

Acceptability of meat with different levels of boar taint compounds for Spanish and English consumers

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Abstract

Boar taint is an abnormal sensory trait of pork mainly due to androstenone (AND) and skatole (SKA). The aim of this work was to study consumers' acceptance of pork with different levels of boar taint in Spain (ES, N= 133) and United Kingdom (UK, N= 146). Three types of samples were used: loins from Females (FE) and loins from entire male pigs with two levels of boar taint according to AND and SKA levels: BT020 had 0.20 ± 0.07 $\mu\text{g/g}$ of AND and 0.06 ± 0.02 $\mu\text{g/g}$ of SKA; BT107 had 1.07 ± 0.40 $\mu\text{g/g}$ of AND and 0.18 ± 0.07 $\mu\text{g/g}$ of SKA, on pure fat basis. Loins from these samples were cooked on a cooking plate at 180 °C and served warm to consumers, and the following attributes were assessed: 'Delicious', 'Odour' and 'Taste' (rated on a Likert scale going from 1: 'dislike very much' to 9:'like very much'), and 'Strength of odour', 'Abnormal odour', and 'Abnormal taste' (scored between 1:'low perception' to 9:'strong perception'); avoiding always the intermediate level (5). Consumers answered information about their behaviour when buying, cooking and consumption of pork (i.e. eat pork with or without fat) as well as socio-demographic questions (age and gender). The SAS Freq procedure and the Mixed procedure were used for data analysis. Age affected the acceptability in ES (higher as age increased), while only abnormal odour was affected in UK (26-40 age group scored higher than 18-25 group). Regarding the gender, only in ES women scored better delicious and odour than men. No significant differences were found on the attributes among consumers classified according to their habits. Under these experimental conditions, main differences were found due to the type of samples and age of consumer. Gender and consumers' behaviour did not affect the acceptability of the meat. Further research is needed to understand why meat with an average of 1.07 $\mu\text{g/g}$ AND on pure fat basis was accepted at the same level than meat from gilts, while meat with less AND levels was less accepted.

RESULTS

Table 1. Significance levels of different effects on the perception of attributes on meat.

	TM	Age	Gender	C	F	TM x Age	TM x G	TM x C	TM x F
<i>Spain</i>									
Delicious	*	*	*	ns	ns	ns	ns	ns	ns
Odour	**	*	**	ns	ns	ns	ns	ns	ns
Taste	*	*	†	ns	ns	ns	ns	ns	ns
In mouth	ns	*	**	ns	ns	ns	ns	ns	ns
Strenght of odour	*	*	ns	ns	ns	ns	ns	ns	ns
Abnormal odour	ns	ns	ns	ns	ns	ns	ns	ns	ns
Strenght of taste	ns	ns	†	†	ns	ns	ns	*	ns
Abnormal taste	*	ns	ns	ns	ns	ns	ns	ns	ns
<i>United Kingdom</i>									
Delicious	ns	ns	ns	ns	ns	ns	ns	ns	ns
Odour	†	ns	ns	ns	ns	ns	ns	ns	ns
Taste	ns	ns	ns	ns	ns	ns	ns	ns	†
In mouth	ns	ns	ns	ns	ns	ns	ns	ns	ns
Strenght of odour	†	ns	ns	ns	ns	ns	ns	ns	ns
Abnormal odour	ns	*	ns	ns	ns	ns	ns	*	†
Strenght of taste	ns	ns	ns	†	ns	**	ns	ns	**
Abnormal taste	ns	ns	ns	ns	ns	ns	ns	ns	ns

TM: Type of meat; Age: Age groups defined as 18-25, 26-40, 41-60 and >61; G: gender of the consumers; C: Responsible for cooking; F: eating pork with the fat.

