

HIGH FOOD QUALITY BY CONSUMERS IN THREE TIME FRAMES – BEFORE, DURING AND AFTER THE COVID-19 PANDEMIC

Magdalena NIEWCZAS-DOBROWOLSKA^{1*}, Agnieszka GÓRKA-CHOWANIEC²

¹ Department of Quality Management, Institute of Quality Sciences and Product Management, College of Management and Quality Sciences, Cracow University of Economics; niewczam@uek.krakow.pl, ORCID: 0000-0001-5664-9886

² Department of Physical Culture and Tourism Management, Jerzy Kukuczka Academy of Physical Education in Katowice; a.chowaniec@awf.katowice.pl, ORCID: 0000-0001-6087-6299

* Correspondence author

Purpose: The aim of this study was to check how the COVID-19 pandemic influenced the perception of the high quality of food products.

Design/methodology/approach: The research process consisted of the following stages: developing research methodology, consultation of the research tool, sample selection, implementation of the measuring phase of the survey; developing a statistical report; elaboration of a final report. The research was made by a professional company operating in quantitative research method. Information on the assumed scope of the study was obtained through the use of a tool - a quantitative questionnaire. The questionnaire was built of closed-typed questions. The sample consisted of 2000 people selected taking into account the place of residence (region), gender and age.

Findings: The global crises observed in the recent horizon, including the crisis caused by the COVID-19 Pandemic, are changing our reality while becoming a source of stress for many people around the world. Due to the restrictions introduced for many of us, obvious shopping behaviour, i.e. access to shops, restaurants, etc. They are becoming more difficult and sometimes even impossible. According to studies carried out, the taste of food has gained importance as an indicator of high food quality. Still (before, during and after the pandemic), the three most popular characteristics of high-quality food are: no food additives, organically grown ingredients, HACCP/ISO 22000 information, and product branding has lost importance and given way to taste. However, after the COVID-19 pandemic, the importance of HACCP/ISO 22000 information increased, demonstrating the importance of the role of hygiene, food safety and the need for information that consumers can trust.

Research limitations: Research limitations result from the analysis of a purposively selected case (food market in Poland), which does not allow general conclusions to be formulated. Nevertheless, the article refers to the perception of food quality on the territory of the whole country.

Practical implications: Our findings should be of interest to decision-makers responsible for shaping the quality of food produced, especially if they want to maintain a competitive advantage in the food market by including customer orientation in their strategies.

Originality/value: This is the first article to present the results of a study on the impact of the crisis on consumers' perceptions of quality food products considering three time perspectives: before, during and after the COVID-19 pandemic.

Keywords: Food, food quality, consumers, consumer behavior, COVID-19.

Category of the paper: Research and review publication.

1. Introduction

The Covid-19 pandemic has changed the world around us and influenced many aspects of our lives including food choices and behavior of consumers (Ammann et al., 2022; Meiselman, 2022) . As WHO reports COVID-19 is the disease caused by a new coronavirus called SARS-CoV-2. WHO first learned of this new virus on 31 December 2019, following a report of a cluster of cases of ‘viral pneumonia’ in Wuhan, People’s Republic of China¹ Covid-19 can easily spread when an infected person coughs, sneezes or talks. You can also get infected if you touch anything that has been sprayed with the carrier’s respiratory droplets and then touch your face – your nose, eyes, ears and mouth (<https://www.gov.pl/web/coronavirus/general-information>). On the 11th March 2020 the World Health Organization (WHO) declared COVID-19 as a pandemic². The first case of COVID-19 in Poland is dated on the 4th of March 2020. On the 12th March 2020, epidemiological threat was announced in Poland. Many restriction were implemented to avoid the spread of COVID-19 such as: wearing masks, keeping the distance, disinfections, limitation of the contacts with other people, where applicable working at home. The total number of infections from the beginning of the pandemic in Poland is 6 496 176 (on 31st of March 2023, information from the Polish Ministry of Health)³. The highest number of daily infections in Poland was on the 27th of January 2022 and it was 57659 infections daily.

The COVID-19 pandemic has been a part of our lives and changed our interactions with other people, frequency of travelling, food consumption and food choice. The pandemic has many consequences such as: job losses, shutdown of the regular patterns of social interaction, lower trust in institutions (Vabova et al., 2021; Scapatucci et al., 2022; AlTarrach et al., 2021). The pandemic has become an element of our everyday life to such an extent that we are talking about the world before and during (after) the pandemic.

The aim of this study was to check how the COVID-19 pandemic influenced the perception of the high quality of food products. The pandemic, restrictions, fear and lack of safety influenced consumers behavior so the perception of high food quality, too. The indications of

¹ <https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-covid-19>.

² <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>.

³ <https://www.gov.pl/web/koronawirus/wykaz-zarazen-koronawirusem-sars-cov-2>.

the high food quality before, during and after the pandemic in Poland are being discussed. Due to the fact that the pandemic is also the source of stress and insecurity, PSS (Perceived Stress Scale) scale was used to assess the level of consumers stress and then to check if it influenced the way they perceived the high food quality. Although the relationship between the perceived stress and the perception of food quality hasn't been checked yet, many authors declare the influence of the stress on the structure of consumption, i.e. the higher stress influences the lower consumption of fruits and vegetables, and the higher consumption of fast food or 5-40% of people increase their food intake when experiencing stress, whilst the remaining proportion either decrease or do not change their food intake in response to stress (Yang et al., 2022; Hill et al., 2022). The next characteristics that may differentiate the perception of high food quality may be the level of trust as it also influences our decisions.

