

Feeding your Flock

Dr. Maurice Pitesky and Dr. Nancy Reimers

There is probably more controversy over feeding backyard chickens than over any other aspect of chicken husbandry. This may be in part because chickens are raised for meat and/ or eggs, they are raised in multiple environments where they can pretty much eat anything and there are over 250 different breeds of chickens, so there are more options with respect to diet than other animals. Consequently, everybody has an opinion about how to best feed their chickens, your chickens and your neighbor's chickens!

From Crop to Cloaca:

Chickens are omnivores meaning they eat both animal protein and plant produced foods. The food moves from the beak to the crop which is a pouch like area in the neck where food can be stored for up to two hours. In prey birds (think your chickens) the crop is thought to be a storage sack where birds store the food they have scavenged until they are in a safer location. In the crop enzymes called amylases begin to break down the food.

Note, if you see a 'mass' under your chickens neck after they eat it is probably just food in the crop. It will go away as the food moves from the crop to the proventriculus which is similar to our stomach with respect to the presence of acids and other enzymes which further break down the food. Next the food moves to the gizzard which is a very muscular oval shaped sac. The gizzard often has bits of gravel and grit which physically grind up the food. Remember, birds don't have teeth so the grit helps mechanically break down food. If you only feed a commercial diet made of pellets your chickens do not require grit because these feeds are already highly digestible. Finally the food moves to the intestines where nutrients are absorbed. Liquid and solid waste exits through the cloaca.

So what should I feed my chicken?

The short answer like everything in medicine is "that depends." For this article we are going to focus on the dietary needs for "backyard" chickens that are raised for their eggs in a non-pastured environment. Below are some general guidelines and husbandry suggestions you should be aware of regarding diet and changes in diet depending on age and laying status. In a commercial setting there are often 5-7 different diets depending on where in the hen's life-cycle we are. For a backyard setting we are recommending the following three diets:

Chick Starter (0-6 weeks): Just hatched chicks need a high energy carbohydrate rich diet usually in the form of corn in commercially available diets. The available protein needs to be high digestible protein (usually soybeans) and should have a protein content of approximately 20%. We also recommend purchasing a medicated feed with an approved Coccidiostat to mitigate the effects of the protozoal parasite Coccidia (see below on medicated feeds). If your chickens are not eating highly digestible commercial pelleted feed you can start adding grit to help with mechanical digestion after the first week.

Pullets (i.e. female hens who have not started laying eggs) (6-18 weeks): In general as the chicks get larger they need less protein but more energy. A grower or pullet ration has a lower protein level than a chick starter to ensure your chickens don't grow too fast.

Laying hens (18 weeks plus): Switch to a laying feed which has increased Calcium and Vitamin D. The Calcium to Phosphorus ratio should be 2:1 and the Calcium should increase from 2.5% to 5.0%. Interestingly, the requirement for Calcium is not constant throughout the day. Shell formation typically occurs around 12AM, so if your hens have thin egg shells which is somewhat common in older laying hens because egg shells get weaker as the chickens get older, supplement oyster shell which is high in Calcium at night.

Molt: As laying birds age and sunlight decreases birds will often undergo a molting period where their reproductive tracts basically "takes a break." When they naturally molt in this fashion they stop egg production while their reproductive tract is regenerating. Therefore, since they are no longer laying eggs, their dietary needs are different with respect to energy, protein and Calcium. In a commercial layer operation, a special diet is formulated during a molt for an entire flock. However, in a backyard setting where some birds may not be molting or all the birds are not molting at the same time, we would recommend maintaining the laying hen ration in order to supply the proper diet to the chickens that are still laying. This is because if a laying hen was given a molting ration it would be more dangerous than feeding a molting hen a laying ration.

Loss of weight and feathers are common during molt. Once the molt is complete after approximately 1-2 months for most breeds the feathers, weight and egg production will return. However, egg production is typically reduced by ~ 15% following each molt.

