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SELECTION OF FEEDSTUFFS FOR POULTRY

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Commercial Versus Home-mixed Rations:

The decision to use a ready-mixed commercial mash or a home-mixed one rests with each individual. Feeds produced by reputable feed manufacturers are generally adequate for highly satisfactory results. They possess the advantage of careful selection of ingredients, of control in mixing, of utilizing the latest information in improved formulas, and often of service. The list of ingredients and the guaranteed analysis should be similar to those recommended here. Follow the manufacturers' directions when using commercial feeds. Reputable manufacturers let results speak for themselves and do not tolerate high-pressure or itinerant salesmen. Their representatives are sound business men in your community.

Many poultrymen prefer to mix their own rations, especially when they have considerable quantities of home-grown grains available. These may be used in the scratch grain or in the mash as well. By home-mixing, considerable savings may be effected. This circular offers simple specifications to be followed in selecting ingredients.

When good ingredients are used and extreme care is taken in weighing and mixing, maximum results may be obtained with the formulas suggested in circular #1543A.

Weighing and Mixing:

Unless there is a good mixing floor on the farm, it is preferable to have a local mill mix the feed in a mechanical mixer. In order to avoid misunderstanding, both the operator and the farmer should insist on each checking the weighing and mixing. This avoids mistakes and assures satisfaction. When hand mixing, pour all ingredients on one pile and turn over by scoop into another cone-shaped pile at least 8 to 10 times.

In mixing poultry rations, as much care should be taken in assuring high quality ingredients as in the choice of adequate formulas and in careful mixing and weighing. The condition of the feed, the type of raw material used, the process and method of manufacture, and the age and storage conditions all have an important effect on nutritive value and palatability. The directions given in this circular for selecting feedstuffs are the result of much scientific research and practical observation.
FEED INGREDIENTS:
All feed ingredients should be fresh, sweet, and clean. Ground feeds should be uniform in particle size, not too fine and not too coarse. Moldy or badly caked feedstuffs never should be used.

WATER:
Water is the most essential nutrient. It makes up two-thirds to three-fourths of the body and of the egg. Fresh, pure water, suitable for human beings, should be available to poultry at all times. Ditch, barnyard, or seep water are all dangerous as sources of infection or alkali. Special precautions must be taken in the summer to keep the water sweet and cool, and in the winter to prevent water from freezing.

RATION:
- Ration is the total feed consumed and usually consists of mash or concentrate, grain, grit, and any green feed or liquid milk.

GRAINS:
Grains constitute most of the feed given poultry and are valuable as sources of carbohydrates (starches, sugars, fiber) and vitamins B and E, as well as other nutrients in a lesser degree. However, they are particularly deficient in protein quantity and quality (amino acid assortment), in calcium, phosphorus, manganese, sodium, chlorine, and possibly iodine, and in vitamins A (except yellow corn), D, and G.

Grains should approximate standard weight or better in most cases. Shrunken wheat can be used if not otherwise damaged. Yellow corn is the only grain with appreciable vitamin A potency. It is therefore a very valuable poultry feed. New grain is satisfactory for chicks or turkeys if it has been properly dried. Improperly cured grain heats and becomes moldy. This in itself is probably not harmful, but occasionally it causes trouble for some unknown reason. If there is some poor grain to be used up, it should be tried out first on a few culls for several weeks. New grain does not cause any known disease.

MASHES:
Mashes are designed to remedy the deficiencies in grains by incorporating protein, mineral, and vitamin supplements. They also contain cereal by-products and some ground grains.

CONCENTRATES OR SUPPLEMENT MIXTURES:
Concentrates or supplement mixtures are mixtures of protein, mineral, and vitamin supplements with no ground grains and often little or no cereal by-products. They are designed to supplement grains.

PROTEIN SUPPLEMENTS:
Meat scrap or meat and bone scrap should be appetizing in odor. Avoid any with an offensive, tainted, or rancid odor, particularly noticeable when moistened, or one with any considerable amount of hair. The most satisfactory grades are those with 50% and 55% protein content. Those with more or less protein may be inferior in nutritive value. Meat scrap is rich in bone meal, which tends to cause porosis (slipped tendons and enlarged hocks) in chicks when fed in excess. The amount of meat scrap fed to chicks or poults must therefore be limited by the partial substitution of soybean oil meal, corn gluten meal, or cottonseed meal.
Fish meal should be appetizing in odor. It should not smell strongly or objectionably fishy or have a tainted, rancid, or scorched odor. It should be uniformly finely ground. The protein of good fish meal is equal to that of milk and is therefore of superior quality. It is highly desirable in rations for growing chicks and poults.

Soybean oil meal (41% protein) should not have any raw or beany flavor when chewed slowly. Raw beans are not efficiently utilized by most poultry and are not recommended. The protein of soybean oil meal approaches that of milk in nutritive value for poultry and therefore is a highly desirable feed. This is particularly true in rations for chicks and poults, since it can replace a large portion of the meat scrap and fish meal, thereby reducing the amount of bone which aggravates the occurrence of perosis.

Corn gluten meal (43% protein) should preferably have a deep golden-yellow color. It serves a purpose similar to soybean oil meal and may be used on a similar basis. However, the ration should contain at least 30% of a mixture of wheat shorts, bran, and oats, and some alfalfa meal and milk for best results. This product is particularly valuable in turkey, capon, and broiler rations because it somewhat improves the finish (fleshing), and a larger proportion of the birds grade as prime.