2. Consumer behavior in the food market - before and after the pandemic

Globalisation, the transformation of the socio-demographic situation in the country, the acceleration of the pace of life of contemporary consumers or the observed change in behavioural patterns are only selected factors which have a significant impact on changes in the general consumption model of Polish society. In a relatively short period of time, the Polish consumer has become a modern consumer moving towards consumptionism, who in his/her purchasing decisions is most often guided by two fundamental and extreme needs: striving to conform and the desire to stand out. In the period of economic transformation, dating back to the 1990s, consumer behavior in Poland began to show a significant correlation with other countries and is now analogous to, for example, changes in consumer behavior in Western European countries and the United States. In the analysis of the scientific output to date, one dominant approach in the way of classifying the determinants of consumer behaviour on the food market is noticeable, and its dynamic character only proves the variability of this phenomenon, suggesting to contemporary enterprises operating on the food market the necessity of its constant monitoring. Two mutually exclusive trends are increasingly outlined in the behavior of contemporary consumers - individualisation of consumption patterns and lifestyles and imitation of consumer behavior and lifestyles. As far as the second trend is concerned, there are all sorts of barriers to the imitation of consumption patterns, which in particular include: income level, social class or the consumer's level of education.

For example, Mowen (1987), Solomon et al. (2006), Kotler et al. (2007), Peter and Olson (2008) focus their attention mainly on psychological (internal) factors that significantly shape consumer behavior. On the other hand, in the papers of, among others, Trommsdorff (2004), Balderjahn and Scholderer (2007) and Foscht and Swoboda (2007) two groups of determinants

of consumer behavior become apparent: individual factors (psychological, internal) and social factors (environmental, external).

Chukwu et al. (2019), in their study, argue that consumer purchasing behavior is influenced by several emotional, psychological and physical factors. These factors may include, among others, the availability and price level of alternative products or the income level of the consumer. In contrast, according to Valaskov et al. (2015), customers' purchasing behavior is strongly influenced by social norms and their personal economic situation.

Analysing the last three years (2020-2022), consumer behavior is influenced by a number of factors: objective and subjective. Recent years have shown that COVID-19 pandemic (World Health Organization, 2020a) was one such factor (Consumers and the new reality, 2020; COVID-19 impact on consumer food behaviours in Europe, 2020; Global Consumer Insights Survey 2020, Loxton et al., 2020). In addition to the basic purchasing criteria of price, availability and convenience, a new criterion has emerged - hygiene (Prasetyo et al., 2021).

In turn, the criterion of self-safety has gained new importance in the interpretation of food market consumers (Soon et al., 2021; Loxton et al., 2020; Zandi et al., 2020; Joia, Lorenzo, 2021). Consumer preferences shifted to local brands (Sumarliah et al., 2021) and the percentage of spontaneous purchases including a certain group of consumers decreased and 'gave way' to the percentage of planned purchases (increase in percentage) (Eger et al., 2021). Additionally, as indicated by the results of a study by Laato et al. (2020), consumers in some countries were forced to switch to alternative brands due to the unavailability of commodities of some brands during the pandemic, mainly due to the accumulation of excessive food stocks by consumers (Ciheam, 2020; Tsao et al., 2019; Naeem, 2021; Beard-Knowland, 2020; EY, 2020). In most European countries, consumers focused on stockpiling nonperishable food items (e.g. flour, pasta, groats, rice, canned foods, etc.) to reduce the risk of future shortages (FAO, 2020, Filimonau et al., 2021). In addition, consumers tended to prioritise purchasing food products that meet their basic needs (Eger et al., 2021) and certain restrictions, such as purchasing unpackaged products (Szymkowiak et al., 2020).

Gulf News (2020) reported that sudden announcements of restrictions due to COVID-19 led to panic buying, which revealed a trend of impulse buying (Anas et al., 2022; Belbag, 2021; Addo et al., 2020; Mejia-Trejo, 2021; Chiu et al., 2021), which then led to shortages of goods in markets and delays in the supply chain. (Choudhuri, 2021). Panic buying and subsequent excessive stockpiling in the form of food products were among the first responses of food market consumers to the COVID-19 pandemic (Billore, Anisimova, 2021; Huang 2020, Wang, Na, 2020). Such behavior ultimately led to shortages of many essential commodities (Tanveer et al., 2020). Analysing the consumption pattern based on transactional data, it can be inferred that in the initial phases of the pandemic, consumers were just hoarding essential commodities such as food items (Chenarides et al., 2021; Güney et al., 2020). Today's food consumer is increasingly a conscious consumer, moving towards a trend of reducing food waste (zero waste) (UNDP, 2020). Compulsive purchasing behavior may have increased the price level of food

products, the amount of food purchased, resulting in exacerbating overconsumption, stock shortages (inventory) and inequitable access to food (Omar et al., 2021).

