

Boar taint in very small organic entire male pigs - preliminary results

DMRI

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Introduction

Very small entire male pigs can be part of a new concept of organic seasonal production of pigs. The concept includes outdoor production of small entire male pigs, very large female pigs and sows slaughtered after first litter. The entire males and the sows are slaughtered in the summer and the female pigs in December. The purpose of the very small entire male pigs is to avoid castration and boar taint at the same time. In order to make the concept special regarding product quality and image, different crossbreeds are considered including a traditional Danish breed. Two seasons (2007 and 2008) are planned. Results of the 2007 season are presented.



Methods

Six LY (Danish Landrace x Danish Yorkshire) sows and six sows of the traditional breed Danish Black-Spotted (BS) were inseminated with Duroc (D) semen and six BS sows were inseminated with BS semen. The sows were kept in huts with access to outdoor pasture (grass and white clover). The sows farrowed in April 2007 and the pigs were weaned at 11 weeks of age.

Twelve LY-D, nine BS-D and eleven BS-BS entire male pigs were slaughtered in July 2007 at approximately 40 kg live weight. Hot carcass weight, slaughter loss and chilling loss were registered. Meat and fat thicknesses were measured with the manual classification equipment MK at two places in the middle part. Skatole was measured in the backfat with the Danish colorimetric online method. Six LYxD, five BSxD and six BSxBS entire male pigs were used for Lab colour measurement (Minolta) of fresh slices of M. longissimus dorsi and sensory analysis of cutlets (fried 20 mm slices of M. longissimus dorsi) and whole boned ham roast (M. semimembranosus) was evaluated by the assessors. The data were analysed with the MIXED and FREQ procedures in SAS.



Discussion

Although the number of pigs included in the trial so far is very small, the preliminary results indicate that pure Black-Spotted entire male pigs have a higher content of skatole in the backfat and that it causes more intense piggy odour and flavour and maybe boar odour. The crossing of Black-Spotted with Duroc may reduce the skatole content of the backfat and the piggy odour and flavour. There may be some confusion between piggy and boar odour among the assessors of the sensory panel. Backfat samples were taken for analysis of androstenone but they are not yet analysed.

In 2008 more pigs will be produced and analysed.

References

Hansen-Møller, J., Andersen, J. R. Boar taint – analytical alternatives. Fleischwirtschaft 1994, 9, 963-966.

Results

The average live weight of the LY-D, BS-D and BS-BS entire males was 40.9, 39.8 and 35.8 kg and the hot carcass weight was 31.1, 28.4 and 27.2 kg. Slaughter loss was 25.5, 25.8 and 26.6 % respectively. The chilling loss was 3.4, 3.7 and 3.7 % respectively. No differences are statistically significant. There were no significant differences in meat and fat thicknesses. The colour of the fresh cut M. longissimus dorsi of BS-BS (8.1) and BS-D (7.9) was significantly more red (a^*) than of LY-D (5.1). SB-D (4.3) was significantly more yellow (b^*) than LY-D (2.9) but BS-BS (3.4) did not differ significantly from the two other crossbreeds. There were no significant differences for the lightness (L^*).

Entire males of BS-BS had higher content of skatole (0.15 ppm) in the backfat than LY-D (0.10 ppm) and BS-D (0.08 ppm). Three of the BS-BS pigs had skatole content over 0.20 ppm where the other two crossbreeds had none (figure 1).