		TM			Age				Gender		C		TM	Age	G	C
		FE	BT020	BT107	18-25	26-40	41-60	>60	Women	Men	No	Yes				
Spain																
Delicious	LSM	6.8 ab	6.4 b	6.9 a	6.2 b	6.6 b	6.5 b	7.5 a	6.9	6.5	6.8	6.7	0.0128	0.0116	0.0351	0.7573
	S.E.	0.17	0.17	0.17	0.31	0.20	0.19	0.27	0.19	0.16	0.24	0.14				
Odour	LSM	6.7 a	6.3 b	7.0 a	6.3 b	6.7 ab	6.4 b	7.3 a	7.0	6.4	6.7	6.7	0.0016	0.0122	0.0018	0.9932
	S.E.	0.16	0.16	0.16	0.28	0.19	0.18	0.25	0.17	0.15	0.22	0.13				
Taste	LSM	6.8 a	6.4 b	6.9 a	6.3 b	6.6 ab	6.6 a	7.4 a	6.9	6.6	6.8	6.6	0.0253	0.0197	0.0948	0.497
	S.E.	0.16	0.17	0.17	0.30	0.20	0.19	0.26	0.18	0.16	0.24	0.14				
Strenght of odour	LSM	5.4 ab	5.0 b	5.6 a	4.8 b	5.2 ab	5.3 ab	6.0 a	5.4	5.3	5.5	5.2	0.0320	0.0470	0.7478	0.3192
	S.E.	0.20	0.20	0.20	0.35	0.23	0.22	0.32	0.22	0.18	0.28	0.16				
Abnormal taste	LSM	2.2 b	2.6 a	2.3 ab	2.4	2.2	2.1	2.7	2.3	2.5	2.2	2.6	0.0459	0.5892	0.4321	0.3127
	S.E.	0.21	0.21	0.21	0.42	0.28	0.26	0.36	0.25	0.21	0.32	0.19				
United Kingdom																
Delicious	LSM	6.8	6.4	6.9	6.2	6.6	6.5	7.5	6.9	6.5	6.3	5.7	0.7089	0.2319	0.7433	0.0492
	S.E.	0.17	0.17	0.17	0.31	0.20	0.19	0.27	0.19	0.16	0.29	0.13				
Odour	LSM	6.3 a	5.9 b	6.2 ab	6.0	6.5	6.2	6.0	6.2	6.1	6.3	6.0	0.0729	0.4203	0.9196	0.3502
	S.E.	0.18	0.18	0.18	0.25	0.28	0.21	0.24	0.20	0.17	0.27	0.12				
Taste	LSM	6.4	5.9	6.4	6.1	6.4	6.4	6.1	6.2	6.3	6.5	6.0	0.3928	0.5761	0.5745	0.0988
	S.E.	0.20	0.20	0.20	0.26	0.29	0.21	0.24	0.21	0.18	0.28	0.13				
Strenght of odour	LSM	4.4 a	3.9 b	4.4 a	4.0	4.7	4.1	4.2	4.2	4.3	4.4	4.1	0.055	0.2068	0.5203	0.4414
	S.E.	0.19	0.19	0.19	0.27	0.31	0.22	0.26	0.21	0.19	0.30	0.13				
Abnormal odour	LSM	2.9	2.9	3.0	2.4 b	3.4 a	2.8 ab	3.1 ab	2.8	3.0	3.0	2.8	0.8414	0.0364	0.4772	0.3884
	S.E.	0.18	0.18	0.18	0.26	0.29	0.21	0.24	0.20	0.18	0.28	0.13				

TM: Type of meat; *BT020*: [AND]= 0.20 ± 0.07 µg/g [SKA]= 0.06 ± 0.02 µg/g; *BT107*: [AND]= 1.07 ± 0.40 µg/g [SKA]= 0.18 ± 0.07 µg/g, on pure fat basis; **G:** gender of the consumers; **Age:** Age groups; **C:** Are you responsible for cooking at home?

Threshold values for taint compounds. Chemical and sensory tests are widely used to detect boar taint in meat from entire male pigs. Chemical tests typically assess tissue concentrations of the compounds associated with taint. Sensory tests classify boar carcasses into either tainted or untainted categories according to test criteria assessed by human evaluators. The threshold concentrations of taint compounds are typically indicated according to the results of chemical tests. It has also been reported that acceptability of boar meat varies differently among different populations. Several studies of the reaction of consumers to boar meat have been carried out in a number of European countries and Canada.