

# Distillers Grains

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# Does Feeding DDGS to Pigs Affect Pork Acceptability in Japan?

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The impact of feeding distillers dried grains with solubles (DDGS) to grower-finisher pigs on pork fat quality continues to be a major topic of discussion in the U.S. pork industry, particularly for pork processors that export pork to the Japanese. Japan is the largest export market for U.S. pork, and soft fat is one of the major factors that reduce pork quality and value in this market.



Shurson

The U.S. Grains Council has developed and implemented numerous DDGS promotional and educational programs in Japan to increase the ethanol coproduct's use in livestock and poultry feeds. The Japan Scientific Feeds Association (JSFA) is an organization that evaluates the nutritional value of new feed ingredients imported into Japan. A group of JSFA researchers—K. Suga, Y. Hashimoto, M. Hanazumi, and C. Yonemochi—recently conducted a study to evaluate dietary inclusion rates and the withdrawal of DDGS in swine finishing feeds on growth performance, carcass composition and pork quality. This study was sponsored by the U.S. Grains Council.

A total of 50 large white x Duroc

crossbred pigs (25 gilts and 25 barrows) weighing 61 to 83 pounds were obtained from a pig farm in Ibaraki Prefecture for use in this study. The experiment was conducted from May to September 2006 at the Japan Scientific Feeds Association's Feed Research Center, located in Narita, Chiba Prefecture.

A 3-phase feeding program was used. The phase 1 diets were fed from 66 pounds to 110 pounds body weight, phase 2 diets were fed from 110 pounds to 154 pounds body weight, and the phase 3 diets were fed from 154 pounds to market weight (243 pounds). Pigs were divided into five dietary treatment groups, which provided 10 pigs per treatment. The dietary treatments were as follows:

1. Control—0 percent DDGS from 66 pounds to market weight
2. 10 percent DDGS in phase 1 and 2, no DDGS in phase 3
3. 15 percent DDGS in phase 1 and 2, no DDGS in phase 3
4. 20 percent DDGS in phase 1 and 2, no DDGS in phase 3
5. 10 percent DDGS in phase 1, 2 and 3

Treatments two, three and four involved withdrawing DDGS from the diet during the final finishing period (154 to 243 pounds body weight), whereas treatment five involved feeding the 10 percent DDGS

diets for the entire feeding period. The U.S. Grains Council provided the nutrient composition information for the source of U.S. corn DDGS used in this study. In addition to DDGS, diets contained corn, milo, soybean meal, wheat bran, fish meal, minerals, vitamins and synthetic amino acids. Dietary levels of lysine, threonine and tryptophan were the same between the control diets and the diets containing different levels of DDGS across treatments within a phase. Diets were formulated to meet the nutritional requirements published in the Japanese Feeding Standards for Swine (2005).

Individual pig body weights were obtained weekly, and feed intake was determined for each group to calculate average daily gain, average daily feed intake and feed conversion (feed/gain). The number of days to reach market weight of 243 pounds was also recorded. Each pig was slaughtered when they reached the target market weight. Carcasses were weighed and the dressing percentage was calculated. Backfat thickness was measured at three locations (mid-back, shoulder and loin) and averaged. Color scores ( $L^*$ ,  $a^*$ , and  $b^*$ ) of the loin muscle and backfat were determined using a Minolta colorimeter, and the carcasses were graded according to a standard Japanese grading system (High=5, Medium=3, Fair=1).

Although a small number of pigs were

used in this study, there were no significant differences among dietary treatments for growth rate (ADG), average daily feed intake (ADFI), feed conversion (feed/gain) and the number of days to reach market weight for the entire feeding period (Table 1). As expected, barrows grew faster and consumed more feed than gilts. These results suggest that the DDGS nutrient values used in the diet formulations were accurate and that DDGS can be added to typical Japanese grower-finisher diets to obtain acceptable growth performance.

