

Consumers perception of the meat quality determined by the animal welfare aspects – case study of the Świętokrzyskie voivodeship*

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Consumers expect from the food products both quality (expected quality) and to fulfill their requirements (experienced quality). The aim of the study was to recognize the extent to which beef qualities, and specifically animal welfare during rearing and slaughter, affect, in consumers' opinion and based on their trust in the product, the quality of beef. The aim was also to determine the significance of other beef quality determinants, taking into account sociodemographic characteristics of the consumers. The research was conducted among 1206 consumers from the Świętokrzyskie voivodeship. Completed questionnaires from 1004 people were qualified for the statistical analyses. The results of the analyses focused on the importance of individual determinants of meat quality were very interesting, as they indicated that, although animal welfare issues are not treated by consumers from Świętokrzyskie voivodeship, as particularly important determinants of meat quality, it is worth noting that the increase in their importance occurs along with the increase in education and income of the population and is associated with living in larger cities and

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representing smaller households, which is convergent with the profile of consumers focusing on the sustainability and refers to the determinants of products made with consideration of those aspects, based on purchasing certified product. It is known that one of the conditions for at least some certificates of food quality and safety is to respect the welfare of farm animals both at the rearing and slaughter stage of the production process.

KEY WORDS: consumer preference, animal origin products, quality, animal welfare

The quality of food included in the Total Food Quality Model (TFQM) [Grunert 2005] clearly refers to the consumer understanding of this conceptual category, emphasizing the duality of this approach. On one hand, taking into account consumer expectations for food (expected quality) and, on the other hand, assessment of their fulfillment by a given food product (experienced quality).

The food quality understood in this way, according to the TFQM concept, can be analysed horizontally and vertically. The horizontal perspective refers to both expected and experienced quality, because it includes both the stage of formulating expected quality and the phase of their verification (experienced quality), referring to the proposed division of products into those which properties can be evaluated before a purchase (search goods), whose attributes can be assessed after purchase and use (experience goods) and those whose properties cannot be verified either before or after the purchase (credence goods) [Nelson 1970]. On this basis, Oude Ophuis and Van Trijp [1995] made a categorization of attributes of food quality based on experience (experience quality attributes) and trust (credence quality attributes). The latter category includes product properties such as safety, positive impact on the environment, attention to the welfare of farm animals, organic production methods [Grunert *et al.* 2014, Tekień *et al.* 2018].

The essence of these attributes is the need to build trust in them based on marketing communication, containing content referring to possessed properties that cannot be verified by the consumer's own assessment.

The aim of the study was to recognize the extent to which beef properties based on trust, and specifically animal welfare at the stage of rearing and slaughter, affect, in consumers' opinion, the quality of beef. The aim was also to determine the significance of other determinants for beef quality, taking into account sociodemographic characteristics of the consumers.

Material and methods

The survey was carried out among residents of the Świętokrzyskie voivodeship between February 2013 and September 2014. The questionnaire used in the research contained 49 questions, of which there were 45 closed-ended questions and 4 open-ended questions. The research was conducted among 1206 consumers. Completed questionnaires from 1004 people were qualified for final statistical analyses. The questions included in the questionnaire concerned habits of consumption of beef

among consumers, as well as issues related to the process of their purchasing decisions, and in particular the place and frequency of acquiring this type of meat. Issues such as consumer opinions about risk at particular stages of delivering beef for consumption with particular emphasis on health risk were also taken into account. In addition, the respondents mentioned the desirable characteristics of beef, sources from which they get information about this type of meat and their expectations in this regard. The questions contained in the questionnaire also identified the interest of consumers in the purchase of innovative beef meat products (e.g. with additional properties, convenient for preparation for consumption, etc.). The choice of the research region was dictated by the surprisingly high level of beef consumption among the inhabitants of the voivodeship. Świętokrzyskie voivodeship, comparable to such provinces as Mazowieckie and Śląskie, where there are clear disproportions between the three regions in the field of macroeconomic indicators, situating the Świętokrzyskie voivodeship in a relatively unfavorable situation, and the other two as characterized by the most favorable macroeconomic indicators. At the same time, there is a well-known opinion in the literature that the economic situation of the region determines the level of consumption of food of animal origin, especially meat, which is currently observed on the example of increased demand for meat in countries such as: China, Korea, Malaysia, Indonesia, Mexico or Brazil as a consequence of the increase in the income of citizens in these countries [Myers and Kent 2004, Gutkowska and Ozimek 2009].

