A comparison of the carcass and meat quality traits of seven sources of pig terminal sires.

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Background

Pure pig breeds are now seldom used except to create hybrids or synthetic lines developed primarily as maternal or terminal sire lines. The choice of sire line to produce pigs for meat production can have an important impact on the profitability of the producer. Yet there is little independent objective information on the merits of the breeding stock available to Irish pig producers. Producers are paid on carcass weight and grade but other traits such as the incidence of PSE and the distribution of lean meat are important to the processor and these may also vary between different lines.

Objective

The objective of this study was to evaluate seven sources of boars available on the Irish market and suitable for use as terminal sires for the production of pigs for slaughter at a carcass weight of 65 to 75 kg.

Methods

The progeny of matings supplied by seven breeders were studied. Over a two year period, each breeder supplied semen from 20 boars. Five sows from the Moorepark herd were inseminated by each boar. At weaning one pair of pigs (one male and one female, close to the litter average in weight) were selected from each litter, reared as a pair to 35 kg approx., then reared in groups of 12-14 with individual feed monitoring to slaughter at an average weight of c. 95kg. Pigs from a single breeder were transported in groups of four (two male and two female, two from each of two boars) 200 km to the National Food Centre and rested for 2 hours before being slaughtered by bleeding after electrical stunning. After evisceration carcasses were split, weighed and linear measurements (carcass length, leg length and ham circumference) were recorded. After overnight chilling at 0°C the carcasses were weighed and jointed. The four main cuts were then dissected into lean, skin plus fat and bone. The lean meat percentage in the carcass was calculated according to the EU approved method (Walstra and Merkus, 1995). The pH of the muscle *longissimus dorsi* (LD) was recorded at 45 min and 24 h after slaughter. Backfat depth, the area of the LD and drip loss over 3 days were recorded. Data were collected on between 25 and 38 pigs per breeder (total = 234). The remainder of the pigs were reared in groups of 16 and slaughtered at a commercial abattoir.

Results and discussion

The results for the production traits have been reported elsewhere (Lynch and Allen, 1998). There were significant differences between breeders in economically important traits including growth rate and feed conversion efficiency. For the individually monitored pigs there were significant differences ($P<0.05$) in all linear measurements and meat quality indicators, although for carcass length, leg circumference and pH these were small (Table 1). For LD area there was a 21% difference between the smallest (Breeder E) and the largest (Breeder D). Although the difference was much smaller, progeny from Breeder D also had the greatest leg circumference and those from Breeder E had the smallest, indicating differences in conformation. The most striking difference was in drip loss with a 71.6% difference (1.3 units) between the lowest (Breeder E) and the highest (Breeders A and C). This suggests the possibility of differences in the incidence of PSE, although this is not supported by the pH data.

Table 2 shows the effect of breeder on overall lean meat percentage and on the relative proportions and composition of the four main joints. The only significant difference ($P<0.01$) in the joint proportions was for the belly, this being smallest for breeder C and largest for breeder E. There were significant differences between breeders in overall lean meat percentage and in the composition of all cuts ($P<0.05$). The range in lean meat percentage was 3.6 units, which would affect the returns to the producer. The lean content of the individual cuts was very much line with the overall lean meat percentage, pigs from Breeder E had the least lean meat in each and the lowest overall lean meat percentage while those from breeders D and G were superior in this respect for all cuts. Although differences were sometimes significant, bone was the least variable tissue.

Conclusions

It is concluded that there are differences in carcass and meat quality traits among these seven sources of breeding stock which could affect the profitability of pigmeat processing. Important differences were also found in production triats (though not reported here) so producers should be able to use this information to make informed choices about the best lines to improve their stock in areas where they are most deficient.

Pertinent literature:

Lynch, P.B. and Allen, P. (1998). Comparison of seven sources of pig terminal sires 1. Pig performance. Proceedings of The Irish Grassland and Animal Production Association Annual Meeting, University College Dublin, 19-20 March 1998.

Walstra, P. and Merkus, G.S.M. (1995). Procedure for assessment of the lean meat percentage as a consequence of the new EU reference dissection method in pig carcass classification. ID-DLO, 3700 AM Zeist, The Netherlands.

Table 1 Effect of breeder on carcass dimensions and meat quality traits

Breeder	A	B	C	D	E	F	G	s.e.	F-test
No. pigs	38	25	32	37	29	37	36		
Length mm	817	839	821	828	833	816	836	3.8	**
Leg length mm	382	389	378	335	345	372	343	13	*
Leg circumference mm	685	684	687	695	677	668	684	5.0	*
LD Area cm^2	38.5	41.3	40.4	42.6	35.1	39.9	40.2	0.89	**
pH 45 min	6.36	6.26	6.29	6.21	6.56	6.29	6.31	0.07	*
pH 24 h	5.57	5.56	5.63	5.62	5.66	5.53	5.61	0.03	*
Drip Loss %	3.0	2.2	3.0	2.5	1.7	2.2	2.3	0.25	**

Table 2 Effect of breeder on joint proportions and composition

Breeder	A	B	C	D	E	F	G	s.e.	F-test
Cut as % of cold side wt:									
Hind leg	25.5	25.4	25.5	25.8	25.2	25.5	25.7	0.26	NS
Shoulder	13.0	13.0	13.0	12.9	13.0	13.4	13.4	0.20	NS
Back	18.6	19.5	18.7	19.0	19.0	18.7	18.9	0.29	NS
Belly	8.1	8.6	8.0	8.1	8.7	8.5	8.6	0.20	**
Carcass lean meat %	52.6	54.9	54.3	55.4	52.1	53.1	55.7	0.54	**
Hind leg composition:									
Meat %	72.3	74.2	73.9	74.8	71.3	75.0	75.0	0.64	**
Bone %	9.6	9.4	9.3	9.3	9.9	9.4	9.6	0.17	*
Skin plus fat %	16.9	15.2	15.9	14.5	17.7	17.1	14.6	0.63	**
Shoulder composition:									
Meat %	63.0	65.2	65.1	66.3	62.9	63.9	65.8	0.81	**
Bone %	11.9	12.6	11.7	12.1	12.0	11.8	12.0	0.31	*
Skin plus fat %	23.1	20.1	21.4	20.0	23.2	22.9	20.5	0.81	**
Back composition:									
Meat %	55.7	57.9	57.7	59.8	54.4	56.4	59.3	1.11	**
Bone %	13.8	14.2	14.0	14.3	13.8	13.8	13.8	0.4	NS
Skin plus fat %	28.1	23.0	26.4	23.9	29.5	28.0	25.1	1.18	**
Belly composition:									
Meat %	59.7	61.7	61.7	63.6	59.6	61.4	61.8	1.36	NS
Bone %	10.0	10.3	10.3	10.0	9.6	9.5	10.7	0.5	NS
Skin plus fat %	28.1	25.6	25.9	23.9	28.5	26.7	25.3	1.3	*