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Phytate Extraction from Corn Ethanol Coproducts (20150123, Dr. Bo Hu)

IP Status: Issued US Patent; **Application #:** 15/148,454

Extracting Phytate from Corn

An easy, scalable method extracts high yields of purified, marketable phytate from ethanol waste streams. Phytate, a coproduct of ethanol production that is not digestible by many livestock, increases phosphate pollution from livestock waste. The efficient phytate extraction process is selective and improves livestock feed properties of dry distillers grains (DDGS) by removing “antinutrient” phytate from DDGS while retaining free inorganic phosphate, an important nutrient. This simple process can be incorporated into current corn ethanol production processes to extract high-value phytate and use the remaining solids as animal feed ingredients, thereby both reducing pollutants and adding value from previously wasted materials.

Improving Dry Distillers Grains

This method differs from current methods in several ways. First, it obtains higher phytate yield and relies on ion-exchange methods instead of bulk pH modification and solvent extraction. Currently-used phytase enzymes remove phytate from DDGS, adding cost to animal feeds or other DDGS derived products. In addition, by destroying valuable phytate, these enzymes prevent phytate purification and its potential revenue as a high-value chemical.

BENEFITS AND FEATURES:

- Removes the indigestible portion of phosphorus from DDGS, thereby decreasing phosphate excretion/pollution
- Increases revenue and profitability by creating phytate-based high value co-products
- Improves DDGS nutrient quality by removing the antinutrient phytate, which chelates essential metals
- Reduces water treatment costs, fertilizer waste, suboptimal phosphate concentration in feed
- Better alternative to phytase enzymes that add cost while destroying valuable phytate
- May improve ethanol yield

APPLICATIONS:

- Enhancing livestock feed
- Raw material source for production of valuable inositol
- Phytate salts can be sold as natural anti-oxidant and chelating agents in food, beverages, cosmetics, anti-corrosive and other applications
- Improved ethanol yield, reduced phosphate release into environment
- Reduced ethanol plant maintenance costs through reduction of scale on piping and vessels

Phase of Development - Lab scale demonstration

Researchers

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Technology ID

20150123

Category

Agriculture & Veterinary/Ag Biotechnology

Learn more

Associate Professor, Bioproducts and Biosystems Engineering

External Link (bbe.umn.edu)

Publications

Cracking The Kernel For Higher Value Products

Ethanol Producers Magazine, Susanne Retka Schill; June 10, 2015