



Maine Organic Farmers and Gardeners Association

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MOFGA FACT SHEET #13

Feeding Whole Grains to Chickens

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Introduction

Feed is the most expensive portion of the cost of raising chickens, and this expense is magnified by the fact that most folks feed a ground mash or pellet that is formulated and produced by a feed company. In an attempt to reduce this cost, you can feed laying hens and meat birds, including young birds, whole grains, either as their entire diet or to supplement purchased feed. Whole grains are more nutritious than ground, since oxidation occurs after grinding, reducing nutritional content; and the longer the ground grain sits around, the greater the loss.

When changing the diet of adult birds, add the whole grain to the diets gradually to promote gizzard development. The gizzard helps grind feed. Use whole grain for 5% of the diet for the first two weeks to adapt the gizzard, then, over a couple of weeks more, increase the percentage to whatever level you have decided to feed. Birds fed whole grains have significantly larger gizzards, which could be a selling point for gizzard bits for gravy. Grit needs to be provided at all times when the birds are not on pasture in order to help digest the whole grain.

Nutritional Requirements

Poultry have more specific nutritional requirements than ruminants or pigs, because they do not manufacture many amino acids, the building blocks of protein, in their gut. So, more amino acids are needed in the feed. The most limiting amino acid is methionine. The National Organic Standards Board allows, until 2008, non-organic sources of methionine in rations. Fish meal and/or sunflower, safflower or sesame meal, all good sources of methionine, can be included.

The standard protein source for chickens is soybeans, which must be roasted and at least cracked in half for birds over eight weeks. Younger birds need smaller bits or ground soy. Milk is a good source of protein and can be fed instead of water for half the day, with water available the other half of the day. You can use ground alfalfa or hay and chop or crush it into pieces that are smaller than 1 inch, or feed the leaves. Alfalfa also provides pigments for yellow yolks and flesh if you don't feed a diet high in corn. Flax seed is high in protein, oil and omega-3 and omega-6 fatty acids, but affects egg flavor when it comprises more than 10% of the feed. A higher concentration of these fatty ac-

ids occurs in eggs of chickens who were fed flax seed as 8 to 10% of the diet.

In addition to protein, an animal diet needs adequate sources of energy, vitamins, minerals and water. These requirements can be met by feeding whole grains and a salt/mineral mix in addition to the protein source. Laying hens need more calcium than is usually provided in the mineral mix; you must include either oyster shell, limestone or aragonite for chickens to make strong shells. Laying hens need about 4% calcium in their diet, and you would have to feed a hen two to three egg shells every day to meet this requirement.

You can feed the hens cooked eggshells to meet part of their calcium requirement. I put the shells in the oven when I am baking something else, until I smell them cooking. Cooking shells changes their smell, so the chickens don't get ideas about eating their eggs. After the shells are cooked, I crush them and mix them with the supplement mix or mash.

You may add other supplements to the ration. Rock phosphate is a good source of phosphorus (see accompanying table for amounts). Yeast provides B vitamins; diatomaceous earth provides minerals and some believe that it helps control internal parasites; probiotics add good bacteria to the gut; and kelp is a source of micronutrients. Salt in some form must be added but can be reduced by one-third if you use kelp. A Poultry Nutri-balancer that contains many of these items is available from NorthCountry Organics (802-222-4277) or from Fertrel (800-347-1566).

Which Grains to Feed?

No grain is ideal. Corn is the standard feed in commercial preparations, but we can't grow it easily in Maine. Of the small grains that are available, wheat can slow digestion but is a good substitute for and is higher in protein than corn; barley is less palatable; oats have less energy and are fibrous; rye inhibits growth; millet is a good energy substitute but is low in protein. "Each one of them has something," explains Jacquie Jacob, a poultry nutritionist at the University of Minnesota (www.ansci.umn.edu/faculty/jacob.htm and www.misa.umn.edu/Other/poultryfeed.html). "In small quantities, each one is okay. But if that's all a farmer is using, then it's going to be a problem." The challenge becomes finding a diet that is simultaneously high in protein and essential amino acids and minimizes the effect of the anti-nutritive aspects of each crop.

