

Relationships between skatole and androstenone in Large White and Meishan pigs

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Introduction Boar taint is an offensive odour and flavour in the meat from some (perhaps 0.05) entire male pigs. It occurs when high concentrations of skatole and androstenone are reached in fat tissue. Boar taint is more common in some breeds than others and as part of an investigation into its genetic basis (Doran *et al.*, 2001), we have studied skatole, androstenone and testosterone relationships in Large White and Meishan cross bred pigs.

Materials and Methods Approximately 90 entire male pigs were used, either Large White x Landrace (LW) or Meishan x Landrace (M). They were fed a standard concentrate feed containing 14MJDE and 10g lysine/kg for the time taken for the LW to reach 100kg live weight. Both breeds were therefore the same age at slaughter. Blood plasma and liver samples were obtained at slaughter and backfat samples one day latter. Plasma testosterone and androstenone, backfat skatole and androstenone and liver skatole concentrations were measured by HRGC using the procedures described in Doran *et al* (2000) and Wiseman *et al* (1999).

Results LW were heavier than M of the same age (77.5 vs 63.7 kg carcass weight \pm 0.97 SEM) yet had thinner backfat (11.5 vs 14.6mm P2 fat thickness \pm 0.85 SEM). Skatole and androstenone concentrations in backfat were much greater in M as was liver skatole although this difference was smaller than in backfat. Plasma testosterone and androstenone were significantly higher in M. Figure 1 shows a curvilinear relationship between androstenone and skatole with values on the steeply ascending part of the curve being predominantly LW. A plot of log skatole against androstenone shows that the 2 breeds can be considered as a continuum, with low values for both compounds in LW and high values in M.

Table 1. Backfat and liver skatole and androstenone (mg/kg \pm SEM) and plasma androstenone and testosterone (nmoles/l \pm SEM)

	Backfat		Liver	Plasma	
	skatole	androstenone	skatole	androstenone	testosterone
LW	0.125 (0.024)	0.808 (0.033)	0.048 (0.004)	25.0 (5.57)	20.4 (2.06)
M	0.616 (0.092)	1.225 (0.050)	0.072 (0.015)	36.7 (7.60)	26.5 (2.42)
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Conclusions In our earlier paper we showed that Meishan cross pigs had higher skatole concentrations in backfat than Large Whites (Doran *et al*, 2001). These results show Meishans also have higher concentrations of both testosterone and androstenone and raise the possibility of an interaction between these compounds in the overall control of boar taint.

Figure 1. Skatole and androstenone concentrations in backfat

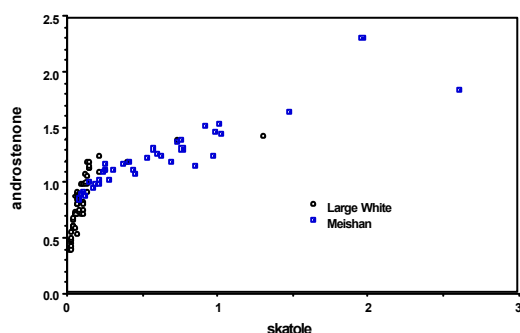
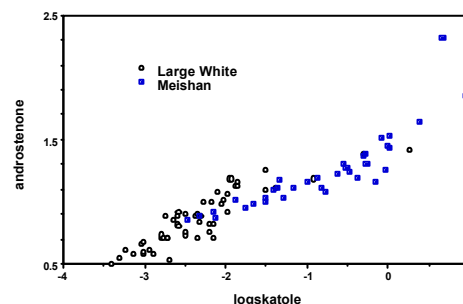


Figure 2. Log skatole and androstenone concentrations in backfat.



References Doran, E., Whittington, F., Wood, J.D. and McGivan, J.D. 2001. The role of P45011E1 protein and mRNA expression in determining adipose tissue skatole level. Proceedings British Society of Animal Science p74.

Wiseman, J., Redshaw, M.S., Jagger, S., Nute, G.R., Whittington, F.W. and Wood, J.D. 1999. Influence of type and dietary rate of inclusion of non-starch polysaccharides on skatole content and meat quality of finishing pigs. Animal Science, 69, 123-133.

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