

Triticale-based Diets for Market Pigs in Deep-Bedded Hoop Barns: A Progress Report

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Summary and Implications

Triticale-based diets were fed to pigs in deep-bedded hoop barns for a swine feeding study. Finishing pigs (240 head) were used to evaluate the dietary effects of triticale-based diets. The experiment was a randomized complete block design. There were four blocks (two summer, two winter); each block had three dietary treatments, with two replications per treatment. Each replication consisted of a pen of ten pigs (five barrows and five gilts).

Addition of triticale up to 80% of the diets for finishing pigs greater than 160 pounds to market weight in deep-bedded hoop barns, compared with a corn-soybean meal diet, resulted in pigs that weighed slightly less, grew similarly, needed more feed per unit of liveweight gain, had more backfat and slightly smaller loin eye areas. Feed intake appeared to increase as triticale inclusion increased. Preliminary review of pork quality characteristics indicates no dietary effects.

There may be several factors that lead to these results. Because triticale-based diets are less energy dense than corn-based diets, pigs will compensate by consuming more feed. Although growth rate was similar for the experimental diets, pigs consuming triticale based-diets required more feed per liveweight gain. More research is warranted in this area.

Introduction

Triticale (trit-ah-kay-lee) is a relatively new, synthetic small-grain crop produced by crossing Durum wheat with rye. Triticale was developed to combine the high crude protein and digestible energy of wheat with the high yields and protein quality of rye. Triticale has the ability to grow in acidic soils and extreme climates, coupled with larger yields than rye, making it a practical and economical feedstuff. Triticale is not a major crop in the United States; therefore, it has not been widely fed to livestock.

Small grains such as triticale may provide an excellent addition to Iowa's swine industry. There may be advantages of adding these cereal grains to swine production. Generally, pigs fed small grain-based diets perform as well as those fed corn-based diets. Other attributes create utilization of these grains attractive as well. Producers are able to add a third crop to a typical corn-soybean field

rotation. This may prove beneficial, as producers are able to reduce costs, improve distribution of labor and equipment, improve yields of corn and soybeans, provide better cash flows, alleviate crop pest problems, and reduce weather risks. Small cereal grains may provide environmental benefits such as erosion control and improved nutrient recycling.

Different cultivars of triticale may have differences in nutrient composition. When using triticale in swine diets, it is important to know the variety and its nutrient composition. Overall, compared with corn, triticale has a higher crude protein content, lower ether extract content (fat), and higher crude fiber, therefore, it provides a lower level of energy than corn. In addition to having greater lysine content than corn, triticale also has a more balanced amino acid profile. While only 14% of the phosphorus in corn is available to pigs, 46% of the phosphorus in triticale is available. This is important as less supplemental phosphorus needs to be fed in triticale-based diets and less phosphorus will be excreted. Also, the additional cost of inorganic phosphorus may be reduced.

Materials and Methods

A total of 24 pens of 10 pigs (5 barrows and 5 gilts) were fed three diets. The three diets were control (corn and soybean meal), 40% triticale, and 80% triticale (by weight). The diets were isolysin, based on calculated analysis. Table 1 shows the composition of the diets used for the study. Prior to allotment, pigs were fed together in a separate, large deep-bedded hoop structure and transferred to the test pens in bedded hoops for the trial. Each test pen had one water space and two feeder spaces. A two-week adjustment period was given for adaptation to the new diets and smaller pens. The pigs were started on experiment at approximately 160 lbs. Weighing of the pigs occurred at the beginning, day 28, and end of the trial and marketed at Farmland, Denison, IA. Pigs were scanned using ultrasound at the end of the trial to measure backfat and loin eye area. Barrows from one summer and one winter block were used to evaluate pork quality measures and sensory characteristics.

Results and Discussion

Performance of the pigs fed experimental diets is shown in Table 2. The pigs were started on test at approximately 160 lbs and fed for 49 days. Average daily gain was 2.0 lb/d for pigs fed corn-soybean meal diet, 1.9 lb/d for pigs fed 40% triticale and 80% triticale. Average daily feed intake was 8.3, 8.5, and 8.9 lb/day for pigs fed corn-soybean meal diets, 40% triticale- and 80% triticale-based diets, respectively. As a result, feed efficiency was poorer for pigs

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fed triticale-based diets. Pigs fed control corn-soybean diet required 4.1 lb feed/lb gain, pigs fed 40% triticale diet required 4.4 lb feed/lb gain, and pigs fed 80% triticale diet required 4.6 lb feed/lb gain. Pigs fed the 40% triticale diet had the same backfat thickness as the 80% triticale diet, while pigs fed control diet had slightly less backfat thickness. Pigs fed triticale diets had slightly smaller loins than pigs fed the corn-soybean meal diet (7.24 in², 6.85 in², and 6.89 in², for the control, 40% triticale, and 80% triticale

diets, respectively). Preliminary review of pork quality characteristics indicates no dietary effects.

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Table 1. Composition of diets fed to pigs in deep-bedded hoop barns, %.

<u>Ingredient</u>	<u>Corn-SBM</u>	<u>40% Triticale</u>	<u>80% Triticale</u>
Corn	85.00	46.50	8.50
Triticale	0.00	40.00	80.00
SBM	12.91	11.53	9.64
Dicalcium phosphate	0.60	0.33	0.07
Limestone	0.90	1.05	1.20
Salt	0.34	0.34	0.34
Vit Premix	0.20	0.20	0.20
Min Premix	0.05	0.05	0.05
Total	100.00	100.00	100.00

Calculated Analysis

	<u>Corn-SBM</u>	<u>40% Triticale</u>	<u>80% Triticale</u>
Crude Protein, %	12.90	13.60	14.10
Lysine, %	0.61	0.62	0.61
Ca, %	0.53	0.54	0.55
Available P, %	0.17	0.17	0.18
ME, kcal/kg	3320	3240	3160

Table 2. Performance of pigs housed in deep-bedded hoops fed 0, 40, and 80% triticale diets.

<u>Diet</u>	<u>Corn/soy</u>	<u>40% triticale</u>	<u>80% triticale</u>
Pigs, no.	80	80	80
Start wt, lbs	157.8	157.8	155.4
End wt, lbs	256.7	254.0	250.4
Avg. Daily Gain, lb/d	2.0	1.9	1.9
Avg. Daily Feed, lb/d	8.3	8.5	8.9
Feed/Gain, lb feed/ lb gain	4.1	4.4	4.6
Backfat, in.	0.70	0.77	0.75
Loin eye area, in ²	7.24	6.85	6.89
Yield, %	76.2	77.0	76.4
Lean, %	54.8	52.6	53.4
pH	5.74	5.69	5.69
Japanese Color Score	3.80	3.44	3.39
Marbling	3.10	3.22	3.00
% Loin Purge	1.68	1.69	1.77