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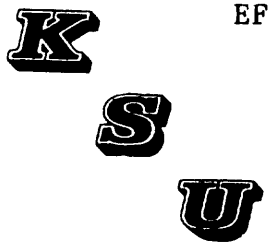

EFFECTS OF FARM ORIGIN AND RESPIRATORY DISEASE ON PIG PERFORMANCE

W.H. Turlington, J.L. Nelssen, P.F. Maxson, G.L. Allee, and S. Potter[1]

Summary

Slaughter checks were conducted on 392 pigs from 9 producers to evaluate factors affecting pig performance, based on the age of the pig and its health status. Among herds, weight per day of age ranged from 1.07 to 1.32 lb/day, whereas days to 230 lb varied from 172 to 214 days. Based on statistical analysis, differences among farms accounted for 40% of the total variation in pig performance, whereas respiratory disease accounted for 20%. From our data, it was concluded that management is the major factor controlling pig performance, yet the health status of the animal is also a contributing factor.

Introduction

During 1984, Elanco Products Company and the National Pork Producers Council (NPPC) sponsored an extensive series of slaughter checks, call TRAC (Total Respiratory Analysis and Control) Clinics. A total of 10,356 hogs were slaughtered, representing 337 herds from 13 midwestern states. Of those hogs, 9 out of 10 had either atrophic rhinitis or pneumonic lung damage (69.1% with measurable rhinitis atrophy, 69.4% with pneumonic lung lesions). It was reported that, in most cases, both diseases were present.

As an addition to this program, an on-farm survey and slaughter check were conducted by Kansas State University and Elanco Products Company. The main objective of this project was to evaluate factors affecting pig performance in the state of Kansas, based on the age of the pig and its health status.

Experimental Procedure

Nine out of an initial group of 15 producers completed the project. Each producer provided 30 to 50 market pigs, yielding a total of 392 pigs. Prior to slaughter, pigs were identified and date of birth ($\pm$ 3 days) was recorded. At slaughter, hot carcass weight (HCWT) and backfat thickness were obtained. Veterinarians conducting the slaughter checks measured percent lung lesions (for pneumonia involvement), snout turbinate openings (for rhinitis atrophy), and the presence of liver ascarid scars (internal parasite damage).

Average standard yields as reported by the USDA (1984) were used to estimate live weights of pigs slaughtered. These predicted weights and the ages of marketed pigs were used to determine days to 230 lb and weight per day of age. Backfat thickness was adjusted to that of a 230 lb pig.

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[1]Elanco Products Company

The degrees of turbinate atrophy and pneumonic lung damage were divided into two scoring systems, based on turbinate openings and percent lung lesions (see Table 1). Snout score was based on a scale of 1 to 3, with 1 being normal or mild turbinate atrophy and 3 being severe turbinate atrophy. Lung score was based on a scale of 1 to 5, with 1 being no pneumonic lung damage and 5 being severe pneumonic lung damage.

Results and Discussion

Only two of nine herds had pigs with liver ascarid damage, thus, data were insufficient to draw any conclusions about the effects of internal parasite damage on pig performance. Also, backfat thickness was highly variable because of differences between slaughter plants (skinning vs. not skinning) and, therefore, it will not be reported for each herd. However, the average, adjusted, backfat thickness across herds was 1.24 inches at 230 pounds.

The proportions of animals with a snout scores 1, 2, and 3 were 44.0, 43.2, and 21.8%, respectively. For the 284 pigs in which the degree of turbinate atrophy was obtained, the average snout turbinate opening was 10.8 mm.

The proportions of animals with lung scores of 1,2, 3, 4, and 5 were 23.1, 26.3, 19.1, 13.3, and 18.2, respectively. For the 346 pigs in which pneumonic lung damage was measured, the average amount of lung lesions was 8.6%.

The averages for criteria measured for pigs from each farm are shown in Table 2. Pig performance varied considerably among farms. Weight per day of age and days to 230 lb ranged from 1.07 to 1.32 lb/day and 172 to 214 days, respectively. All farms used antibiotics in the starter and grower diets, whereas seven of nine farms used antibiotics in the finisher diets. For atrophic rhinitis and mycoplasma pneumonia, 5 of 9 producers treated pigs at weaning.

