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Photo by Duane Tinkey

-Bob Riley is leading Feed Energy Co. in a new direction as it conducts research to find new uses for biofuel co-products such as glycerin. The company recently hired nationally recognized scientist Mohan Dasari as its research and development director.

Not just chicken feed

■ Feed Energy Co. developing new products from biofuel co-products

By Joe Gardyas

A few years ago, Bob Riley was thinking of slowing down, maybe retiring. Now, with the potential he sees for his company to add value to the biofuel industry, he can't wait to get to work in the morning.

Riley, who 20 years ago bought Des Moines-based Feed Energy Co., has focused his company's efforts on developing value-added products from soybean oil co-products for agribusiness uses. Now, the company is using its scientific expertise to find new uses for the flood of co-products that will be produced by the booming biodiesel and ethanol industries.

Feed Energy, which operates processing plants in Des Moines, Sioux City and Pacific Junction, is planning for a fourth plant in Iowa as its strategy for developing new products unfolds. The company currently employs about 60 people.

"We've always been in the energy business; that's in our name," said Riley, who has worked for more than 30 years in the agricultural oil processing industry. "We've always seen (the industry) as 'feed, food and fuel' all combined into one. I think we're in a particularly good position to give the industry that feed-food-fuel perspective and to market products to those industries as needed."

One of the co-products Feed Energy has zeroed in on is glycerin. Every 10 gallons of biodiesel produced generates about one gallon of glycerin. The U.S. biodiesel industry currently has an annual production capacity of 395 million gallons, according to the National Biodiesel Board. Additional plant openings and expansions are expected to drive that capacity to more than 1.1 billion gallons within the next 18 months, which would mean more than 800 million pounds of glycerin produced annually.

Earlier this summer, Feed Energy

hired a key scientist, Mohan Dasari, to lead their efforts in finding new applications for glycerin. Dasari was part of a University of Missouri research group that developed a new, highly efficient process for converting glycerin into propylene glycol, which is used to make products such as antifreeze, brake fluid, cosmetics and food additives.

"We thought with all this biodiesel [production] going on and just kind of a feeding frenzy of bio-renewable-type things, people were still not answering the supply-side or co-products side of things," Riley said. As with its present products, Feed Energy's focus on new products will be on finding value-added applications, not shipping out commodities, he said.

Norm Olson, facility manager of the Biomass Energy Conversion Center at Iowa State University, said glycerin represents "a very versatile market" because of the numerous products it can be used to make.

"One big use that we've done research on here is to turn (glycerin) into antifreezes, which is a huge market and a very valuable market," he said. "We try to look at all the possible uses, and if you can't think of anything else to do with it, use it for energy. But that would be the lowest price you would get for the product."

Riley said that marketing high-value products made from glycerin could lower the cost of biodiesel by as much as 40 cents a gallon, making it more competitive as an alternative fuel.

Using more glycerin could also be good for the environment. The propylene glycol that can be made from glycerin is an environmentally safe alternative to ethylene glycol, a toxic petroleum-based chemical. The U.S. Environmental Protection Agency recently awarded Dasari a 2006 Presidential Green Chemistry Award for his breakthrough in glycerin technology.

Glycerin also has potential uses in the animal feeds industry. A recent study at the University of Arkansas found that

glycerin could be safely used as a feed additive for broiler chickens.

Later this year, the first chemical manufacturer to license Dasari's process, Washington-based Senenergy Chemical, plans to open a commercial facility that will produce an estimated 60 million pounds of propylene glycol annually.

New market for corn oil

On the supply side of the equation, Feed Energy is working with Iowa ethanol producers on a plan to purchase corn oil co-product from their plants, which the company plans to refine to a higher quality and sell to biodiesel plants, which in turn can use it in their production process.

As the biofuels industry develops, using all the materials available from the production process will become increasingly important, said Rick Brehm, president and CEO of Lincoln-way Energy. His company is working with Riley to find the most cost-effective means for extracting corn oil at its 50-million-gallon ethanol plant near Nevada.

"Because this is a relatively new industry, I think there are going to be many of these discoveries as we progress," Brehm said. "Ten years ago, it was hard to get anyone to spend the money to research these opportunities. Now, people like Bob are looking at it because he could have five or six customers in his territory."

Feed Energy is now in the process of installing its first set of corn-oil collection equipment at a Central Iowa ethanol plant. "We want to be sure we're able to tune that system the way we think on a production-scale basis, and then we'll be rolling out those every month or two," Riley said. "That will then drive the corn oil cleanup business (to provide that product to the biodiesel plants), so that will come right on the heels of that. Then when the biodiesel plants are up and running, we'll be taking the glycerin from those plants to make value-added products."

Feed Energy, which has 20 million pounds of storage capacity at its three plants, is one of the largest processors of soapstock, a co-product of the soybean oil refining industry, in North America. It has customers from coast to coast for its products, which include ingredients used in feed, agronomy, dust control, fuel, industrial and fertilizer applications.

When Riley bought the company in 1986, "it was a blending company that took different types of fatty acids and put them together," he said. "We put a lot of effort into sophisticating that process and finding out what our products did when we fed them to an animal, what they did when we sprayed them on a crop, or put them on coal, or used them for dust control. We're more on the technical side of figuring out what these products can do, and have historically done that, rather than saying, 'We know you can sell this stuff if you put it in a truck and ship it out.'"

Because each product's benefits are quantified in the company's laboratory, the results are "tunable" to each customer's needs, he said. "If a producer wants to get larger eggs with our product, we can talk to them and say, 'If you feed this much, you'll get this large an egg.' It's a much more intentional system than has been in the industry before."

Riley said Feed Energy's Sioux City and Des Moines plants will likely be retrofitted to handle initial co-product processing. "But as this thing grows it's probably going to require another facility," he said.

Building a second plant in Des Moines isn't likely, as the current facility south of the Iowa State Fairgrounds is landlocked, and being in a rural area closer to the feedstocks would be more economical, he said.

However, "my intention would be to put it in Iowa," Riley said. "I've had many opportunities to go outside the state and I've made sure we stayed here." □

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