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### **Evaluation of factors determining consumer preferences relating to pork quality**

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Analiza czynników decydujących o preferencjach konsumentów w odniesieniu  
do jakości mięsa wieprzowego

**Summary.** The purpose of the paper was to explore consumer behaviour when buying and consuming pork. The analysis referred to the opinions of 100 respondents who had completed the questionnaire. Based on the opinion survey, it was concluded that pork enjoyed considerable popularity among the consumers. The fact stemmed from a ready access to the meat and its relatively low price as compared with beef. Furthermore, pork was the meat of choice due to its taste, smell and colour. More than 80% of the interviewees thought that the pork they bought was of good quality and only 16% were dissatisfied with it. The majority (55%) of the respondents purchased meat at butcher's shops, 28% at farms and 17% in supermarkets, with a preference for pork with a minimal fat layer. Consumers expressed particular interest in acquiring pork from traditionally fed animals or animals raised on organic farms.

**Key words:** pork, consumers, criteria of choice

#### INTRODUCTION

The dominant position in the structure of meat consumption in Poland is occupied by pork (approx. 60%); poultry meat has a share of approx. 26% and beef ca. 7% [Adamczyk 2002]. At present, around 15 million pigs are kept in Poland, which numerically represents a high productive capacity. Both in the country and worldwide, the pork market is the most important one for producers and consumers alike. Annually, Poland produces ca. 2 million tons of pork and is more than a self-sufficient country (the production and consumption ratio was 110–130% in the recent years). In the EU, the highest level of self-supply is that of Denmark – 475%, followed by Holland – 250%, and then Belgium and Luxemburg – 225%. More than half the proceeds from farms is generated by sales of animals and animal products. There is a preference for pork over beef, while pork and pork fat are considered more appetizing, with a sweeter taste. Pork

has many uses and is highly valued in Poland, as well as in East Asia and the Pacific region [Foregin Agriculture Service USDA 2010]. Nowadays, intensive breeding programs and modified fodder yield carcasses with approx. 23% lower fat content than was the case 20 years ago. The increase in meat content results in a substantial reduction of fat and changes in its composition in pig carcasses [Hay and Preston 1994, Morrissey *et al.* 1998]. In Western Europe, fat content in pork was reduced by over 30% [Higgs 2000, Czarniecka *et al.* 2007]. Meat is a specific product, due to being frequently bought and consumed. The choice of pork for consumption reveals individual likes and preferences [Babicz-Zielińska *cit.* M. Jeznach 2008] and depends on many factors, among which the economic aspects play a dominant role. Among the factors affecting the choice at present, there is the growing importance of quality and safety. Quality improvement requires interdisciplinary research and multi-faceted analyses in order to generate a database on the present and future consumer expectations relating to purchasing and using the food product. The food quality and safety requirements are not statistical concepts and undergo constant change. The systems designed to manage the quality of meat intended for direct consumption comply with commercial standards that are uniform in all the EU countries but do not allow for individual quality requirements of consumers. An approach oriented on the fulfillment of quality expectations of buyers was considered crucial for the present work.

The results presented refer to important aspects of consumer behaviour connected with the purchase and consumption of pork.

#### MATERIAL AND METHODS

The pilot study concerning the influence of selected factors on consumer preference for pork was performed using the questionnaire interview method. It was carried out in rural and urban milieus in the Mazowieckie Voivodeship (central and eastern Poland). The questionnaire consisted of two parts. The first one contained sociodemographic questions, i.e. age, sex, education, monthly income, number of people in the household, domicile, age of finishing education, job etc. The second one concerned precise consumer preferences relating to the purchase, preparation and quality of meat. In this part, it was possible to mark several versions of the answers. Hence, the percentage sum of the answers is not 100 for all the questions.

