



COMMERCIAL EGG TIP . . .

ENZYMES FOR POULTRY FEED: YES OR NO

A number of enzyme products are currently on the market intended for addition to poultry feed. Most of these are digestive enzymes, intended to improve the chicken's ability to digest nutrients in the feed. No common feed ingredient is 100% digested in the animals' gastrointestinal tract. Poultry producers, and in particular nutritionists, are often asked to consider the use of enzymes in their rations. A simple four-step process can serve as a guide in making decisions concerning enzyme use.

1. What is the substrate? The biological action of enzymes is frequently compared to that of a lock and a key, with the enzyme being the key and the substrate the lock. If there is no lock, it is pointless to purchase a key. Thus, in considering possible enzyme use, we must be certain the feed contains the substrate the enzyme is designed to hydrolyze or digest. If not, there is no point in adding the enzyme.

2. Is there adequate substrate to justify enzyme use? In plant materials, such as grains and oilseed meals, most phosphorus is present as *phytate*. This compound is generally indigestible by the bird. The use of the phytase enzyme to digest phytate is frequently justified, as the substrate is present in appreciable quantities.

The modern popularity of enzymes began in Europe and Canada where wheat and barley are principle feed grains. These two grains contain appreciable amounts of non-starch polysaccharides (NSPs), which are not well digested by the bird's own endogenous enzymes. Other grains, such as corn and milo (sorghum), have lower levels of NSPs. The use of NSP enzymes in diets based on the latter two grains may or may not be justified, depending on the amount of substrate present.

3. Does it matter? Supposing the substrate for a given enzyme exists in appreciable amounts, we must be certain the utilization of the breakdown products of enzyme activity are important. If nutrients are made more available for absorption, this is usually the case. On the other hand, as an example, if we have 7% meat and bone meal in the diet, and the meal contains 5% phosphorus, we would derive about 0.35% available phosphorus only from this ingredient, and an

PUTTING KNOWLEDGE TO WORK

additional 0.10% from the grain and soy. In this case, there is no reason to supplement phytase to improve the phosphorus availability from plant ingredients, as the total level of available phosphorus would exceed the bird's requirement for this nutrient.

4. Is it economically worthwhile? This is an extremely important consideration. In the case of an enzyme designed to improve carbohydrate digestion, and thus metabolizable energy, we must consider the cost of alternate energy sources such as grains, fat, or high quality bakery meal. There are situations where the use of an enzyme to improve metabolizable energy might be justified when feed costs are high, but be uneconomical if energy is relatively inexpensive. An economic analysis is needed to determine whether the use of a specific enzyme at a given time is justified.

In some areas, the environmental impact of manure application is more important in a consideration of enzyme use than strictly economic factors. Undigested carbohydrates which enter the excreta are generally non-controversial, and serve to increase the organic matter in soils on which they are applied. However, phosphorus excretion is a problem in many areas, and serves as a further justification for the use of the enzyme phytase.



Nicholas M. Dale
Extension Poultry Scientist

Extension County Coordinator/Agent

****Consult with your poultry company representative before making management changes.****

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