The pandemic has undoubtedly affected the lifestyles and behaviors of modern society. Some of these changes in behaviors and attitudes, as indicated by the analysis to date, mainly concern food purchases (Sheth, 2020; Kumar, Dwivedi, 2020), individual and collective consumption preferences (Ben Hassen et al., 2021a; Husain, Ashkanani, 2020; Mumena, 2020), and attitudes related to food safety (Osaili et al., 2021; O'Hara, Toussaint, 2021; Kar et al., 2021). Many studies also highlight changes in the quantity and quality of food consumed. The most common change in dietary patterns discussed was an increase in the consumption of 'unhealthy' foods in both the pandemic and post-pandemic periods related to, among other things, the amount of sweets consumed (Adams et al., 2020; Di Renzo et al., 2020; Gornicka et al., Ulqinaku et al., 2021; Laguna et al., 2020; Papandreou et al., 2020; Pellegrini et al., 2020; Romeo-Arroyo et al., 2020; Ruiz-Roso et al., 2020; Scarmozzino, Visioli, 2020) and alcohol consumed (Gordon-Wilson, 2021; Pantano et al., 2021). The increased consumption of the above-mentioned food groups may be an individual's emotional response to eating to reduce stress level. Many studies also indicate an increase in the overall amount of food consumed (Ammar et al., 2020; Carroll et al., 2020; Castellini et al., 2020; Di Renzo et al., 2020; Gornicka et al., 2020; Papandreou et al., 2020; Pellegrini et al., 2020; Romeo-Arroyo et al., 2020; Scarmozzino, Visioli, 2020; Sidor, Rzymiski, 2020). Some researchers diversify the changes in purchasing behavior of contemporary consumers by identifying them with the pandemic phase. A large number of consumers showed panic behavior, impulsive buying behavior only in the early phase of the COVID-19 pandemic (Aljanabi, 2021; Stuart et al., 2021) and compulsive buying behavior (Samet, Gözde, 2021). While shopping behavior in the middle of the COVID-19 pandemic was characterised by high mobility (Gao et al., 2020; Tao et al., 2022; Zhang et al., 2020; Lu et al., 2021). In contrast, as indicated in their study by Baker et al. (2020) we can observe a great deal of variability in the food economy over the last three years. While the level of expenditure on out-of-home consumption has declined (mainly during the lockdown period), expenditure on food at home has increased due to, among other things, the closure of caterers, increasing the proportion of households preparing meals at home. Similar changes in food purchasing behavior during COVID-19 pandemic were observed worldwide (Alaimo et al., 2020; Bohlouli et al., 2021; Chenarides et al., 2021a; Chang, Meyerhoefer, 2021; Hirvonen et al., 2021; Janssen et al., 2021; Kanssiime et al., 2021; Eriksson, Stenius, 2020; Gao et al., 2020; Goddard, 2020; Segovia et al., 2021). The COVID-19 pandemic also changed food buying and purchasing behavior. Before the pandemic, a greater proportion of consumers still preferred to buy groceries from large supermarkets (Wamda, 2019). With the COVID-19 pandemic, an online shopping trend emerged among consumers, which undoubtedly accelerated the digital adaptation of societies, requiring significant changes in food retailing (Bohlouli et al., 2021; Chang, Meyerhoefer, 2021).

Additionally, as Bounie et al. (2020) point out in the results of their study consumers are shifting to online shopping options, which mitigate the overall impact of shock and reduce the level of fear of both shopping and the fear of being in a shared social space (Sherman et al., 2021; Naeem, 2021a; Omar et al., 2021; Sidor, Rzymiski, 2020; Kumar, Abdin, 2021). Mobile applications and social media platforms are identified as drivers of change in contemporary consumer behavior (Ramos et al., 2019). Accordingly, online shopping has experienced a significant expansion since the beginning of the pandemic (Alhaimer, 2021, Accenture, 2020; EY, 2020; Gu et al., 2021, Alessa et al., 2021; Tran, 2021; Xayrullaevnamet al., 2020), mainly due to modern consumers' avoidance of crowded hypermarkets. At the same time, there is such a group of shoppers who still purchase food in person because they prefer to check the quality and freshness of the food, which cannot be done online (Ben Hassenn et al., 2022). Nevertheless, many studies highlight the fact that the increased trend of online shopping that intensified during the pandemic will also continue in the post-pandemic setting (Dannenberg, et al., 2020). As the results of current research indicate, the likelihood of increased online shopping is also influenced by whether or not a person is a reflexive buyer (Naeem, 2021; Gu et al., 2021).

The modern consumer has also adopted healthier eating patterns and reduced food waste (Jaggers et al., 2020; Toiba et al., 2022). Some studies also highlight the fact that consumers increasingly prefer local food (Severo et al., 2021). Being aware that, as a consequence of past events, consumers have not only been affected economically but also psychologically, we can identify five new trends in the behavior of contemporary consumers in the food market, taking into account the internal conditions of an individual: the demand for simplicity, time saving, thoughtful consumption, green consumerism and ethical consumerism. It is also projected that COVID-19 will not only be a health problem but will lead to a global economic recession, increased unemployment and escalating poverty rates, especially in developing countries, thus also affecting access to food, the quality of nutrition and its level of diversity (Fitzpatrick et al., 2020; Laborde et al., 2020) and thus food security (HLPE, 2020).