The questionnaire was answered by a total of 100 people, including 51 women and 49 men. The age structure of the respondents was the following: 16–24 years – 21%, 25–34 years – 29%, 35–44 years – 13%, 45–54 years – 22% and over 55 years of age – 15%. 11% of the interviewees had a monthly income of up to 1000 PLN, 30%: 1001–1500 PLN, 26%: 1501–2100 PLN, 20%: 2101–3000 PLN, 12%: 3001–5000 PLN and 1%: over 5001 PLN. The education structure was the following: 17% had primary, 53% secondary and 30% higher education. Among the interviewees, 26% were farmers, 31% blue-collar workers and 43% white-collar workers. 75% of the respondents were rural-based and 25% urban-based. The number of people in a household was the following: not a single person ran a household on his/her own, 11% were households run by 2 people, 31% by 3 people, 24% by 4 people and 34% by more than 5 people.

The respondents were asked to provide answers to the questions at their own homes. Each of the inmates received his/her own questionnaire for inspection and, while tracing the questions read out by the interviewer, gave answers. The interviewer marked the answers on separate sheets of paper, for each person.

After collecting all the questionnaires, the responses were entered in a statistical package. The calculations were made using MS Excel.

## RESULTS

Based on the results of the preference study on 100 people, it turned out that the respondents answered the question: „Do you like pork?” in the following way: 84% wrote “yes” and 16% wrote „no”. The consumers who answered in the affirmative ate pork, since the meat was readily available, good in taste, cheap, nourishing, gave strength and energy, could serve for the preparation of many dishes, contained numerous beneficial ingredients and the consumers were used to this type of meat. On the other hand, the remaining 16% of the respondents did not eat meat due to the fact that they were vegetarian. The majority of the interviewees (81%) had meat for lunch, only 7% for supper and 6% as part of each meal and for breakfast, respectively. As it results from the analysed questionnaires, the interviewees mostly spent 30 minutes to 1 hour on preparing a meal (58%), 25% of the consumers prepared a meal in less than 30 minutes and 17% of the people under study spent more than one hour on preparing it. Over half the respondents (62%) claimed that they prepared the main meals (lunch and supper) every day at home and 33% several times a week. The interviewees most often had meat several times a week (64% of the people), 15% ate meat every day, 13% once a week and 8% only several times a month (Fig. 1).

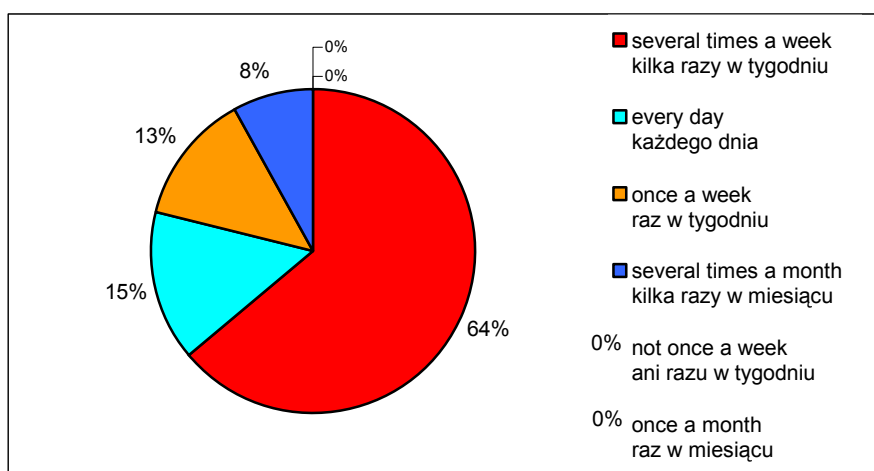


Fig. 1. How often do you eat meat?  
Rys. 1. Jak często spożywa Pan/Pani mięso?

