Tip-Top Mixed Feed analyzed, 1; too low in fat; no wheat bran, ground corn or corn gluten feed found; salt present tho not guaranteed; misbranded.

B. C. Chinn, Paris, Ky. Inspection sample of Farmers 24% Dairy Feed analyzed, 1; equaled guaranty.

The Cincinnati Grain & Hay Co., Cincinnati, O. Inspection samples analyzed, 9.

Malted Barley, 1; much too low in protein and fat.
41% Cottonseed Meal, 1; equaled guaranty.
"No Better" Baby Chick Feed, 1; oat groats present tho not guaranteed; no barley found.
"No Better" Egg Mash, 1; no linseed oil meal found; salt present tho not guaranteed.
"Standard Brand" Egg Mash, 1; equaled guaranty.
"No Better" Hog Ration, 1; too high in fiber; no corn gluten meal found; alfalfa meal and salt present tho not guaranteed.
"Standard Brand" Dairy Sweets, 1; ground corn present tho not guaranteed.
"No Better" Sweet Dairy Feed, 2; equaled guaranty.

City Roller Mills, Vevay, Ind. Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

Climax Roller Mills, Shelbyville, Ky. Inspection sample of Climax Farm Feed analyzed, 1; equaled guaranty.

Cogar Grain & Coal Co., Harrodsburg, Ky. Inspection samples of Cogar's Stock Feed analyzed, 2; equaled guaranty.

E. A. Cohen, Greenville, Ky. Inspection sample of "Pride of Muhlenburg" 17% Dairy Feed analyzed, 1; equaled guaranty.

Clell Coleman & Sons, Burgin, Ky. Inspection samples of Coleman's Favorite Mixed Feed analyzed, 2; too high in fiber.

The G. E. Conkey Co., Cleveland, O. Inspection samples analyzed, 2.

Conkey's Balanced Rabbit Feed With Cod Liver Oil, 1; no soybean oil meal found.
Red Seal Dairy Ration, 1; equaled guaranty.

Cornishville Milling Co., Cornishville, Ky. Inspection samples of Mixed Feed analyzed, 2; equaled guaranty.

The Corno Mills Co., E. St. Louis, Ill. Inspection samples analyzed, 10.

Corno All-Mash Starting and Growing Ration, 1; equaled guaranty.
Nutro Egg Mash, 2; equaled guaranty.
Corno Premium Feed, 1; equaled guaranty.
Corno Sweet Feed, 1; equaled guaranty.
Nutro Sweet Feed, 1; equaled guaranty.
Corno Hog Feed, 1; equaled guaranty.
Corno Dairy Feed, 2; equaled guaranty.
Corno Dairy Supplement 34%, 1; equaled guaranty.

Crenshaw Oil Co., Crenshaw, Miss. Inspection sample of "Wylodine Brand" 41% Prime Cottonseed Meal analyzed, 1; too low in protein.

Crescent Milling Co., Cynthiana, Ky. Inspection sample of Crescent Mixed Feed analyzed, 1; equaled guaranty.

Crescent Roller Mills Co., Taylorsville, Ky. Inspection samples analyzed, 4.

Shipstuff, 1; equaled guaranty.
Crescent Mixed Feed, 3; too low in protein.

Crofton Milling Co., Crofton, Ky. Inspection sample of Richfeed analyzed, 1; equaled guaranty.

Crown Jewel Milling Co., Cynthiana, Ky., Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

Chas. Cummins & Son, Cumminsville, Ky. Inspection sample of Shipstuff analyzed, 1; too low in protein; wheat flour present.

Dairyman's Feed & Supply Co., Mayfield, Ky. Inspection sample of "Daily Cackle" Laying Mash analyzed, 1; equaled guaranty.

The Albert Dickinson Co., Chicago, Ill. Inspection sample of Dickinson's My Lassie Dairy Feed analyzed, 1; too low in fat; no linseed oil meal found; adulterated with oat hull feed; misbranded.

Dossey-Clay-Howard Milling Co., Fountain Run, Ky. Inspection sample of Shipstuff analyzed, 1; equaled guaranty.

Dutschke Milling Co., Cannelton, Ind. Inspection samples analyzed, 4.

Dutschke All-Mash No. 1, 2; 1 much too low in protein.
Dutschke All-Mash No. 2, 1; too low in protein.
Mixed Feed, 1; too low in protein.

Eagle Flour Mills, Denver, Colo. Inspection sample of Wheat Mixed Feed and Screenings analyzed, 1; too low in protein.

The Early & Daniel Co., Cincinnati, O. Inspection samples analyzed, 34.

Wheat Bran and Screenings, 2; equaled guaranty.
Wheat Middlings and Screenings, 2; equaled guaranty.
Mixed Wheat Feed and Screenings, 2; equaled guaranty.
Hominy Meal, 1; equaled guaranty.
Tuxedo 41% Cottonseed meal, 1; too low in protein and too high in fiber.
Tuxedo Starting Mash (With Cod Liver Oil), 1; equaled guaranty.
Cincy Growing and Developing Mash, 1; equaled guaranty.
Tuxedo Poultry Fattener, 1; equaled guaranty.
Tuxedo Egg Mash, 2; equaled guaranty.
Cincy Egg Mash, 1; corn gluten meal present tho not guaranteed.
Tuxedo Fiddlers Mash, 1; corn gluten meal present tho not guaranteed.
Tuxedo All-Mash, 1; equaled guaranty.
Tuxedo Starting and Growing All-Mash, 2; equaled guaranty.
Tuxedo Turkey All-Mash, 2; equaled guaranty.
Tuxedo Chop, 1; equaled guaranty.
Miami Sweet Feed, 1; equaled guaranty.
Tuxedo Pig Meal, 1; corn gluten meal present tho not guaranteed.
Tuxedo Dairy 16%, 3; equaled guaranty.
Cerealia Sweets, 1; equaled guaranty.

Tuxedo Dairy 20%, 1; equaled guaranty.
Tuxedo Dairy 24%, 5; equaled guaranty.
Tuxedo Special Twenty-four Dairy, 1; equaled guaranty.

Emge & Sons, Ft. Branch, Ind. Inspection sample of Emge's 60% Protein Tankage analyzed, 1; equaled guaranty.

The F. L. Emmert Co., Cincinnati, O. Inspection sample of Buffalo Brand Dried Brewers Grains analyzed, 1; equaled guaranty.

John W. Eshelman & Sons, Lancaster, Pa. Inspection samples analyzed, 8.

