INDUSTRIAL YIELDS OF PIG BREEDS COMMERCIALLY IMPORTANT IN CUBA

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SUMMARY

Yorkshire-Landrace x Hampshire (YL x H) and Yorkshire-Duroc x Yorkshire (YD x Y) pigs gave very good yields of hams, shoulders and loins, ranking first and second, respectively, as regards meat yield from prime cuts, among the five breeds studied.

Yorkshire x Landrace x Duroc (Y x L x D) pigs gave smaller hams and shoulders, larger bellies and more leaf fat than the rest.

Offal yields did not show definite trends among breeds.

According to their overall commercial suitability, YL x H pigs ranked first, followed by YD x Y. Yorkshire-Landrace x CC_{21} and Yorkshire-Landrace x Duroc would follow, closely grouped, whereas Y x L x D was the fattest, least adequate breed.

INTRODUCTION

It is well known that industrial yields of pigs are influenced by several factors, such as feeding, live weight at slaughter, sex and breed (Babatunde et al. 1975; Povlik 1977; Carr et al. 1978; Martin 1980; Cordovés et al. 1981).

In Cuba commercially produced pigs are handled and fed in a quite similar way and the live weight at slaughter of a considerable proportion of them is between 80 and 90 kg.

This leaves the breed as the main difference between pigs from different areas and farms.

The five predominant breeds in the country are: YL x H; YD x Y; YL x CC_{21}; YL x D and Y x L x D, where Y stands for Yorkshire, L for Landrace, D for Duroc, H for Hampshire and CC_{21} is a type of pig developed in Cuba.

The objective of this work was to assess the influence of the breed on the industrial yields of these pigs.

MATERIALS AND METHODS

Through a period of 7 months ca. 100 gilts and barrows of each of the breeds were slaughtered. They had been fed molasses and swill and their age at slaughter was 8.5 months.

The pigs were held for 12 hours before slaughter. Dressing, cutting and boning operations were standard.

For each animal the slaughter weight, the weight of the main offals, head and jowl and the carcass weight were recorded. Carcasses were chilled at 0 to 4°C and 85-95% RH for 24 hours.

During cutting the shoulder was separated at the 4 th - 5 th rib and the ham at the last lumbar vertebra. The belly was separated longitudinally from the loin. Shoulders, hams and loins were boned.

Results of yield indexes for different breeds were compared by analysis of variance and Duncan's multiple F tests.

Table 1.- Average values of slaughter yields on live weight.

Yield index		YLxH	YxLxD	YLxCC21	YLxD	YDxY	MSE
Hot carcass	(%)	71.30c	71.40bc	72.90a	72.10b	69.10d	7.573
Crupon	(%)	2.18	2.03	2.13	2.10	2.06	0.196
Head	(%)	5.11c	5.64a	5.39b	5.01c	5.81a	0.441
Jowl	(%)	2.52c	2.74b	3.08a	2.54c	2.54c	0.123
Liver	(%)	1.76a	1.61b	1.64b	1.62b	1.82a	0.049
Heart	(%)	0.31b	0.29c	0.31b	0.33a	0.30b	0.002
Kidney	(%)	0.29c	0.32b	0.30c	0.33a	0.33ab	0.002
Tongue	(%)	0.26a	0.24b	0.26a	0.23b	0.26a	0.001
Spleen	(%)	0.21a	0.20ab	0.18c	0.19b	0.18c	0.001
Cold carcass	(%)	70.10b	70.30b	71.80a	71.10a	68.30c	7.997

a,b,c,dMean values in a row without letter in common differ at P<0.05 (Duncan's multiple F test).

Table 2.-Average values of cutting yields. Percentage of chilled carcass weight.

Yield index		YLxH	YxLxD	YLxCC21	YLxD	YDxY	MSE
Loin	(%)	15.01a	14.62a	13.76b	14.65a	13.94b	2.692
Shoulder	(%)	27.99ab	26.32c	28.63a	27.92b	28.33ab	5.230
Ham	(%)	31.50ab	31.03b	31.21b	31.37b	32.05a	4.973
Belly	(%)	13.92b	15.86a	13.66b	13.83b	13.19c	2.628
Leaf fat	(%)	1.91c	2.38a	2.09b	2.16b	1.68c	0.383

a,b,cMean values in a row without letter in common differ at P<0.05 (Duncan's multiple F test).

Table 3. Average values of meat, fat and bone yield per cut.

