

Practical Problems in Layer and Pullet Nutrition

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Today the most frequently encountered problem in layer and pullet nutrition is soft bones, gout and shell quality. All of these are related to calcium metabolism. The ability of hens to utilize calcium does have some strain relationship. Calcium source and particle size is very important for shell and bone development. Are some of the enzyme products, phytase, a part of the problem? I don't think so, but we discuss the role of this enzyme and possible ways it could be over valued in diets.

Soft bones in pullets are caused by low calcium, low phosphorus or low levels of vitamin D3 or low levels of some trace minerals. Sometimes all of these factors are combined in a disastrous case. Generally, calcium levels of 1 percent are adequate for all growing stages of replacement layers through 15 weeks of age. Available phosphorus levels of 0.5 percent for the first 3 weeks, 0.48 percent through 6 weeks of age and 0.45 percent to housing are adequate. Vitamin D3 levels need to be around 1500 to 2000 IU per pound of feed. If we have all of these things in place, can we still see soft bones? We sure can. Skeletal growth occurs at such a rapid rate that only a day off feed, or out of feed, during the first 2 weeks will result in soft bones. Enteritis can increase the number of chicks suffering from soft bones.

Soft bones in layers are caused by the same factors as seen in pullets. In addition, hens have a tremendous expense of calcium in the egg shell. High rates of egg production and inadequate dietary calcium levels will result in collapsed ribs and soft long bones. This can occur over a very short period, 3 to 4 days. Calcium requirements are strain related. Normally, 4 grams of calcium is adequate daily intake level for peak production. W36's get by on a little less and Babcock 300 need a little more. Available phosphorus intakes should be around 500 milligrams per day through peak and drop down to 380 milligrams at 55 weeks of age for most layer strains. I think magnesium plays a role in reducing soft bone problems in layers. Vitamin D3 levels of about 1500 IU per pound of feed are normal for layers.

Egg shell quality is greatly dependant on the skeletal condition of the layer. Hens with soft bones usually, but not always, produce thin egg shells. Low calcium levels in the diet will result in poor egg shells after about 4 days of feeding. High levels of phosphorus can cause poor egg shell thickness in layers of all ages but more problems are seen in older hens.

More cases of gout have been reported this year than I have ever seen. It may be that higher levels of calcium, 1.5%+, are being fed too early to the pullet. This will result in some kidney damage. Low salt, sodium, levels in diets may send water intake down and gout could follow. High levels of crude protein are a common culprit in high producing layers. It takes a very low, 18 pound, feed intake to justify the use of 21 percent crude protein.

Plants store phosphorus in seeds in a structure called phytin. The phosphorus is pretty well trapped in that structure as far as the chicken is concerned. We commonly figure only 30 percent of the phosphorus from plant material is available to the bird. Phytase is a naturally occurring enzyme produced by bacteria and even some plants. The chicken does not produce this enzyme. When we supplement the diet with phytase, the chicken gets another 30 percent more phosphorus out of the plant components. This is good. We get more efficient use of dietary phosphorus and reduce the amount in the manure. Can phytase use result in soft bones and poor egg shells? Yes. If the value of phytase is exaggerated, then we would give the diet far greater phosphorus content on paper than is truly found. Early on phytase was used in Europe in wheat based diets. Wheat has a pretty high level of phytase. The value of phytase in corn or milo based diets is not as high. When fed at recommended levels, phytase will safely result in a decrease of 20 percent phosphorus and only about 2.5 percent decrease in calcium in the diet.