Eshelman Red Rose Corn Feed Meal, 1; equaled guaranty.
Eshelman Red Rose Fattening Mash, 1; equaled guaranty.
Eshelman Red Rose Laying Mash, 1; equaled guaranty.
Eshelman Red Rose All-Mash Starter, 1; too high in fiber.
Eshelman Pennsy 16% Dairy Feed, 2; equaled guaranty.
Eshelman Conestoga 20% Dairy Feed, 1; equaled guaranty.
Eshelman Red Rose 24% Protein Dairy Feed, 1; corn gluten meal used instead of corn gluten feed.

Evans Milling Co., Indianapolis, Ind. Inspection samples of Emco Hominy Feed analyzed, 4; equaled guaranty.

J. C. Everett & Co., Maysville, Ky. Inspection sample of Heavy Mixed Wheat Feed and Screenings analyzed, 1; equaled guaranty.

Excelsior Milling Co., Minneapolis, Minn. Inspection samples of Camel Fancy Wheat Feed analyzed, 2; equaled guaranty.

Exchange Milling Co., Sturgis, Ky. Inspection samples of Mixed Feed analyzed, 3; 1 too low in protein and fat.

Falls City Feed Mills, Louisville, Ky. Inspection samples analyzed, 4.

Falls City Broiler-Starter-Grower Mash, 1; no copper sulfate found.
Radio 16% Dairy Feed, 1; corn gluten meal present tho not guaranteed.
Cherokee 24% Dairy Feed, 1; only traces of wheat bran and wheat middlings found; soybean oil meal present tho not guaranteed.
Falls City 24% Dairy Feed, 1; equaled guaranty.

Falls City Ice & Beverage Co., Louisville, Ky. Inspection samples of Brewers Dried Grains analyzed, 2; 1 too low in fat.

Farm Bureau Supply Co., Elizabethtown, Ky. Inspection sample of Camel Wheat Mixed Feed analyzed, 1; equaled guaranty.

Farmers Hominy Mill, Seymour, Ind. Inspection sample of Apex Hominy Feed analyzed, 1; equaled guaranty.

Farmers & Merchants Milling Co., Brooksville, Ky. Inspection sample of Mixed Wheat Feed analyzed, 1; equaled guaranty.

Farmers Milling Co., Somerset, Ky. Inspection samples analyzed, 2.

Mixed Feed, 1; too low in protein; wheat flour present.
Farmers Stock Feed, 1; equaled guaranty.

Farmers Supply Co., Lexington, Ky. Inspection samples analyzed, 11.

Farmo Starting Mash, 1; equaled guaranty.
Farmo Growing Mash, 1; too high in fiber.
Farmo Laying Mash, 2; 1 too low in fat.
Farmo Sheep Feed, 1; equaled guaranty.
Trico 16% Dairy Feed, 4: equaled guaranty.
Red Diamond Dairy Feed, 1; equaled guaranty.
Farmo 24% Dairy Feed, 1; equaled guaranty.

Farmers Union Mill, Versailles, Ky. Inspection samples analyzed, 2.
Mill Feed, 1; equaled guaranty.
20% Dairy Feed, 1; equaled guaranty.

J. H. Fedders & Sons, Covington, Ky. Inspection samples analyzed, 2.

Grey Wheat Middlings, 1; too high in fiber.
Corn Feed Meal, 1; equaled guaranty.

Ferncliff Feed & Grain Co., Louisville, Ky. Inspection samples analyzed, 14.

P. D. Q. Shorts and Screenings, 1; equaled guaranty.
P. D. Q. Mixed Wheat Feed and Screenings, 2; equaled guaranty.
Cracker Jack 41% Cottonseed Meal, 1; too low in protein and too high in fiber.
Cracker Jack Alfalfa Meal, 1; equaled guaranty.
P. D. Q. Starting and Growing Mash, 2; 1 linseed oil meal present tho not guaranteed.
Cracker Jack Egg Mash, 1; equaled guaranty.
Cracker Jack Hog Meal, 1; equaled guaranty.
Butternut Dairy Feed, 1; equaled guaranty.
"Sweet Sixteen" Dairy Feed, 3; equaled guaranty.
Ferncliff 24% Dairy Ration, 1; corn feed meal present tho not guaranteed.

Henry Fischer Packing Co., Louisville, Ky. Inspection samples analyzed, 3.

50% Ground Cracklings, 1; equaled guaranty.
60% Mellwood Brand Digester Tankage, 2; equaled guaranty.

Flaherty Roller Mills Co., Vine Grove, Ky. Inspection samples of Mixed Wheat Feed analyzed, 2; too low in protein; wheat flour present; 1 too low in fat.

French-Bauer, Inc., Cincinnati, O. Inspection sample of Clover Bottom Buttermilk Powder analyzed, 1; equaled guaranty.

Henry Fruechtenicht, Louisville, Ky. Inspection samples analyzed, 3.

Producer 16% Dairy Feed, 1; no alfalfa meal found.
Arrow Dairy Feed, 1; equaled guaranty.
Producer 24% Dairy Feed, 1; too low in protein; corn gluten feed present tho not guaranteed.

Garland Milling Co., Greensburg, Ind. Inspection samples of Garland Mixed Wheat Feed and Screenings analyzed, 2; equaled guaranty.

Garrard Mills, Lancaster, Ky. Inspection sample of Glen Lily Mixed Feed analyzed, 1; equaled guaranty.

General Mills, Minneapolis, Minn. Inspection sample Gold Medal Pig and Hog Meal analyzed, 1; equaled guaranty.

Georgia Distributing Co., Atlanta, Ga. Inspection samples analyzed, 2.
Gold Dust Brand 41% Protein Cottonseed Meal, 1; much too low in protein and too high in fiber.
Gold Dust Brand 43% Prime Cottonseed Meal, 1; equaled guaranty.

Germantown Milling Co., Germantown, Ky. Inspection sample of Mixed Wheat Feed analyzed, 1; equaled guaranty.

Glass Milling Co., Wilmore, Ky. Inspection sample of Hi-Grade Feed analyzed, 1; equaled guaranty.

Glenmore Distilleries Co., Owensboro, Ky. Inspection sample of Distiller's Bourbon Dried Grains analyzed, 1; equaled guaranty.

Edw. F. Goeke Sons, Evansville, Ind. Inspection samples analyzed, 3.

Big Gee Wheat Shorts and Screenings, 1; too low in fat.
A-1 All-Mash, 1; equaled guaranty.
"Eg-Go" Egg Ration, 1; equaled guaranty.

