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B A. Koch

G L. Allee

Robert H. Hines

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Abstract

Two trials were conducted to evaluate the benefits of modifying the KSU swine finishing barn by adding hovers, flooring, or both with and without supplemental heat. In trial 1, pigs with no supplemental heat, hover or floor gained significantly poorer than pigs with supplemental heat plus floor, supplemental heat plus hover and floor, or no heat and floor. Pigs with no heat but with hover, floor or both gained similarly with pigs having the benefit of supplemental heat plus modifications. Average daily gain and feed per lb gain were similar for pigs exposed to supplemental heat and those exposed to no supplemental heat. These data would suggest that finishing pigs (100 lbs plus) can perform satisfactorily without supplemental heat, if a hover or floor is provided. The second trial was conducted during March, April, and May, at which time the average temperature was above 50F, consequently no differences were observed in pig performance due to building modifications.; Swine Day, Manhattan, KS, November 9, 1978

Keywords

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KSU

Modification of KSU Swine Finishing Facility Hovers, Floors, or Supplemental Heat

R. H. Hines, B. A. Koch, G. L. Allee

Summary

Two trials were conducted to evaluate the benefits of modifying the KSU swine finishing barn by adding hovers, flooring, or both with and without supplemental heat. In trial 1, pigs with no supplemental heat, hover or floor gained significantly poorer than pigs with supplemental heat plus floor, supplemental heat plus hover and floor, or no heat and floor. Pigs with no heat but with hover, floor or both gained similarly with pigs having the benefit of supplemental heat plus modifications. Average daily gain and feed per lb gain were similar for pigs exposed to supplemental heat and those exposed to no supplemental heat. These data would suggest that finishing pigs (100 lbs plus) can perform satisfactorily without supplemental heat, if a hover or floor is provided. The second trial was conducted during March, April, and May, at which time the average temperature was above 50F, consequently no differences were observed in pig performance due to building modifications.

Introduction

The KSU swine finishing barn is a modified open fronted unit with total slatted floor (cement). During cold months the front of the building is enclosed with 4' x 8' plywood sheets along the bottom with a curtain above the plywood. To provide supplemental heat, one 4,000 BTU/hr catalytic heater is used per 6' x 16' pen. Cost of providing supplemental heat has tripled the past few years; consequently we are interested in investigating other methods of providing warmth and comfort for finishing pigs.

Procedure

Modifications studied were hovers and wooden floors with and without catalytic heaters. The hovers were constructed of one-half inch plywood sheets laid over the top of the pen dividers, approximately 40 inches above the slats. Two sheets of plywood were used to make a covered area of 6' x 8'. Oak flooring (1" x 12") was laid over the slats to develop a solid area of 6' x 8' in the back half of the pen.

In trial 1, we randomly assigned one hundred and forty-eight Yorkshire barrows and gilts to the following replicated treatment groups: (H) catalytic heater, no floor or hover; (HH) catalylic heater plus hover; (HF) catalytic heater plus floor; (HHF) catalytic heater plus hover and floor; (NH) no heat, hover or floor; (NHH) no heat, only a hover; (NHF) no heat, only the floor; (NHHF) no heat, both hover and floor. All pigs were fed ad libitum a fortified diet of sorghum grain-soybean meal (16% protein). Ration was fed in meal form. This trial was conducted from Nov. 22, 1977, to Jan 31, 1978.

Trial II involved 108 crossbred pigs allotted to three replicates of four treatments. No supplemental heat (catalytic heaters) was used; thus the four treatments were NH, NHH, NHF, and NHHF. This trial was conducted from March 20 to May 30, 1978.

Results and Discussion

Table 17 presents the average temperature inside and outside the finishing barn for the five two-week periods the pigs were on trial. December and January were extremely cold in Kansas; from January 1 to January 31 the outside temperature was below 10F on 16 days. (Temperatures were read at 8:00 a.m. each day.) The inside building temperature was obtained above the pen with no hover, floor or heater, approximately 40 inches off the floor. Pens equipped with hover were approximately 6^{o} warmer than pens without hovers or floors. Pens with a floor recorded only 1^{o} change in temperature. Temperature in pens with heaters and those with no heater varied only 3-5^{o}. The relative humidity in the building averaged 74%, with a range of 67 to 83%.

Performance results of trial 1 are presented in Tables 18 and 19. Pigs with no heat, hover, or floor gained significantly less than pigs fed in pens with no heat and floor; with heat and hover, with heat and floor; and with heat, hover and floor. Pigs fed in pens with catalytic heaters gained slightly faster than pigs fed in pen, with no heaters; however, the difference was not significant (Table 20). Improved feed efficiency was observed for pigs in pens equipped with a hover, floor, or both as compared with pens having none of these modifications.