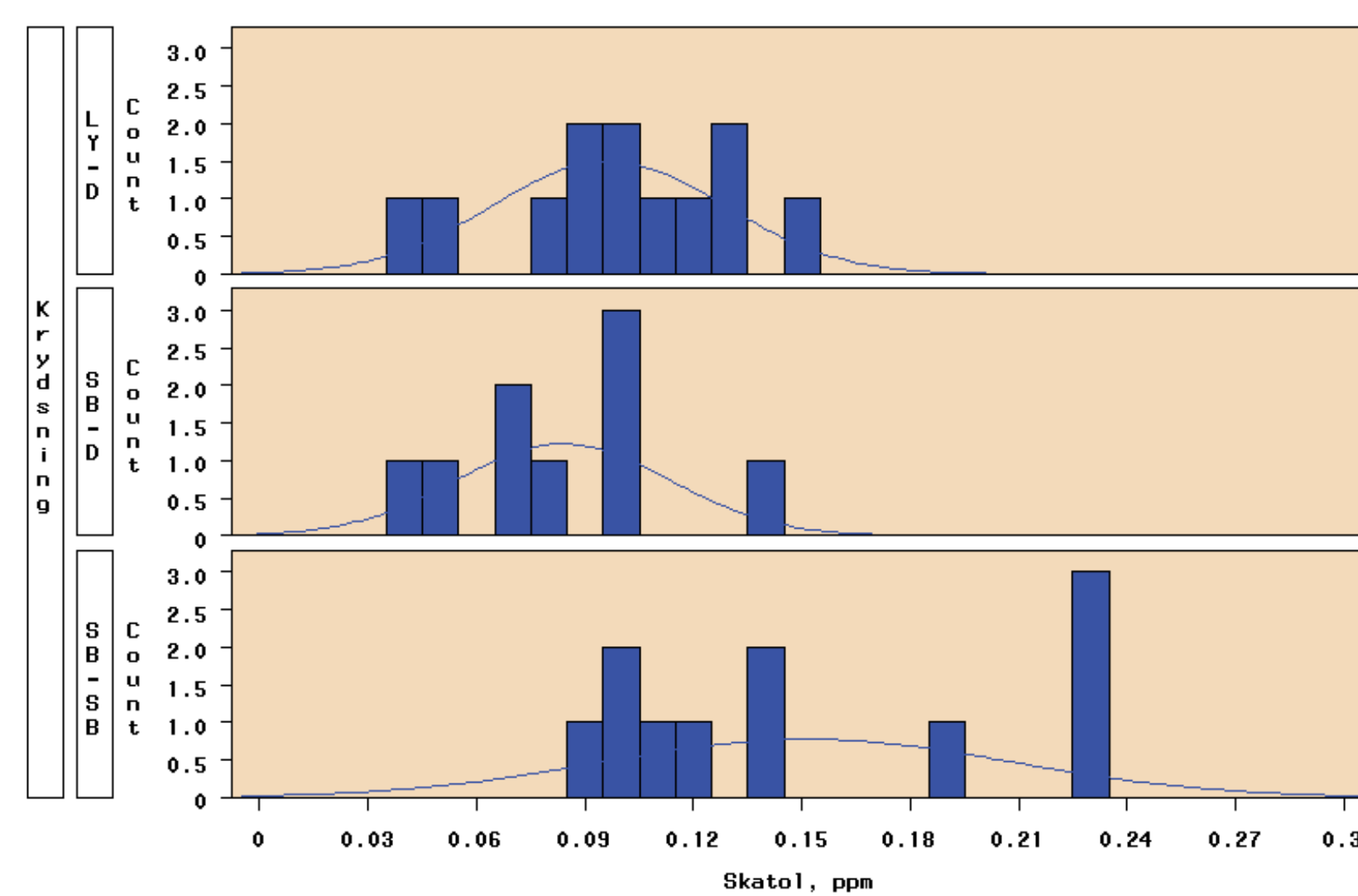


Figure 1. Distribution of skatole (ppm) in backfat of entire male pigs of three cross breeds: LY-D, BS-D and BS-BS

