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Evaluation of Hover Types with and without Supplemental Heat for Finishing Pig Performance

R. H. Hines, G. L. Allee, and D. A. Nichols

Summary

One hundred sixty Yorkshire barrows and gilts were used to evaluate supplemental heat and various types of hovers for finishing pigs during December, 1978, and January, 1979. Hovers constructed of plywood, straw, and plywood covered with foil were placed over pens with and without catalytic heaters to determine the effect of each on performance. Hovers modified the pig's environment by an average of 8° straw hover, 9° foil covered plywood, and 3° plywood hover. Average daily gain and feed required per pound of gain were similar for all treatments. Pigs fed in pens with catalytic heaters gained slightly faster and were 5% more efficient than pigs fed in pens without heaters.

Introduction

The KSU swine finishing barn is a modified open front unit with total slatted floor (concrete). During cold months, the front is enclosed with 4' x 8' plywood sheets with a curtain above the plywood. To provide supplemental heat, one 4,000 BTU/hr. catalytic heater is used per 6' x 16' pen. Last year, we investigated the use of oak flooring and plywood hovers to provide warmth and comfort for finishing pigs. Data collected suggested that hovers without supplemental heat give satisfactory performance. This study compares various types of hovers with and without catalytic heaters.

Procedure

Hovers evaluated were constructed of plywood, straw, and plywood covered with foil. The plywood hovers were made of one-half inch sheets. Reflective hovers utilized one-half inch plywood sheets covered on one side with aluminum foil to direct heat back down on the pigs. The straw hovers were constructed of woven wire panels overlaid with approximately 6 inches of straw. Hovers were laid over the pen dividers, about 40 inches above the slats. All hovers covered 6' x 8' areas.

We randomly assigned 160 Yorkshire barrows and gilts to these replicated treatment groups: (A) heater, no hover, (B) heater, straw hover, (C) heater, plywood hover, (D) heater, foil covered hover, (E) no heat, no hover, (F) straw hover, (G) plywood hover, and (H) foil covered hover. All pigs were fed ad libitum a fortified meal diet of sorghum grain-soybean meal (16% protein) from November 30, 1978, to January 25, 1979.

Results and Discussion

Table 12 presents average temperatures inside and outside the finishing barn for the four two-week periods the pigs were on trial. Period III was coldest; the mean temperature was 9 F with temperatures below 10 F at 8:30 AM 8 of the 14 days. The average outside temperature for the entire feeding period was 19 F; whereas the average inside the finishing barn approximately 5 feet off the floor was 42 F. Temperature recorded under the hovers (no heater) in the pig area (approximately 3 feet off the floor) averaged 10 to 19° warmer than the inside building temperature. Temperatures beneath the straw and the foil covered hovers averaged 60 and 61 F, respectively, well above temperatures in pens with no hovers. Both straw and foil covered hovers consistently provided a 5 to 8 F warmer environment than the plywood hover during the colder periods.

Performance results are presented in tables 13 and 14. Differences among hovers measured by average daily gain and feed per lb. of gain were not significant. The pigs with no heat and no hover gained the slowest; all other groups gained very similarly. Pigs fed in pens with catalytic heaters gained slightly faster and were approximately 5% more efficient than pigs fed in pens with no supplemental heat (table 15). Pens with straw or foil covered hovers (no heat) recorded higher temperatures than pens without hovers resulting in improved pig performance. Rate of gain was improved 5% and feed efficiency 4%.

Table 12. Average Temperatures (degrees F) Outside and Inside Finishing Barn and Beneath Each Type of Hover.

Period	Date	Outside	Inside	None	Hovers		
					Straw	Plywood	Foil
I	11/30-12/13	22 (10-35)	43 (33-51)	51 (42-62)	57 (46-66)	57 (50-68)	62 (52-72)
II	12/14-12/27	28 (10-42)	49 (42-60)	57 (46-69)	64 (50-72)	61 (53-72)	68 (56-74)
III	12/28-1/10	9 (-6-37)	34 (28-44)	47 (36-52)	56 (48-64)	46 (38-58)	52 (44-64)
IV	1/11-1/25	17 (3-34)	42 (31-56)	53 (42-63)	63 (54-74)	55 (46-66)	60 (52-70)
$\bar{x}$		19	42	52	60	55	61

¹Temperature was recorded at 8:30 AM each day.

Table 13. Average Daily Gain of Pigs by Two-Week Intervals^{1,2,3}

Type hover:	Heat				No heat			
	None	Straw	Plywood	Foil	None	Straw	Plywood	Foil
I	1.91	1.98	1.78	1.98	1.79	1.93	1.76	1.83
II	2.07 ^{abc}	1.93 ^c	2.22 ^{ab}	2.29 ^a	1.93 ^c	2.19 ^{ab}	2.25 ^{ab}	2.00 ^{bc}
III	1.57 ^a	1.46 ^{ab}	1.41 ^{abc}	1.42 ^{abc}	1.17 ^c	1.26 ^{bc}	1.19 ^c	1.18 ^c
IV	1.30	1.37	1.35	1.31	1.42	1.41	1.44	1.54
Overall	1.72	1.69	1.69	1.75	1.58	1.70	1.66	1.66

¹Average initial weight of finishing pigs 134.7 lbs.; average final weight 224.4 lbs.

²Average of two replicates, 20 pigs per treatment.

³Means in the same line with different superscripts differ significantly ($P < .05$).

Table 14. Feed Efficiency by Two-Week Intervals^{1,2}

Type hover:	Heat				No heat			
	None	Straw	Plywood	Foil	None	Straw	Plywood	Foil
I	3.04	3.01	3.56	3.08	3.48	3.16	3.34	3.24
II	3.07	3.28	3.00	2.94	3.22	2.93	2.94	3.03
III	4.50	4.30	4.72	4.78	5.64	5.56	5.80	5.80
IV	4.86	4.54	4.26	4.98	4.37	4.75	4.47	4.08
Overall	3.62	3.66	3.73	3.72	4.00	3.84	3.89	3.79

¹Average initial weight of pigs 134.7 lbs.; final weight 224.4 lbs.

²Each mean an average of 2 replicates.

Table 15. Performance of Pigs Fed in Pens with and without Catalytic Heaters

	Heat	No heat
Number pens	8	8
Number pigs	80	80
Average daily gain, lbs.	1.71	1.65
Average daily feed, lbs.	6.29	6.40
Feed/gain	3.68	3.88