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Using the Akey PROPHET database to help Optimize DDGS Use

Increased Dried Distillers Grains with Solubles (DDGS) use has increased our need to properly optimize its potential. Because DDGS vary in composition, pig growth performance and carcass characteristic variability is often affected with increased DDGS use. This performance variability is further compounded if the rations are not properly adjusted for the variable composition between ethanol plants.

DDGS Variability

DDGS compositional variation typically arises from its source material (i.e. grain type), processing and drying methods. Source material variability is related to the type and quality of grain used, and it is well known that wheat and sorghum DDGS differ from corn (maize) DDGS. Within a grain stock source, DDGS variability from processing and drying are equally critical, and harder to quantify. These differences result from different processing methods (wet or dry), condensed solubles syrup compositions; drying speed and temperature differences (Davis, 2001; Shurson et al., 2004). Most of the DDGS used in swine or poultry diets comes from dry-milled processing. An additional variation source is the extraction of DDGS components for further processing. For example, corn oil is extracted from some DDGS sources, thus reducing the resultant DDGS fat content and energy level.

Understanding and quantifying DDGS's variable composition is a key part of using DDGS (Table 1). Controlling for these factors requires experience, relevant commercial research and continually updated nutrient profiles. Because of this long-term need, Akey has invested heavily for several years in DDGS analytical tools and nutrition research. One of these, the Akey PROPHET DDGS database, has been in use since 2007. This database allows us to more accurately optimize diets containing higher DDGS levels.

Akey PROPHET DDGS Database

Akey's proprietary DDGS database, PROPHET, accurately predicts the levels of 13 key nutrients by DDGS source or plant. These 13 nutrients include Metabolizable and Net Energy, Specific Minerals; 7 essential amino acids. This database contains up-to-date nutrient levels for over 120 different DDGS production plants in the United States and Canada. The database uses proprietary Akey near-infrared reflectance (NIR) technology to analyze each sample, determine nutrient content; predict ME and NE (Figure 1). The NIR analytical equations are regularly updated versus wet chemistry to ensure accuracy. Estimated DDGS nutrient contents by production locale are kept current through a rigorous sampling program. The use of the PROPHET database allows Akey and their customers to account for DDGS source variation, thus allowing greater formulation reliability. As ethanol manufacturers continue to modify their production practices, the resultant DDGS are also changing. For example, many DDGS sources now have a lower fat content than 2007. By keeping our database current, Akey adjusts the predicted DDGS nutrient levels, providing the most up to date nutrient profiles for your diets.

Finally, Akey's proprietary PROPHET database also allows us to analyze the cost of various DDGS sources and rank them by nutritional value relative to their cost (Table 2). We can then provide an adjusted price that is reflective of their nutrient content, thus allowing you the opportunity to better evaluate the cost-effectiveness of your possible DDGS sources.

References

Davis, K. S. 2001. Corn Milling, Processing and Generation of Co-products. Minnesota Nutrition Conference, Minnesota Corn Growers Association Technical Symposium. Sept. 2001.

Shurson, G., M. Spiehs and M. Whitney. 2004. The use of maize distiller's dried grains with solubles in pig diets. Pig News and Information 25:75N-83N.

Table 1. Nutrient composition ranges in the Akey PROPHET DDGS database.

Nutrient, %	Minimum	Maximum	CV%
Moisture	7.5	12.5	8.6
Crude Protein	23.6	28.2	4.3
Fat (oil)	8.1	12.0	7.9
Ash	4.2	6.1	7.5
Starch	2.1	7.9	31.9
ADF	7.4	13.8	12.7
NDF	21.7	29.2	6.9
ME, % of corn	87.4	95.1	1.9

2011. Proximi North America. These are ranges of 4,716 samples from 121 North American plants.

Figure 1. How Akey estimates energy content of plant-specific DDGS samples.

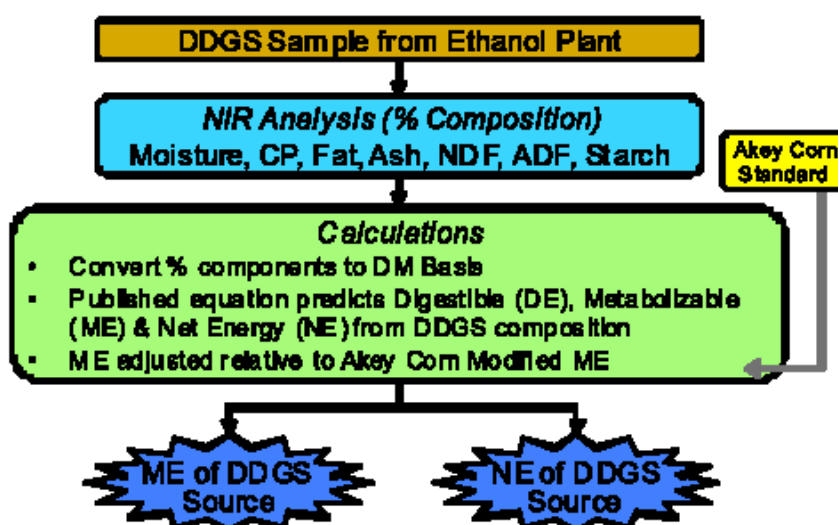


Table 2. Akey DDGS Ranking based upon price and nutritional value.

SOURCE	LOCATION	FOB COST \$/TON	FREIGHT COST \$/TON	DELIVERED COST \$/TON	ADJUSTED COST \$/TON	RANK
		\$175.00	\$10.00	\$185.00	\$183.41	1
		\$178.00	\$10.00	\$188.00	\$189.79	2
		\$185.00	\$10.00	\$195.00	\$191.67	3
		\$185.00	\$15.00	\$200.00	\$195.19	4

The DDGS with the LOWEST ADJUSTED COST \$/ton is the most economical DDGS source. Adjusted cost is determined by adjusting delivered price based upon the relative nutritional merit of the individual DDGS sources.