

changes in climatic conditions and differences in breed characteristics. A great deal of common sense must be used in applying the principles that have been worked out by the experts. One must also feed somewhat in accordance with the future expectations from the flock. A flock kept with no other object than winter egg production may be fed and pushed much more forcibly than one which is expected to produce many fertile eggs with strong germs for spring hatching. Various food rations will give satisfactory results if wisely adjusted to the case in hand. For this reason one must know what constituents are necessary to promote health in the flock and at the same time furnish the materials necessary for egg production. The chief requirements are that the food be wholesome, that enough be fed to keep up the natural functions, and that it be fed in such a way as to furnish incentive for vigorous exercise.

An egg contains 57.4 per cent. white, 32.5 per cent. yolk, and 10.1 per cent. shell. The shell consists almost entirely of lime. The yolk contains 50 per cent. water, 15.5 per cent. protein, 33.5 per cent. fat, and one per cent. mineral matter. The white contains 85 per cent. water, 12.36 per cent. protein, 2.3 per cent. fat, and .34 per cent. mineral matter. This shows that an egg is a little more than half water, and that it contains a good deal of protein and fat. This naturally suggests the importance of a plentiful supply of fresh, clean

pounds of carbohydrates. As to total dry matter, they need 27.5 pounds, and this should contain about 1.5 pounds of mineral constituents.

Having seen that a laying hen requires 4.5 times as much carbohydrates as protein, making a ratio of 1 to 4.5 of protein to carbohydrates, let us examine some of the common grains to see if they contain these nutrients in that proportion. Wheat contains one part of protein to seven of carbohydrates; oats, one to six; barley, one to eight; buckwheat, one to 6.6; bran, one to 4.1; shorts, one to 4.3; alfalfa, one to 3.7; oil meal, one to 1.6; corn, one to 10; beef scrap, one to five.

These facts show that corn has a great deal too much carbohydrate material (fat-forming elements), while beef scrap has far too little. None of the grains contain enough protein without the addition of a little beef scrap. This is one reason why beef scrap is such a valuable poultry food. Green food aids digestion, and it also aids the body in getting rid of the waste products which exist in every ration.

It seems best to grind all the grain food rather coarsely, and then screen out the fine mealy portions. The coarser grain is placed in the hoppers after being previously mixed in the proper proportion. The fine meal is then used in an occasional wet mash for variety. Some whole grain should be fed in the litter to induce exercise. The real object in grinding the grain is to



An Indian camp.

water for laying hens, and also a ration comparatively rich in protein. Corn contains an excess of carbonaceous matter; consequently, when this is being fed we need other materials to balance it. Lean meat, milk, and some of the leguminous foods such as cowpeas, alfalfa, clover, etc., are suitable for this purpose. The legumes are used for vegetable protein; the meat, milk, and green bone for animal protein. Some claim that animal matter is not necessary if enough vegetable protein is furnished, but we believe that a little of both is better than either kind alone.

We usually speak of carbohydrates and fat in the same terms in making up rations, although strictly speaking, they are not the same; the latter is more concentrated than the former. The nutriment in one pound of fat is as valuable as that in 2.55 pounds of carbohydrates. Both, however, are used as fuel for the body to keep up fat in the body and in the yolk of the egg. The term "carbohydrates" is a collective name for such constituents as sugars, starches, and other similar bodies. Protein is used in the body of the hen for producing muscle, feather, the white of the egg, etc.

The New York Experiment Station has figured out that 100 laying hens weighing about five pounds each will require the following amounts of digestible nutrients daily: Protein, five pounds; carbohydrates, 18.8 pounds; and fat, 1.8 pounds. In other words, for every pound of protein they require 4.5

enable the hen to save the energy she would use for this purpose. A ration based upon the above facts is as follows: 400 pounds wheat, 200 pounds corn, 50 pounds oats, 75 pounds bran, 75 pounds shorts, 50 pounds oil meal. Save the whole wheat for feeding in the litter; also screen out 100 pounds of the coarsest of the cracked corn for the same purpose.

Grind the oats and mix with these the other constituents evenly. Use this mixture in the food hoppers and let the hens eat all they want of it. In addition to this, feed six pounds a day of the cracked corn and wheat mixture per 100 hens in the litter. The hens will help themselves to the food in the hoppers and if made to scratch in deep litter for the whole grain there is no danger of their getting too much feed.

In addition to this grain, give six pounds of cut alfalfa hay per day per 100 hens, or leave the hay in mangers where they can help themselves. They will also need six pounds of roots or green food a day and all the grit, oyster shell, meat scrap, and green bone that they care to help themselves to from the hoppers. Some slaked lime broken in chunks and lying where the fowls can get at it will make up for a lack of lime in the suggested ration. If the fowls are kept busy, happy, and warm they will do their own balancing of rations, if the right kind of food is before them.

Don't Let Gophers Rob You This Year

The gophers and squirrels are now sleeping and dreaming of what great feasts they will have as soon as you start your spring seeding. As soon as the snow disappears, they will wake up from their long sleep and join together for the big feast of grain that the farmer will be spreading and which he believes will produce bounteous crops for him. The gophers didn't last year and the year before and they can't figure out any reason why they won't be able to do it again. Yet the whole matter is in your hands, Mr. Farmer. Are you going to stand a loss of \$200 every 80 acres, or are you going to prevent this loss?

ANTON MICKELSON
President

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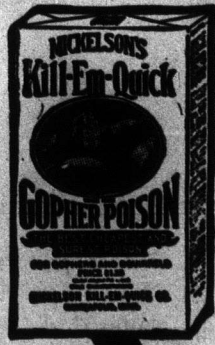
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