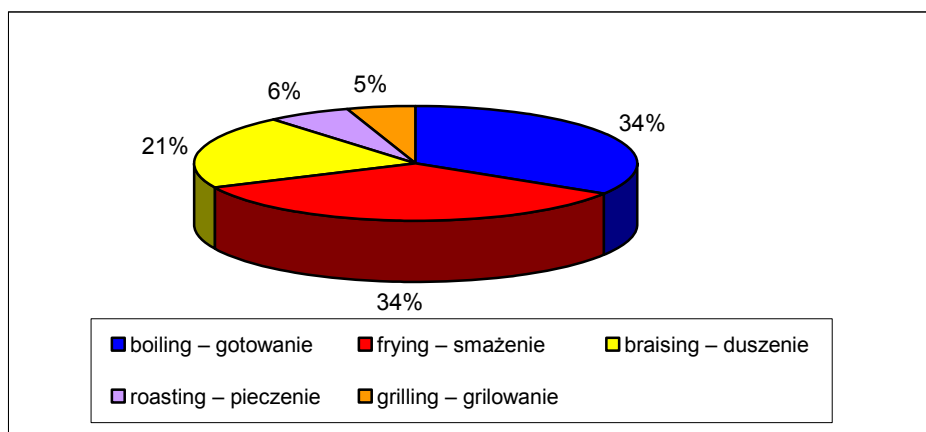


Fig. 2. The processing method preferred by the consumers  
Rys. 2. Sposób obróbki kulinarnej preferowany przez konsumentów

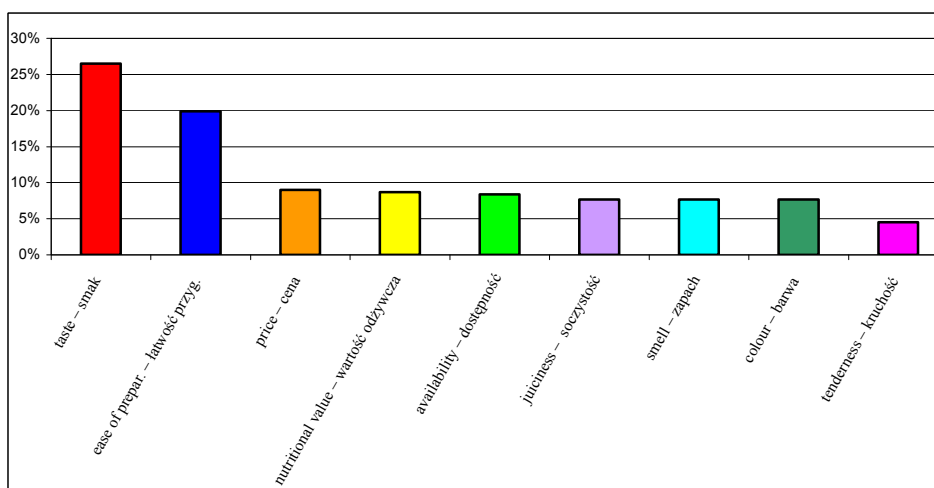


Fig. 3. The influence of particular characteristics on consumer preferences  
Rys. 3. Wpływ czynników na preferencje konsumentów

Among the ways of preparing pork for consumption, boiling and frying were most frequently mentioned (34%, respectively), followed by braising (21%), roasting (6%) and grilling (5%) (Fig. 2). As regards quality assessment of the pork bought by the respondents, 84% of the interviewees thought it was always of good quality and 16% said it was sometimes of good quality. No interviewees marked the answer “almost never of good quality” or “never of good quality”. Asked if the outward appearance of meat incited them to buy it, as many as 78% of the interviewees claimed it did and only 1%

were dissatisfied with this aspect. Considering the colour of the meat preferred by the customers when shopping, it was concluded that 57% of the customers chose pink, 27% light red, 13% red and only 3% pale meat. Based on the responses to the next question in the questionnaire, concerning the influence of particular characteristics on consumer preferences (Fig. 3), the following value hierarchy was determined for the characteristics: taste (26.5%), ease of preparation (19.9%), price (9%), nutritional value (8.7%), availability (8.36%), juiciness (7.67%), smell (7.67%), colour (7.67%) and tenderness (4.53%).

The majority of the interviewees (55%) bought pork at butcher's shops, 28% bought it on a farm and 17% purchased meat in a supermarket. From an analysis of the frequency of purchasing meat it results that 63% of the respondents bought it once a week, 23% twice a week, 9% four times a week and 5% every day. Considering the time of the year at which the respondents purchased pork with the greatest frequency, the results are the following: 47% regularly bought it at each time of the year, 27% mostly in the winter, 17% in the autumn, 6% in the spring and only 3% in the summer. The consumers rather preferred meat for cooking with a minimal fat layer thickness (53% of the respondents) and no visible intramuscular fat (40%). As many as 92% of the consumers selected meat with no visible liquid discharge.