As shown in Figures 1 and 2, there were no significant differences in carcass weight or dressing percentage among dietary treatments for barrows and gilts. Furthermore, there were no significant differences among dietary treatments for average backfat thickness (Figure 3). One of the questions these researchers had before conducting this study was whether the xanthophyll (yellow pigment) present in corn DDGS would affect muscle or fat color. Lightness or darkness of muscle and fat color ( $L^*$ ) were not affected by dietary treatments (Figure 4). There was no difference among dietary treatments for the redness of muscle color ( $a^*$ ) for barrows or gilts, but barrows fed the 20-0 percent DDGS dietary treatment had higher yellowness of color ( $b^*$ ) value than muscle from barrows fed the 10-0 percent DDGS treatment. There were no differences among dietary treatments in  $a^*$  and  $b^*$  fat color for barrows, but gilts fed the 10-0 percent DDGS treatment had higher  $a^*$  than the 15-0 percent and 20-0 percent DDGS groups, and a higher  $b^*$  value than the control group. These researchers concluded that there were no definite trends in muscle and fat color relative to the level and feeding duration of DDGS diets. No differences were observed in carcass quality among the dietary treatments.

### Conclusion

Results from this study are consistent with the results obtained from recent University of Minnesota studies reported in the previous issue of *Distillers Grains*

Table 1.

Effect of dietary DDGS level and withdrawal during phase 3 on growth performance of grower-finisher pigs.					
	0% DDGS	10-0% DDGS	15-0% DDGS	20-0% DDGS	10-10% DDGS
<b>ADG, lbs.</b>					
Barrows	2.03	1.92	2.03	2.03	2.05
Gilts	1.85	1.59	1.74	1.76	1.74
<b>ADFI, lbs.</b>					
Barrows	6.20	6.06	6.20	6.28	6.24
Gilts	5.56	5.05	5.24	5.56	5.34
<b>Feed/Gain</b>					
Barrows	3.05	3.16	3.05	3.10	3.04
Gilts	3.00	3.18	3.01	3.15	3.06
<b>Days to Market</b>					
Barrows	78	81	79	77	77
Gilts	88	101	91	91	91

Figure 1.

Effect of dietary DDGS level and withdrawal during phase 3 on carcass weight of gilts and barrows.

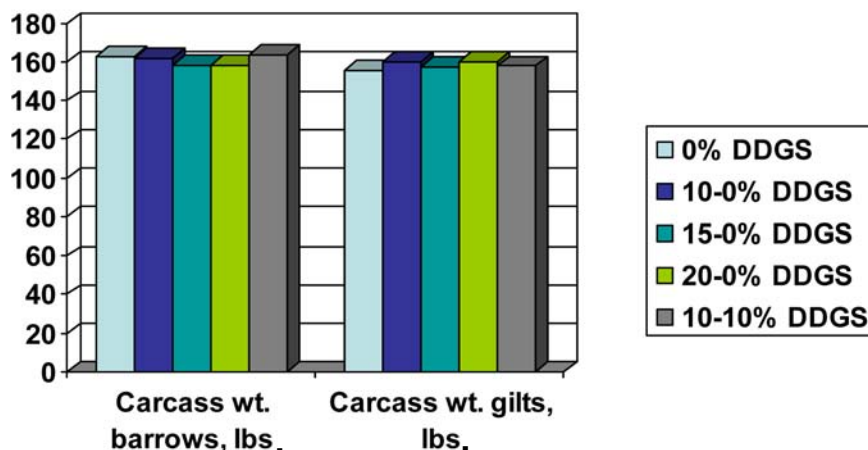
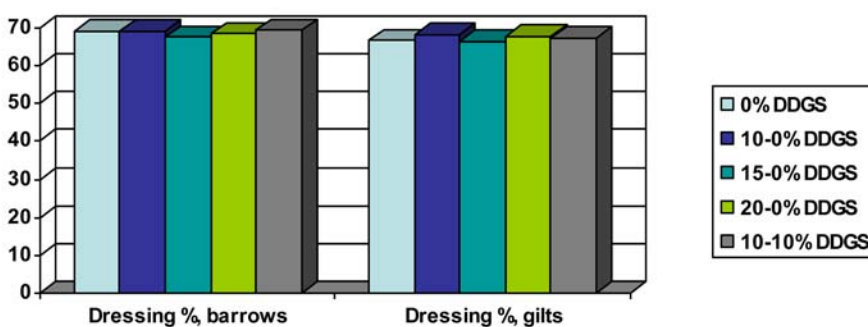


Figure 2.

