

## Nonruminant Nutrition: Improving the Nutritional Value of Alternative Feed Ingredients

### **236 Anti-nutritional compounds and other limitations to the use of alternative feed ingredients.** H. H. Stein\*, *University of Illinois, Urbana.*

Alternative feed ingredients that are used in the swine industry may be categorized in 4 groups: 1) Intact ingredients such as field peas, canola seeds, barley, wheat, and oats; 2) Processed ingredients that are by-products from other industries such as distillers dried grains with solubles (DDGS), high protein distillers dried grains, corn gluten meal, hominy feed, corn gluten meal, corn germ, wheat middlings, soybean hulls, alfalfa meal, canola meal, de-hulled sunflower meal, cotton seed meal, glycerol, and liquid whey; 3) Off-spec products from other industries such as pet food, cookies, bread, etc, and 4) Left-overs from other industries such as outdated bread, out dated milk, left-over chocolate, etc. Anti nutritional compounds may be present in some of these ingredients such as gossypol in cottonseed products, glycosinolates in canola products, tannins in field peas, alkaloids in lupins, and mycotoxins in many cereal grains and by-products of grains. However, these anti-nutritional compounds can usually be managed and in most cases, they do not represent major limitations to the use of alternative feed ingredients, although there are exceptions to this rule. Many alternative feed ingredients, especially from the group of processed ingredients, contain relatively large concentrations of dietary fiber, which on many occasions limits the inclusion rate of these ingredients in diets fed to swine. This is true in particular for ingredients such as alfalfa meal and soybean hulls. Undesirable characteristics of the carcass of pigs fed alternative ingredients may also limit the inclusion rate of ingredients such as DDGS with high concentrations of unsaturated fatty acids.

Another major limitation to the inclusion rate of alternative ingredients is variability in the concentration and digestibility of the nutrients in the ingredient. This concern limits the inclusion rate of many ingredients in group 3) and 4), and the ingredients in these groups are usually only attractive if some guarantees for consistency can be obtained from the supplier of the ingredients.

**Key Words:** alternative ingredients, anti-nutritional compounds, pigs