Safety and Quality of Food from Animals
Occasional Publication No. 17 — British Society of Animal Production 1993
edited by J. D. Wood and T. L. J. Lawrence

Further observations on the effects of molassed sugar-beet feed on the eating quality of pig meat

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Introduction

Sugar-beet feed (SBF) is efficiently utilized by pigs (Longland, Wood, Enser, Carruthers and Keal, 1991) although some reports suggest that high levels in the diet will increase caecal fermentation and lead to high levels of skatole in meat (Lundstrom, Malmfors, Malmfors, Stern, Petersson, Mortensen and Sorensen, 1988). This would be expected to reduce eating quality because of 'off-odours' and flavours. Other work suggests that high fibre diets could result in low cholesterol concentrations in meat which could conceivably aid in marketing.

Material and methods

Forty pigs (equal numbers of male and female Large White × Landrace type) were given four diets in groups of 10. All diets had the same digestible energy and lysine content (13·8 MJ and 9·5 g/kg respectively) with SBF replacing barley as SBF increased from 0 to 450 g/kg. The growth period was 20 to 77·5 kg live weight and feeding was *ad libitum*.

After slaughter, samples of backfat were taken from the last rib region for fatty acid, cholesterol, skatole and indole measurements and loin joints were taken and conditioned for 6 days at 1°C. These were then frozen prior to taste panel analysis. For this, 2·5-cm thick steaks were griddled to an internal temperature of 80°C and 10 trained taste panellists scored eating quality traits on 1 to 8 scales increasing in intensity.

Results and discussion

Results for P_2 fat thickness and the fatty acid composition of backfat are shown in Table 1. As the concentration of SBF increased, P_2 declined, the water concentration in backfat increased and the concentration of linoleic acid (C18 : 2) in backfat decreased. This was due to higher levels of soya oil in the low SBF diets (see Longland *et al.*, 1991). Normally the concentration of C18 : 2 increases as fat thickness declines.

Results for cholesterol, skatole and indole concentrations in backfat are shown in Table 2. There was no effect of SBF on cholesterol but skatole concentration decreased as SBF increased. All values were below the level of 0·2 mg/kg considered to represent the point above which taint problems occur (Lundstrom *et al.*, 1988) or the value of 0·12 found in a recent Danish report to cause low eating quality in pigs given high levels of peas (Madsen, Osterballe, Mortensen, Bejerholm and Barton, 1990).

Results for eating quality are shown in Table 3. In fat tissue both pork odour intensity and abnormal odour intensity tended to decline as SBF increased but these effects were not significant. In lean, pigs given the 300 g/kg SBF diet had the palest colour and the most

Table 1 *Effects of sugar-beet feed (SBF) on P_2 and the chemical composition of backfat*

	SBF (g/kg)					
	0	150	300	450	s.e.d.	Significance
P_2 (mm)	13·7	10·4	10·8	9·7	1·12	*
Fat water content (g/kg)	167	183	216	226	20·5	*
Backfat fatty acids (g/kg)						
C14 : 0	16	16	16	16	0·5	
C16 : 0	247	246	251	252	3·8	
C16 : 1	26	27	29	30	1·8	*
C18 : 0	134	125	133	133	4·4	*
C18 : 1	382	363	395	367	11·9	*
C18 : 2	156	166	135	126	10·3	*
C18 : 3	17	20	15	14	1·3	*

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Table 2 *Effects of sugar-beet feed (SBF) on cholesterol, skatole and indole concentrations in backfat (mg/kg)*

	SBF (g/kg)					
	0	150	300	450	s.e.d.	Significance
Cholesterol	661	685	658	660	37·3	
Indoles	0·023	0·022	0·022	0·012	0·0077	
Skatole	0·069	0·064	0·038	0·036	0·0138	*

Table 3 *Eating quality of pork chops (mean scores of 10 trained taste panellists using 1 to 8 scales)*

	SBF (g/kg)					
	0	150	300	450	s.e.d.	Significance
Fat						
Pork odour intensity	4·50	4·44	4·34	4·36	0·204	
Abnormal odour intensity	1·96	1·91	1·77	1·76	0·184	
Lean						
Colour	4·62	4·49	4·09	4·45	0·121	***
Tenderness	3·82	4·25	4·76	3·94	0·157	***
Juiciness	4·19	4·20	4·31	4·12	0·147	
Pork flavour intensity	4·72	4·50	4·40	4·09	0·180	**
Abnormal flavour intensity	2·62	2·32	2·22	2·15	0·218	
Overall liking	4·46	4·70	4·96	4·40	0·168	**

tender meat. They also had the highest score for overall liking. Pork flavour intensity decreased with SBF inclusion and abnormal flavour intensity tended also to decrease although this effect was not significant.

Conclusions

Increasing the concentration of SBF from 0 to 450 g/kg had no effect on the concentration of cholesterol in pig backfat but reduced the concentration of skatole. Far from reducing eating quality traits as was expected, increasing SBF was associated with reduced abnormal odours and flavours. The highest tenderness and overall liking scores were given to meat from pigs given 300 g/kg SBF.

References

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https://doi.org/10.1017/S0263967X00001403 Published online by Cambridge University Press