Determining the value of dried distillers grains with solubles for swine diets

Customers often ask us how they should value dried distillers grains with solubles (DDGS) in swine diets. Although this seems like a straightforward question, we actually need to consider several factors in order to accurately determine the value.

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Factors such as nutrient characterisation of the DDGS, prices of other ingredients, percent inclusion in the diet, hog prices, and stage of production all affect the nutritional value of DDGS. Producers and nutritionists need to recognise and correctly assess these aspects if they want to capture the value of DDGS in their swine diet formulations. To start this discussion, we first need to review and perhaps challenge some perceptions related to nutrient characterisation of DDGS.

Nutrient characterisation of DDGS

Distillers grains provides a significant amount of energy and, as a result, many producers sometimes look at the fat value to estimate value.

Unfortunately, this approach can result in missed opportunities because DDGS fat content does not always reflect the actual metabolisable or digestible energy.

To demonstrate this, we can use published data which reported gross energy and digestible energy of several DDGS with different fat contents.

Plotting gross energy against fat content of the DDGS (Fig. 1) shows a strong linear relationship which depicts gross energy decreases with greater oil removal. However, graphing digestible energy and DDGS fat content of these same DDGS samples (Fig. 2) shows very little relationship.

Why the difference? Biorefineries use different processes, equipment, and yeasts/enzymes during ethanol production. Furthermore, the ethanol industry continues to evolve to place more of a focus on DDGS quality.

All of these changes result in DDGS with different nutritional characteristics. For example, certain processes which minimise heat can improve the digestibility of the DDGS and thus, increase the actual energy value of the DDGS. This shows the shortcomings of trying to value DDGS based on a single nutrient like fat.

Value of corn and soybean meal

Distillers grains provides a source of both energy and protein (amino acids) so comparing the DDGS price to ingredients like corn or soybean meal presents a very quick and easy comparison.

However, even this approach requires some interpretation. For example, Fig. 3 shows the relative improvement in income over feed costs (IOFC) if DDGS gets priced at 85%, 100%, or 115% the value of corn.

As we would expect, DDGS priced at 85% the value of corn significantly increases income over feed cost compared with no DDGS. At 20% DDGS inclusion, IOFC improves by almost three relative points for the 85% value to corn and slightly more than one relative point for the 100% value to corn scenario.

Fig. 3 also shows that DDGS priced at 100% the value of corn still improves IOFC. In fact, we do not see a negative relationship until

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Fig. 1. The gross energy of DDGS with different fat concentrations (Kerr, 2013).

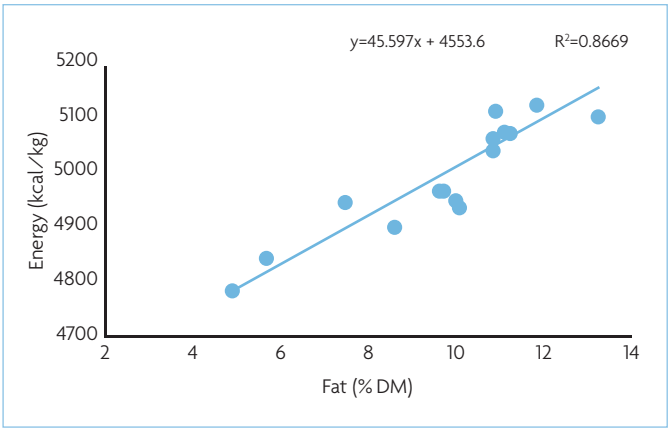
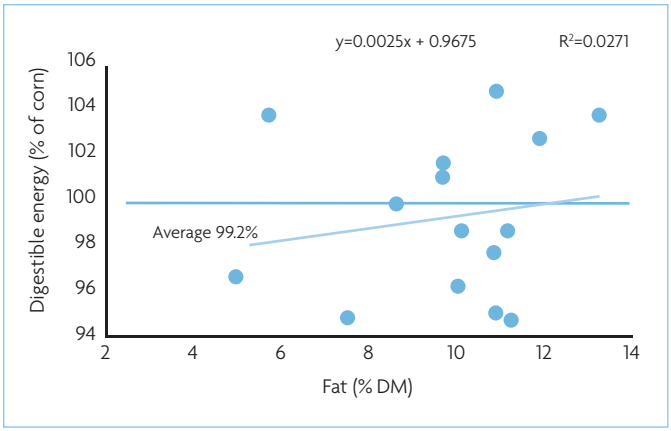


Fig. 2. The digestible energy (% of corn) of DDGS with different fat concentrations (Kerr, 2013).



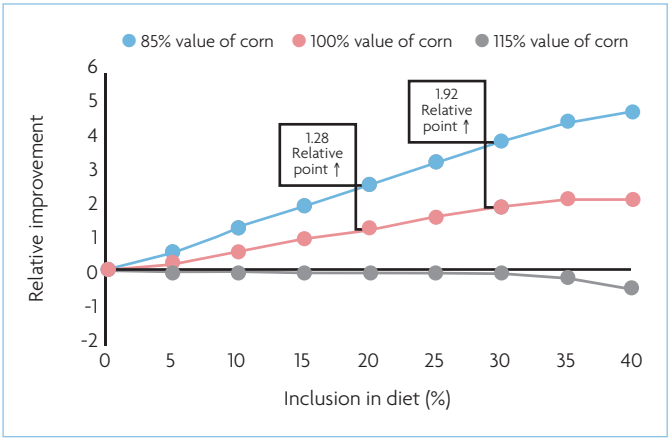


Fig. 3. Relative improvement in IOFC with DDGS priced at 85%, 100%, or 115% the value of corn. Corn priced at 45% the value of soybean meal.