Feeding laying hens a mixture of grain with peas or canola seed will not provide adequate protein quality to maintain egg size and production. Some soybean is needed as an amino acid source. Mixing a 35 to 40% protein supplement in the correct

proportions with your grain will produce a balanced 16 to 19% protein layer ration. Poultry can be fed a wide variety of grains and will do well if the grains are fed in a balanced ration. Chicks can be fed wheat, oats or barley. The oats or barley need to be limited to 25% of the starter diet. After six weeks of age, the birds can be fed rations with oats or barley as the whole source of grain, especially if they have been exposed to these grains previously. All poultry can be fed hard red, durum, extra strong or utility wheat. Rye can be introduced after six weeks of age and can comprise up to half of the grain in laying hens' diets. Rye containing ergot should not be used. Screenings are acceptable for poultry if they contain 75% or more wheat and cracked wheat.

Pasture is Essential

During the growing season, tender green pasture is essential for all birds over three or four weeks of age. Pasture reduces the cost of raising poultry; reduces the amount of mash and grain consumed somewhat; and allows the use of a simple growing ration. By eating insects and pecking at the soil, chickens can get a lot of necessary minerals and protein. Good pasture results in vigorous pullets that can produce many eggs the following winter. Rye sown in the fall or a thick, early seeding of oats can provide early pasture for chicks hatched in the spring. Move the poultry shelter often to give the flock clean ground and fresh green feed. Keep pasture 3 inches or shorter by grazing or cutting. For an adequate supply of pasture, an acre is needed for 200 adult birds or 300 chicks for the season.

Methods of Feeding: Hen's Choice---to a Point

Carlyle Bennett, poultry specialist from Manitoba Agriculture and Food Animal Industry Branch, has written a great article entitled "Choice-Feeding of Small Laying Hen Flocks" (www.gov.mb.ca/agriculture/livestock/poultry/bba01s10.html). The article begins: "Choice-feeding can be an easy way for small flock owners to feed their laying hens. When you choice-feed your hens, you do not have to worry about grinding the grain or mixing it accurately with a supplement. Instead, you have separate feeders for the grain, supplement and... limestone or oyster shell for

a calcium source. Then let the birds choose how much of each they want to eat."

Bennett explains that hens should not have too many choices, but can cope with three nutritionally distinct choices. The "grain is high in starch and energy, supplement is high in protein and vitamins, and limestone is high in calcium. The hens learn which feeders to go to and how much to eat to meet their basic nutritional needs. Do not feed vitamins or micro-minerals (e.g., copper, zinc, etc.) in a separate feeder." These ingredients are included in the supplement. The supplement should be 25 to 40% protein--around 25% for laying hens and closer to 40% for pullets or meat birds. Bennett has shown that hens consume 70% of their diet as whole grain when it is choice-fed. You should not have more than 50% of the diet as whole grain if you're using one feeder; the rest of the feed should be ground. Given more than 50% whole grain, the hens sometimes have trouble finding the supplement among the grains. If the grain, supplement and limestone are in different feeders, this problem is eliminated.

The chart below from ***Morrison's Feed and Feeding, 21st Edition*** will help you formulate your own grain and supplement combinations. A simple ration recipe would be easier, but the ingredients and combinations are many. Try to find some local grain by looking at the growers list at www.mofga.org, or call the MOFGA office (207-568-4142) for contacts, and do your own balancing.

For those who don't want to venture into whole grain feeding, remember that much research has shown that feeding up to 50 percent of the diet as whole wheat will not affect the production rates of poultry at any stage.

For an updated list of organic feed distributors, see *Raising Organic Livestock in Maine: MOFGA Accepted Health Practices, Products and Ingredients*, available on www.mofga.org, or by calling the MOFGA office at (207)568-4142.

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Feed Composition (%) for Chicken Feed

Ingredients	Chicks 0-8 weeks	Grower 8-18 Wks.	Laying Hens	Breeding Hens
Total Protein	20	16	15	15
Grains	62-72	68-78	62-77	56-68
Veg. Protein	15-18	12-15	15-19	12-14
Fish Meal	3-4	4-5	4-5	7-9
Alfalfa Meal/Pasture	2-5	4-10	4-10	4-10
Calcium & Phosphorus	2	2	2	2
Salt	1	1	1	1
Vitamin-Mineral, Kelp, etc.	4	4	4	4