Goff Milling Co., Hiseville, Ky. Inspection samples of Mixed Wheat Feed and Screenings analyzed, 2; too low in protein; 1 corn bran added.

Goldcamp Mill Co., Ironton, O. Inspection samples analyzed, 2.
Rye Middlings, 1; equaled guaranty.
Universal Feed, 1; equaled guaranty.

Grayson Milling Co., Grayson, Ky. Inspection samples analyzed, 5.

"Honest Made" Chick Starter, 2; 1 much too low in protein; 1 no alfalfa leaf meal found.
"Honest Made" 16% Dairy Feed, 1; no oat hull feed found; salt present tho not guaranteed.
"Honest Made" 18% Dairy Feed, 1; salt present tho not guaranteed.
"Honest Made" 24% Dairy Feed, 1; equaled guaranty.

Green Bros., Falls of Rough, Ky. Inspection sample of Mixed Feed analyzed, 1; too low in protein.

Green River Milling Co., S. Carrollton, Ky. Inspection sample of Green River Feed analyzed, 1; much too low in protein and fat; ground corn used instead of corn bran.

Green River Milling Co., Owensboro, Ky. Inspection samples analyzed, 7.

"Big 6" 16% Dairy Feed, 4; 2 too low in protein; 1 too low in fat, excess oat hulls present; 3 ingredients not as guaranteed, misbranded.
"Big 6" 24% Dairy Feed, 3; too low in protein and too high in fiber; ingredients not as guaranteed; misbranded.

Gwinn Bros. & Co., Huntington, W. Va. Inspection samples analyzed, 8

Wheat Middlings and Screenings, 1; equaled guaranty.
Farm Feed, 1; equaled guaranty.
Mixed Feed and Screenings, 1; equaled guaranty.
Early Lay Egg Mash, 1; ground oats present tho not guaranteed.
Gwinn's 16% Dairy Feed, 1; equaled guaranty.
"Sweet Maid" Dairy Feed, 1; equaled guaranty.
"Grade A" Sweet Dairy Feed, 1; equaled guaranty.
Make-Milk Dairy Feed, 1; no clipped oat by-product found.

The Gwinn Milling Co., Columbus, O. Inspection samples analyzed, 3.

Gwinn's Wheat Feed and Screenings, 1; equaled guaranty.
Gwinn's Stock Feed, 1; equaled guaranty.
Gwinn's 24% Dairy Feed, 1; much too low in protein; brewers dried grains substituted for distillers dried grains.

Hales & Hunter Co., Chicago, Ill. Inspection samples analyzed, 13.

Ground White Oats, 1; equaled guaranty.

Morning Glory Chick Starter, 1; too high in fiber; no charcoal or sulfur found.

Red Comb Growing Mash, 1; no sulfur found.

Red Comb Crate Fattener, 3; 2 no bone meal found.

Morning Glory Egg Mash, 1; too low in protein.

Pioneer Hog Feed, 2; corn gluten feed present tho not guaranteed; no calcium iodide found.

Red Horn Calf Meal, 1; no calcium iodide found.

Gold Flake Dairy Feed, 3; too low in fat; 1 wheat bran and brewers dried grains present tho not guaranteed.

Hall Milling Co., St. Louis, Mo. Inspection samples analyzed, 3.

Rex Wheat Middlings and Screenings, 2; equaled guaranty.

Rex Wheat Mixed Feed and Screenings, 1; equaled guaranty.

Hanson Rolier Mills, Hanson, Ky. Inspection sample of Crushed Ear Corn and Shuck analyzed, 1; equaled guaranty.

R. L. Harrison & Son, Bagdad, Ky. Inspection sample of Harrison's "A" 24% Dairy Feed analyzed, 1; equaled guaranty.

The P. H. Harsha Milling Co., Portsmouth, O. Inspection samples analyzed, 3.

Harsha's Middlings and Screenings, 1; equaled guaranty.

Magnolia Mixed Feed, 1; equaled guaranty.

"Jersey Brand" Dairy Feed, 1; corn bran present tho not guaranteed; no ground oats found.

Edwin C. Hawkins, Paducah, Ky. Inspection samples analyzed, 2.

Wheat Bran and Screenings, 1; equaled guaranty.

Mixed Wheat Feed and Screenings, 1; equaled guaranty.

Haydon Mill & Grain Co., Springfield, Ky. Inspection samples of Economy Feed analyzed, 3; no corn bran found.

The C. E. Haynes Milling Co., Waverly, O. Inspection sample of Wavo Mixed Feed analyzed, 1; too low in protein and too high in fiber; excess corn bran present.

Helena Cotton Oil Mill, Helena, Ark. Inspection samples of "Blanco Bran" 41% Cottonseed Meal analyzed, 2; equaled guaranty.

Henderson Elevator Co., Henderson, Ky. Inspection samples analyzed, 3.

All-Purpose Poultry Mash, 1; equaled guaranty.

Bullitt's Special Dairy Feed, 1; equaled guaranty.

Bullitt's 24% Dairy Feed, 1; equaled guaranty.

Hirst & Begley Linseed Co., Chicago, Ill. Inspection sample of H. & B. L. Co. Brand 34% Linseed Meal analyzed, 1; too low in fat.

Hodgenville Roller Mills, Hodgenville, Ky. Inspection sample of Lincoln analyzed, 1; equaled guaranty.

N. J. Holmes, Manchester, O. Inspection sample of Soft Winter Wheat Bran analyzed, 1; equaled guaranty.

Home Milling Co., Greenville, Ky. Inspection sample of "Happy Home" Mixed Feed analyzed, 1; equaled guaranty.

Hook Milling Co., Hardinsburg, Ky. Inspection sample of White Swan Mixed Feed analyzed, 1; equaled guaranty.

Horse Cave Mills, Horse Cave, Ky. Inspection samples of "Superior Brand" Mixed Feed analyzed, 2; too low in protein, wheat flour present; 1 too low in fat.

Humphreys-Godwin Co., Memphis, Tenn. Inspection samples of Dixie Brand 41% Cottonseed Meal analyzed, 5; 2 too low in protein.

Ideal Roller Mills, Falmouth, Ky. Inspection sample of Mixed Wheat Feed analyzed, 1; too low in protein; wheat flour present.

Igleheart Bros., Evansville, Ind. Inspection samples analyzed, 6.