Cottonseed meal (41% protein) is a good vegetable protein supplement of high nutritive value for chicks. It should not be used in amounts exceeding 5% in the laying mash because larger amounts cause egg yolks to turn olive-green and the whites pink when the eggs are stored.

VITAMIN SUPPLEMENTS:

Dried milk products (buttermilk, skim milk, whey) should show no signs of severe scorching or of rancidity. Dried buttermilk and skim milk have about 33% protein and are rich in vitamin G, the dried buttermilk being considerably richer in vitamin G. Dried whey lies between dried buttermilk and dried skim milk in vitamin G content. It contains about 12% of protein.

Liquid milk products (buttermilk, skim milk, whey) should not have any putrefied (rotten) odor, should be palatable and should not be diluted. Buttermilk and skim milk contain about 33% protein, and whey contains about 12. All are rich in vitamin G. When used to replace dried milk or whey or protein in the mash, these products should be fed constantly without any omissions. The containers should be kept clean and sweet by frequent scouring and disinfecting. Large amounts of milk will cause more loose or watery droppings and litter must be changed more often.

Condensed milk (semi-solid, etc.) contains about 11% protein and about one-third as much vitamin G as the dried form. Three pounds of condensed milk (semi-solid) are therefore equivalent to 1 pound of the dried form.

Alfalfa leaf meal should be a bright deep-green color and should contain at least 20% protein and less than 15% fiber. Straw-colored meals or any showing a considerable proportion of straw-colored particles are low in vitamin value. The value is in the green leaves. If locally grown alfalfa hay is obtainable, cut in the bud or early stage (not in full bloom), high in percentage of leafy material and well cured, retaining its deep-green color, it will make an excellent meal when ground. A good third-cutting alfalfa generally meets these requirements. The dehydrated meal is usually richer in vitamins.
Green range must be succulent, tender, and leafy, as well as green. Ranges meet these requirements only in the spring or when alfalfa, clover, or rye, wheat, or other grain pastures are kept mowed short and are well-irrigated. Alfalfa and clover should not be allowed to grow over 9 inches high or they become too coarse for consumption by poultry. Growing birds should be allowed to range freely in the green feed and should not be fed heavily in the morning. Feed hoppers should therefore be scattered around the range and moved frequently to avoid killing off the grass or allowing mass infection of disease and worms. Grass range can be kept in ideal condition if sufficient sheep are pastured on it to keep the grass short, providing the sheep are free of erysipelas. This disease is transmitted to turkeys. Feed hoppers must be kept in creeps to keep the sheep out.

When birds are consuming plenty of green feed, the mash fed to the birds will not need any milk products or alfalfa meal, and the amount of yellow corn can be reduced. Fresh green feeds cause deep orange yolks. For commercial egg production, the consumption of fresh greens must be limited to avoiid too-dark yolks.

Sprouted grains must be sweet and clean and not soured. When fed, they should be deep green. They then make excellent green feed. If birds are given all they will consume in 5 to 10 minutes daily, the alfalfa meal and dried milk products in mash can be reduced by about half, possibly more.

Cod liver oil or sardine oil must be fed as a source of vitamin D when birds are not out in direct sunlight. These oils also supply important amounts of vitamin A. Sunlight through window glass is of no value as a source of vitamin D. The oil must be biologically tested and guaranteed. An untested, unguaranteed fish oil may have little or no vitamin D potency. The amount to be used will depend upon the guarantee on the container as follows:

<table>
<thead>
<tr>
<th>Guaranteed A.O.A.C. units of D per gram</th>
<th>Lbs. or pints per 100 lbs. of mash or concentrate</th>
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<tr>
<td></td>
<td>Laying hens</td>
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<td>Concentrate</td>
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<td>3</td>
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<td>85 - Standard</td>
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<td>200 -</td>
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<td>400 - Reenforced</td>
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**"Confined" refers to the total confinement of birds out of direct sunlight. "Semi-confined" is when the birds get a moderate amount of direct sunlight,—for instance, the curtain fronts and windows of poultry houses are open and allow sunlight to pour in the house and on the birds. Birds running outdoors into direct sunlight require no fish oil. Sunlight costs nothing.

The vitamin D in the oil loses its potency slowly when stored in feed. More oil must therefore be added in the mash if it is allowed to stand unused for over 2 months.
MINERAL SUPPLEMENTS:

Grit is not essential for chicks. If used, it should be insoluble, such as granite or quartz, and should be very resistant to pulverizing. Soluble grit (limestone) upsets the mineral balance and may lead to rickets in chicks (low phosphorus-high calcium type). For hens or pullets, crushed oystershell or limestone grit serves satisfactorily as well as providing calcium for shells.

Steamed bone meal should be finely ground and clean, with a mild, bland odor.

Limestone must contain at least 90% calcium carbonate and may be amorphous (limestone) or crystalline (calcite).

Oystershell should be clean smelling, and practically free of sand. It should be uniform in size whether crushed or pulverized.

Manganese sulphate should be 90 to 95% pure anhydrous powder. It is used at the rate of 4 ounces per ton of starting mash for chicks or pouls in batteries or on wire floors to help prevent perosis.

Mineral mixtures are more or less complex mixtures of the above-mentioned minerals with others. They are nearly always high priced, are not necessary for properly formulated rations, and are harmful if added to such rations.

Tonics and patent remedies are advertised as the panacea for all ills, real or imagined. They are unnecessary. If your poultry is not doing as it should, the trouble is in breeding, feeding, housing, incubation, sanitation, disease or management, and must be corrected there. Treatments for disease control are described in Colorado circular "Controlling Poultry Diseases."