In conclusion, we can infer that factors such as price, availability, convenience, food safety and hygiene are still important to most consumers when making food purchasing choices in both pandemic and post-pandemic periods. Many current studies on consumer behavior emphasise that health fear is becoming a strong factor influencing current consumer purchasing behavior (Sumi, Ahmed, 2022; Yuen et al, 2020; Samet, Gözde, 2021). Taking into account the current conditions of the food market in the territory of Poland, the question should be asked: What transformations await the Polish food market, after the pandemic crisis? What impact will the COVID-19 pandemic and other current crises⁴ have on the behavior of today's consumers in the nearest time scope? According to the authors, the most important transformations are identified mainly with the following trends: 1. An increase in the frequency of buying local food

⁴ War in Ukraine, environmental crisis, energy crisis, inflation.

products, 2. Concern for their own safety, 3. Changing the preferred channels of contact with food suppliers (online transactions), 4. Convenience and ease of shopping, 5. The growing importance of value for money, 6. The abandonment of cash in transactions (cashless transactions), 7. Excessive stockpiling, 8. Impulsive buying, 9. Reduced spending on higher-order needs (dormant demand, demand suppression), 10. Conscious consumption, 11. Consciously planned shopping, 12. Health and nutrition as a priority in food choices.

3. Selected characteristics of food quality

In utilitarian terms, quality can be defined as the fitness for consumption which should meet the consumers requirement so to satisfy them. Food quality is a complex and multi-dimensional concept. The characteristics contributing to food quality are (Food Quality Knowledge for policy (europa.eu)): food safety, ethical, aesthetical, functional, convenience, authenticity, sensory, nutrition, origin. Considering the history of defining the food quality it can be seen that quality has been primarily understood as the absence of a defect, fraud and adulteration. Later, more attention has been paid to expected properties such as organoleptic and nutritional characteristics or resulting benefits, and finally, desirable characteristics likely to justify added value, i.e. organic farming, country of origin (Feldmann, Hamm, 2015). Brunso et al. (2002) characterized four types of food quality: (1) product-oriented quality, (2) process-oriented quality, (3) quality control, (4) users-oriented quality. These four types of quality are interrelated. Three types of the objective quality (product-oriented, process-oriented, quality control) affect the subjective users-oriented quality. The decision of the consumer to buy a product depends on the subjective evaluation, the perception of the important food product characteristics from his point of view. Looking at various information on the food package consumers can expect a certain level of food quality. Truong et al. (2022) showed the importance of certification on the evaluation of the food quality by consumers. Food certification is becoming more and more popular and commonplace but for many consumers it is a sign of high quality (Bailey, Garforth, 2014; Tran, Goto, 2019). Of course, there is always a question about the trust in the certification. Truong et al. (2022) concluded in their research that the higher the level of trust in the certification, , the lower the need for trust in food actors. They stated that consumer trust in certifications depends on their perceived trustworthiness of the food system and its actors to deliver certified food. Consumers also pay attention to the brand of the product because they are unable to check the quality of food before the purchase (Sadilek, 2019). Of course to some extent consumers can check the freshness of the food product they buy, i.e. the change of the color, the texture, but this is very limited.

Quality is a set of consumer requirements such as: safety, nutritional, sensory, production context and others. Considering these various requirements Peri (2006) divided them into two categories: 1) requirements toward the product as a food and 2) as an object of trade. If we consider the characteristic of a product as a food, we can list the following characteristics: safety requirements, conformity to standards, nutritional requirements, sensory requirements, production context and ethic. If we look at the food as the object of trade, we then consider the characteristics such as: certification, traceability, functional and aesthetic requirements of packaging, information, convenience, availability, price. As it was shown quality is a very complex issue. Although quality characteristics can be assessed by objective measurements, it is still subjective due to the evaluation of the consumer who finally decide to buy and consume a food product. When defining the food quality from the consumer point of view we can identify the intrinsic characteristics. i.e taste and other organoleptic properties and also external factors such as, i.e. origin, labelling what refers to the division of food product into food to be consumed and product of the trade exchange (Bernues et al., 2003; Mascarello et al., 2015). The perception of the food quality as high influence various aspect of consumer activities. As Toudert and Bringas-Rabago (2021) show the subjective perception of high quality has a positive impact on satisfaction with gastronomy or tourism. Zait et al. (2021) divided quality attributes of animal-source foods into seven dimensions and between consumers and producers, processing actors. When we talk about the food quality from the consumer perspective the following attributes should be mentioned: sensory, nutritional, image. When the perspective of food producers is considered: technological attributes, commercial attributes. For both consumers and producers: safety attributes and convenience attributes.

Stylidis et al. (2020) said that perceived quality is a complex, multifaceted adaptive system where a human is a main agent. Zaithaml (1988) defined the perceived quality as “the consumer's judgment about a product's overall excellence or superiority”. Debanjan and Golder (2006) defined the perceived quality as ‘perception of the customer’ and oppose it to the ‘objective’ quality. A similar definition was given by Aaker (2009) as *the customer's perception of the overall quality or superiority of a product or service with respect to its intended purpose, relative to alternatives*. Castleberry and McIntyre (2011) explain perceived quality as “a belief about the degree of excellence of a goods or service that is derived by examining consciously and/or unconsciously, relevant cues that are appropriate and available, and made within the context of prior experience, relative alternatives, evaluative criteria and/or expectations”. It is worth to remember that perceived quality play an important role because significantly influences the customer's opinion and, therefore, has an impact on the purchase decision and the customer satisfaction. It depends on the person as the perception of quality characteristics is a subjective process and happens consciously as well as unconsciously in order to satisfy evident and hidden customer needs (Falk et al., 2017).

