Advancing Biofuels Research
NCERC at SIUE

ILLINOIS CORN MARKETING BOARD

Coproducts Project Report: Data Analysis and Trends – December 2014

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Background

The NCREC at SIUE is home to the National DDGS Library, which includes coproducts samples collected from 27 dry-grind ethanol plants in the Midwest from 2007 to 2012. Thanks to the generous support of the Illinois Corn Marketing Board, the Coproducts Project was relaunched in September 2014.

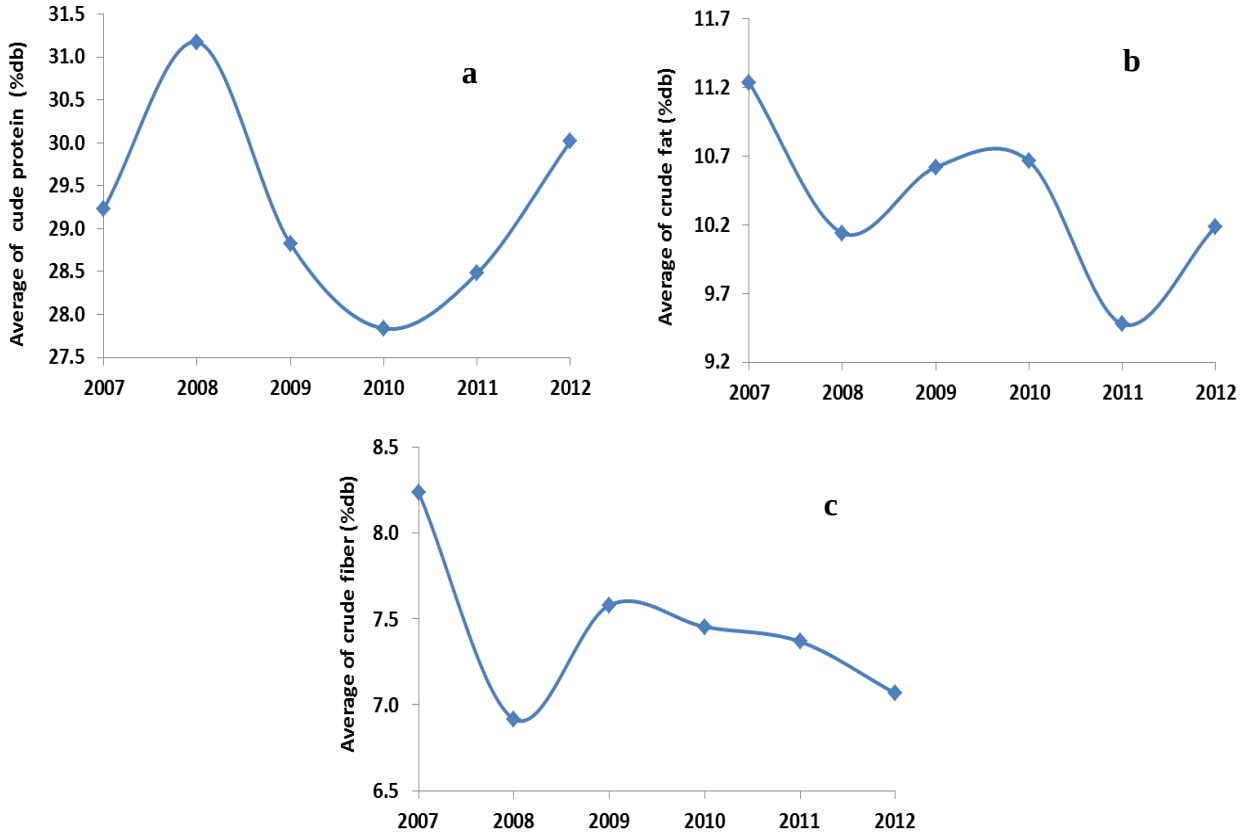
The Coproducts Project aims to increase the use of DDGS and boost profitability of ethanol plants and corn processors by demonstrating the nutritional value and consistency of DDGS over time. The NCERC has completed extensive proximate compositional analysis on the collected samples over this 5-year period and investigated the evolution of DDGS nutritional quality during this time. The analyses included moisture, crude protein, crude fat, crude fiber, amino acid profile, and total phosphorous. The results of the statistical analysis are presented in this report.

