

Recommended Methods of Analysis for Distillers Dried Grains

Please note that a quick summary of the industry recommended methods for testing distillers dried grains are posted below. These methods recommendations are a result of a study completed by an AFIA Sub-Working Group. A description of the study and supporting data are available in a file which I can send to individuals that request it in separate email (due to the size limitation of the foodshield system I cannot post it). Thank you for your consideration in the use of these methods when testing DDGs in your laboratory. The feed industry is hopeful of some standardization of testing to reduce variability or results among laboratories.

Moisture/Loss on Drying

Although it is commonly known and widely accepted that Karl Fischer Titration provides the most accurate measurement of water in feed, the labor (both time and training), reagent, and instrument costs make Karl Fischer analysis an economic burden that most laboratories would not be willing to bear. The committee recognizes these concerns and has used Karl Fischer as the means of determining the gravimetric (loss on drying) method that has the least amount of bias when compared to actual Karl Fischer method. Using this criteria, **NFTA 2.2.2.5, Lab Dry Matter (105 °C / 3 hr), was selected as the recommended method for the analysis of moisture in DDGS**; this method also had acceptable CV's (coefficient of variation—a method of determining repeatability) in both the intra- and inter- laboratory portions of the study.

The committee also wishes to emphatically note that all gravimetric methods be considered, and used accordingly, as “**loss on drying**” methods and only serve as an estimation of the “true” moisture level. One of the gravimetric methods, AOAC 930.15, *Loss on Drying (Moisture) for Feeds (135 °C / 2 hr)*, was shown to dramatically overestimate the moisture content in DDGS and therefore, it is highly discouraged to use this method to analyze samples of DDGS; use of this method is widespread as demonstrated by the fact that 17 of the 23 labs reported values using AOAC930.15.

Crude Protein

The protein methods investigated in this study were determined to be statistically equivalent, and both had acceptable coefficients of variation for both the intra- and inter- laboratory portions of the study. **AOAC 990.03, Protein (Crude) in Animal Feed – Combustion, and AOAC 2001.11, Protein (Crude) in Animal Feed and Pet Food (Copper Catalyst), can therefore be used interchangeably to provide accurate and precise protein results on DDGS.**

Crude Fat

The three non-hydrolysis fat methods (AOAC 2003.05, AOAC 945.16, and AOAC 2003.06) were determined to be statistically equivalent methods for the analysis of DDGS, however, in the inter laboratory portion of the study, **AOAC 945.16, Oil in Cereal Adjuncts (Petroleum Ether), had a significantly lower coefficient of variation than the other non-hydrolysis methods and has thereby proven to be a more robust method in the analytical community, and is therefore chosen as the recommended test method for the analysis of fat in DDGS.**

The acid hydrolysis method (AOAC 954.02) was determined to be significantly different, with a bias of ~+4% (absolute difference). It should be noted that only relative accuracy was compared and since all four methods in the investigation are empirical in nature, further work would need to be completed to determine the most accurate method. However, since the three non-hydrolysis methods were found to be statistically equivalent methods, it was decided that the most robust (most repeatable) non-hydrolysis method in the inter- laboratory portion of the study would be selected as the method of choice.

Crude Fiber

Both crude fiber methods evaluated, AOAC 978.10 and AOCS Ba 6a-05, were considered to be not significantly different. However, the “F58 Filter Bag”, which is needed to comply with AOCS Ba 6a-05 is no longer commercially available. The recommended replacement, the “F57 Filter Bag”, which is commercially available has been shown to cause a 10% (relative) low bias. It is doubtful that AOAC 978.10 and AOCS Ba 6a-05, modified for the F57 bag, would be statistically equivalent. Based on lack of

availability of the F58 filter bag which is needed to perform AOCS Ba 6a-05, **the committee is recommending AOAC 978.10, *Fiber (Crude) in Animal Feed and Pet Food (F.G. Crucible)*, as the recommended method for crude fiber analysis on DDGS.**

Thank you for your consideration in the use of these methods when testing DDGs in your laboratory. The feed industry is hopeful of some standardization of testing to reduce variability of results among laboratories