Why should I be feeding distillers grains to poultry?

Dried distillers grains with solubles (DDGS) represents a nutritious ingredient which nutritionists can use in feed formulations for all types of poultry. Furthermore, the ample supply of DDGS makes the product available to poultry producers at a very competitive cost compared with other ingredients typically used in poultry feed formulations.

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These reasons alone should motivate producers and nutritionists to include DDGS as part of their feeding programme.

However, partly because of incorrect perceptions and partly because of early experiences with poor quality DDGS, many producers do not use DDGS or include DDGS in the diet at less than optimal concentrations. This represents a missed opportunity for the poultry industry.

Economics

Part of any decision about feeding management needs to include an economic evaluation. The poultry industry recognises DDGS as an affordable ingredient.

However, how much could producers save on feed costs when using DDGS? Conditions vary from producer to producer so answering this question proves difficult.

Producers may have different ingredients available or nutritionists may have different formulation strategies. Furthermore, ingredient prices vary between regions. All these factors can change the relative value of DDGS.

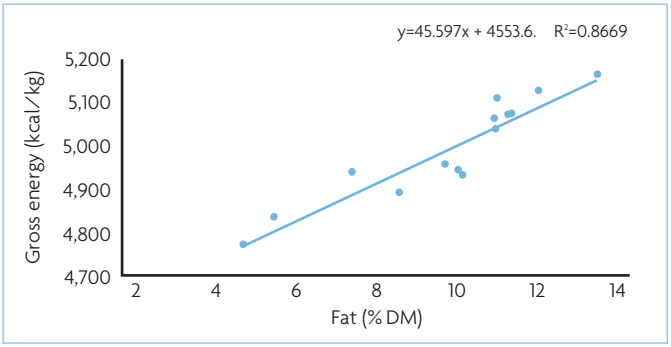
However, previous publications provide a thumb-rule that 100 pounds of DDGS will replace between 50-60 pounds of corn and 40-50 pounds of soybean meal. If we use these general substitution guidelines and current commodity prices, we see that replacing corn and soybean meal in poultry diets could result in feed cost savings of almost 50-52%.

DDGS history and background

As previously mentioned, some individuals have incorrect perceptions about DDGS value. A brief look at the history of the DDGS industry provides an opportunity to challenge these perceptions.

Although ethanol production has existed for several decades, the real growth only occurred during the past 15-20 years. Political influence and global strategies encouraged ethanol production and as a result, ethanol producers took advantage by rapidly constructing biorefineries to meet the growing ethanol demand.

Fig. 1. DDGS fat content vs. gross energy.



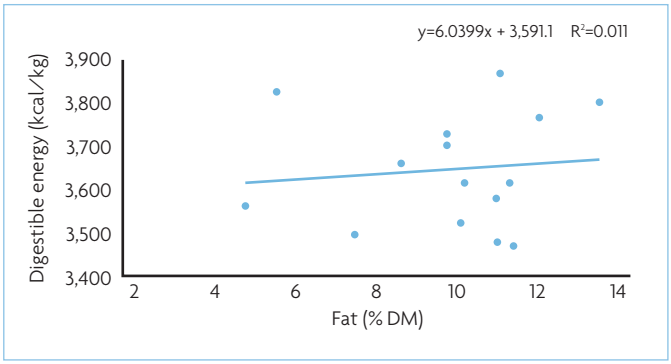


Fig. 2. DDGS fat content vs. digestible energy.

Unfortunately, some ethanol producers focused only on ethanol production and largely ignored DDGS quality during this early growth. As a result, a portion of the DDGS used by the industry probably had heat damage or reduced availability of nutrients. This resulted in poor experiences for some nutritionists and farmers who used this early product.

As the ethanol industry matured, ethanol producers developed new equipment and started to better understand the ethanol process. This evolution improved ethanol efficiency, but it also resulted in a greater emphasis on DDGS quality because ethanol producers quickly recognised DDGS as a potentially valuable co-product.

Improvements in nutrient testing, drying equipment, and a focus on reducing variability helped to create a product which livestock producers could successfully include in their feed formulations.

This focus on DDGS quality continues today as several ethanol producers currently conduct research or support university research to better understand DDGS nutritional value.

DDGS and fat content

One of the most significant advancements in DDGS nutrition relates to increased oil removal. Distillers corn oil prices encouraged ethanol producers to implement technologies which allowed for greater oil recovery during the ethanol process.

At first, this practice would seem to suggest that current DDGS contain less energy compared with full-fat DDGS and, as a result, less value to the livestock producer. However, research demonstrates that other factors besides fat contribute to the DDGS energy value for the animal.