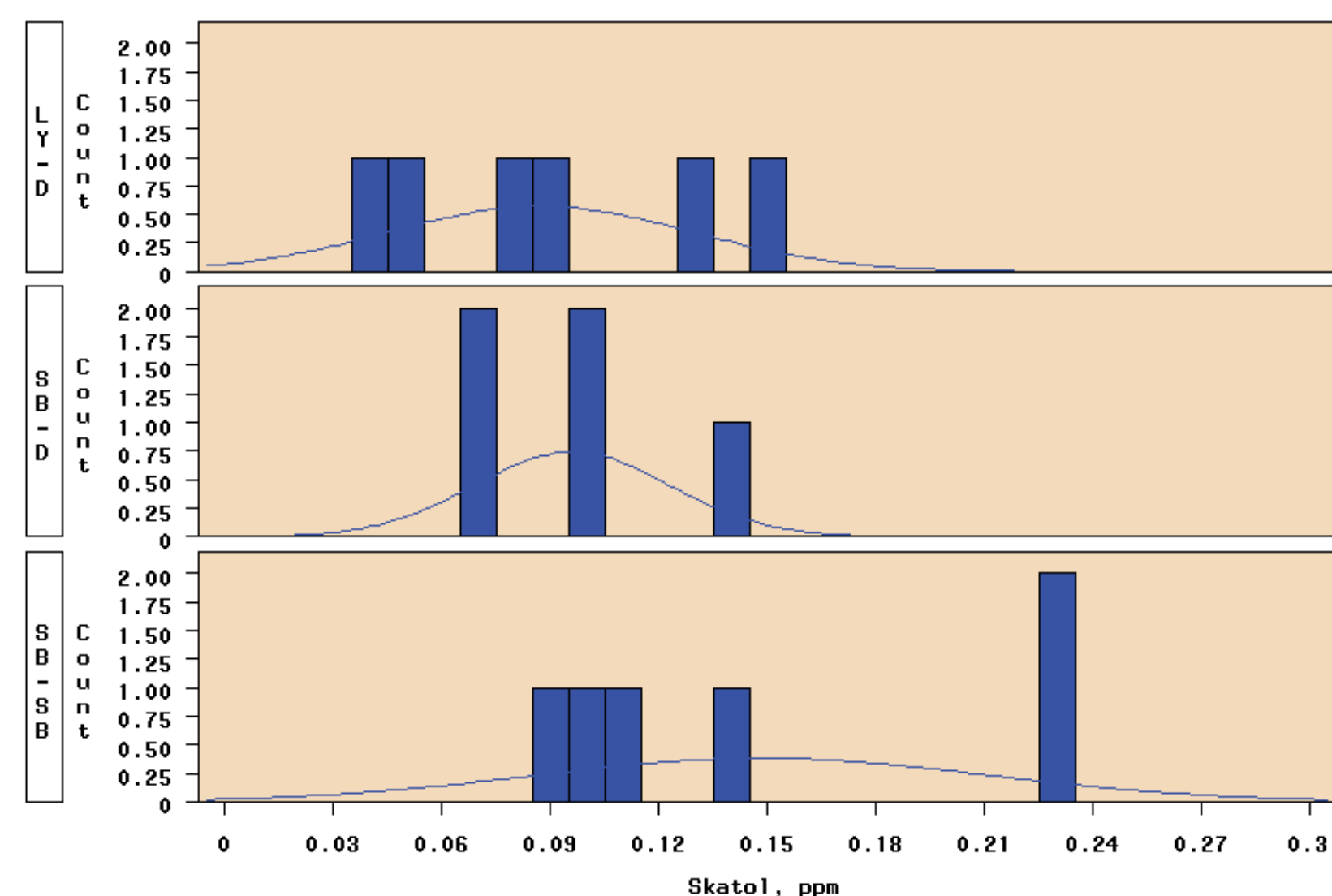


Figure 2. Distribution of skatole (ppm) in backfat for pigs of three cross breeds: LY-D, BS-D and BS-BS included in sensory analysis

The sensory analysis of the cutlet showed tendency to more piggy odour and flavour for BS-D and BS-BS than for LY-D. There was a tendency to more tender meat for BS-D. The sensory analysis of the ham roast (M. semimembranosus) showed that BS-BS had significantly more piggy odour than LY-D and that this can be explained by the differences in skatole content. There is also a tendency to more boar odour in BS-BS. Furthermore, there is a tendency to less meat flavour in BS-BS especially compared to BS-D and this may to some extent be explained by the skatole content. Entire males of BS-BS had more metal taste than the two other crossbreeds, which cannot be explained by the skatole content.