Based on statistical analysis of the data, differences among farms accounted for approximately 40% of the total variation in pig performance. Snout and lung scores accounted for 20% of the total variability. The effects of snout and lung scores on pig performance are shown in Tables 3 and 4. Pigs with a higher snout score (score=3; $P<.05$) took longer to reach 230 lb and gained less per day of age. Pigs with higher lung scores (score=4 or 5; $P<.05$) also reached 230 lb later and grew at a slower rate.

Conclusions

Based on our data, management is the major factor controlling pig performance, since farm accounted for such a large proportion of the variation. However, health status of the animal is also a contributing factor to pig performance. Based on health data collected, a turbinate opening greater than 12 mm or lung lesions of 11% or more would tend to reduce pig performance by 2.5%. Under these circumstances, a pig would take approximately 5 days longer to reach 230 lb and would gain .03 lb/day less than a pig with no turbinate damage or lung lesions. Other researchers have reported a larger reduction in pig performance because of the health status of the animal. Results from the 1984 TRAC Clinics estimated that respiratory disease reduces average daily gain by 6.3% and extends days to market by 10 days. Our data were collected during a period of the year

when respiratory infections and environmental factors have a minimal effect on pig performance; therefore, they may not reflect the total detrimental capabilities of respiratory diseases in these herds. Other important factors affecting pig performance that should be considered are genetic potential of the pig, plane of nutrition, and environmental conditions.

Table 1. Scoring Systems for Turbinate Atrophy and Pnuemonic Lung Damage.

Turbinate Atrophy		Pnuemonic Lung Damage	
Snout Score	Turbinate Opening, mm	Lung Score	Lung Lesions, %
1	3 - 9	1	0
2	10 - 12	2	1 - 5
3	> 12	3	6 - 10
		4	11 - 15
		5	> 15

Table 2. Averages of Pig Performance Criteria for Each Farm Surveyed.

Farm	HCWT per day of age, lb/d	Weight per day of age, lb/d[a]	Days to 230 lb[b]	% Lung Affected	Tubinates Opening, mm
1	.929	1.28	180	9.4	8.8
2	.788	1.08	213	7.8	13.2
3	.954	1.32	172	7.1	13.2
4	.813	1.12	203	17.2	
5	.860	1.19	192	9.4	8.9
6	.771	1.07	214	7.1	10.0
7	.933	1.28	182	4.9	9.6
8	.963	1.31	179	10.6	10.5
9	.876	1.20	189	6.3	12.0
Overall	.876	1.20	191	8.7	10.8

[a]Weight per day of age = (predicted live weight)/(age at slaughter).
[b]Days to 230 = age at slaughter + (230 - predicted weight)*((age at slaughter - 38)/(predicted weight)).

Table 3. Effects of Snout Score on Pig Performance.

Snout Score Criteria	1	2	3	C.V.[a]
HCWT/day of age, lb	.89[b]	.89[b]	.86[c]	7.90
Days to 230 lb	190[b]	187[b]	195[c]	6.43
Weight/day of age, lb	1.22[bc]	1.23[b]	1.19[c]	7.39

[a]C.V. = coefficient of variation ((standard deviation/mean)*100).
[bc]Means in the same row bearing different superscripts indicate means differ, P<.05.

Table 4. Effects of Lung Score on Pig Performance

Lung Score Criteria	1	2	3	4	5	C.V.[a]
HCWT/day of age, lb	.90[b]	.88[bc]	.90[b]	.87[bc]	.86[c]	7.90
Days to 230 lb	187[b]	191[bc]	187[b]	194[c]	194[c]	6.43
Weight/day of age, lb	1.24[b]	1.21[bc]	1.24[b]	1.19[c]	1.19[c]	7.39

[a]C.V. = coefficient of variation ((standard deviation/mean)*100).
[bc]Means in the same row bearing different superscripts indicate means differ, P<.05.