

Oat Based Diets for Market Pigs in Deep-bedded Hoop Barns

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ASL-R1819

Summary and Implications

The objective of this study was to determine the effect of oats in diets on the performance of finishing pigs in deep-bedded hoop barns. Oats may be used in limited quantities in swine diets. High-quality oats are typically valued at 80 to 85% the feed value of corn when fed to finishing pigs. Finishing barrows (240 head) were used to evaluate the dietary effects of oat-based diets in hoop barns. Six pens of 10 barrows each were fed three diets for four replications for two seasons, winter and summer. The summer season consisted of May through September. The winter season consisted of November through March. Two years were used to minimize seasonal variation. The oats used in the study had a test weight of no less than 36 pounds per bushel. The diets were isolysin, on a calculated analysis. Pigs fed both the 20 and 40% oat diet performed similarly to those fed a control corn-soybean meal diet. Addition of oats up to 40% of the diet for finishing barrows greater than 150 pounds to market weight (270 pounds) in deep-bedded hoop barns, had no effect on average daily gain, average daily feed intake, feed efficiency, backfat, loin eye area, or lean percentage. There may be several factors that led to these results. The use of barrows, the use of heavy finishing pigs, the type of environment, and the heavy test weight of the oats used in the study may be possible explanations for the results. The performance of the pigs fed the 40% oat-based diets, was difficult to explain. More research may be needed. Based on these results, heavy test weight oats are a viable and useful feedstuff for pigs fed in deep-bedded hoop barns and can be used up to 40% of the diet for barrows over 150 pounds to market. Oats can be substituted for corn and some soybean meal in pig diets. The use of oats in pig diets in hoop barns should be based on economical consideration and not on anticipated changes in pig performance or carcass traits.

Introduction

The use of hoop barns for feeding finishing pigs has expanded rapidly in Iowa. A recent survey reported more than 2,000 hoops used for finishing pigs in Iowa. Iowa State University researchers have conducted extensive work on feeding pigs in hoops. Finishing pigs were fed for 3 years in bedded hoop structures and a confinement building with slotted floors in central Iowa. When summer and winter feeding periods for 3 years were combined, the work showed that the finishing pigs in hoops ate more feed, grew faster, and required more feed per unit of liveweight gain

than confinement pigs. Also, the hoop pigs were fatter with smaller loin muscle area and a lower percentage of carcass lean and carcass yield compared with confinement pigs. The efficiency of lean gain also was poorer for the hoop pigs.

Because the hoops are cold structures, there were seasonal effects. The hoop pigs ate more feed, particularly in the winter, grew faster in the summer, and were less efficient in the winter than the confinement pigs. The hoop pigs were fatter only in the summer and less efficient in converting feed to lean only in the winter. All of the pigs were fed corn-soybean meal diets. To optimize lean growth, the hoop pigs may need to be fed diets somewhat different than those fed to confinement pigs.

Diets with more fiber, or a lower energy density, may offset the increased feed intake of pigs in hoops and result in leaner pigs. Oats have more fiber and less energy than corn. The objective of this study was to determine the effect of oats in diets on the performance of finishing pigs in deep-bedded hoop barns.

Materials and Methods

A total of 24 pens of 10 barrows were fed (3 diets \times 4 replications \times 2 seasons). The barrows had a start weight of 155–160 pounds and were fed until a market weight of approximately 270 pounds. Table 1 lists the feedstuffs and amounts used for the study. The three diets were control (corn and soybean meal), 20% oats, and 40% oats. The diets were isolysin, based on calculated analysis. Before allotment, barrows were fed together in a separate, large-bedded hoop structure and transferred to the test pens located in bedded hoops for the trial. Each test pen had one waterer space and two feeder spaces. The pigs were weighed every 14 days and were marketed at Farmland (Denison, IA). Carcass information was collected on each dietary treatment group, using separate slaughter summaries from the packing plant.