The consumer's perception of quality depends on (Ophuis et al.,1995):

- the perception process - the consumer's judgment about the quality of a product, taking into account its visible and invisible features, which have been judged by experience or which the consumer expects. The perception of quality depends on the product, the person of the consumer and the place,
- the product - the same characteristic for different products has a different meaning when assessing the quality, e.g. the fat content is an important feature in the case of meat and meat products (both positive and negative), and in the case of vegetables and fruit, it is insignificant,
- people - consumers differ in terms of preferences, experience, perception abilities, therefore they perceive quality in different ways,
- places (context, purpose of product use) - e.g. tomatoes can be assessed as low quality in order to use them e.g. in a salad, but suitable for preparing a soup or sauce.

Wheelock (1992) proposed to divide the features that can be taken into account when assessing quality into two categories:

1. Genuine genuine quality: selection of product ingredients (e.g. a product made of wholesome meat or offal), distribution method - which allows to maintain the appropriate properties of the product, nutritional value, durability of the product, protection against contamination.
2. Pseudo-quality - phrases placed on the packaging that are supposed to suggest higher quality, such as: no preservatives - most consumers are afraid of ingredients marked with the alphanumeric code E + number and consider them to be preservatives that consumers avoid.

It is worth to investigate the consumer perception/evaluation of food quality because it helps the marketers to adjust their strategies to consumers expectations (Petrescu, 2022).

4. Material and Methods

The research process consisted of the following stages:developing research methodology, consultation of the research tool, sample selection, implementation of the measuring phase of the survey; developing a statistical report; elaboration of a final report. The research was made by a professional company operating in quantitative research method. Information on the assumed scope of the study was obtained through the use of a tool - a quantitative questionnaire. The questionnaire was built of closed-typed questions. The sample consisted of 2000 people selected taking into account the place of residence (region), gender and age. Respondents were asked to indicate high food quality characteristics three times: before, during and after the COVID-19 pandemic (in January 2020, in March 2022 and in March 2023). In order to put the

pandemic in Poland on a timeline, it is worth noting that the first case of COVID-19 in Poland was reported on the 4th of March 2020, in May 2022 was the official end of the pandemic. Respondents were also characterized in terms of education and material status and the role during the food purchase. The study was carried out using the CAWI (Computer Assisted Web Interviewing) technique based on conducting a computer-supervised internet survey. Numeric variables were characterized using basic descriptive statistics: cardinality (N), arithmetic mean (mean), standard deviation (SD), median, lower and upper quartile (IQR), minimum and maximum values (range). Categorical variables are presented in terms of numbers and interest. Group comparisons were made using the Kruskal-Wallis or U Mann-Whitney test (for continuous variables) and the Chi-square test or Fisher test (for categorical variables). The value of significance (p) was set at 0.05. Calculations were made in the R program (ver. 3.5). 2000 respondents took part in the surveys. The exact distribution of the sample taking into account gender, age and place of residence is presented below (Table 1). It reflects the structure of the population of adult Poles residing in the country.

Table 1.

Respondents of the survey in 2020 (before the COVID-19 pandemic)

Regions	Woman (age)						Man (age)						Total
	18-29	30-39	40-49	50-59	60-69	+70 lat	18-29	30-39	40-49	50-59	60-69	+70	
Dolnośląskie	12	16	13	11	15	13	12	16	13	11	13	8	153
Kujawsko-pomorskie	10	10	9	9	10	9	10	11	9	8	8	5	108
Lubelskie	10	10	9	9	10	10	10	11	9	8	8	6	110
Lubuskie	4	5	5	4	5	4	5	5	5	4	4	2	52
Łódzkie	11	12	11	10	13	13	11	12	11	9	10	7	130
Małopolskie	16	18	15	13	14	15	16	18	15	13	12	9	174
Mazowieckie	23	29	25	20	25	25	23	28	25	19	20	14	276
Opolskie	4	5	5	4	5	5	4	5	5	4	4	3	53
Podkarpackie	10	11	9	9	9	9	11	11	10	9	8	5	111
Podlaskie	6	6	5	5	5	6	6	6	5	5	4	3	62
Pomorskie	11	12	10	9	10	9	11	12	11	9	9	6	119
Śląskie	19	23	21	20	22	21	20	23	21	19	19	13	241
Świętokrzyskie	6	6	5	5	6	6	6	6	6	5	5	4	66
Warmińsko-mazurskie	7	7	6	6	7	6	7	8	6	6	6	3	75
Wielkopolskie	16	18	16	14	16	14	16	19	16	13	13	8	179
Zachodnio-pomorskie	7	9	8	7	9	7	8	9	8	7	8	4	91
Total	172	197	172	155	181	172	176	200	175	149	151	100	2000