	Crossbreed			p
	LY -D	BS -D	BS -BS	
Number	12	9	11	-
Live weight before bleeding, kg	40.9	39.8	35.8	0.6
Hot carcass weight, kg	31.1	28.4	27.2	0.3
Slaughter loss, %	25.5	25.8	26.6	0.3
Chilling loss, %	3.4	3.7	3.7	0.4
MK 11 meat thickness, mm	55	51	58	0.7
MK 12 meat thickness, mm	37	31	33	0.1
MK 11 fat thickness, mm	9	9	11	0.2
MK 12 fat thickness, mm	8	8	8	0.7
Skatole, ppm	0.10 a	0.08 a	0.15 b	0.002
Number \geq 0.10 ppm	7	7	14	0.03
Number \geq 0.20 ppm	0	0	5	na

Table 1. Slaughter quality (ls-means)

	Crossbreed			p
	LY -D	SB -D	SB -BS	
Number	6	5	6	-
L^* (lightness)	54.0	53.7	49.4	0.1
a^* (red)	5.1 a	7.9 b	8.1 b	< 0.0001
b^* (yellow)	2.9 a	4.3 b	3.4 ab	0.09

Table 2. Colour (Minolta) of fresh slices of M. longissimus dorsi (ls-means)

	Crossbreed			p
	LY -D	BS -D	BS -BS	
Number	6	5	6	-
Hot carcass weight, kg	30.5	29.7	26.4	0.5
Skatole in backfat, ppm	0.09	0.10	0.15	0.09
Boar odour	-	-	-	-
Piggy odour	2.6	3.4	4.0	0.3
Fried meat odour	6.4	6.6	6.3	0.9
Acidic odour	4.3	4.3	4.5	0.7
Metallic odour	1.8	2.0	1.8	0.8
Sweet odour	3.4	3.8	3.3	0.4
Boar flavour	-	-	-	-
Piggy flavour	2.7	3.8	4.0	0.2
Fried meat flavour	5.4	5.6	5.4	0.9
Acidic taste	6.1	6.0	6.5	0.2
Metal flavour	2.7	3.1	3.4	0.4
Sweet flavour	3.1	2.8	2.5	0.1
Bitter taste	2.0	2.5	2.4	0.6
Tenderness	7.8	9.1	7.2	0.5
Juiciness	7.7	7.7	6.7	0.2
Hardness at first bite	4.9	4.2	5.9	0.3
Crunchiness	5.1	5.5	5.4	0.8
Crumbiness	4.0	5.2	4.9	0.2
Fibrous mouth feeling	3.5	3.4	4.0	0.5
Cooking loss, %	20.0	19.2	17.9	0.6

Table 3. Sensory profile of cutlet (ls-means on a scale from 0 to 15)

	Crossbreed			p
	LY -D	BS -D	BS -BS	
Number	6	5	6	-
Hot carcass weight, kg	30.5	29.7	26.4	0.5
Skatole, ppm	0.09	0.10	0.15	0.09
Boar odour	1.4	1.2	2.4	0.07
Piggy odour ¹	3.4	3.6	3.8	0.6
Piggy odour ²	3.0 a	3.3 ab	4.4 b	0.06
Fried meat odour ¹	4.0	4.6	3.9	0.2
Fried meat odour ²	4.2	4.7	3.6	0.07
Acidic odour	4.3	4.5	4.7	0.4
Metallic odour	2.7	3.0	3.3	0.3
Sweet odour	1.7	2.2	2.0	0.08
Boar flavour	1.5	2.1	2.5	0.3
Piggy flavour ¹	3.1	3.3	2.8	0.4
Piggy flavour ²	2.8	3.1	3.3	0.6
Fried meat flavour	4.6	4.7	4.1	0.4
Acidic taste	5.6	5.3	5.5	0.7
Metal flavour	4.0 a	4.0 a	4.6 b	0.03
Sweet taste	3.3	3.2	3.0	0.6
Bitter taste	3.7	3.8	3.7	0.9
Tenderness	9.1	9.4	8.6	0.7
Juiciness	5.1	4.1	4.1	0.3
Hardness at first bite	4.9	5.1	5.3	0.9
Crunchiness	4.0	4.4	4.2	0.8
Crumbiness	7.3	7.4	7.3	0.9
Fibrous mouth feeling	2.4	2.1	2.3	0.8
Cooking loss, %	29.8	29.9	26.7	0.5

Table 4. Sensory profile of ham roast (ls-means on a scale from 0 to 15)

1. Model including skatole in backfat
2. Model not including skatole in backfat