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Sorting and Mixing Effects in a Wean-to-Finish Facility

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Summary and Implications

An experiment was conducted to evaluate whether removing and mixing lightweight pigs in a wean-to-finish facility resulted in improved pig performance to slaughter compared to never removing pigs from a pen from weaning to slaughter. Two populations of pigs were compared. The removed and mixed population consisted of pens comprised of 1) 20 pigs per pen with the five lightest pigs removed three weeks after weaning and 2) 15 pigs per pen with the pen comprised of the five lightest pigs from three of the 20 pig pens. The unsorted population consisted of 15 pigs per pen from weaning to slaughter. There was no effect of treatment when comparing populations on daily gain, daily lean gain, carcass lean percentage, daily feed intake or feed conversion efficiency. On day 158 following weaning when the heaviest pigs from both populations were removed for slaughter, pigs in the removed and mixed population were represented in both ends of the pig weight distribution curve, while no pigs from the unsorted population were present in the lightest weight category. Results of this experiment do not support the recommendation that removing and remixing lightweight pigs in a wean-to-finish facility improves performance and decreases variation in pig weight at time of slaughter.

Introduction

Managing variation in pig weight has major consequences for pig flow and price received for producers using wean-to-finish facilities. Many producers using wean-to-finish management routinely overstock pens at weaning, sorting off the lightest weighing pigs and remixing the pigs at some point during the first three to five weeks following weaning. They follow this management practice in the belief that removing the lightest pigs from a pen and remixing with other lightweight pigs results in better overall pig performance for the population of pigs placed in the facility at weaning. The purpose of the following experiment was to evaluate whether removing and mixing lightweight pigs in a wean-to-finish facility results in improved pig performance compared to never removing pigs from a pen from weaning to slaughter.

Methods

The experiment was conducted at the University of Nebraska's Haskell Ag Lab at Concord. Pigs were housed from weaning until slaughter in a fully slatted, curtain-sided facility with fresh water, under-slat flushing for daily manure removal. Pens measured 8 ft x 14 ft and contained one, two-hole wean-to-finish feeder and one wean-to-finish cup drinker. At weaning, each pen had a rubber mat and heat lamp for pig comfort.

Following weaning at an average age of 17 days, barrows were trans-

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Table 1. Effect of experimental treatments on pig performance for first 21 days post-weaning, least square means.

	Treatment[a]		
Item	20/15	15S	*P* values
No. pens	9	3	
Pig wt, lb			
Weaning	10.7	10.6	0.436
21 d	19.7	20.9	0.046
Coefficient of variation of within pen weight, %			
Weaning	15.7	17.2	0.132
21 d	19.5	17.0	0.140
Daily gain, lb	0.43	0.49	0.028
Daily feed, lb	0.61	0.67	0.063
Feed:gain	1.42	1.36	0.880

[a]20/15 = 20 pigs per pen for 21 days followed by removal of 5 lightest; 15S = 15 pigs/pen never sorted or moved.

Table 2. Effect of experimental treatments on pig performance, least square means.

	Treatment[a]			*P* values	
	Sorted/Mixed		Unmixed		20/15 + 15M
Item	20/15	15M	15S	Treatment	vs 15S
No. of pens	9	3	3		
Pig wt, lb					
21 d post-sort	21.4	15.3	21.0	0.001	0.001
61 d	65.6	56.2	63.4	0.001	0.110
158 d	257.8	243.7	253.7	0.001	0.234
Slaughter	271.2	261.0	267.3	0.027	0.715
Coefficient of variation of within pen weight, %					
21 d post-sort	13.7	11.3	17.0	0.009	0.003
158 d	7.6	7.9	6.9	0.732	0.443
Daily gain, lb					
21-61 d	1.11	1.02	1.07	0.047	0.909
61 d-slaughter	1.98	1.90	1.96	0.051	0.378
21 d-slaughter	1.65	1.59	1.64	0.007	0.347
Daily feed, lb					
21-61 d	2.01	1.61	1.92	0.003	0.258
61 d-slaughter	5.63	5.39	5.46	0.027	0.572
21 d-slaughter	4.41	4.17	4.39	0.008	0.157
Feed:gain					
21-61 d	1.81	1.58	1.79	0.001	0.063
61 d-slaughter	2.85	2.83	2.78	0.203	0.129
21 d-slaughter	2.67	2.62	2.68	0.252	0.291
Carcass lean, %	54.4	54.1	54.5	0.242	0.276
Daily lean gain, lb	0.76	0.72	0.74	0.026	0.832

[a]20/15 = 20 pigs per pen for 21 days followed by removal of the 5 lightest pigs/pen; 15M = 5 lightest pigs from each of the 3 20/15 pens; 15S = 15 pigs/pen never sorted or moved.

ported 225 miles from a southwest Minnesota farrowing facility to the research site. Immediately after arrival, the pigs were ear tagged, weighed, and assigned to the experimental treatments. Weight blocks were not used in order to increase within-pen weight variation at the beginning of the study. There were three replicates of the experimental treatments with five pens per replicate for a total of 15 pens.

Experimental treatments were:

1) Fifteen pigs/pen from weaning to slaughter (15S)
2) Three pens of 20 pigs/pen for three weeks following weaning, reduced to 15 pigs/pen (20/15)
3) Fifteen pigs/pen comprised of the five lightest pigs from the three pens of the 20/15 treatment (15M).