Among the respondents, 42.4% were the sole decision-makers in the purchase of food products. About 49.7% of respondents said they make the majority of purchasing decisions for the household. The smallest group (7.9%) were people for whom someone else makes the majority of purchasing decisions. In the survey, respondents also specified their education, size of place of residence and net income per family member. Most respondents had secondary education (32.2%) and basic vocational education (30.7%). Persons with higher education constituted 26.9%, and the remaining 10.3% of respondents had primary/lower secondary education. Persons with a net income not exceeding PLN 1200 (about 300 €) per person

constituted about 19.1% of the total number of respondents. One-fifth of survey participants (20.0%) indicated an income of PLN 1201 to 1600 (301 to 400 €), and respondents declaring income per person within PLN 1601-2000 (401 to 500€) net constituted 20.7% of all respondents. Income in the amount of 2001-2400 (501 to 600 €) was indicated by 19.5% of respondents and 20.9% of respondents had income per one person exceeding PLN 2400 (+600 €) net.

People living in the village accounted for 19.9% of the total, while about 23.0% of the respondents were city dwellers up to 50,000 inhabitants. Approximately 29.0% of respondents were residents of cities with 50 to 250 thousand inhabitants, and 14.7% lived in cities with 250 to 500 thousand inhabitants. The least 13.5% of respondents lived in cities with over 500,000 inhabitants.

In the same way, in 2022 (during the COVID-19 pandemic) the research sample consisted of 2000 respondents selected in a quota manner. The selection of respondents reflected the actual structure of sex, age and region of residence of adult Poles. The distribution of the research sample was analogous to that obtained in a similar study carried out in 2020 (Figure 1-6). Because of the COVID-19 pandemic in the survey made in 2022 and 2023 the additional socio-characteristic was added – Perceived Stress Scale (Cohen et al., 1983), and also the case of trust as trust plays an important role during various crises (Figure 7 and 8). It is one of the most commonly used tools to measure perceived stress (Mondo et al, 2021). The perceived stress influences consumers decisions and also the perception of high food quality and may result in i.e. searching for the objective proofs of high food quality such as for example the certificates. Consumers were asked to assess their level of stress.

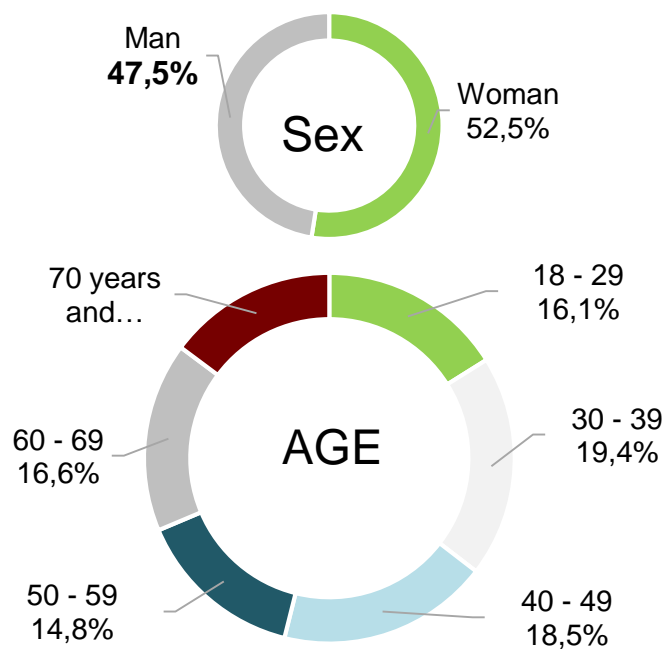


Figure 1. Characteristics of respondents in 2022 – the sex and the age.

Source: own elaboration.

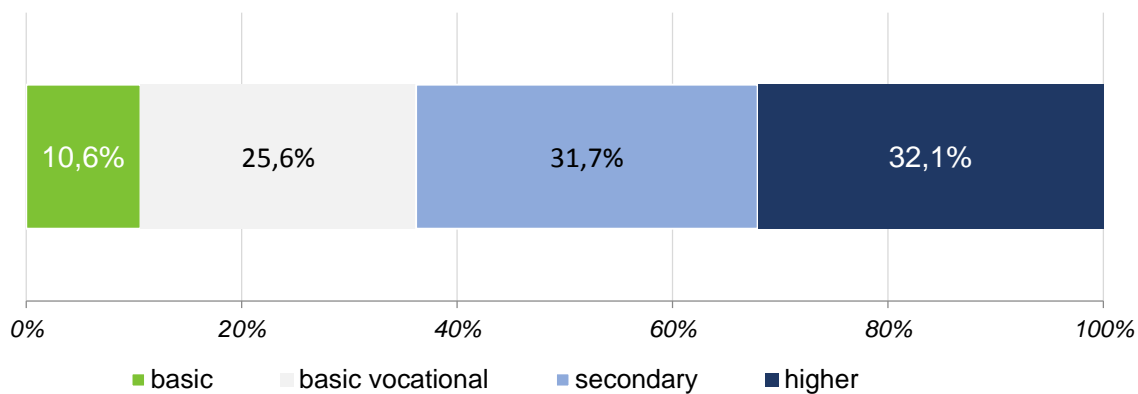


Figure 2. Characteristics of respondents in 2022 – the level of education.

Source: own elaboration.