Winter Wheat Shorts and Screenings, 4; 3 too low in protein.
Wheat Mixed Feed and Screenings, 2; equaled guaranty.

J. F. Imbs Milling Co., Belleville, Ill. Inspection sample of "Charm" Pure Wheat Mixed Feed analyzed, 1; equaled guaranty.

Jellico Grocery Co., Corbin, Ky. Inspection samples of Daisy Soft Wheat Middlings and Screenings analyzed, 2; equaled guaranty.

C. L. Jewell & Son, Louisville, Ky. Inspection samples analyzed, 2.

Jewell's 18% Protein Laying Mash, 1; equaled guaranty.
Jewell's 24% Dairy Feed, 1; equaled guaranty.

Joslin-Schmidt Corporation, Cincinnati, O. Inspection sample of Abattoir Brand Steamed Bone Feeding Meal analyzed, 1; equaled guaranty.

The E. Kahn's Sons Co., Cincinnati, O. Inspection samples of Kahn's Diamond K. 60% Digester Tankage analyzed, 3; 1 too low in protein and too high in fiber.

Kasco Mills, Toledo, O. Inspection samples analyzed, 10.

Apex Laying Mash, 1; equaled guaranty.
Oc-Sak Laying Mash, 1; equaled guaranty.
Kasco Laying Mash, 1; equaled guaranty.
Kasco Special Poultry Mash (For Flushing Purposes), 1; equaled guaranty.
Kasco Bulky Sweet Feed, 1; equaled guaranty.
Kasco Pig-Hog Feed, 1; equaled guaranty.
Kasco 16% Dairy Feed, 1; excess oat hull feed present.
Apex 20% Protein Dairy Feed, 1; too high in fiber; excess oat hull feed present.
Oc-Sak 24% Dairy Feed, 1; much too low in protein; too high in fiber; corn feed meal and brewers dried grains present tho not guaranteed; misbranded.
Kasco Mormilk Dairy Ration, 1; brewers dried grains present tho not guaranteed.

The Kentucky Chemical Manufacturing Co., Covington, Ky. Inspection samples analyzed, 2.
K-C Special 50% Meat and Bone Scraps, 1; equaled guaranty.
K-C Brand 60% Digester Tankage, 1; equaled guaranty.

Kentucky Feed Mills, Louisville, Ky. Inspection samples analyzed, 47.

Corn Feed Meal, 2; equaled guaranty.
Hominy Feed, 1; too high in fiber.
Premo Chick Starter, 1; equaled guaranty.
Premo Crate Fattener, 1; only trace of alfalfa leaf meal found; no yeast or potassium iodide found.
Premo Growing Mash, 1; too low in protein.
Premo All-Mash Starter and Grower Broiler Ration, 2; 1 no copper sulfate found.
Kentucky Star Starting and Growing Mash, 1; equaled guaranty.
Premo Laying Mash, 2; 1 too low in protein.
Kentucky Star Laying Mash, 3; 1 corn gluten meal present tho not guaranteed.
Success 18% Yeast Dried Grains, 1; malt sprouts also present.
Alfalfa Meal, Cane Molasses, Oat Hull Feed and Flax Plant By-product, 1; equaled guaranty.
Premo Hog Feed, 1; too low in protein.
Success Horse and Mule Feed, 1; equaled guaranty.
Kentucky Star Horse and Mule Feed, 4; 1 wheat bran present tho not guaranteed.
Sedan 16% Dairy Feed, 9; 7 corn gluten meal present tho not guaranteed; 1 corn blowings present tho not guaranteed.

Kentucky Star 16½% Dairy Feed, 3; equaled guaranty.
Premo Dairy Feed, 1; equaled guaranty.
Success 24% Dairy Feed, 5; 1 too low in protein; 1 corn gluten meal used instead of corn gluten feed.
Marshall's 24% Dairy Feed, 5; 1 too low in protein; no salt found.
Premo 34% Dairy Supplement, 2; 1 no salt found.

R. U. Kevil & Sons, Princeton, Ky. Inspection sample of Mixed Feed analyzed, 1; too low in protein.

Chas. A. Krause Milling Co., Milwaukee, Wis. Inspection samples analyzed, 6.

Kookoo Chick Starter Mash, 1; too high in fiber.
Blue Top Starting and Growing Mash, 1; equaled guaranty.
Blue Top Egg Mash, 2; 1 too low in protein.
Badger 16% Sweet Dairy Feed, 1; equaled guaranty.
Amerikorn Dairy Ration, 1; equaled guaranty.

The Kroger Grocery & Baking Co., Cincinnati, O. Inspection sample of Wesco Egg Mash analyzed, 1; equaled guaranty.

Kuttawa Milling Co., Kuttawa, Ky. Inspection samples of Swan Feed analyzed, 2; equaled guaranty.

Lafayette Milling Co., Lafayette, Ky. Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

Lake County Oil Mill, Tiptonville, Tenn. Inspection sample of 41% Protein Cottonseed Meal analyzed, 1; too low in protein.

Lancaster Milling Co., Lancaster, Ky. Inspection samples of Lamico Mixed Feed analyzed, 2; 1 no salt found; 1 corn bran substituted for ground corn.

The Larabee Flour Mills Co., Kansas City, Mo. Inspection sample of Winter Wheat Mixed Feed and Screenings analyzed, 1; equaled guaranty.

The Larrowe Milling Co., Detroit, Mich. Inspection samples analyzed, 6.

Larro Chick Starter, 1; equaled guaranty.
Larro Growing Mash, 1; too low in protein.
Larro Egg Mash, 1; equaled guaranty.
Larro Turkey Grower, 1; equaled guaranty.
Beet Pulp and Beet Molasses—Dried, 1; equaled guaranty.
Larro The Ready Ration for Dairy Cows, 1; equaled guaranty.

Lawrenceburg Roller Mills, Lawrenceburg, Ind. Inspection samples analyzed, 4.

"Farm King" Gray Shorts and Screenings, 1; too low in protein.
Snowflake Middlings and Screenings, 2; 1 too low in protein.
Snowflake Mixed Wheat Feed and Screenings, 1; equaled guaranty.

Leitchfield Milling Co., Leitchfield, Ky. Inspection samples analyzed, 2.

Mill Run Feed, 1; too high in fiber.
Dairy Feed, 1; equaled guaranty.

Lewisport Mill Co., Lewisport, Ky. Inspection samples of Farmer's Choice analyzed, 2; equaled guaranty.

Lexington Roller Mills Co., Lexington, Ky. Inspection samples analyzed, 9.