Statistical analysis

To measure the relationship between selected variables, the Chi² Pearson Test (χ^2) independence test was performed. If there was quite a few and low frequencies, the probability of accepting or rejecting the dependence on the basis of the Fisher's exact test for asymmetrical tables was calculated.

The level of $p \leq 0.05$ was accepted as significant. The analysis was conducted using Statistica software version 8.0 (StatSoft Inc., Tulsa, OK, USA).

Results and discussion

According to respondents, high quality meat was most often evidenced by its origin (country of production or producer) (37%), fresh appearance (25%), taste (19%), colour (16%), smell (14%). On the other hand, in the opinion of the respondents, the lowest evidence was for the price (10%), composition (8%), low fat content (6%), certificates (5%), brand (1%) and expiration date (1%).

According to the study results from Jeznach [2014], quality perceived by the consumers and the evaluation criteria are different for various food products, as well as for individual segments or categories of consumers. The work quoted showed statistically significant differences in the assessment of meat quality characteristics such as freshness, appearance, taste, quality mark, naturalness, no additives, brand, local or regional product, seller's reputation and high price depending on selected

sociodemographic features of the surveyed consumers, however the freshness and appearance of the meat were the most important distinguishing factors identified [Jeznach 2014].

In our research it was determined which factors are important for the quality of meat. The respondents, using a 5-point scale, were to give weight to individual determinants of the quality of meat, where 1 meant an insignificant factor and 5 a very important factor. These scores were then averaged and ranked from the most important to the least important ones. The most important determinant of meat quality, in the opinion of the respondents, was the appropriate temperature during storage at the point of sale (average = 4.40) and the appropriate rules for storing meat in the household (4.29). A slightly less important factor was the method of feeding animals (4.21) and the appropriate thermal treatment in the process of preparing meat for consumption (4.17). The least important factors for the quality of meat were: animal welfare at the slaughtering stage (3.99) and at the rearing (3.97), as well as hygiene rules at the meat selling point (3.88) (Tab. 1).

The analysis carried out with the Mann-Whitney U test showed statistically significant differences between female and male respondents in terms of assessing the validity of individual meat quality determinants. For women, all factors included in the study were more important than for men ($p < 0.001$). Mean values, medians of distribution and test results are included in Table 2.

The analyses also took into account the influence of other sociodemographic variables on the importance of individual determinants of meat quality perceived by the respondents. For older people, it was more important than for young people to take into account animal welfare at the animal breeding and slaughtering stage ($p < 0.001$), hygiene rules at the meat selling point ($p < 0.001$), appropriate temperature during storage ($p < 0.001$), appropriate rules for storing meat in the household ($p < 0.001$) and appropriate thermal treatment in the process of preparing meat for consumption ($p < 0.001$).

It was found that for people with higher

Table 1. Measures of central tendency and dispersion of the factors important for the quality of meat (1 – insignificant factor, 5 – very important factor)

Factor	Mean	Standard deviation	Median	Dominant	Minimum	Maximum
The appropriate temperature during storage at the point of sale	4.4	1.0	5.0	5.0	1.0	5.0
The appropriate rules for storing meat in the household	4.4	1.0	5.0	5.0	1.0	5.0
Method of feeding animals	4.3	1.0	5.0	5.0	1.0	5.0
The appropriate thermal treatment in the process of preparing meat for consumption	4.2	1.2	5.0	5.0	1.0	5.0
The animal welfare at the slaughtering stage	4.2	1.1	5.0	5.0	1.0	5.0
The animal welfare at the rearing stage	4.0	1.1	4.0	5.0	1.0	5.0
The hygiene rules at the meat selling point	4.0	1.1	4.0	5.0	1.0	5.0