The great thing about commercially available poultry feeds at your feed store is that they are already formulated and balanced for chicks (i.e. starter feed), pullets and laying hens. In addition, they are stabilized to prevent rancidity. If you purchase commercial feeds remember a few simple things:

Don't store food for more than 1-2 months. Even though there are stabilizers the food can become rancid over time. Store the food in an air tight cool storage area where rodents and other wildlife are unable to gain access. Wild animals can eat feed and defecate in the feed transmitting diseases including *Salmonella* which can then sicken us. Finally, because backyard chickens are so popular, there are multiple brands so if you don't like bone meal in your chicken feed then find a brand that doesn't have bone meal.

Should I make my own chicken feed?

OK, so some of you don't want to use commercial feeds because you have an abundance of home grown grains and a grinder, or you purchase ground ingredients and you want to make your own ration. If you do, make sure you consult the most recent Nutritional Requirements for Poultry by the National Research Council at <http://www.nap.edu/openbook.php?isbn=0309048923> in order to make a balanced diet and avoid any nutritional deficiencies. Just remember this can be extremely challenging to do correctly especially when trying to measure nutritional quality and consistency of homegrown feeds and to optimize micronutrients and specific amino acids like methionine which are important for egg production.

Where do scraps fit in?

As noted earlier chickens eat everything including our table scraps. Just make sure the table scraps are still good quality. Obviously, we don't want to feed our chickens' rotten or otherwise unhealthy food. Chickens don't require high amounts of fat, so avoid fatty foods. Avoid feeding chickens avocado, raw beans, chocolate, green areas of potatoes, leaves from tomato, rhubarb, pepper, potato, eggplant, or nightshade plants and any alcohol or tobacco which can be toxic.

Finally, when feeding your chickens scraps, treat the scraps like a treat not like the main course. The main course is balanced to maximize health and egg production, the scraps are not balanced and you may cause nutritional disorders if the scraps are displacing too much of the balanced diet.

Medicated Feeds???

One thing that is important to realizing is that if your birds don't have a healthy "gut" (i.e. intestinal tract) it doesn't matter what you feed them. Avian intestinal coccidiosis is a ubiquitous protozoal gastrointestinal (GI) parasite (i.e. microscopic single celled organism) which primarily affects young chickens. Clinical signs include mucoid or bloody diarrhea, dehydration, anemia, listlessness, ruffled feathers, suboptimal growth and death. One way to mitigate coccidiosis until your chickens have developed natural resistance is to utilize medicated feed which is commonly added to starter feed. The medication is a coccidiostat

which reduces harmful protozoa in the chicken's gastro-intestinal tract.

Even if you do everything by the book chickens have a tendency to get the following nutritional disorders:

Vitamin A deficiency: Chickens will have poor growth and feathering and in severe cases will be unable to stand. You may also see "blood spots" in eggs from laying hens.

Vitamin E Deficiency (aka. Encephalomalacia): Young chicks will be uncoordinated and will have an inability to stand. Typically occurs in young chicks around 3 weeks of age that were fed diets in which vitamin E has been destroyed.

Rickets in young birds and Osteomalacia in older birds: Pliable soft beaks and bones. Calcium or Phosphorus deficiency or an imbalance between the two.

Hemorrhagic fatty liver syndrome: Just like humans, chickens don't always know when to say when with food. Consequently, chickens can get obese. One side effect are the development of fatty liver lobes which can rupture and kill chickens.

If you see any of the above described disorders contact your local veterinarian in order to properly diagnose and potentially treat the disease or nutritional disorder.

Poultry Science is written by faculty from the School of Veterinary Medicine at the University of California, Davis (www.vetmed.ucdavis.edu) and University of California Cooperative Extension (www.ucanr.edu). This column was written by Dr. Maurice Pitesky DVM., MPVM, DACVPM, who specializes in poultry health and food safety epidemiology. Dr. Nancy Reimers D.V.M. ACPV is a commercial poultry veterinarian with a strong interest in backyard and small-scale poultry production.

They can't have a healthy intestinal tract if the environment around them is contaminated with high levels of pathogenic organisms including the protozoal parasite Coccidia.