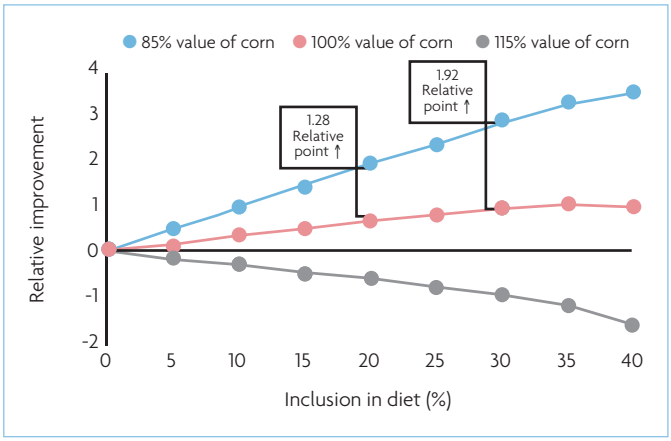


Fig. 4. Relative improvement in IOFC with DDGS priced at 85%, 100%, or 115% the value of corn. Corn priced at 50% the value of soybean meal.

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DDGS exceeds 115% the value of corn. In this comparison we set the price of corn at 45% the value of soybean meal. How does this relationship change if we lower the price of soybean meal so that corn now represents 50% the value of soybean meal (Fig. 4)?

The scenario in Fig. 4 shows a similar difference in relative value between DDGS pricing, but significantly different values compared to the scenario with more expensive soybean meal.

Instead of predicting an improvement in relative IOFC by almost three relative points for the 20% inclusion, we now predict an improvement of just shy of two points.

The 100% value to corn still predicts benefits, while the 115% value to corn continues to predict negative returns when including DDGS. This simple comparison reinforces a few key points:

- Even DDGS priced at greater than 100% the value to corn can still give producers improved economic returns.
- Since DDGS provides both energy and protein, we need to consider multiple ingredients if we want to evaluate the value of DDGS as a percentage of an ingredient.
- Inclusion of DDGS affects the return on investment per pig.

Inclusion, carcase yield, and hog prices

As Figs. 3 and 4 demonstrate, IOFC changes as DDGS inclusion increases. Including DDGS in diets typically decreases feed costs and as a result, greater inclusions increase the amount of savings for producers.

Unfortunately, as we feed greater amounts of DDGS, pigs tend to have poorer carcase yields. Research has shown that carcase yields can decrease between 3 and 5% as fibre or DDGS increases.

This highlights the importance of considering both feed costs and income over feed costs when determining DDGS value (Fig. 5).

Anytime we start discussing income over feed cost we need to also consider those factors affecting income.

The previous discussion includes some comments on carcase yield. The other main component of gross income includes hog prices.

Since hog performance decreases with greater inclusions of DDGS, we would expect to see an eventual decrease in IOFC at a certain inclusion.

We would also expect to see greater IOFC with lower hog prices. Fig. 6 illustrates this relationship.

As expected, IOFC eventually starts to decrease. However, this decrease does not start to occur until DDGS inclusion exceeds 35% for all scenarios with different hog prices.

Furthermore, even though IOFC does decrease, feeding DDGS still increases IOFC relative to not feeding DDGS.

Summary

Prior to the start of any value discussion, producers need to have accurate nutrient characterisation. Simply looking at values like protein and fat may not accurately represent the true nutritional value and could end up missing opportunities for cost savings or sacrificing animal performance.

Work with your DDGS provider to get accurate nutrient profiles which include nutrient digestibility estimates. This will provide you with more information to accurately characterise your DDGS.

Determining the value of DDGS compared with other ingredients like corn and soybean provides a quick and easy approach.

However, producers need to interpret this carefully and recognise that other factors affect the value of DDGS. Making purchases based on only this criteria may not allow you to capture the true value of DDGS.

Finally, understand the limitations of DDGS in swine diets. The fibre content of DDGS will affect carcase yield so you need to consider potential effects of inclusion amount and hog price on any value discussion of DDGS.

Distillers grains represent an excellent opportunity for pig producers to improve profitability.

This article provides a few topics for discussion but omits other topics like the effects of DDGS on fat quality.

Furthermore, management restrictions such as short/long space and availability of ingredients could also affect the value proposition of DDGS. Consider all these topics carefully as you make the decision about the value of DDGS in your feeding program. ■

Fig. 5. Feed cost savings vs income over feed cost at greater inclusions of DDGS and medium hog price points.

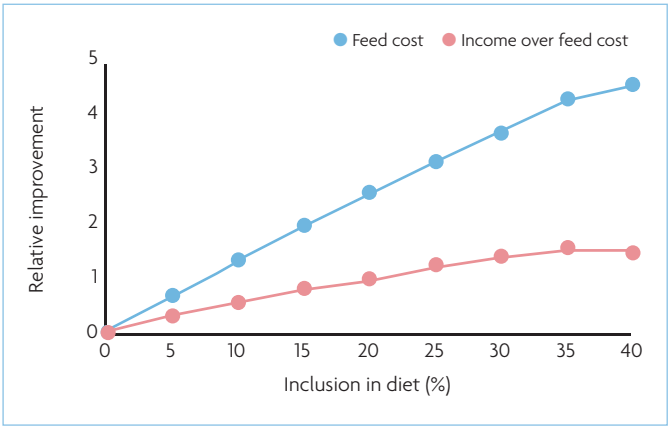

Fig. 6. Changes in IOFC with low, medium, or high hog price. DDGS priced at 85% value to corn and corn priced at 45% value to soybean meal.