Table 2. Determinants of meat quality, according to the gender of surveyed consumers

Factor	Gender of the respondent		Mann-Whitney U test
	male (n _m =268)	female (n _f =735)	
	mean±SD	median (range)	Z
Method of feeding animals (n _m =208; n _f =626)	3.7±1.4	4.0 (1.0-5.0)	-6.14
The animal welfare at the rearing stage (n _m =194; n _f =578)	3.7±1.2	4.0 (1.0-5.0)	-4.59
The animal welfare at the slaughtering stage (n _m =191; n _f =554)	3.7±1.1	4.0 (1.0-5.0)	-6.14
The hygiene rules at the meat selling point (n _m =206; n _f =600)	4.0±1.2	4.0 (1.0-5.0)	-4.59
The appropriate temperature during storage at the point of sale (n _m =204; n _f =590)	4.1±1.1	5.0 (1.0-5.0)	-6.14
The appropriate rules for storing meat in the household (n _m =196; n _f =579)	4.0±1.1	4.0 (1.0-5.0)	-4.59
The appropriate thermal treatment in the process of preparing meat for consumption (n _m =198; n _f =570)	3.9±1.2	4.0 (1.0-5.0)	-6.14

Z – value of Mann-Whitney U test, p – significance level.

education, determinants such as: consideration of animal welfare principles at the animal rearing and slaughtering phase (p=0.004 and 0.006), hygiene rules at the meat sales point (p<0.001), appropriate temperature during storage (p<0.001), appropriate rules for storing meat in the household (p<0.001) and appropriate heat treatment in the preparation process (p= 0.004) were more important for the quality of meat.

For people representing less numerous households, the following determinants proved to be more important for the quality of meat than for people from less

numerous households: consideration of animal welfare principles at the animal rearing and slaughtering stage ($p < 0.001$), hygiene rules at the point of sale of meat ($p = 0.008$), appropriate temperature during storage ($p < 0.001$), appropriate rules for storing meat in the household ($p = 0.006$) and appropriate heat treatment in the preparation for consumption ($p = 0.004$).

Similar opinions were expressed by the inhabitants of large cities, who declared this sequence of determinants of meat quality significantly more frequent than consumers living in smaller towns and villages. It was found that the number of people under 18 in the household and the amount of income obtained did not significantly differentiate the respondents' opinions on the validity of the meat quality determinants included in the study. Detailed information on the importance of selected determinants for the quality of meat, taking into account selected sociodemographic features of the subjects are presented in Table 3.

The results of the analyses carried out regarding the importance of individual determinants of meat quality are very interesting, as they indicate that, animal welfare issues are not treated neither by consumers from the Świętokrzyskie voievodship nor by other Polish consumers, as particularly important factors affecting the quality of meat. It is worth noting that the increase in the significance of these determinants occurs with the increase in education and income (although not statistically significant) and is associated with living in larger cities and representing smaller households. It confirms the regularity stated by Zrałek [2018] in the sociodemographic profile of sustainable consumers, which can be defined as consumers undertaking behaviors appropriate for sustainable consumption.