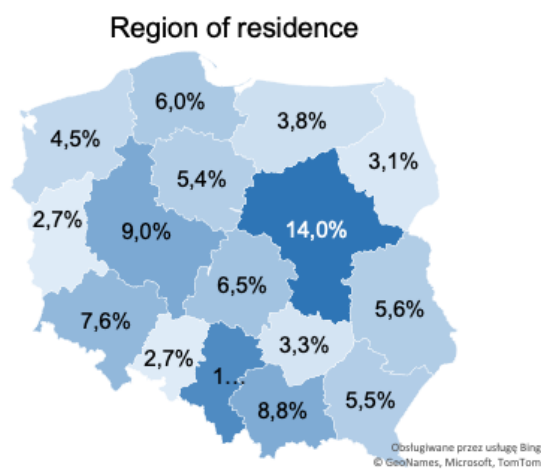


Figure 3. Characteristics of respondents in 2022 – the region of residence.

Source: own elaboration.

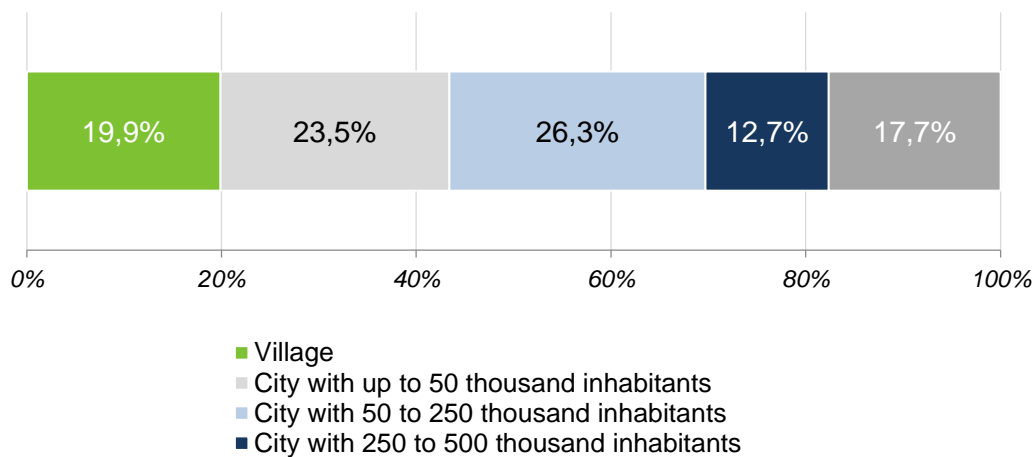


Figure 4. Characteristics of respondents in 2022 – the place of residence.

Source: own elaboration.

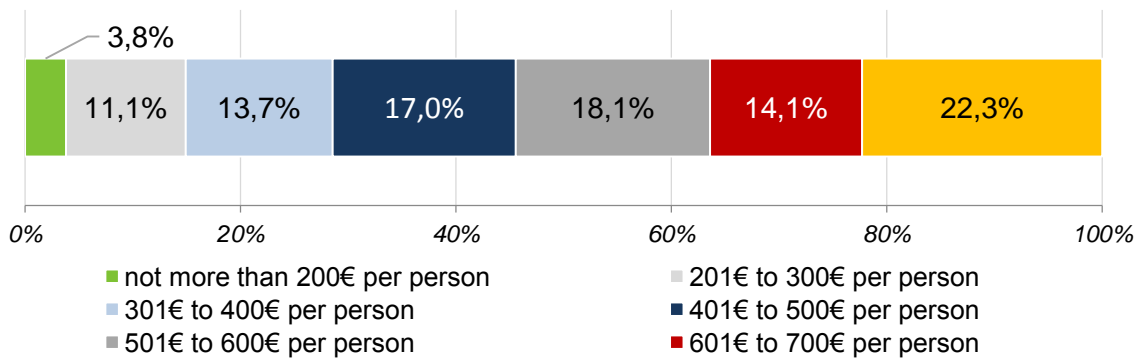


Figure 5. Characteristics of respondents in 2022 – the monthly income.

Source: own elaboration.

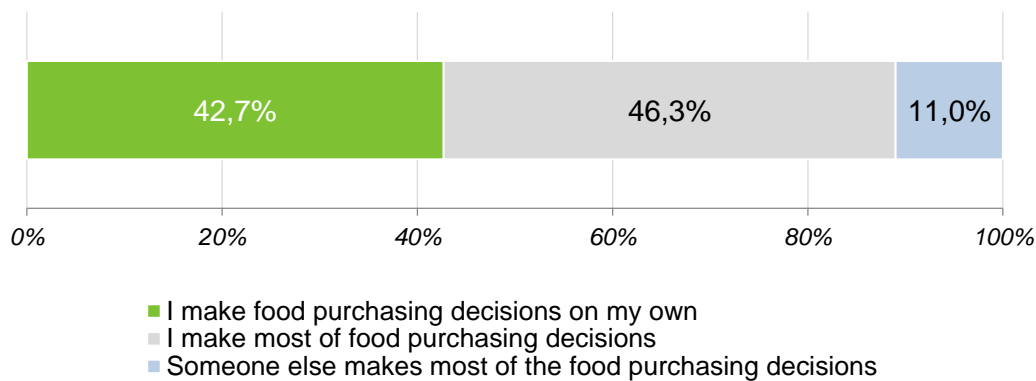


Figure 6. Characteristics of respondents in 2022 – responsibility for the buying decisions.

