

## Guar Meal Characteristics and Animal Feeding

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Guar meal, the co-product left after guar gum extraction is complete, is commonly used (in other countries – EU, Mideast, India) as a concentrated protein source in animal diets. However, potential issues with decreased feed intake, performance, animal health, as well as availability of other concentrated protein sources, has limited use in the USA.

Guar meal is the combined germ fraction and hull fraction that remain after guar gum is extracted from guar seed. The meal will contain between 35 and 50% crude protein depending on the degree of gum removal and the relative concentrations of the germ and hulls that are recombined. For comparison purposes, cottonseed meal is 41-44%CP, soybean meal is 44-48%CP, and canola meal is 35-38%CP.

There are some concerns when feeding guar meal but these issues can be managed by processing the guar meal and also limiting the amounts included in animal diets. Residual guar gum present in the meal contains galactomannan and has been reported to have adverse effects in poultry, pigs and lab animals (rats and mice). In pigs and rats, the guar gum has been reported to inhibit glucose absorption possibly by limiting mixing of intestinal contents; reduced glucose absorption will reduce growth and performance. However, there are also reports that galactomannans (from the gum) in guar meal may aid in gut health (reduced colonization and shedding of pathogenic bacteria in the gut). Saponins and polyphenols in guar meal have been implicated in liver, kidney, and intestinal damage in laboratory animals (rats and mice); but, these may also be beneficial from a gut pathogen standpoint. These issues (galactomannans, saponins, polyphenols) should be manageable by limiting the amount of guar meal in formulated diets (since it is used primarily as a protein source in diets – the amount is usually limited anyway). The Poultry Science Department at Texas A&M University (<http://posc.tamu.edu>) has conducted guar meal research in the past (search publications of Dr. David Caldwell).

In addition, guar meal contains trypsin inhibitors. Trypsin is a primary enzyme in the true stomach that is involved in initial stages of protein digestion.

Palatability is another reported issue with guar meal. If diets containing guar meal are less palatable, then total feed intake will be lower and performance will decline.

Guar meal apparently needs to be heat processed before use as a feed. Heat processing reportedly improves palatability and also inactivates trypsin enzyme inhibitors that are present. Inactivation of the inhibitors is of greater concern for monogastrics as they have no microbial fermentation in the gut prior to digestion in the true stomach and small intestine.

The beneficial aspects of antimicrobial activity in the gut might be an avenue for the guar industry to pursue (health food for pigs and chickens); especially in today's world where legislative and environmental interests may to limit and regulate the use of conventional approaches to managing animal health.

For additional Texas A&M AgriLife crop production resources and information about guar consult <http://lubbock.tamu.edu/guar>

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