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Triticale Fed to Finishing Pigsin Hoop Barns

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Abstract
Triticale is a synthetic small grain made by crossing durum wheat and rye. Triticale has more crude protein and an amino acid profile that more closely matches the needs of the finishing pig than corn. Using triticale as an ingredient in swine diets decreases the amount of soybean meal needed to meet the amino acid needs of the pig, compared to corn-based diets. There have been conflicting results on the effects of feeding triticale to finishing pigs. Some studies reported similar pig performance when triticale replaced corn as the dietary grain source, while others have shown decreased performance. The objective of the present study was to evaluate the effects of triticale-based diets in deep-bedded hoop barns on finishing pig performance.

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Animal Science

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Triticale Fed to Finishing Pigs in Hoop Barns

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Introduction

Triticale is a synthetic small grain made by crossing durum wheat and rye. Triticale has more crude protein and an amino acid profile that more closely matches the needs of the finishing pig than corn. Using triticale as an ingredient in swine diets decreases the amount of soybean meal needed to meet the amino acid needs of the pig, compared to corn-based diets. There have been conflicting results on the effects of feeding triticale to finishing pigs. Some studies reported similar pig performance when triticale replaced corn as the dietary grain source, while others have shown decreased performance.

The objective of the present study was to evaluate the effects of triticale-based diets in deep-bedded hoop barns on finishing pig performance.

Materials and Methods

Finishing pigs (n=480) were used to evaluate the effects triticale-based diets fed in hoop barns had on pig performance. The study consisted of eight trials: four in winter and four in summer at the ISU Western Research and Demonstration Farm, Castana, IA.

Each trial consisted of six pens of ten pigs (five barrows and five gilts) in three small-scale hoop barns (6.0 × 10.8 m). Each test pen had one water space and two feeder spaces. The pigs were started on experiment at approximately 150-160 lb and fed for 49 d. A two-week adjustment period was allowed for adaptation to triticale diets and experimental pens. Pens were assigned one of three dietary treatments: 1) corn-soybean meal control (0% triticale), 2) 40% triticale diet (by weight) or 3) 80% triticale diet (by weight). The 40 and 80% triticale diets had corn and soybean meal added. All diets were ground with a hammer mill through a 0.64 cm screen and fed in meal form. Composition and calculated analysis of experimental diets are given in Table 1. Pigs had *ad libitum* access to feed and water during the study. At the end of each trial, all pigs were individually scanned for backfat and loin area by a certified technician with an ultrasound. Triticale straw was used as bedding in the deep-bedded hoop barns. The first year the triticale variety was Trical 815 and the second year it was NE426GT.

Results and Discussion

During summer, average daily feed intake (ADFI) was similar for all diets, but during the winter the pigs fed corn-soy ate less and those fed the 80% triticale diet ate more (Table 2). Pigs fed the corn-soy diet grew (ADG) faster than pigs fed the 80% triticale diets (Table 2). The feed efficiency (feed:gain, lb feed per lb live weight gain) was best for the corn-soy diet and poorest for the 80% triticale diet (Table 2). When the backfat (BF 250) and loin muscle area (LMA 250) were adjusted to a standard live weight of 250 lb, backfat did not differ, but the pigs fed corn-soy diet had larger loin areas than the pigs fed 80% triticale diets (Table 2). The calculated percentage of carcass lean was similar for all diets, but calculated lean gain per day was greatest for pigs fed the corn-soy diet (Table 2). Based on these results, triticale inclusion rates of 30 to 50% of the total diet for finishing pigs may result in similar pig performance as corn-soy diets. Higher inclusion rates, approximately 80%, may result in slower gains, poorer feed efficiency, and smaller loin areas. However, triticale-based diets may be lower cost than corn-soy diets because less soy meal, dicalcium phosphate, and corn would be needed in the diet when triticale is added.

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

Ingredient, %	Control[a]	40% Triticale[a]	80% Triticale[a]
Corn	85.00	46.50	8.50
Triticale	0.00	40.00	80.00
Soybean meal (48% CP)	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
Vitamin premix[b]	0.20	0.20	0.20
Mineral premix[c]	0.05	0.05	0.05
Calculate analysis			
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	0.17
ME, kcal/kg	3320	3240	3160

[a]Contained 0.5 g/kg aureomycin chlortetracycline (Alpharma Inc., Fort Lee, NJ).
[b]Premix supplied vitamins to meet or exceed NRC (1998) requirements for finishing pigs.
[c]Premix supplied minerals to meet or exceed NRC (1998) requirements for finishing pigs.

Table 2. Performance of finishing pigs fed triticale-based diets in deep-bedded hoop barns during summer and winter[a].

	Summer			Winter			SEM
Item	Control	40%	80%	Control	40%	80%	
No. of pigs	80	80	80	80	80	80	--
No. of pens	8	8	8	8	8	8	--
Start wt, lb	151.9[e]	152.3[e]	148.2[e]	165.5[f]	163.7[f]	158.1[f]	2.9
End wt, lb	254.9[g]	247.1[g,h]	237.8[h]	277.8[e]	269.8[e,f]	258.0[f,g]	4.5
ADFI, lb/d	7.98[e]	7.87[e]	7.98[e]	8.92[f]	9.17[f,g]	9.59[g]	0.20
ADG, lb/d	2.13[e,f]	1.96[f,g]	1.85[g]	2.29[e]	2.17[e,f]	2.04[f,g]	0.07
Feed:gain lb/lb	3.77[e]	4.03[e,f]	4.33[f]	3.94[e]	4.26[f]	4.71[g]	0.11
BF, in.	0.82	0.77	0.76	0.81	0.86	0.80	0.04
LMA, in.[2,b]	7.02[e,f]	6.54[f,g]	6.32[g]	7.29[e]	6.90[e,f]	6.59[f,g]	0.17
BF 250, in.[c]	0.80	0.78	0.79	0.71	0.79	0.76	0.04
LMA 250, in.[2,c]	6.93	6.58	6.50	6.84	6.59	6.46	0.17
Lean, %[d]	52.8	52.2	52.2	52.7	51.5	51.7	0.8
Lean gain[d], lb/d	0.82[j,k]	0.73[l,m]	0.69[m]	0.86[j]	0.77[k,l]	0.77[l,m]	0.02

[a]Summer=April through September; Winter=October through March.
[b]From ultrasound scan data.
[c]Calculated values standardized to 250 lb using NPB formulas.
[d]Lean percentage and lean gain calculated using NPB formulas.
[e,f,g,h]=P<0.05.
[j,k,l,m]=P<0.01.