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GUAR MEAL COULD BE USED AS CHICKEN FEED

Writer: *Edith A. Chenault, (979) 845-2886,e-chenault1@tamu.edu*
Contacts: *Dr. Lee Cartwright, (979) 845-4319,a-cartwright@tamu.edu*
Dr. John Sij, (940) 552-9941,j-sij@tamu.edu

COLLEGE STATION – Research from the Texas A&M University System could dramatically increase guar production and benefit poultry producers in Texas, and that's not chicken feed. A cooperative project between researchers in Vernon and College Station is studying the feasibility of using a byproduct of the guar bean in poultry rations.

Guar is a drought-tolerant legume primarily grown in North Texas and southwestern Oklahoma. Its beans are used as a vegetable for humans in Asia, and guar gum is used as a stiffener in soft ice cream, a stabilizer for cheeses, instant puddings and whipped cream substitutes.

Guar gum is derived from the finely ground endosperm, or the food storage area that surrounds the embryo, said Dr. John Sij, professor of soil and crop sciences at the Texas A&M University Agricultural Research and Extension Center in Vernon. The endosperm makes up about 35 percent of the seed weight.

"The powder is sold as guar gum," Sij said. "Putting just a little powder in water will greatly increase the water's viscosity. Guar gum has great thickening properties."

What is left after the endosperm is removed are the hull and germ. The germ is high in protein, and is a good cattle feed supplement, much like soybeans, Sij said.

But, he thought it might have other uses. Sij contacted College Station researchers Dr. Lee Cartwright, associate professor and Texas Cooperative Extension poultry specialist, and Dr. Chris Bailey, professor with the Texas Agricultural Experiment Station, to see if the value of the guar bean could be increased.

"The main product of the bean is the endosperm, and the rest is essentially a waste product," Sij said.

"By finding value for a product that is high in protein, one should increase the value of the guar beans, and hence, income to the farmer," he said.

A large poultry company has moved in north of Chilicothe near Vernon, and since poultry require a high protein diet, Sij thought Texas A&M could develop waste guar meal into a protein supplement acceptable to the poultry industry.

What makes guar attractive to Texas farmers is that it can be grown in areas where water is not readily available for irrigation, Cartwright said.

"It grows in very inhospitable conditions, and it can be grown in areas that would not be in normal agricultural use," he added. From 20,000 to 40,000 acres of guar are grown annually in Texas, Sij said.

Guar has been grown in North Texas since the mid-1960s. Cheap imports from mainly Pakistan and India basically killed the industry in the 1970s through the 1990s.

"Guar acreage is small compared with the main crops of cotton and wheat in the Rolling Plains," he said.

And, up until now, it was thought guar meal's only real use was as cattle feed and could not be fed to poultry at all.

"There is a problem with feeding guar meal at fairly high levels in monogastric (one stomach) animals like chickens," Cartwright said. "The gum in the meal is not digestible."

During studies on broilers (meat chickens) from 3 to 6 weeks of age, the researchers found the guar meal was composed of germ and the whole fractions. The hull fraction had a large amount of gum in it, which is thought to be the source of poor digestibility, Cartwright said.

The germ, or tiny embryo or seedling, did not have as much of the gum.

"We found the germ could be fed at high levels without growth inhibition, and it could be used to formulate diets fairly easily," he said.

Cartwright believes the value of guar meal already has been increased.

"Since we began working on this project, we estimate the value of guar gum has increased to nearly double what it was in the beginning," he said.

In a study such as this, the value of the availability of protein and energy of the feed being tested is compared to the actual market value of corn and soybeans, which are the cheapest sources of protein and energy. According to these values, the meal could be valued at three times its market value at the beginning of the study. This difference in price of the guar meal byproduct makes all the difference in the world to the economics of guar farming by increasing the price the producer can get for guar seed, Cartwright said.

Further feeding tests are needed to see if guar meal can be fed to egg-laying chickens.

The initial study also pointed out other possible research areas, he said.

"Gum is an indigestible carbohydrate, and it can bind bacteria so that they don't grow in the intestinal tract," he said.

For instance, if a bacteria such as salmonella tried to grow in the intestinal tract, indigestible carbohydrates could be used to wash it out faster than it could reproduce.

"We think that the value of guar meal is substantially more than its nutrient (protein) availability," Cartwright said. "There may be other values that have not been recognized, such as stimulating the immune system of an animal so it can resist disease better."

Guar gum is actually used to treat enteritis, or inflammation of intestines, in humans, he said.

"There's still a lot of research to do on the actual impact on the immune system and on bacterial populations," Cartwright said. "These new discoveries we hope will improve the economics of guar production, expand the guar industry in Texas, and improve food safety and animal health to boot."

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Texas A&M University System
2112 TAMUS
College Station, TX 77843-2112
(979)845-2895 (979)845-2414
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