

CONSUMER STUDY OF BOAR MEAT DEPENDING ON THE APPRECIATION OF ANDROSTENONE SMELL IN SPAIN

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Background

Boar taint is a sensory defect of pork meat mainly due to two substances, androstenone and skatole. Traditionally in Spain the males were not castrated, but there is a tendency now to castration, almost in some areas because of consumer demand and also to produce cured products. While skatole is perceived by 99 % of the consumers, some of them are not able to perceive androstenone even in high concentrations. The percentage of consumers insensitive or less sensitive to androstenone (including men and women) was estimated in a recent European study in Spain as 53.6 % and in Germany as 67.7 % (Weiler et al. 2000). This response is genetically determined, as reported by Gilbert and Wysocki (1987) and depends on the sex of the consumer (Griffiths and Patterson, 1970). Women are more sensitive to androstenone than men in all the studies carried out. In a Spanish study, loin meat with medium and high levels of androstenone had a significantly lower level of acceptability (odour) from the sensitive to androstenone smell with respect to insensitive or less sensitive consumers (Weiler et al., 2000). A single highly sensitive consumer per family may be able to change the consumption habits of the whole family, especially if that person is the cook (because the score for odour was worse than for flavour) (Weiler et al., 2000). In Spain the % of sensitive people was found to be 40 % for men and 52 % for women, while in Germany the % was 40 and 30 respectively which corresponds to approximately 12 million Spanish and 14 million German consumers.

The objective of this paper is now to ascertain the influence of appreciation of androstenone smell on the consumer acceptance of pork meat in a Spanish study.

Material & Methods

480 consumers were selected in two replicates and from three different areas of Spain (Monells, a rural area, Zaragoza, a medium city and Madrid, a big city). The selection and preparation of the samples were described in Bonneau et al. (2000) and Matthews et al. (2000). 42 loins from gilts as a control group and 378 loins from males were selected and the boars were classified in 9 groups depending on their levels of androstenone and skatole (high: > 1.0 and > 0.21 µg respectively, medium and low: < 0.5 µg/g of androstenone and < 0.10 µg/g of skatole). The acceptability of the meat flavour was evaluated from loins cooked at 180°C and re-cooked at 250 °C, while the acceptability of meat odour was evaluated in loins cooked in the same way and kept for 1 minute on a hot plate at 250 °C just before serving. Consumers evaluated 5 samples in a 7 level hedonic scale (1-3=like the meat, 4= neither like nor dislike, 5-7=dislike the meat). At the end of the meat test, each consumer was checked for androstenone sensitivity as described by Weiler et al. (2000). Also consumers were asked about their appreciation of androstenone odour, i.e. if they like the androstenone odour very much (1) dislike very much (7). When the response was *like*, *like a lot* and *like very much*, we consider that they are in the group of consumers that *like* androstenone smell. When the score of appreciation of the smell was *neither like nor dislike* they were considered in the group of *indifferent*. Finally when the response was *neither like nor dislike*, *dislike*, *dislike a lot* or *dislike very much*, we consider that they are in the group of consumers that *dislike* this smell.

Results and discussion

The distribution of the linking of pure androstenone odour by sensitivity is given in Table 1. Looking at the highly sensitive consumers, 8% of them like the odour, being this percentage 20.4 in the middle sensitive/insensitive group. Overall, 18.1 % of them like the odour, 49 % are indifferent and 33 % dislike it. These results showed that in total 82 % of consumers do not like or are indifferent to the androstenone smell.

Table 1. Percentage of consumers depending on their appreciation of the smell of pure androstenone and sensitivity to androstenone.

| | Appreciation of androstenone smell | | |
|------------------------------|------------------------------------|-------------|---------|
| | Like | Indifferent | Dislike |
| Highly sensitive | 8.0 | 9.6 | 82.4 |
| Middle sensitive/insensitive | 20.4 | 66.9 | 12.7 |
| Overall | 18.1 | 48.9 | 33.0 |

The results after the GLM procedure with SAS are showed in Table 2 and Figure 1. There is a significant influence on the acceptability of pork loin depending on the appreciation of the androstenone smell. Consumers who like the smell of pure androstenone score both the odour and the flavour of cooked pork significantly better than consumers who dislike or are indifferent to that smell independently of the level of androstenone. When we considered the sensitivity to androstenone, the highly sensitive consumers do not discriminate for flavour depending on the androstenone level of the samples (Weiler et al., 2000). It indicates a higher discrimination in the acceptability of odour and flavour of pork when the linking of androstenone smell is considered instead of the sensitivity to that compound.

Table 2. Least square means and S.E. of the odour and flavour scores of cooked pork loin depending on the consumer's appreciation of androstenone smell (like=1-3; 4=indifferent; 5-7=dislike) and odour and flavour scores from 1 (like very much) to 7 (dislike very much).

| Appreciation | n | Flavour | | Odour | |
|------------------------------------|------|-------------------|------|-------------------|------|
| | | Mean | SE | Mean | SE |
| Like (18 % of consumers) | 429 | 3.25 ^b | 0.06 | 3.65 ^b | 0.06 |
| Indifferent (49 % of consumers) | 1158 | 3.65 ^a | 0.04 | 3.94 ^a | 0.04 |
| Dislike (33 % of consumers) | 783 | 3.61 ^a | 0.05 | 4.06 ^a | 0.05 |

n= loin samples tested.

Different letters within the same column indicate significant differences $P < 0.05$.

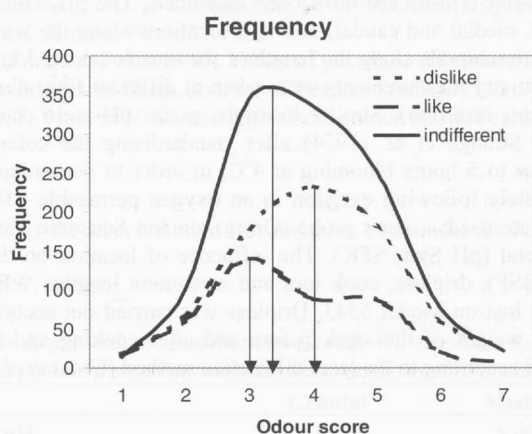


Figure 1. Odour score distribution from 1 (like very much) to 7 (dislike very much) (hedonic scale) depending on the consumer appreciation of androstenone.

Conclusion

The pork meat sector should take into account the results from that Spanish study, because it is demonstrated that the appreciation of androstenone smell affects pork meat acceptability. Spain, together with Germany is one of the European countries with higher levels of pork meat consumption. To improve the quality of the pork meat and sustain the high levels of pork meat consumption, some initiatives against the commercialisation of boar meat should be taken, at least from fresh meat and cured products.

References:

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