Yield indexes		YLxH	YxLxD	YLxCC21	YLxD	YDxY	MSE
Meat/loin	(%)	51.46a	47.92c	46.16c	46.51c	49.73b	36.109
Fat/loin	(%)	24.10d	28.26bc	30.15ab	30.58a	26.52c	45.691
Bone/loin	(%)	24.43	23.82	23.69	22.91	23.75	12.784
Meat/shldr	(%)	63.35a	60.98c	61.35bc	61.59bc	62.19b	11.981
Fat/shldr	(%)	19.79b	22.06a	21.62a	21.46a	19.94b	14.640
Bone/shldr	(%)	16.86b	16.96b	17.03b	16.95b	17.87a	4.999
Meat/ham	(%)	65.80a	61.16d	62.76b	61.18d	63.83b	12.440
Fat/ham	(%)	23.47c	27.82a	26.37b	27.56a	25.55c	15.654
Bone/ham	(%)	10.73c	11.02bc	10.87c	11.26ab	11.63a	1.734

a,b,c,dMean values in a row without letter in common differ at P<0.05 (Duncan's multiple F test).

Table 4.- Discriminant analysis. Grouping of breeds according to carcass, prime cuts and meat yields.

P(0)	YLxH	YxLxD	YLxCC21	YLxD	YDxY	correctly grouped (%)
A(0) 480	130	84	111	72	83	-
A(1) 100	65	12	8	9	6	65.0
A(2) 88	15	43	10	10	10	48.9
A(3) 100	8	7	63	10	12	63.0
A(4) 100	20	15	23	35	7	35.0
A(5) 92	22	7	7	8	48	52.2

Table 5.- Discriminant analysis. Grouping of breeds according to head, jowl, belly, fat and bone yields.

P(0)	YLxH	YxLxD	YLxCC21	YLxD	YDxY	correctly grouped (%)
A(0) 480	109	102	88	90	91	-
A(1) 100	58	16	11	7	8	58.0
A(2) 88	7	65	7	5	4	73.8
A(3) 100	10	8	55	10	17	55.0
A(4) 100	22	9	6	56	7	56.0
A(5) 92	12	4	9	12	55	59.8

Multivariate comparison of the breeds was carried out by two discriminant analyses, one for desirable traits (carcass, shoulder, ham and loin yields, as well as the yields of meat from each of the prime joints) the other for undesirable traits (yields of head, jowl, leaf fat and belly, as well as the yields of fat and bone from prime joints).

Statistical analyses were carried out with the SPSS/PC+ Statistical Package (SPSS Inc.).

RESULTS AND DISCUSSION

Average slaughter weights for all breeds ranged from 81.8 kg for YL x H and 84.8 for YD x Y.

Table 1 shows slaughter results. Breed YL x CC_{21} gave the best carcass yields , whereas YD x Y gave the worst, 3.8% lower than the former. The lower carcass yield of YD x Y is not associated with larger yields of head, crupon or jowl, and therefore can be properly ascribed to a carcass trait of this breed.

Offal yields did not show definite trends among breeds. Larger liver weights were obtained for YD x Y and YL x H, liver being the most valuable offal. Yield indexes measured were similar to those reported by Babatunde (1975).

In Table 2 cutting results are compared. Y x L x D animals have smaller hams and shoulders, larger bellies and more leaf fat. No breed was consistently better than the rest as regards prime cut yields in general. However, YL x H and YD x Y gave very good yields of hams, shoulders and loins.

Boning results are shown in Table 3. YL x H animals gave the largest meat yields for all cuts. Hampshire influence might be determinant in this regard, the superiority of this breed as to meat production being widely acknowledged (King 1966; Fahmy and Bernard 1971; Diéguez et al. 1979).

YD x Y ranked second in this trait, whereas the rest of the breeds followed closely grouped.

Fat yield variation was inversely related to that of meat, as expected. Bone yields, on the other hand, varied only in a 1% range.

These results indicate that YL x H pigs are leaner. The slower growth of Hampshire pigs as compared to Yorkshire, Landrace and Duroc, pointed out by several authors (Hale and Southwell 1967; Carr et al. 1978; Diéguez et al. 1980) is compensated by a better carcass composition (Diéguez et al. 1980).

Table 4 presents the results of the discriminant analysis for favorable traits. YL x H was differentiated best, although YD x Y was fairly close, meat yields being the determinant trait. The rest of the breeds could not be clearly grouped.

As to unfavorable traits (Table 5), Y x L x D was differentiated best, most likely on account of its producing the fattest carcasses.

It should pointed out that none of the groupings reached 75% correct assignments, which shows the effect of individual variability, even when statistically significant differences were found among average values of the different breeds.

CONCLUSIONS

The breeds assessed showed different performance as to industrial yields. According to their commercial suitability, YL x H ranks first, followed by YD x Y. YL x CC_{21} and YL x D would follow, closely grouped, whereas Y x L x D was the fattest, least adequate breed.

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