On day 21 following weaning, the five lightest pigs in three of the 20/15 pens were removed and mixed to create the treatment pen labeled 15M. From day 21 to slaughter, all pens had 15 pigs/pen, unless death loss or poor performance resulted in removal of a pig. Pen size was not adjusted in the event of death or removal.

At arrival, pigs were fed two pounds of a commercial pelleted diet per pig. Following this, diets were in meal form and formulated to contain the following lysine levels: 1.44% from 13 to 18 lb, 1.37% from 18 to 25 lb, 1.31 % from 25 to 40 lb, 1.20% from 40 to 60 lb, 1.10% from 60 to 90 lb, 1.00% from 90 to 135 lb, 0.80% from 135 to 190 lb, and 0.62% from 190 lb to slaughter.

On day 158 following weaning, all pigs that weighed 255 lb or greater were individually identified and removed for slaughter. All remaining pigs were individually identified and sent to slaughter on day 172 following weaning. Pigs were slaughtered at IBP Inc., Madison, Neb. Carcass lean was reported on the individually identified pigs for calculation of daily lean gain from day 61. Day 61 post-weaning corresponded most closely with typical arrival weights for purchased feeder pigs and initial weights for calculation of daily lean gain.

The orthogonal contrast of 20/15 + 15M versus 15S was examined to test whether population differences existed for the two management schemes.

Results

There was an effect of group size for the first 21 days following weaning (Table 1). Pigs in the 15S treatment weighed more ($P < 0.05$) because of a greater daily gain ($P < 0.05$) and daily feed intake ($P = 0.06$) compared with the 20/15 treatment. There was no effect of treatment on feed conversion efficiency or within pen weight variation. These results are in agreement with published data suggesting group size effects are most dramatic during the early post-weaned period.

As expected, within-pen weight variation expressed as the coefficient of variation decreased for the 20/15 and 15M population following removal of

the lightest five pigs from the 20/15 treatment pens (Table 2). Because the 15M pen contained the lightest pigs on day 21, the pen average weight was also the lightest on day 61 and day 158. Final weight for this treatment was also lowest due to the method used to remove pigs for slaughter.

When comparing the population of 20/15 + 15M versus the 15S population, there was no effect of treatment on within-pen weight variation, daily gain, daily lean gain, carcass lean percentage, or daily feed intake. For the 21 to 61 day period, the 15S population had an improved ($P = 0.06$) feed:gain ratio compared with the 20/15 + 15M population. There was no difference between the populations for the time period of 61 days to slaughter or from 21 days to slaughter.

Figure 1 displays the variation in pig weight of each population on day 158 when the heaviest pigs in the facility, regardless of population, were removed for slaughter. The sorted and mixed population is represented in both ends of the population weight curve, while the unsorted population is not represented in either the two lowest weight groupings or the heaviest weight grouping. Further evidence that the removal and remixing of the lightest pigs on day 21 post-weaning did not improve overall performance is provided by the fact that on day 158, 51% of the 15S population were removed for slaughter, while only 43% of the 20/15 + 15M population were removed.

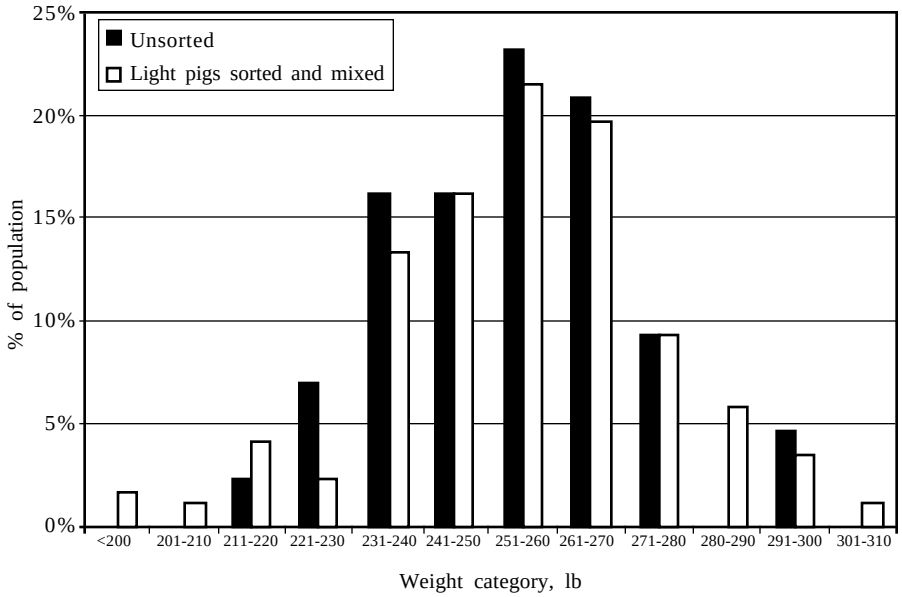

Figure 1. Effect of sorting and mixing vs no sorting on distribution of pig weight on day 158 post-weaning.

Conclusion

Results of this experiment do not support the recommendation that removing and remixing light weight pigs 21 days after weaning in a wean-to-finish facility improves performance of a population of pigs and decreases weight variation at time of slaughter compared to maintaining pen integrity from weaning to slaughter.

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