In trial II, the temperature was more constant than in trial I; less than 40F was recorded at 8:00 a.m. on only a few days (Table 21). the building temperature was maintained in the upper sixties, well within the comfort zone of finishing pigs. No difference in average daily gain or feed efficiency was observed in trial II because of the modifications used (Table 22).

Table 17. Average temperature (F) outside and inside of swine finishing barn by periods (trial I).[1]

Period	Date	Outside		Inside	
		Avg	Range	Avg	Range
		Temperature(F)^{o}			
I	11/22-12/5	27^{o}	(6-34^{o})	52^{o}	(37-59^{o})
II	12/6-12/19	27^{o}	(2-47^{o})	52^{o}	(35-62^{o})
III	12/20-1/2	21^{o}	(6-36^{o})	50^{o}	(40-62^{o})
IV	1/3-1/16	14^{o}	(-8-31^{o})	47^{o}	(38-58^{o})
V	1/17-1/31	13^{o}	(0-27^{o})	47^{o}	(38-52^{o})

[1]Temperature was recorded at 8:00 a.m. each day.

Table 18. Average daily gain by two week intervals for trial I.[1,2]

Period	H	HH	HF	HHF	NH	NHH	NHF	NHHF
I	1.84	1.92	1.94	1.92	1.74	2.01	1.86	1.87
II	1.55	1.82	1.82	1.71	1.64	1.72	1.93	1.74
III	1.46	1.48	1.41	1.71	1.47	1.51	1.53	1.42
IV	1.21	1.27	1.42	1.32	1.08	1.16	1.24	1.29
V	1.62	1.57	1.59	1.68	1.30	1.41	1.42	1.52
Overall[3]	1.53^{ab}	1.60^{b}	1.63^{b}	1.66^{b}	1.44^{a}	1.56^{ab}	1.59^{b}	1.57^{ab}

[1]Average initial weight of finishing pigs 107.5 lbs.; average final weight, 220.2 lbs.

[2]Average of two replicates, 16 pigs per treatment.

[3]Means in the same line with different superscripts are significantly different (P<.05).

Table 19. Feed efficiency by two week intervals for trial I.[1]

Period	H	HH	HF	HHF	NH	NHH	NHF	NHHF
I	2.88	2.69	2.70	2.56	2.93	2.64	2.59	2.60
II	2.32	2.06	2.11	2.24	2.14	2.14	2.03	2.07
III	4.26	4.11	4.04	3.64	4.16	3.89	3.96	3.84
IV	5.19	4.82	5.04	5.07	5.48	5.27	5.12	5.35
V	4.00	4.13	3.80	3.69	4.37	4.19	4.47	3.96
Overall	3.63	3.43	3.49	3.34	3.75	3.52	3.59	3.35

[1]Average initial weight, 107.5 lbs.; final weight, 220.2 lbs.

Table 20. Performance of pigs fed in pens with and without catalytic heaters, compared.

	Heaters	No heat
No. pens	8	8
No. pigs	64	64
Avg. daily gain, lbs.	1.60	1.54
Feed/gain	3.47	3.55

Table 21. Average temperature (F) outside and inside swine finishing barn by periods (trial II).[1]

Period	Date	Outside Avg	Outside Range	Inside Avg.	Inside Range
		Temperature(F)^{o}			
I	3/20-4/2	49^{o}	($30-65^{o}$)	63^{o}	($50-74^{o}$)
II	4/3-4/16	56^{o}	($43-68^{o}$)	69^{o}	($64-75^{o}$)
III	4/17-4/31	49^{o}	($35-65^{o}$)	65^{o}	($59-74^{o}$)
IV	5/1-5/14	51^{o}	($42-64^{o}$)	68^{o}	($63-74^{o}$)
V	5/15-5/30	63^{o}	($51-78^{o}$)	75^{o}	($69-80^{o}$)

[1]Temperature recorded at 8:00 a.m. each day.

Table 22. Performance of finishing pigs in trial II.[1]

Treatment	NH	NHH	NHF	NHHF
No. pigs	27	27	27	27
Avg. daily gain, lbs.	1.62	1.67	1.66	1.64
Daily feed intake, lbs.	5.83	5.75	5.69	5.40
Feed/gain	3.60	3.44	3.43	3.29

[1]Average initial weight of pigs, 88.5 lbs.; final weight, 208.5 lbs.