"Kentucky Queen" Starting Mash (With Cod Liver Oil), 1; equaled guaranty.
"Kentucky Queen" Growing Mash (With Cod Liver Oil), 1; too high in fiber.
"Kentucky Queen" Egg Mash (With Cod Liver Oil), 1; equaled guaranty.
"Kentucky Queen" Double X Egg Mash, 2; equaled guaranty.
Thoroughbred Feed, 1; too low in protein.
"Bossie" Feed, 1; equaled guaranty.
"Kentucky Queen" Dairy Feed, 1; equaled guaranty.
Thoroughbred 20% Dairy Feed, 1; equaled guaranty.
Thoroughbred 24% Dairy Feed, 1; equaled guaranty.

London Roller Mills, London, Ky. Inspection samples of "Kentucky Pride" Dairy Feed analyzed, 2; equaled guaranty.

Lone Oak Feed Store, Paducah, Ky. Inspection sample of Crushed Corn, Cob and Shuck analyzed, 1; equaled guaranty.

Loretto Mill Co., Loretto, Ky. Inspection sample of Shipstuff analyzed, 1; equaled guaranty.

The Loudonville Milling Co., Loudonville, O. Inspection sample of Soft Winter Wheat Middlings and Screenings analyzed, 1; too low in protein.

Louisa Supply Co., Louisa, Ky. Inspection samples analyzed, 3.

Louisa Starting and Growing Mash, 1; linseed oil meal and alfalfa leaf meal present tho not guaranteed.
Standard Feed, 1; excess corn bran present.
Big Sandy Dairy Feed, 1; equaled guaranty.

Louisville Cereal Mill Co., Louisville, Ky. Inspection samples analyzed, 3.

Nonesuch Hominy Feed, 2; equaled guaranty.
Nonesuch Feed, 1; too low in protein.

Louisville Feed Mills, Louisville, Ky. Inspection samples analyzed, 5.

Lincoln Laying Mash, 1; equaled guaranty.
Aetna 16% Dairy Feed, 1; equaled guaranty.
Paragon 24% Dairy Feed, 3; 1 too low in protein, only traces of wheat bran and middlings found; 2 brewers dried grains present tho not guaranteed; 1 corn gluten meal used instead of corn gluten feed.

Louisville Milling Co., Louisville, Ky. Inspection samples analyzed, 3.

"Sonny South" Wheat Shorts and Screenings, 1; equaled guaranty.
"Sonny South" Wheat Mixed Feed and Screenings, 2; equaled guaranty.

Louisville Provision Co., Louisville, Ky. Inspection samples of Loupro 50% Digester Feeding Tankage analyzed, 3; 2 moldy condition; 1 short weight.

L. B. Lovitt & Co., Memphis, Tenn. Inspection samples of "Lovit Brand" 41% Cottonseed Meal analyzed, 6; 3 too low in protein; 1 too high in fiber.

The Lynn Grove Milling Co., Lynn Grove, Ky. Inspection sample of Wheat Bran and Shorts analyzed, 1; equaled guaranty.

Lyon & Greenleaf Co., Ligonier, Ind. Inspection sample of Waseo Gray Wheat Middlings analyzed, 1; equaled guaranty.

Magnolia Roller Mills, Magnolia, Ky. Inspection samples of Mill Run Feed analyzed, 2; 1 too low in protein, wheat flour present.

The B. Manischewitz Co., Cincinnati, O. Inspection sample of Matzos Sweepings analyzed, 1; equaled guaranty.

S. M. Marcum & Bro., Sulphur Well, Ky. Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

Marianna Sales Co., Memphis, Tenn. Inspection samples of White Mule Brand 41% Cottonseed Meal analyzed, 3; too low in protein.

Marion Milling Co., Marion, Ky. Inspection samples of "Feeder's Favorite" Mixed Feed analyzed, 2; too low in fat and too high in fiber; corn blowings present; 1 too low in protein.

Mayfield Milling Co., Mayfield, Ky. Inspection sample of Mixed Feed analyzed, 1; too low in protein.

Mayfield Sweet Feed Mill, Mayfield, Ky. Inspection samples analyzed, 2.

19% Protein Laying Mash, 1; equaled guaranty.
16% Protein Dairy Feed, 1; equaled guaranty.

Mayflower Mills, Ft. Wayne, Ind. Inspection sample of Mayflower Mixed Wheat Feed and Screenings analyzed, 1; equaled guaranty.

Gentry-McCauley, Versailles, Ky. Inspection sample of Pleez-U Dairy Feed analyzed, 1; too low in protein; molasses and salt present tho not guaranteed.

Middlesboro Milling Co., Middlesboro, Ky. Inspection samples analyzed, 6.

Champion Mixed Feed, 2; 1 no oat hull feed found.
"Hi-Grade Brand" Mixed Feed, 1; no brewers dried grains found.
Good Value 16% Dairy Feed, 1; no crushed cob found.
"Reliable Brand" 24% Dairy Feed, 2; 1 too low in protein.

The Midland Flour Milling Co., Kansas City, Mo. Inspection sample of "Town Crier" Pure Wheat Bran analyzed, 1; equaled guaranty.

G. G. Milller & Son, Glasgow, Ky. Inspection sample of Wheat Bran analyzed, 1; too low in protein.

Miller Cereal Mills, Omaha, Nebr. Inspection sample of Maizco Hominy Feed analyzed, 1; too low in protein and fat.

Model Flour Mills, Greeley, Colo. Inspection sample of Topsy Stock Feed analyzed, 1; equaled guaranty.

Monarch Milling Co., Mt. Sterling, Ky. Inspection samples analyzed, 2.

"Superior Brand" Laying Mash, 1; ground corn present tho not guaranteed.
Mixed Feed, 1; equaled guaranty.

The Monarch Milling Co., Kansas City, Mo. Inspection sample of Winter Wheat Bran and Screenings analyzed, 1; equaled guaranty.

Monroe Milling Co., Waterloo, Ill. Inspection sample of Silver Fox Middlings and Screenings analyzed, 1; equaled guaranty.

Morganfield Roller Mills, Morganfield, Ky. Inspection samples analyzed, 3.

"White Rose" Mixed Feed, 2; 1 too low in protein, salt present tho not guaranteed.
"Culver Farm Relief Brand" 16% Dairy Feed, 1; no salt found.

Mountain City Mill Co., Chattanooga, Tenn. Inspection samples of Blue Stock Feed analyzed, 3; 2 too low in protein; 1 no phosphatic limestone found.