Table 3. Values of Kendall's Tau correlation coefficient for the relationship between the importance of individual determinants of meat quality and sociodemographic characteristics of the subjects

Item	R	P-value	Age	Education	Number of people in the household	Number of people under the age of 18 in the household	Monthly income of the household	Place of residence
The animal welfare at the brearing stage	0.124	<0.001	0.092	0.004	-0.124	-0.053	-0.002	0.110
								<0.001
The animal welfare at the slaughtering stage	0.098	0.001	0.109	0.001	-0.104	-0.012	0.936	0.115
								<0.001
The hygiene rules at the meat selling point	0.130	<0.001	0.128	<0.001	-0.081	-0.063	0.815	0.078
								<0.001
The appropriate temperature during storage at the point of sale	0.236	<0.001	0.137	<0.001	0.008	0.235	0.812	0.012
								0.138
The appropriate rules for storing meat in the household	0.213	<0.001	0.158	<0.001	-0.001	-0.023	0.028	<0.001
								0.367
The appropriate thermal treatment in the process of preparing meat for consumption	0.207	<0.001	0.094	<0.001	0.006	-0.039	0.014	0.128
								<0.001
								0.089
								0.004

The issue of animal welfare is recognized by European consumer behavior scientists in the meat market as an important factor affecting the level and structure of fresh meat consumption [Verbeke and Viaene 2000], although it is also stressed that at the end of the 1990s it was one of less important attributes of fresh meat in the opinion of consumers. Therefore, it can be expected that Polish consumers will increase their sensitive to ethical issues related to meat consumption. Opinions expressed by the researchers on the factors conditioning consumer behavior in the fresh meat market differ depending on the cultural context in which they are analysed. And so, the observations of McCarthy *et al.* [2003], indicate that in the case of Irish consumers, animal welfare is not a factor significantly affecting attitudes towards beef and its consumption. Napolitano *et al.* [2007] generalizing the results of research conducted in Europe, state that in the case of European consumers, if meat is accepted because of its sensory properties, information on animal welfare and nutritional properties, the overall increase in the acceptability of meat grows. Other studies indicate that consumers in their buying decisions take into account ethical issues, choosing products that they perceive as associated with a higher level of animal welfare, among other reasons, thanks to the information on the labels assuring meat origin, for example organic food or originating from a particular geographical region.

Referring to the mentioned impact of cultural differences on consumer perception of the importance of animal welfare in their attitudes towards meat, it is worth noting the results of American researchers. According to 60% of American consumers, food that is produced in an ethical way is healthier, and 58% are convinced that this type of food is safer compared to other types of food [Ethical food 2010]. The results of another report from studies conducted among American consumers indicate that 60% of respondents are willing to pay a price higher by 1 to 10% compared to the initial price for a product that is healthier, safer and produced according to higher ethical standards [Beyond Organic 2009].

Results of surveys of European consumer attitudes regarding, among others animal welfare [Eurobarometr, Attitudes 2005] indicate that European consumers generally declare interest in welfare and protection of livestock. Most of the respondents (66%) expressed positive opinions about the welfare of dairy cows, and 45% of respondents declared such opinions about pigs, while one in three respondents form a similar position (32%) in relation to the conditions of poultry keeping. In addition, consumers who declared frequent food purchases and who took into account animal welfare when buying food products, as well as those who were convinced that animal welfare is possible through rational purchasing, consequently declared greater interest in the animal welfare legislation in their country. At the same time, the analysis of the statements of surveyed consumers indicated that when taking purchase decisions referring to meat directly in the store, half of respondents paid attention to animal welfare. On the other hand, the other half of respondents said that they never or very rarely do. Taking into account cultural differences between individual countries, it is worth noting that in 16 out of 25 countries, the majority of respondents claim

that when buying meat, they do not take into account animal welfare or source of meat. About 2/3 of the surveyed Czechs (74%), Slovaks (73%), residents of Estonia (69%) and Poles (68%) claimed that they very rarely or never consider importance of the source from which the meat they purchase comes from. For comparison, similar percentages of Swedes (67%), Greeks (66%) and residents of Luxembourg (64%) took into account information related to the welfare of animals during meat purchases.

The authors of the report cited claim that the main reasons for such differences are, among others: differences in living standards of Europe's inhabitants, the level of access to information regarding the conditions in which livestock are reared, the system of labelling and identification of meat, and so-called ecological sensitivity of consumers [Eurobarometr, 2005].

