The effect of conventional and deep litter housing on belly composition of finished Large White x Landrace gilts

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The inherent differences in the physical and thermal environment of conventional and deep-litter housing systems for pigs are likely to affect the deposition of fat and lean tissue during growth. The differences in thermal conductivity between concrete flooring and straw bedding may affect the deposition of fat. In addition, the ingestion of bedding could also affect fat deposition by diluting the energy content of the diet. Bedding consumption is also likely to alter the digestible amino acid and digestible energy ratio of the diet and the amino acid requirements of pigs, and these requirements may not be accounted for in the formulated diet. In turn, this could cause variation in growth and carcass quality (van Barneveld *et al.*, 2003). In this study we hypothesised that the tissue distribution in growing pigs would differ between pigs housed on deep litter and pigs housed conventionally. We also expected the impact of housing type on fat deposition and distribution would be more pronounced during the finishing period because the proportion of fat deposited in the total gain increases with age.

One hundred and sixty female pigs were stratified by weight at three weeks of age and allocated randomly to four treatments. The treatments were: C: conventional housing from weaning to slaughter (24 weeks); DL: deep litter housing 3-24 weeks; DL-C: deep litter housing from 3-13 weeks of age followed by conventional housing for 13-24 weeks; and C-DL: conventional housing from 3-13 weeks of age followed by deep litter housing for 13-24 weeks. At 13 weeks all treatment groups moved pens. Pigs were phase-fed the same commercial, cereal-based diets and were slaughtered at a commercial abattoir at 24 weeks of age. Twenty-four hours after slaughter one side of the carcass, from 12 pigs per treatment, was broken down into shoulder, loin, belly and hind-quarter (ham). The primals were analysed for fat and lean content (dual energy X-ray absorptiometry). The data were analysed by ANOVA using Genstat v6.

Table 1. Carcass characteristics of pigs raised under different housing regimes.

	C	C-DL	DL	DL-C	lsd[1]	P
Final LW (kg)	123	117	123	117	4.43	0.016
Dressing %	68.2	70.2	69.5	69.3	2.31	0.434
P2 (mm)[2]	19.2	18.8	21.7	18.7	2.62	0.639
Proportions:						
Fat:Lean Side	0.52	0.34	0.42	0.43	0.14	0.077
Fat:Lean Shoulder	0.29	0.21	0.26	0.27	0.06	0.100
Fat:Lean Loin	0.78	0.56	0.65	0.63	0.22	0.228
Fat:Lean Belly	0.68	0.44	0.54	0.56	0.15	0.032
Fat:Lean Ham	0.31	0.22	0.27	0.26	0.07	0.106

[1]LSD: least significant difference. [2]Carcass weight used as co-variate in analysis

At 24 weeks, pigs that had remained in the same type of housing throughout the experiment had higher live weights at slaughter (P=0.016) but dressing percentage and P2 were not affected by treatment. Pigs in the C-DL and DL treatments had a lower ratio of fat to lean in the belly primal (P=0.032) than C pigs and there was also a very strong trend for the C-DL and DL pigs to have a lower fat:lean ratio in the carcass side (P=0.077). There were no treatment differences in the ratio of fat:lean of the shoulder, loin and ham primals.

These results suggest that there are differences in fat distribution in the carcasses of pigs grown in different housing systems, particularly in regards to the belly primal. The presence of bedding, through its thermal properties and/or via ingestion and altering of dietary energy, protein and fibre intake, may be primary contributing factors to the variation found in the composition of pork bellies.

References

van BARNEVELD R., EDWARDS, A.C. and CHOCT, M. (2003). *Pig Industry News* **87**:13-15.