Munfordsville Milling Co., Munfordsville, Ky. Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

Nancy Milling Co., Nancy, Ky. Inspection samples analyzed, 2.
Mixed Feed, 1; wheat screenings present tho not guaranteed.
Mixed Wheat Feed, 1; too low in protein.

National Live Stock Remedy Co., Chicago, Ill. Inspection sample of National Horse and Cattle Powder analyzed, 1; excess salt present; no elecampane root found.

National Milling Co., Toledo, O. Inspection sample of Namico Middlings and Screenings analyzed, 1; equaled guaranty.

Neuhoff Packing Co., Nashville, Tenn. Inspection sample of 60% Digester Tankage analyzed, 1; too low in protein.

New Concord Milling Co., Murray, Ky. Inspection samples of Shipstuff analyzed, 2; equaled guaranty.

New Era Mills, Allensville, Ky. Inspection samples of Mixed Feed analyzed, 2; 1 too low in protein and fat, wheat flour present.

Nicholson Mills, Henderson, Ky. Inspection sample of "Numix" Special All-Mash analyzed, 1; too high in fiber.

Noblesville Milling Co., Noblesville, Ind. Inspection sample of "N. M. Co's" Mixed Wheat Feed and Screenings analyzed, 1; equaled guaranty.

Nolin Milling Co., Nolin, Ky. Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

Owensboro Milling Co., Owensboro, Ky. Inspection samples analyzed, 11.

Ground Oats, 1; equaled guaranty.
"Tru-Test Brand" Wheat Feed, 1; too high in fiber.
Mixed Wheat Feed and Screenings, 2; 1 too low in protein.
O-Mil-Co Laying Mash, 2; corn gluten feed and charcoal present tho not guaranteed.
D. & H. Stock Feed, 3; 1 too high in fiber.
Star Dairy Feed, 2; 1 too low in protein.

Parksville Roller Mills, Parksville, Ky. Inspection samples of Mixed Feed analyzed, 2; too low in fat; 1 wheat screenings present tho not guaranteed.

Payne & Ramey, Eubank, Ky. Inspection sample of "Farmer's Choice" Feed analyzed, 1; too low in protein; ground corn present tho not guaranteed.

Perfection Foods Co., Battle Creek, Mich. Inspection sample of Perfection Brand Dog Food analyzed, 1; much too low in protein.

Philpot Mills, Philpot, Ky. Inspection samples of Mixed Feed analyzed, 2; equaled guaranty.

Phoenix Cotton Oil Mill, Dyersburg, Tenn. Inspection sample of Phoenix Choice 41% Cottonseed Meal analyzed, 1; equaled guaranty.

Phoenix Flour Mills, Evansville, Ind. Inspection sample of Wheat Mixed Feed and Screenings analyzed, 1; equaled guaranty.

Phoenix Milling Co., Providence, Ky. Inspection sample of Mixed Feed analyzed. 1; equaled guaranty.

Pillsbury Flour Mills Co., Minneapolis, Minn. Inspection sample of Palisade A. M. Feed and Screenings analyzed, 1; equaled guaranty.

R. C. Poage Milling Co., Ashland, Ky. Inspection samples analyzed, 2.
Wheat Middlings, 1; equaled guaranty.
"Ideal Brand" Stock Feed, 1; equaled guaranty.

Polo Mills Co., E. St. Louis, Ill. Inspection samples analyzed, 2.
Holsum 16½% Dairy Feed, 1; equaled guaranty.
Holsum 24% Dairy Feed, 1; no bone meal found.

Poole Milling Co., Poole, Ky. Inspection sample of Mixed Feed analyzed, 1; too low in protein.

Pratt Food Co., Hammond, Ind. Inspection samples analyzed. 9.
Pratts All-Mash Baby Chick Feed, 1; no millet found.
Pratts All-Mash Chick Starter, 1; equaled guaranty.
Pratts Growing Mash, 1; equaled guaranty.
Iroquois Growing Mash, 1; equaled guaranty.
Pratts Broiler Mash, 1; equaled guaranty.
Pratts Laying Mash, 1; equaled guaranty.
Pratts Cak-Cak Egg Mash, 1; equaled guaranty.
Pratts Rabbit Feed, 1; equaled guaranty.
Pratts Sweet 24% Dairy Feed, 1; equaled guaranty.

Purcell Seed Co., Evansville, Ind. Inspection samples analyzed, 4.
"New Idea" Egg Mash, 1; too low in protein.
"New Idea" All-Mash Poultry Ration, 1; equaled guaranty.
"New Idea" All-Mash Poultry Ration (With Cod Liver Oil), 2; equaled guaranty.

Quaker Oats Co., Chicago, Ill. Inspection samples analyzed, 4.

Corn Feed Meal, 1; equaled guaranty.
Buckeye Feed, 1; equaled guaranty.
Quaker Ful-O-Pep Egg Mash, 1; equaled guaranty.
Quaker Sweet Schumacher Feed, 1; equaled guaranty.

Ralston Purina Co., St. Louis, Mo. Inspection samples analyzed, 19.

Grey Wheat Middlings, 1; equaled guaranty.
Purina Chick Growena Chow, 1; equaled guaranty.
Purina All-Mash Startena Chow, 2; equaled guaranty.
Purina Lay Chow, 1; equaled guaranty.
Purina All-Mash Egg Chowder, 1; equaled guaranty.
Purina "Family Flock" All-Mash Laying Ration, 2; equaled guaranty.
Purina Turkey Startena Chow, 1; equaled guaranty.
Purina Calf Chow, 1; equaled guaranty.
Purina Pig Chow, 1; equaled guaranty.
Purina Pig and Hog Chow (Southern States), 1; equaled guaranty.
Purina Bulky Las Chow, 1; cottonseed meal and oat hull feed present tho not guaranteed; misbranded.
Protena 24% Dairy Feed, 2; equaled guaranty.
Purina 24% Cow Chow, 4; equaled guaranty.

Randolph Milling Co., Bandana, Ky. Inspection samples analyzed, 2.

Mixed Feed, 1; too low in fat.
O-Joy, 1; equaled guaranty.

Rapier Sugar Feed Co., Owensboro, Ky. Inspection samples analyzed, 10.