Only a small number of the interviewees preferred meat with a considerable fat layer (3%) and abundant intramuscular fat (1%). Television or press advertisements of pork did not affect the eating habits of the respondents, as 88% of the consumers did not change their pork eating habits due to information contained in the advertisements. The choice and purchase of pork were predominantly affected by its ready availability (57% of the interviewees), price (23%) and appearance (20%). The consumers definitely preferred meat obtained from animals fed in a traditional way (68%), with 17% of them giving preference to meat from ecologically raised animals. On the other hand, the meat of animals fed exclusively with commercial compound feeds was preferred by 6% of the respondents. Only 1% chose meat from animals raised intensively in large numbers. In response to the question: "What is the greatest threat to food safety – applicable to meat?", the consumers mentioned BSE in the first place, then pathogenic microflora. Residues of feed additives, hormones and medicines were referred to as the third danger, followed by genetically modified food. The last on the list was chemical contamination.

#### DISCUSSION

For years the meat market had been shaped by demand and supply and had always been characterised by a relatively high supply even during periods of crisis. Since marketisation, it has displayed the characteristics of a consumer market to an even greater degree. Practically, this entails the dominant role of the consumer. Therefore, the knowledge of individual choice criteria will constitute a benchmark for the development of the high quality meat market.

From the point of view of the customer, meat quality assessment includes: outward appearance, tenderness, juiciness, colour, marbling, taste, smell, liquid discharge and fat content [Ngapo *et al.* 2003, Cosgrove *et al.* 2005, Dransfield *et al.* 2005, Koćwin-Podsiadła and Krzęcio 2005a, 2005b, 2005c, Verbeke *et al.* 2005]. The characteristics are interrelated and evaluated as a whole by the consumer.

The most important characteristic of pork which is taken into account by the potential customer is its outward appearance which involves anything that can be detected with the naked eye. The consumer experience enables one to assume that a better presentation of a piece of meat makes it more likely to be used for cooking or processing.

One of the main criteria taken into account at the choice of meat by the customer is its colour. It is visually assessed and constitutes the main factor at the purchase of meat. The consumers pay attention to this characteristic, since they think that it indicates that the product will fulfil their expectations. The majority of domestic buyers select pink and light red pork, as it looks fresh and attractive. On the other hand, pale and red meat is less preferred by the customers. From the studies performed in France, Denmark, Sweden and Great Britain, it results that almost half the British and Danish gave preference to lighter pork, whereas the French preferred it darker [Verbeke *et al.* 2005]. A lighter colour of meat is also favoured by the Spanish [Bello and Calvo 2000]. It was also concluded that darker meat was more often preferred by consumers of over 35 years of age, predominantly male farmers [Verbeke *et al.* 2005]. Pink meat was chosen by women who, guided by their cooking experience, thought the colour guaranteed a superior taste and better processing properties of a piece of attractive-looking meat. Furthermore, it was proved that pink and light red pork was selected by people with higher education.

Intramuscular fat content is frequently an indication of the quality of meat and its fitness for cooking. The consumers claimed that the presence of fat helped preserve the moisture and taste during e.g. cooking. The respondents by far preferred pork without intramuscular fat and they were unwilling to buy meat containing intramuscular fat, since they associated it with a higher calorie and cholesterol content. The meat of choice for the Polish people contains a small amount of intramuscular fat that guarantees an exquisite taste and helps preserve tenderness and juiciness during adequate thermal processing. The study conducted by Verbeke *et al.* [2005] shows that there is variation in the preference for the marbled texture. Some think that intramuscular fat in meat is indispensable, others do not accept it at all. This depends on the age and fat digestion capability of the consumer, as well as on his preferences and habits.

