

PORK FLAVOUR - A NORDIC PROJECT WHICH AIMS TO IDENTIFY CONSUMER RESPONSE TO PORK FLAVOUR

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Background.

To enable the market success of new meat products, it has become increasingly important that these are optimally aligned with consumer expectations, demands and desires. Knowledge of the latest consumer preferences and consumer trends regarding pork in the Nordic countries is of the utmost importance in producing pork meat and meat products of the highest quality, and constitutes the basis for future product development.

Flavour is probably the single most important sensory attribute that makes cooked meat and meat products desirable. The increasing interest in pre-cooked ready-to-heat products, together with increased competition in pork products on the domestic market, has changed the demands made on the Nordic meat industry. In order to compete, a higher level of pork processing in the industry and a longer storage time for pork going to export are necessary. The change from local meat-producing units to large industrial facilities producing pork products for export, as well as processed pork products, entails problems with product quality and flavour.

Due to the relatively high unsaturation and the low levels of antioxidants, pork is vulnerable to lipid oxidation during storage, giving rise to off-flavours. Off-flavours due to the oxidation of phospholipids during the chill-storage of cooked pork are common in ready-to-heat foods, sous-vide products, etc. Knowledge of fast food consumers' attitudes to warmed-over flavour is lacking. The prerequisite for transferring these attitudes to measurable quality parameters is finding out and quantifying the sensory attributes and key chemical components governing pork flavour. Key components may be used as reference compounds or samples for the calibration of sensory panels (Agerhem *et al.*, 1997). Furthermore, it is important for the meat industry to incorporate new, rapid and objective methods of analysing pork flavour into quality assurance systems. Electronic nose technology provides the possibility of on- or at-line quality control.

The present project focuses on relationships between sensory qualities, consumer preferences and the chemical composition of pork. New, rapid and objective methods for analysing pork flavour, which are of importance to the meat industry to incorporate into quality assurance systems, are being tested.

The active partners in the project are: Swedish Meats R&D; the Danish Institute of Agricultural Sciences; the Royal Veterinary and Agricultural University, Denmark; the Danish Meat Research Institute; the Norwegian Food Research Institute; and the Norwegian Meat Research Centre. The project is supported by the Nordic Industrial Fund and the meat industry of the three countries.

Objective.

The principal aims of the project are: 1) Surveying consumer attitudes and preferences regarding pork, particularly pork flavour, in three Nordic countries. 2) Intercalibrating sensory and instrumental methods. 3) Establishing relationships between consumer preferences, important sensory qualities and the content of volatile components in pork. 4) Characterising the key components of pork flavour, to be used in calibrating sensory panels. 5) Developing a rapid and objective analytical method for determining pork flavour using an electronic nose.

Task 1. Surveying consumer attitudes and preferences regarding pork, particularly pork flavour, in three Nordic countries

The purpose of Task 1 was to provide knowledge of Nordic consumers' attitudes towards pork. The study aimed to provide an answer to the question: "Which criteria do consumers associate with pork quality"? Surveys of consumer attitudes and preferences regarding pork were carried out using detailed questionnaires. The surveys consisted of about 150 consumers in each of the three Nordic countries, Denmark, Norway and Sweden.

Methods.

Questionnaire

The consumer surveys were performed using detailed written questionnaires. The questionnaires were identically formulated in the different countries (apart from for language translations). A focus group of regular consumers of pork was conducted in Norway, in order to generate quality cues that consumers use when buying and consuming pork. The participants provided a long list of quality aspects such as smell, taste, texture, price, fat-content, deep-frozen or fresh, convenience and so on. Based on these results and previous studies, a list of cues was selected for the study. The questionnaires consisted of 13 statements on quality cues, including reasons for purchase and 12 questions on demographic/sociological variables. Respondents rated each statement on a 7 point agree-disagree scale.

Respondents and data collection

Five hundred and twenty-six Nordic pork-consumers aged between 16 and 75 were interviewed at large supermarkets in 1-3 cities in each respective country. Men and women were approximately equally-represented in Sweden, with women in the majority in Denmark and Norway. As shown in Table 1, the consumption of pork in the interviewed group was quite high. Approximately 60% consumed pork at least once a week, but there were large national variations: 36% in Norway, 72% in Denmark and 87% in Sweden.