Rapier's Blue Hen Laying Mash, 2; much too low in protein; 1 no corn gluten meal, linseed oil meal or molasses found, misbranded.
Rapier's All-in-One Mash, 1; equaled guaranty.
Rapier's Special Laying Mash, 1; too low in protein; no corn gluten meal, alfalfa leaf meal or molasses found; misbranded.
Rapier's Special Horse and Mule Feed, 1; equaled guaranty.
Rapier's Creamo Dairy Feed, 1; no corn gluten meal or linseed oil meal found.
Rapier's "Jersey Cream Brand" Dairy Feed, 2; no corn gluten meal or linseed oil meal found; alfalfa stem meal substituted for alfalfa meal; misbranded; 1 too low in protein and fat and too high in fiber; 1 grain screenings present tho not guaranteed.

Rapier's Golden Rod Dairy Feed, 2; no corn gluten meal found; 1 too high in fiber, no linseed oil meal found; 1 too low in protein.

Read Phosphate Co., New Albany, Ind. Inspection samples analyzed, 3.
Read's Red Diamond 50% Meat Scrap, 1; equaled guaranty.
Read's Red Diamond 60% Digester Tankage, 2; 1 too high in fiber.

The Red Star Milling Co., Wichita, Kans. Inspection sample of "Red Star" Wheat Mixed Feed and Screenings analyzed, 1; equaled guaranty.

R. D. Riedling, Louisville, Ky. Inspection samples analyzed, 6.
R. D.'s Feed, 1; equaled guaranty.
Magnolia Chick Starter and Growing Mash, 3; 1 rolled oats present tho not guaranteed.
Happy Cow Feed, 1; too low in fat; no oat hull feed found; corn blowings and screenings present tho not guaranteed.
Magnolia Cow Feed, 1; too low in fat.

Roberts Cotton Oil Mill, Cairo, Ill. Inspection sample of "Star Brand" 41% Protein Cottonseed Meal analyzed, 1; equaled guaranty.

Rotex Milling Co., Cleveland, O. Inspection samples analyzed, 2.
Rotex Brand Starting and Growing Mash, 1; equaled guaranty.
Rotex Brand Egg Mash, 1; equaled guaranty.

P. M. Rountree, Benton, Ky. Inspection sample of Wheat Bran, Shorts and Screenings analyzed, 1; equaled guaranty.

Sacramento Milling Co., Sacramento, Ky. Inspection sample of Mixed Feed analyzed, 1; too low in fat.

Salt Lick Roller Mills, Salt Lick, Ky. Inspection sample of Perfect Brand X Mixed Feed analyzed, 1; equaled guaranty.

Saxony Mills, St. Louis, Mo. Inspection sample of Wheat Bran and Screenings analyzed, 1; equaled guaranty.

Schultz-Baujan & Co., Beardstown, Ill. Inspection samples analyzed, 2.
Sunbeam Middlings and Screenings, 1; equaled guaranty.
Critic Middlings and Screenings, 1; corn feed meal added.

W. N. Scoville, London, Ky. Inspection sample of Mixed Wheat Feed analyzed, 1; too low in protein; wheat flour present.

Sebree Milling Co., Sebree, Ky. Inspection sample of Cream Patent analyzed, 1; too low in protein; gray middlings present tho not guaranteed.

Security Mills, Knoxville, Tenn. Inspection samples analyzed, 2.
Security Dairy Feed, 1; equaled guaranty.
Blue Eagle Dairy Feed, 1; oat hull feed present tho not guaranteed; excess screenings present.

Sedalia Roller Mills, Sedalia, Ky. Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

U. B. Sellers, Okolona, Ky. Inspection sample of "Sellers" Growing Mash analyzed, 1; ingredients not as guaranteed; misbranded.

Shepherdsville Roller Mills, Shepherdsville, Ky. Inspection samples analyzed, 2.
"Silver Leaf" Farm Feed, 1; equaled guaranty.
16% Protein Dairy Feed, 1; no oat hull feed found; wheat screenings present tho not guaranteed.

Clayton Shown, Beaver Dam, Ky. Inspection sample of "Economy Brand" 16% Protein Dairy Feed analyzed, 1; equaled guaranty.

Simmons Milling Co., Cincinnati, O. Inspection samples of Decko Poultry Fattening Feed analyzed, 1; too low in fat.

J. Allen Smith & Co., Knoxville, Tenn. Inspection sample of "Peerless Brand" Feed analyzed, 1; no corn meal or corn bran found.

Smithfield Milling Co., Smithfield, Ky. Inspection sample of Mixed Feed analyzed, 1; equaled guaranty.

Southern Feed & Grain Co., Louisville, Ky. Inspection samples analyzed, 6.

Diamond Wheat Feed and Screenings, 1; equaled guaranty.
Eagle Laying Mash, 1; much too low in protein; no soybean oil meal found.

"Sugar S. Brand" Dairy Feed, 3; 2 much too low in protein, no alfalfa meal found, salt present tho not guaranteed; 1 corn gluten feed and soybean oil meal present tho not guaranteed; misbranded.
Standard Dairy Feed, 1; equaled guaranty.

Southern Illinois Milling & Elevator Co., Murphysboro, Ill. Inspection sample of Winter Wheat Bran and Screenings analyzed, 1; equaled guaranty.

Sparks Milling Co., Alton, Ill. Inspection samples analyzed, 3.
Wabash Middlings, 1; too low in protein.
Try Me Bran and Screenings, 1; equaled guaranty.
Try Me Mixed Wheat Feed and Screenings, 1; equaled guaranty.

The George T. Stagg Co., Frankfort, Ky. Inspection sample of Distillers Dried Grains analyzed, 1; equaled guaranty.

Staley Milling Co., Kansas City, Mo. Inspection samples analyzed, 2.
"Hypower Brand" Hominy Feed, 1; equaled guaranty.
Four Bells Farm Feed, 1; equaled guaranty.

Stanard Tilton Milling Co., St. Louis, Mo. Inspection samples of "American Beauty" Wheat Bran analyzed, 2; 1 too high in fiber.

Star Milling Co., Clinton, Ky. Inspection samples analyzed, 2.
Mixed Feed, 1; equaled guaranty.
"Farmer's Friend" Dairy Feed, 1; too low in protein.

Star Roller Mills, Cloverport, Ky. Inspection sample of Star Laying Mash analyzed, 1; equaled guaranty.

The St. Louis Mills Co., St. Louis, Mo. Inspection samples analyzed, 3.
Gilt Edge 16% Dairy Feed, 2; 1 corn cob present.
Gilt Edge 24% Dairy Feed, 1; equaled guaranty.