Effect of dietary DDGS level and withdrawal during phase 3 on dressing percentage of gilts and barrows



*Quarterly.* Feeding diets containing 10 percent DDGS throughout the grower-finisher phase will result in acceptable growth performance, carcass composition, and muscle and fat color to meet Japanese pork quality standards. Removing DDGS from the phase 3 finisher diets appeared to be unnecessary based upon the measurements taken in this study because there were no differences in growth performance, carcass weight, dressing percentage and backfat thickness among dietary treatments, and no consistent trends in muscle and fat color. These researchers concluded that DDGS is an acceptable feed ingredient for use in Japanese swine diets, and pork quality is not a concern with the dietary inclusion rates and feeding duration of DDGS diets in this study. Look for more information from similar studies being completed at the University of Minnesota in future issues of *Distillers Grains Quarterly*. **DGQ**

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Figure 3.

Effect of dietary DDGS level and withdrawal during phase 3 on average backfat thickness of barrows and gilts

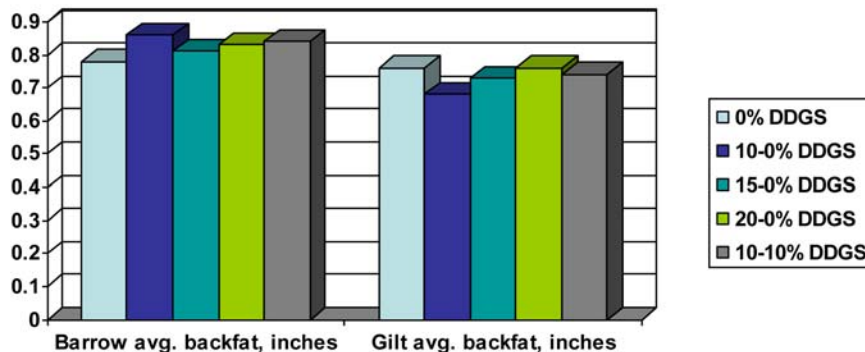
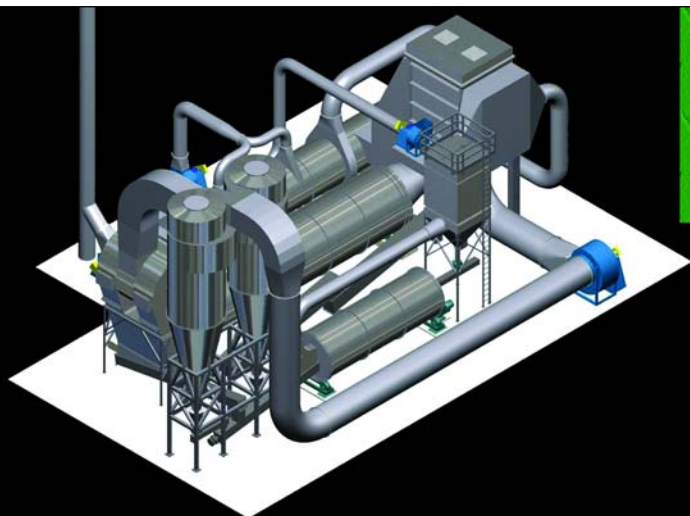
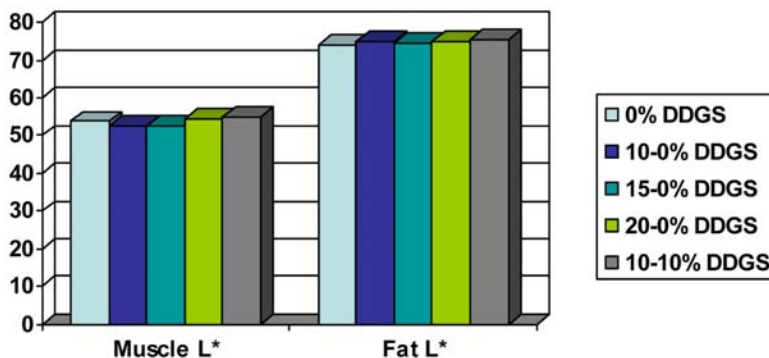


Figure 4.

Effect of dietary DDGS level and withdrawal during phase 3 on lightness or darkness (L\*) of muscle and fat color of pork



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