In order to better understand this relationship, we need to first highlight the differences between gross and digestible energy as it relates to animal nutrition. Gross energy represents the total energy in any ingredient, while digestible energy accounts for energetic losses by the animal through the digestion process. Thus, digestible energy represents a more accurate and true energy value to the animal compared with gross energy.

We can look at data from previous research to see how this discussion on gross and digestible energy relates to DDGS.

Kerr et al. (2013) evaluated multiple sources of DDGS for gross and digestible energy in swine. Although this example highlights swine research, the same relationship exists in poultry.

Furthermore, similar types of relationships exists between different measures of energy (metabolisable or net energy). When we plot the fat content of each DDGS against gross energy, we see a very strong linear relationship (Fig. 1). We expect this type of

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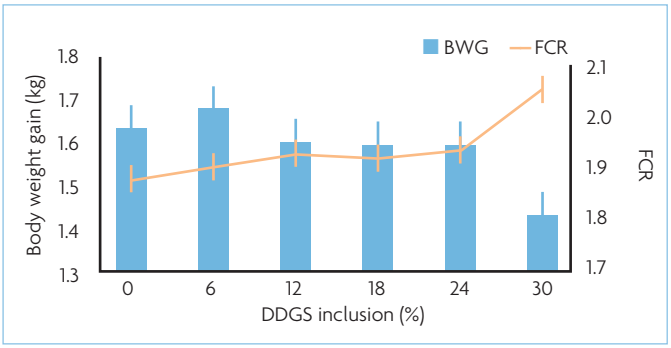

Fig. 3. DDGS inclusion during finisher I phase.

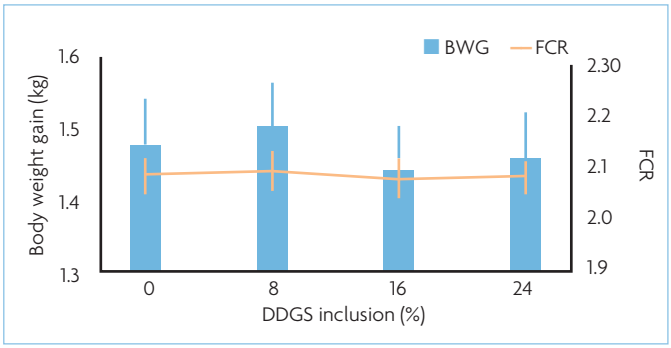

Fig. 4. DDGS inclusion during finisher II phase.

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relationship since fat contains more energy than carbohydrates.

However, when we plot the fat of these same DDGS samples against digestible energy (Fig. 2), we see very little relationship. This clearly demonstrates a poor relationship between fat content of DDGS and energy available to the animal.

Inclusion in poultry diets

As previously discussed, including DDGS in poultry diets can reduce feed costs. In order to capitalise on these feed cost savings, a significant amount of research has focused on identifying the maximum inclusion of DDGS in poultry diets without affecting production.

Researchers from the ARS-USDA Poultry Research Unit at Mississippi State recently published results from a study investigating the inclusion of a reduced-fat DDGS on broiler diets.

Experimental diets for the finisher I phase (day 28-42) included 0, 8, 16, 18, 24, or 30% of a reduced-fat DDGS, while diets for the finisher II phase (day 43-56) included 0, 8, 16, and 24% of the same reduced-fat DDGS. All diets contained similar energy and met or exceeded all other minimum nutrient requirements.

Body weight gain during the finisher 1 phase did not vary (P>0.05) between the 0, 6, 12, 18, and 24% DDGS treatments (Fig. 3). Body weight gain only decreased when researchers added 30% DDGS to the diet. Researchers observed a similar relationship with feed conversion rate. Bird performance (body weight gain and feed conversion rate) did not differ (P>0.05) during the finisher II phase (Fig. 4).

Researchers concluded that including a reduced-fat DDGS at 24% of the diet supported bird performance similar to a diet containing no DDGS. Based on previous research, they also suggested that including a reduced-fat DDGS supported similar animal performance to diets formulated with a higher-fat DDGS.

Conclusion

Replacing other more expensive feed ingredients with DDGS can reduce feed costs and improve profit margins for poultry producers.

However, in order to achieve success with this strategy, nutritionists and producers need to recognise recent advancements in DDGS nutrition.

Furthermore, having a precise nutrient characterisation of DDGS will allow for accurate formulation and optimal bird performance. ■

References are available from the author on request