Success Mills, Chicago, Ill. Inspection sample of Success Brand 50% Selected Poultry Scraps analyzed, 1; equaled guaranty.

Sunnyside Milling Co., Evansville, Ind. Inspection samples analyzed, 3.
Winter Wheat Shorts and Screenings, 2; equaled guaranty.
Winter Wheat Mixed Feed and Screenings, 1; equaled guaranty.

Superior Milling Co., Harriman, Tenn. Inspection sample of Superior Mixed Feed analyzed, 1; no cottonseed meal found.

D. B. Sutherland & Sons, Bloomfield, Ky. Inspection samples analyzed, 2.
Sutherland's Feed, 1; too low in protein.
Sutherland's Mixed Feed, 1; too low in protein.

Swift & Co., Chicago, Ill. Inspection sample of 60% Digester Tankage analyzed, 1; too low in protein.

Swift & Co., Memphis, Tenn. Inspection sample of 41% Protein Cottonseed Meal analyzed, 1; equaled guaranty.

Syn-Kro Mills, St. Louis, Mo. Inspection sample of Syn-Kro Mixed Feed analyzed, 1; no brewers dried grains found; oat hulls and salt present tho not guaranteed.

J. H. Tate & Co., Monticello, Ky. Inspection sample of J. H. Tate & Co's Feed analyzed, 1; too low in protein and fat; no corn bran found.

Tell City Flouring Mills, Tell City, Ind. Inspection samples analyzed, 6.
Hoosier Shorts and Screenings, 1; corn bran added.
Hoosier Poultry Feed, 1; no oats or oyster shells found.
Hoosier All-Mash Poultry Ration, 1; equaled guaranty.
Hoosier Special Mixed Feed, 3; 2 too low in protein; 1 only trace of ground oats found, no phosphatic limestone found.
Hoosier Dairy Feed, 1; equaled guaranty.

Tennessee River Milling Co., Chattanooga, Tenn. Inspection sample of "Moccasin Bend" Mixed Feed analyzed, 1; corn bran and cottonseed meal present tho not guaranteed.

Thomson's Mill, Madisonville, Ky. Inspection sample of "Red Bird" Cow Feed analyzed, 1; equaled guaranty.

Trenton Milling Co., Trenton, Ill. Inspection sample of Wheat Shorts and Screenings, 1; equaled guaranty.

Trimble Flour Mills, Milton, Ky. Inspection samples analyzed, 2.
All-Mash, 1; equaled guaranty.
Mixed Brans, 1; too low in fat.

The Ubiko Milling Co., Cincinnati, O. Inspection samples analyzed, 13.
Old Process 34% Linseed Meal, 1; equaled guaranty.
Ubiko Egg Mash, 1; no copper sulfate found.
Commercial Laying Mash, 2; equaled guaranty.
Ubiko Horse Feed, 2; equaled guaranty.
Ubiko Calf Meal, 1; equaled guaranty.
Ubiko Pig and Hog Ration, 1; equaled guaranty.
Ubiko Hog Feed, 1; equaled guaranty.
Clover Bloom Sweet 16% Feed, 1; too low in fat; no alfalfa meal found; excess oat hulls present.
Ubiko Union Grains 20% Sweet Dairy Ration, 1; equaled guaranty.
Sunbeam Dairy Ration, 1; equaled guaranty.
Ubiko Union Grains 24% Sweet Dairy Ration, 1; too low in protein.

Upton Milling Co., Upton, Ky. Inspection sample of Mixed Feed analyzed, 1; no corn bran found.

Van Meter-Terrell Feed Co., Lexington, Ky. Inspection sample of Viola Cow Feed analyzed, 1; equaled guaranty.

Vitality Mills, Chicago, Ill. Inspection samples analyzed, 8.
Advance Scratch Feed, 1; only trace of oats found.
Vitality All-Mash Starting and Growing Feed, 1; equaled guaranty.
Vitality C-Er Pay Laying Feed, 2; 1 no buttermilk found.
Sweet Honey Bee Dairy Feed, 4; no linseed oil meal found; 1 much too low in protein.

Walters & Thompson, Shelbyville, Ky. Inspection sample of Thompson's Laying Mash analyzed, 1; equaled guaranty.

Walton Feed Mills, Walton, Ky. Inspection samples analyzed, 7.
Big Bone Starting and Growing Mash, 1; no baking soda found.
Big Bone Fattening Mash, 1; too high in fiber.
Unique Egg Mash, 1; too low in protein; no alfalfa meal found; dried buttermilk, charcoal and salt present, tho not guaranteed.
Big Bone Hog Ration, 2; equaled guaranty.
Big Bone Dairy Ration, 2; 1 too low in protein.

Washburn Crosby Co., Louisville, Ky. Inspection samples analyzed, 2.
"Sonny South" Wheat Brown Shorts and Screenings, 1; equaled guaranty.
"Sonny South" Wheat Mixed Feed and Screenings, 1; equaled guaranty.

Weisenberger Sanitary Flour Mills, Midway, Ky. Inspection samples of "Repeater" Feed analyzed, 3; 2 excess corn bran present; 1 too low in protein.

West Louisville Mills, W. Louisville, Ky. Inspection samples of Mixed Wheat Feed analyzed, 2; equaled guaranty.

Geo. Wetherill & Son, Prestonville, Ky. Inspection sample of Goldenrod Egg Mash analyzed, 1; equaled guaranty.

Williams Grocery Co., Paintsville, Ky. Inspection sample of Eagle Flour Middlings analyzed, 1; equaled guaranty.

Williamstown Roller Mills, Williamstown, Ky. Inspection samples analyzed, 2.
Mixed Feed, 1; too low in fat.
Tip Top Sheep Feed, 1; too low in protein.

Winchester Roller Mills, Winchester, Ky. Inspection samples of "Perfection Brand" Mixed Feed analyzed, 2; equaled guaranty.

Wyatt Milling Co., Benton, Ky. Inspection sample of Wheat Mixed Feed and Screenings analyzed, 1; equaled guaranty.

Yopp Seed Co., Paducah, Ky. Inspection sample of Mixed Wheat Feed and Screenings analyzed, 1; too low in protein.

J. W. Zaring Grain & Mill Co., Richmond, Ky. Inspection sample of Bonanza Feed analyzed, 1; too low in protein; excess corn bran present.

Ziliak & Schafer Milling Co., Evansville, Ind. Inspection sample of Lameys Three-In-One All-Mash analyzed, 1; too low in protein.