Sizeable majority of the respondents lived in cities/towns: 100% of the Danish sample, 89% of the Norwegian sample and 90% of the Swedish sample. Thirty-two percent of the total sample had connections with meat production or processing.

Results.

Reasons for purchase

The consumers gave three reasons for buying pork, shown in Table 2. The results have shown that "Suitable for many different dishes" rated number one among the reasons marked in all three countries. Pork is versatile, which makes it possible to use in many different kinds of dishes and on different occasions, also providing variation in everyday life. The subsequent reasons for purchase were "good taste", "good for everyday use" and "cheap". In an European study carried out in 1996 in France, Germany, Spain and the UK (Grunert, K., 1996), it has been shown that beef was rated as being highly-suitable for festive occasions and impressing people. In the present study, pork is not at all regarded as being suitable for entertaining, or being acceptable to guests. The character "party food" got the lowest rating. The reasons for purchase differed only slightly between the three Nordic countries.

Quality aspects

Taste is the single most important attribute for liking pork, followed by juiciness and tenderness, irrespective of country. Pork is regarded as being lean and nutritious. Only small differences in attitudes to pork were observed between men and women. The combined sample is satisfied with the pork available, although meat quality in the three countries may differ. By and large, the sample also agrees with the positive statements. One national difference is that the Swedish sample is more positively-minded towards pork quality, and that it also has a higher level of consumption than in Denmark and Norway. Whether this is a question of cause-and-effect has not been explored in detail, but such a conclusion seems natural. On the other hand, the Norwegian sample was more negative towards the taste of the pork available than the others, at the same time having a lower consumption of pork. The Norwegian sample also had more negative comments relating to pork, but again: whether this is a question of cause-and-effect has not been explored.

There are age differences in the consumption of pork: consumers aged 16-35 were less likely than those older than 36 to eat pork. There was a tendency for younger respondents to use the middle alternative on the 1-7 scale. Whether this is due to the fact that these respondents have less experience in relation to the questions asked, or whether they just marked the centre point to avoid taking a stand, is open to speculation. Comparisons have been made between the age/sex distributions in the samples and in the national populations, without finding extreme deviations. It is, however, obvious that sampling a population using in-hall questionnaires, within a limited area, is not the correct way. On the other hand, this method is less cumbersome than selecting a nation-wide sample based on the complete lists of the populations. Also, using in-hall samples, one will often find people who buy food, and these are often the same people who choose what the family eats. Previous studies have shown that customers at a shopping mall are often reasonably representative of a complete population, but one must bear in mind that one can also find shopping malls that – for different reasons – tend to attract skewed samples, with respect to one or more attributes.

Conclusions.

Consumer attitudes to pork in Denmark, Norway and Sweden were surveyed as part of a Nordfood2 project regarding Pork Flavour, supported by the Nordic Industry Fund and the meat industry of the three countries. The 526 pork consumers in the three Nordic countries generally had a positive attitude towards pork. The results have shown that "Suitable for many different dishes" was rated number one among the reasons for purchase marked in all three countries. Taste is the single most important attribute for liking pork, followed by juiciness and tenderness, irrespective of country. One national difference is that the Swedish sample is more positively-minded towards pork meat quality, also having a higher level of consumption than in Denmark and Norway. There are age differences in the consumption of pork: consumers aged 16-35 were less likely than those older than 36 to eat pork.

References.

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Table 1. Relative consumption (%) of pork, n=526 respondents.

Frequency	Total	Denmark	Norway	Sweden
Less than once a month	6.1	8.9	7.1	1.9
Once to three times a month	31.9	19.1	56.6	11.0
Once to three times a week	50.4	58.0	34.9	63.8
Four times a week or more often	11.6	14.0	1.4	23.2

Table 2. Important reasons for buying pork in order of priority (1-9).

Attribute	Total	Denmark	Norway	Sweden
Suitable for various dishes	1	1	2	1
Tastes good	2	3	1	2
Everyday food	3	2	4	4
Accessibility	4	5	5	3
Cheap	5	4	3	9
Lean	6	6	6	7
Juicy	7	8	7	5
Tender	8	7	8	8
Party food, banquets	9	9	9	6