

Low-Solubles Dried Distillers Grains Improves Pork Fat Quality

Lee Johnston
West Central Research and Outreach Center
2/6/09

The rapid expansion of the U.S. ethanol industry has made dried distillers grains with solubles (DDGS) readily available for livestock feed. The University of Minnesota Swine Nutrition Group has spent considerable effort on learning how to properly use DDGS in swine diets. A comprehensive collection of our results resides on our DDGS website (<http://www.ddgs.umn.edu/>). One challenge associated with DDGS feeding relates to soft fat that occurs in pork carcasses when high levels of DDGS are included in the diet. Soft fat creates problems for processors when they slice bacon and for consumers that discriminate against pork products that have an oily or soft appearance. The soft fat results from the high levels of corn oil present in the DDGS.

The high cost of fossil fuels has forced many ethanol plants to seek alternatives for drying distillers grains. One alternative used by some ethanol plants is to burn the solubles generated during ethanol production as fuel for their dryers. In these plants, burning the solubles to dry wet distillers grains reduces the amount of natural gas needed in the drying process. As a result, the livestock feed they produce is Low-Solubles Dried Distillers Grains (LS-DDG). Since the solubles are not added back to the wet grains before drying, LS-DDG has lower fat content than typical DDGS (7.95% vs 8.87%). An obvious question is how do pigs respond to LS-DDG since it is different than typical DDGS?

To answer this question, we conducted an energy balance trial at the Southern Research and Outreach Center in Waseca, MN and a growth performance trial at the West Central Research and Outreach Center in Morris, MN. In the energy balance trial, we determined that

metabolizable energy content of LS-DDG is essentially equal to that of typical DDGS. In addition, nitrogen digestibility (an indicator of protein digestibility) of diets containing high levels of LS-DDG was marginally better than diets with similar concentrations of typical DDGS. So, LS-DDG can be included in diets for growing finishing pigs without compromising energy density of the diet and there might be some improvements in protein digestibility of LS-DDG-containing diets.

In the second experiment, diets contained 20% LS-DDG or DDGS and were compared to typical corn-soybean meal diets with no added ethanol by-products. We found no differences in growth rate (1.94, 1.89, 1.94 lb/d) or feed intake (5.1, 5.2, 5.3 lb/d) of pigs fed the control, LS-DDG, or DDGS diets, respectively. We determined firmness of the belly by draping it over a suspended bar (see picture). A firmer belly will not droop as much as a soft belly. Pigs fed LS-DDG produced bellies that were firmer than the DDGS-fed pigs but still slightly softer than pigs fed the control diet. These differences in belly firmness are likely due to the lower concentration of polyunsaturated fatty acids in the LS-DDG bellies (14.0%) compared with DDGS bellies (15.4%). Both LS-DDG and DDGS bellies had higher polyunsaturated fatty acids than Control bellies (9.4%). Following a similar pattern, iodine value of LS-DDG bellies (63.1) was lower



than DDGS bellies (64.9) but still higher than Control bellies (57.8).

Results of this investigation suggest that LS-DDG is a valuable feed ingredient for growing-finishing pigs. Use of LS-DDG should help reduce some of the less desirable carcass traits observed when high levels of

DDGS are included in diets for pigs late in the finishing period.

This research was conducted by Roberta Amaral, University of Minnesota, Department of Animal Science in association with Drs. Lee Johnston, Sam Baidoo, Jerry Shurson and Jon Anderson. Financial support from the Agricultural Utilization Research Institute and donation of LS-DDG and DDGS from the Corn Plus ethanol plant in Winnebago, MN made this research possible.