

Proposed Recommended Laboratory Testing Procedures for Distiller's Grains By-Products

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Most commercial laboratories use scientifically approved and validated analytical procedures (AOAC and others) to determine the nutrient content of feed ingredients. However, for many nutrients, there are several approved methods that can be used. As a result, depending on the analysis procedure used, different analytical results are commonly obtained, and can vary substantially. Since this is such an important issue in the marketing of Distiller's Dried Grains with Solubles (DDGS) and associated by-products, it is essential that the ethanol and feed industry recognize and adopt standardized laboratory testing procedures to minimize disputes related to DDGS not meeting minimum guarantees, and to allow potential DDGS customers to more accurately compare nutrient profiles of DDGS among ethanol plants.

To address this important ethanol industry issue, an ad hoc committee called the DDGS Production and Marketing Issues Working Group was formed to discuss and make recommendations for the ethanol industry to consider. This committee was comprised of technical experts in DDGS marketing, analytical chemistry, ethanol plant operation, animal nutrition and the feed industry, and university DDGS researchers. This group met recently to discuss and make recommendations for standardized testing procedures for distiller's grains by-products to the ethanol, feed, and livestock industry in the U.S., and internationally. This committee is interested in receiving comments and input on these recommended standards from current and prospective DDGS producers and users. Please contact Dr. Jerry Shurson, Committee Chair, by email shurs001@umn.edu with comments on these new proposed standards.

The group agreed that the following AOAC[®] methods would be the most accurate methods for determining various nutrient compounds typically evaluated in the DDGS market, and recommend that these methods be adopted by the ethanol industry as industry-wide testing standard methods:

Moisture	AOAC [®] Official Method 930.15	(135° C for 2 hours)
Crude Fat	AOAC [®] Official Method 920.39	(petroleum ether extract)
Crude Protein	AOAC [®] Official Method 990.03	(combustion method)
Crude Fiber	AOAC [®] Official Method 962.09	(ceramic fiber filter method)
Ash	AOAC [®] Official Method 942.05	(600° C for 2 hours)

Antibiotic Residues

Antibiotics such as Penicillin G, Penicillin V, and Virginiamycin are used in very small quantities to control bacterial infections in fermenters during the ethanol production process. However, there are no antibiotic residues in distiller's grains by-products because these antibiotics are destroyed at a temperature of 200° F in the distillation towers. Ethanol plants are encouraged to work with their antibiotic vendors to obtain an annual certified test, and keep the certification on file, demonstrating that no detectable levels of antibiotics are present in distiller's grains by-products.

Mycotoxins

Aflatoxin, Vomitoxin, Fumonisin, Zearalenone and T2 Toxin are mycotoxins that can be present in distiller's grains by-products if the grain delivered to the ethanol plant is contaminated. Mycotoxins are not destroyed during the ethanol production process and are not destroyed during the drying process to produce distiller's grains by-products. However, the risk of mycotoxin contamination in distiller's grains by-products is very low because most ethanol plants monitor in-coming grain quality with approved ELISA test kits and reject sources that may be contaminated.

If ELISA tests kits are used on distiller's by-products, false positive determinations often occur and are invalid. It is suspected that distiller's grains by-products contain certain salts and oxidizers that affect detection. Currently ELISA test kits for Vomitoxin (Deoxynivalenol) and Fumonisin have been validated against standard methods for DDGS by Neogen Corporation and found acceptable for use.

When samples of distiller's by-products are tested, only High Performance Liquid Chromatography (HPLC) and Thin Layer Chromatography (TLC) methods are acceptable for most mycotoxins.

References:

Official Methods of Analysis of the Association of Official Analytical Chemists International
www.aoac.org.

Neogen Corporation, Lansing, Michigan www.neogen.com.