Results and Discussion

Performance of the pigs fed during the winter is shown in Table 2. Average daily gain and average daily feed intake was similar for all diets. Feed to gain ratio, or feed efficiency did not differ for the three diets. The pigs produced 200-lb carcasses. No differences were found in backfat, loin eye area, lean percentage, or yield.

Performance of the pigs fed during the summer is shown in Table 3. Average daily gain was similar for all diets. There was a numerical trend that the pigs fed oats ate 5 to 7% more feed per day. Feed efficiency was similar for all diets. No differences were found in backfat, loin eye area, lean percentage, or yield.

Several possibilities may explain these findings. This may be due to the use of heavy test weight oats. The oats in this trial had a test weight of no less than 36 pounds per bushel. The use of barrows for the study may have had an

impact, because barrows have a capacity to eat larger quantities of feed, coupled with a lower lean gain potential, compared to gilts. Heavy finishing pigs have a larger appetite and lower lean gain capacity than younger pigs.

The deep-bedded hoop environment is one in which pigs typically eat more feed. Also, the small pen sizes create less competition for feeder space compared with commercial settings.

Table 1. Composition of diets fed to barrows in hoop barns.

<u>Ingredient</u>	<u>Corn-SBM</u>	<u>20% Oats</u>	<u>40% Oats</u>
Corn	85.53	66.56	47.59
Oats	0.00	20.00	40.00
SBM	12.60	11.60	10.60
Dicalcium phosphate	0.53	0.50	0.49
Limestone	0.74	0.74	0.72
Salt	0.33	0.33	0.33
Vit Premix	0.20	0.20	0.20
BMD	0.02	0.02	0.02
Min Premix	<u>0.05</u>	<u>0.05</u>	<u>0.05</u>
Total	100.00	100.00	100.00

Calculated Analysis

	<u>Corn-SBM</u>	<u>20% Oats</u>	<u>40% Oats</u>
Crude Protein, %	13.08	13.33	13.58
Lysine, %	0.60	0.60	0.60
Ca, %	0.45	0.45	0.45
Available P, %	0.15	0.15	0.15
ME, kcal/kg	3350.84	3210.26	3069.69

Table 2. Performance of barrows housed in bedded hoops during winter, fed 0, 20, and 40% oat diets.

<u>Diet</u>	<u>Corn/soy</u>	<u>20% oats</u>	<u>40% oats</u>	<u>SEM</u>
Pigs, no.	40	40	40	—
Start wt, lb	159	159	159	3.0
End wt, lb	270	267	272	1.8
Gain, lb	111	108	113	4.0
Days on test, d	51	51	51	4.0
Avg. Daily Gain, lb/d	2.21	2.16	2.26	0.11
Avg. Daily Feed, lb/d	8.89	9.05	9.15	0.28
Feed/Gain, lb feed/ lb gain	4.04	4.21	4.06	0.10
Yield, %	75.5	75.5	76	0.5
Backfat, in.	0.86	0.86	0.84	0.03
LEA, in. ²	6.63	6.70	6.77	0.09
Lean, %	51.9	52.1	52.6	0.4
FFLI, %	48.2	48.2	48.5	0.4

Table 3. Performance of barrows housed in bedded hoops during summer, fed 0, 20, and 40% oat diets.

Diet	<u>Corn/soy</u>	<u>20% oats</u>	<u>40% oats</u>	<u>SEM</u>
Pigs, no.	40	40	40	—
Avg. start wt, lb	155	154	154	3.0
Avg. end wt, lb	274	276	274	1.8
Avg. gain, lb	119	122	120	4.0
Days on test, d	58	58	58	4.0
Avg. Daily Gain, lb/d	2.07	2.12	2.08	0.11
Avg. Daily Feed, lb/d	7.41	7.81	7.95	0.28
Feed/Gain, lb feed/ lb gain	3.60	3.70	3.84	0.10
Yield, %	76.7	76.3	76.8	0.5
Backfat, in.	0.93	0.92	0.89	0.03
LEA, in. ²	6.61	6.59	6.58	0.09
Lean, %	51.4	51.3	51.7	0.4
FFLI, %	47.5	47.7	47.9	0.4