Fractionation of Distillers Dried Grains with Solubles (DDGS) Through Gravity Separator

Abstract

- Distillers Dried Grains with Solubles (DDGS) mainly contain protein, oil, fiber, and ash. Fractionation process could increase its economic value and broaden the utilization.
- The optimization of three parameters of a gravity separator (side slope of the deck, eccentric shaft vibration, and airflow rate), was conducted to separate DDGS. Nutrient analysis was measured to determine the most effective parameter combination for DDGS fractionation. This process was found to be effective in getting substantial fractions enriched in protein and oil.

Material and Methods

- The DDGS we used for fractionation were collected from Lincolnway Energy, LLC in Neveda, Iowa.
- DDGS were then stored in plastic tubes at room temperature (23 ± 1°C).
- DDGS were firstly sieved into five size categories using sifter, then three categories and raw DDGS were further separated into four fractions using gravity separator.

Results

Near-Infrared Spectroscopy (NIR) tests showed satisfactory separation on protein and oil.

Conclusions

The most economic profit can be attained when using following parameters:
- Eccentric shaft vibration: 420 rpm
- Deck side slope: 5°
- Airflow rate: 0.8890 m/s
- DDGS size category: 0.425-2.000 mm