Data Analysis

The Trend of composition changes for DDGS samples from 2007 to 2012 is presented in Figures 1 (a-c). In general, the DDGS samples produced in 2008, with the maximum crude protein content of 31.8 %db., were richer in crude protein content compared with those samples produced in the next 4 years. This value decreased by nearly 15% over the next two years and dropped to its minimum value of 27% in 2010. However, an increasing trend in the protein content of this coproduct is apparent during the last two years of this data collection (i.e. 2010 to 2012).

With regard to crude fat concentration, an overall decreasing trend was observed from 2007 to 2012. The older DDGS samples produced in 2007 were rich in fat with the maximum value of 11.3%db. Later on, a significant reduction in crude fat content of the samples was evident, though, slight increases in 2009 and 2012 were also observed. As depicted in Figure 1-c, the average crude fiber content of DDGS products were also decreased during this 5-year period.

Figure 1: Change of DDGS Proximate Compositions over 5 years (2007-2012)



From 2010 to 2012, an increasing trend of protein content along with decreasing trends of fat and fiber contents are evident. The inconsistent trends in the earlier years (i.e. from 2007 to 2010), could be due to several reasons such as adaptation to different technologies, variations in the compositions of initial feed stock and possibly drought.

As shown in Fig. 2, during 2007 to 2012, approximately 70% of the DDGS samples produced in IL and IN states had crude protein content of between 28 to 31% .

More than 30% of the DDGS samples in IN had crude fat content of 8 to 12 (%db), while only 13% of DDGS produced in IN had such amount of crude fat in dry weight basis. The majority of DDGS samples in both of these states had more than 9% crude fiber content; however, the percentage of low fiber DDGS samples was slightly higher in IN state compare to IL-origin DDGS during 2007-2012.

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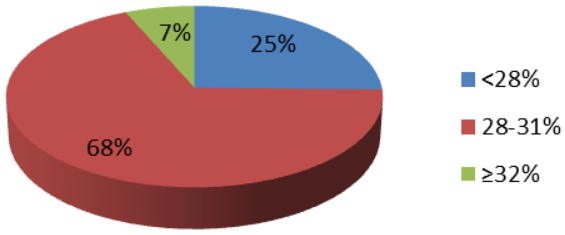
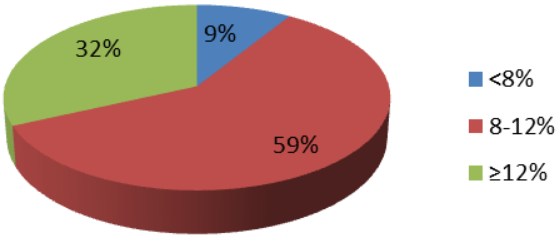
Figure 2: Comparison of the percentage of samples within the range for IL and IN

ILLINOIS

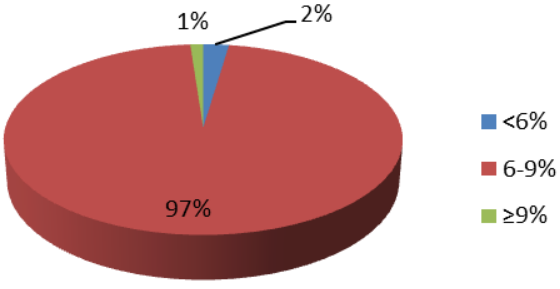
Crude Protein (%db)



Crude Fat (%db)

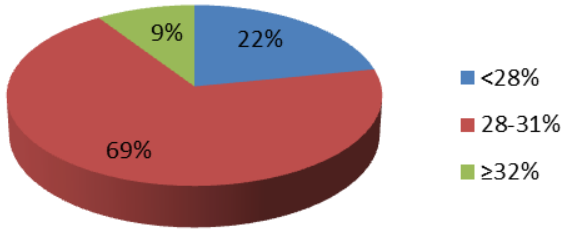


Crude Fiber (%db)

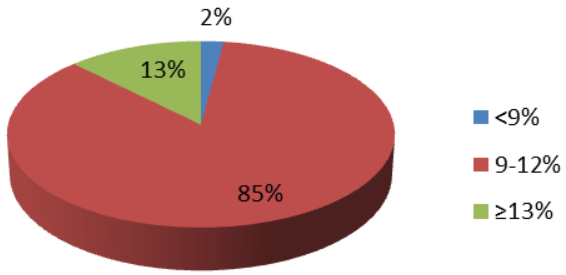


INDIANA

Crude Protein (%db)



Crude Fat (%db)



Crude Fiber (%db)