



## **Research: Feeding cattle algae co-products**

04 Jun 2012

<http://www.allaboutfeed.net/news/research-feeding-cattle-algae-co-products-13292.html>

Algae isn't typically associated with cattle feed, but a Texas AgriLife Research scientist and graduate student have found some interesting results that may change this during their three-phased study.

Two of the three phases are currently complete and the third phase is slated for completion this June, according to researchers. Their research is part of an overall bioenergy research program led by AgriLife Research and is supported by the Department of Energy as a component of the National Alliance for Advanced Biofuel and Bio-Products.

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Dr. Tryon Wickersham, AgriLife Research animal nutrition scientist, and graduate student, Merritt Drewery, conducted a study where co-products of the production of biofuel from algae were fed with both medium and low-quality forages. Surprisingly, the steers used in the study were not picky eaters as they widely accepted the algal residue in a processed form, the researchers said. The algae co-product is what is leftover after oil extraction and is in powder form.

“The first project tested palatability,” Drewery said. “We offered 12 different supplements with different levels of algae inclusion. We measured how long they took to completely finish the allotted supplement.”

The experiment used 13% crude protein hay and 2.2 pounds of supplement offered daily. The algae co-product, which is 20 percent crude protein, was blended with dried distiller's grains at 31% crude protein or cottonseed meal at 52% crude protein. The co-product was introduced at 0%, 20%, 40%, 60% and 100% blends. Additionally, a commercial liquid supplement was also blended with algae.

"The algae could be blended up to 60% with distiller's grains or cottonseed meal, but as a liquid supplement or alone, intake was markedly reduced," Drewery said. "The study results show a 54% completion rate and lower rate of consumption when the algal co-product was offered alone.

"For the second project we used raw algae. We compared this to cottonseed meal supplementation and found forage intake and utilization was stimulated to a similar extent when algae was used." This experiment used Angus steers that had free choice to low-quality hay with 4 percent crude protein, and supplements were administered ruminally.

"We would administer the supplement in the morning just prior to feeding hay," Drewery said. "Supplementation rate was based on steer body weight."

Steers were initially offered the supplement for one hour in the first experiment, but when offered supplements containing 100 percent algae for the whole day during the third experiment, they would completely finish it.

"We were worried they wouldn't eat all of it this time around, but there haven't been issues with supplement refusals," Drewery said. In visual observations, the steers would eat half the supplement within 10 minutes and then finish the rest sometime during afternoon hours.

"They would also eat hay and drink a lot of water," she noted. Wickersham said they were also attempting to get the algae in a form that was "easily deliverable to cattle."

"We are trying to identify the best processing method to feed it to grazing cattle," he said. "The algae co-product is high in salt, as the algae is a saltwater product."

Wickersham said there are still questions to be answered, such as how much would the beef cattle industry pay for this product compared to distiller's grains and cottonseed meal, a common

ingredient found in cattle feed today.

“Crude protein is 20 percent, but half of the chemical composition is ash,” he said. “In comparison to cottonseed meal, you have to feed twice as much algae to get the same effect. In the beef industry, traditionally the cow-calf operator pays more for protein than the feedlot side. That’s something we have to consider. Additional research is required to fully explore the value of feeding algae to grazing cattle.”

Wickersham said the algae feed “performed much better than expected compared to cottonseed.”

“This is very novel (research) and there’s not much out there,” Drewery said.

Wickersham said, “No one has ever really looked at feeding a co-product from algal biofuel production to cattle.”

Source: AgriLife

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