

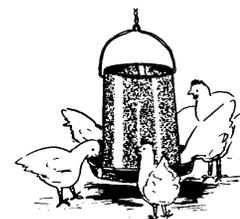


The University of Georgia

**Cooperative Extension Service**

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## ***BACKYARD FLOCK TIP . . .***

### **A FEW BASIC POINTS ABOUT PROTEIN**

Everyone is familiar with the word "protein", because it turns up so frequently in everything from food to shampoo. Whether we are dealing with commercial or backyard flocks, all poultry need protein in the feed. Because of its tremendous importance, it is worthwhile to gain a basic understanding of this important nutrient.

The range of different substances that are composed of proteins is so varied it is difficult to remember we are talking about the same basic thing. To illustrate, animal tissues as different from each other as meat, hair, hooves and nails, egg white, cells in the blood, leather and skin, and feathers are almost all solid protein. Plants, and especially seeds like corn and soybeans, contain protein, but are mixed with carbohydrates like sugars, starch, and fiber.

The reason proteins can be so different from each other is that they are assembled out of 20 different building blocks, called amino acids. If we think about it, we can probably come up with a list of 20 different construction materials such as red bricks, cement blocks, concrete slabs, wooden beams, steel rods, and the like. While all are what we would call "building materials", they can be used to construct an astonishing variety of structures. The same is true with the 20 amino acids...there is no end to the different types of proteins that can be made from them. Here we should mention that all acids are not like the fuming flasks in Dr. Frankenstein's laboratory, and amino acids are not like that at all. They are simply white powders. The two most common that we add to poultry feeds are *lysine* and *methionine*.

The protein in poultry feeds comes mainly from plant sources, such as soybean meal. Oil is extracted from the soybean for human use, with the remaining solid portion having almost 50% protein after the fibrous hull is removed. Many by-products of animal processing, such as meat and bone meal from cattle and swine, and poultry and feather meal from chickens and turkeys, have 50% or more protein (i.e., amino acids, which collectively are called protein). Grains are mostly made up of starch and fiber, but are about 10% protein.

### **PUTTING KNOWLEDGE TO WORK**

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At this point a very reasonable question might be asked: "If the protein in poultry feeds comes from the ingredients mentioned in the above paragraph, and if all proteins are composed of amino acids, then why do we have to add to the feed extra synthetic amino acids like lysine and methionine, which are extremely expensive? If the feed needs additional amino acids, why not simply add more soybean meal?".

The answer lies in the fact that in the diverse proteins, such as those mentioned above, the 20 amino acids are present in wildly different concentrations. It should not be a surprise that the proteins in plants have a very different combination of amino acids than do those in tissues of animals. Thus, when the chicken converts soybean protein into meat and eggs, it is reasonable to find that the concentrations of the 20 amino acids don't exactly match up. Research has found that the animal needs more lysine and methionine than is present in a feed made mostly of corn and soybean meal. While expensive, it is more economical to provide the birds with these amino acids in synthetic form. This is logical...if we only need to top off the levels of lysine and methionine to reach the bird's requirement. Therefore, there is no reason to add all 20 amino acids which is what would happen if we simply added more of a high-protein ingredient. Synthetic amino acids allow us to more precisely meet the birds nutritional needs, and do so more economically.



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“Your local County Extension Agent is a source of more information on this subject.”