Precise blending makes marketable product from ethanol co-product

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(PhysOrg.com) -- A Purdue University researcher has found a way to predict the nutrient content in distillers dried grains with solubles, making the ethanol byproduct more marketable as a feedstock.

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Distillers dried grains with solubles, or DDGS, are the portions of grains that couldn't be broken down into sugars to create ethanol. The byproduct can be sold as feedstock for cattle and other livestock, but DDGS often have varying fiber, protein, sugar and amino acid levels, making many livestock nutritionists and producers wary of purchasing them.

"If every time they get a batch it's different from the last, you are uncertain of the nutrient value you're giving your animals," said Klein Ileleji, the Purdue assistant professor of agricultural and biological engineering who led the research. "What you want is a consistent product."

The solution lies in the balance of the liquid and solids used to create the finished DDGS product. The ethanol production process leaves behind solids that couldn't be converted into sugars to make fuel and a liquid that is centrifuged to remove excess water, creating a syrup. The solids and liquid are mixed to create DDGS.

Ileleji found that differences in the ratio of grains and syrup will change the nutrient profile. Through 36 tons of different ratios, Ileleji and his team were able to learn which nutrients increased or decreased based on the ratio change. For instance, increasing the syrup leads to a decrease in fiber and protein, but an increase in residual sugars.

"Ethanol plants don't blend these streams of solids and syrup in a uniform manner," said Ileleji, whose results are published in the early online version of the journal *Bioresource Technology*. "The jumping around of these different properties comes from different blending processes."

Ileleji is creating a model based on this study's data that will allow ethanol producers to blend DDGS to give specific nutrient profiles.

"If a large customer wants a particular profile, it can be created based on the blend. We can engineer products to meet a customer's needs," Ileleji said. "The idea that distillers grains are variable and you don't know what is in them has become a myth. We've taken the variability out of the equation."

Provided by Purdue University (news : web)