The influence of ecological sensitivity of consumers on their market behavior, including their preferences in relation to beef, was also identified among Canadian consumers [Belcher *et al.* 2007]. The results of these studies indicated that the method of production used (e.g. the use of hormones or antibiotics in the production of beef) was the most important factor determining the purchase of beef; while secondly price and the so-called environmental factor. Respondents for whom environmental protection was important most often expressed the opinion about the importance of the environmental factor and production methods in the purchasing decisions they take. These consumers also thought that beef was produced mostly using methods that would cause additional environmental inputs (e.g. additional protection caused by environmental degradation in the production process) decreased the product's usefulness, while beef, which was produced with environmentally friendly methods, had positive relevance to the usefulness of the final product. People interested in environmental issues were more willing to agree with such an opinion than others, and moreover, those interested in environmental protection assessed the conventional methods of production more negatively. Both persons interested in environmental protection, as well as others, were willing to pay up to 15% more in relation to the initial price for products produced using environmentally friendly methods; whereas the group for which environmental problems were significantly important, was more willing to pay a higher price for products produced under such conditions. This observation may be explained by the fact that generally the price level may be perceived in this situation as a less important criterion for product selection or it may also be provided by the fact that the environmental factor is more important in making purchasing decisions compared to the price.

Schnettler *et al.* [2009] considering opinion also of other authors, noted that the issue of the animal welfare is becoming increasingly important on the continents of the Americas; meat exporting countries (Argentina, Brazil, Canada, the United States, Paraguay and Uruguay) and the countries that are increasing their export (Chile and Mexico) have implemented various animal welfare solutions to the regulations in these countries and procedures mainly related to beef exports. These authors also emphasize that among the most important, three factors regarding purchasing decisions of beef

consumers were listed following order: origin, animal welfare and price. However, these authors admit that consumers representing the southern part of Chile are not yet willing to pay more for beef, derived from animals maintained in accordance with the principles of welfare. Not only the issues of cultural differences between individual continents and even countries affect different consumer attitudes towards the issue of animal welfare. Intra-cultural factors as well as those related to sociodemographic determinants play a role in this respect. And so, Grunert and Valli [2001] indicated a segment of young consumers, with high incomes and higher education, as a group of buyers for whom the welfare of animals has a clear meaning in purchasing decisions. This statement also has at least partial reference to the surveyed local community of the Świętokrzyskie voivodship, where mainly respondents with higher education and living in larger cities declared greater importance of animal welfare at the breeding and slaughtering stage for the quality of meat.

Our research proved that according to the respondents high quality meat most often it proved by its origin (the country of production, the methods of breeding, slaughter), before fresh appearance, colour and smell. On the other hand, meat quality, low fat content, certificates, brand and expiration date proved less frequently. However, the most important determinant of meat quality, in the opinion of the respondents, was the appropriate temperature during storage at the point of sale and the appropriate rules for storing meat in the household. A slightly less important factor was the method of feeding animals and the appropriate thermal treatment in the process of preparing meat for consumption. The least important determinants of meat quality were: the consideration of animal welfare at the stage of slaughter and rearing, as well as concern for hygiene at the point of sale of meat. It is worth noting that for women, all the factors affecting the quality of beef included in the study were more important than for men.

The results of the analyses carried out regarding the importance of individual determinants of meat quality are very interesting, as they indicate that animal welfare issues are not treated by consumers from the Świętokrzyskie, as well as by all Polish consumers as particularly important determinants of meat quality. It is worth noting that the increase in their importance occurs along with the increase in education and income and is associated with living in larger cities. The importance of animal welfare as a determinant of the meat quality is represented by smaller households, which is convergent with the profile of sustainable consumers and refers to the determinants of sustainable consumption, among which there is the issue of purchasing certified products. It is known that one of the conditions for at least some certificates of food quality and safety is to respect the welfare of farm animals both at the breeding stage and slaughter.

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