Consumers most often opt for lean pork, i.e. ham or loin with approx. a 2% fat content. Meat pieces with a high fat content, e.g. spareribs (up to 16%) are bought less often and the fat is frequently melted out through grilling or frying [Blicharski *et al.* 2006]. The Belgians are accustomed to lean meat. According to Ngapo *et al.* [2003] and Verbeke *et al.* [2005], the English, Swedish, Danish and French preferred pieces of meat with minimal fat cover. According to the authors, 68% of the customers associated fatty meat with a high calorie content which may be the discouraging factor in purchase decisions.

Another characteristic of pork is the muscular juice discharge. For a buyer of meat such an outflow is an evident defect which detracts from the taste and reduces tenderness. An excessive discharge indicates that the meat is of poor quality; at present, a normal discharge level is considered to be 4% [Gajewczyk 2008]. The discharge was also negatively perceived in all Western European countries [Ngapo *et al.* 2003, Verbeke *et al.* 2005]. Consumers associated an observable discharge with a lack of freshness, prolonged storage at sub-zero temperatures in a frozen state and subsequent defreezing.

According to the consumer inquiry, more than half the respondents (55%) bought meat at shops. Górska-Warsewicz's [1999] study showed that 30% of the interviewees

purchased meat at a grocery store and 13.4% in a supermarket. The price is a very important factor for consumers buying various products, including meat. Despite the fact that the society is becoming more affluent, both domestic and foreign customers pay attention to the price. The price is by far the determinant factor at the purchase of pork by young, single and low-income people [Krupa and Majka 2000, Dransfield 2001]. Most consumers associate the price with the outward appearance of meat and do not want to pay more if they disapprove of the look. Few consumers, only 10%, are prepared to pay more, as they think the higher price correlates with a higher quality of the product [Dransfield 2001]. High-income customers more often opt for more expensive, attractive-looking and good-quality pork. However, average-income people are dominant in Poland. They choose the more expensive product only on special occasions, e.g. major festivities and holidays.

#### CONCLUSIONS

1. The consumer inquiry enabled a preference analysis relating to the purchase of pork over a long period of time by large numbers of consumers. Moreover, it made it possible to perform a comparative study on an international basis, which could provide particularly interesting results.

2. According to the inquiry conducted in Central and Eastern Poland, pork enjoyed considerable popularity among the consumers. This is the result of its ready availability and relatively low price in comparison to e.g. beef. Moreover, pork is preferred due to its taste, smell and colour.

3. Over 80% of the interviewees claimed that the pork bought by them was of good quality and only 16 % were dissatisfied with it. The majority (55%) of the respondents purchased meat at a butcher's shop, 28% on a farm and 17% in a supermarket; they preferred pork with rather minimal fat cover.

4. The customers expressed particular interest in pork obtained from traditionally fed animals or those raised on organic farms.

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**Streszczenie.** Celem pracy było poznanie zachowań nabywczych konsumentów branych pod uwagę przy zakupie i konsumpcji wieprzowiny. Wyniki uzyskano z badania opinii 100 respondentów wypełniających arkusz ankietowy. Na podstawie przeprowadzonych badań stwierdzono, że mięso wieprzowe cieszy się wśród konsumentów dużym powodzeniem. Wynika to z faktu łatwej dostępności i niezbyt wysokiej ceny np. w porównaniu z wołowiną. Ponadto mięso wieprzowe wybierane jest ze względu na smak, zapach i barwę. Ponad 80% ankietowanych uważa, że kupowana przez nich wieprzowina jest dobrej jakości, jedynie 16% wyraża swoje niezadowolenie. Większość (55%) respondentów zaopatruje się w mięso w sklepie mięsnym, 28% w gospodarstwie rolnym, a 17% w supermarkecie, preferując wieprzowinę z minimalną ilością okrywy tłuszczowej. Nabywcy wyrażają szczególne zainteresowanie pozyskiwaniem wieprzowiny ze zwierząt żywno-nych tradycyjnie oraz utrzymywanych systemem ekologicznym.

**Słowa kluczowe:** mięso wieprzowe, konsumenci, kryteria wyboru