Source: own elaboration.

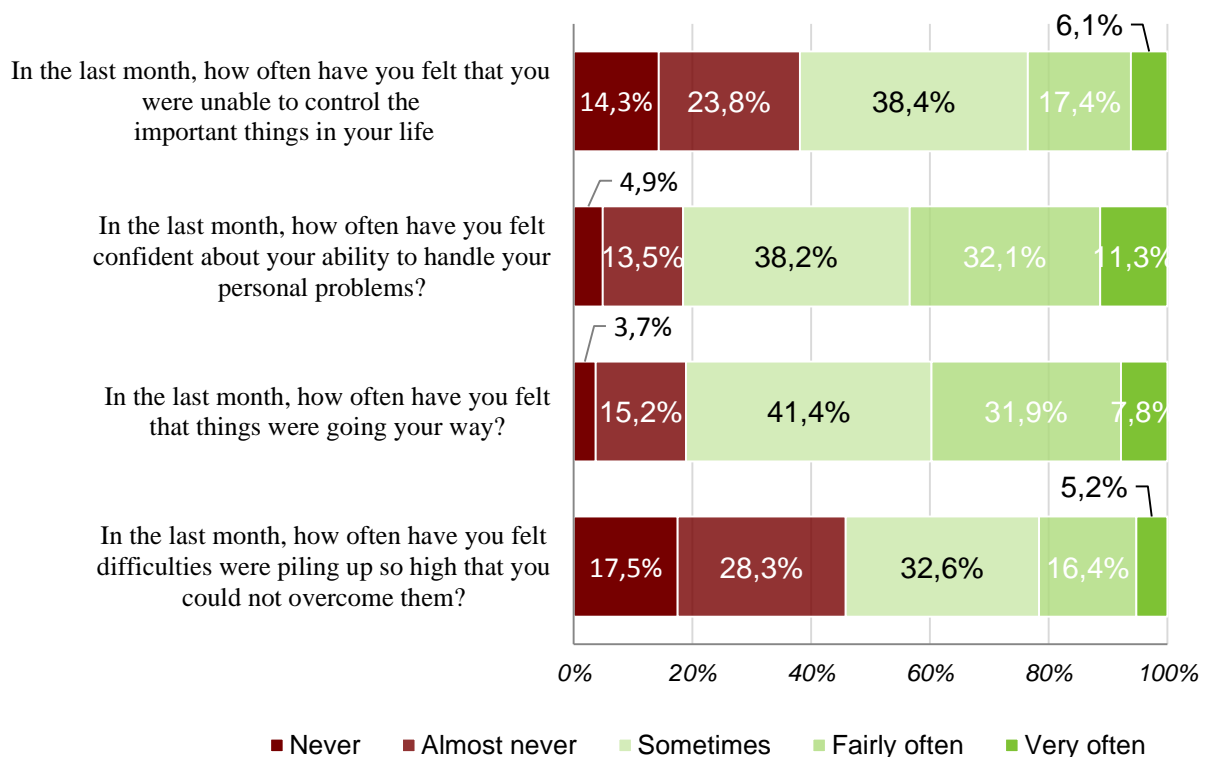


Figure 7. Characteristics of respondents in 2022 (during the pandemic) – perceived stress.

Source: own elaboration.

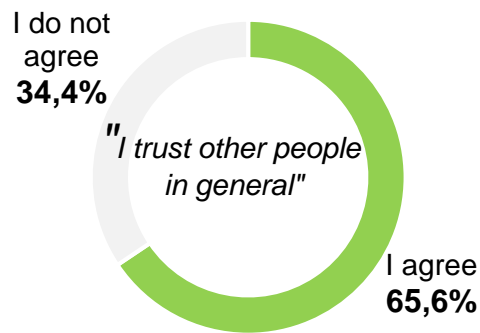


Figure 8. Characteristics of respondents in 2022 – trust.

Source: own elaboration.

In the third survey (year 2023) 1253 women and 747 men gave their opinions. The highest number of respondents were between 40-49 years old (28.6%). Most of them had higher education (46.2%) and lived in cities between 50-250,000 citizens (37.7%). Every fifth person participating in the study (20.5%) lived in the southern region of Poland - 10.9% of the inhabitants of the province Śląskie and 9.6% of the inhabitants of the province Lesser Poland. People living in the Mazowieckie region accounted for 18.1% of the research sample, being the most numerously represented region in Poland. The monthly household budget declared by every fourth survey participant (25.4% of respondents) was over 700 € net per person. The surveyed people whose households had relatively the lowest budget (no more than 200 €) formed the smallest group - 3.4% of all survey participants.

The participants of the study were also characterized due to their participation in the decision-making process regarding the purchase of food products. The sole decision-makers in the field of purchasing food products accounted for 38.6% of the respondents. Other respondents admitted that they make decisions jointly with another household member. About 50.8% indicated that they make most decisions on their own. In the results of the study, the authors did not identify the population of people who indicated that in their household someone else makes most of the decisions (0%). Respondents were also asked to assess their perceived stress (Figure 9) and trust (Figure 10).

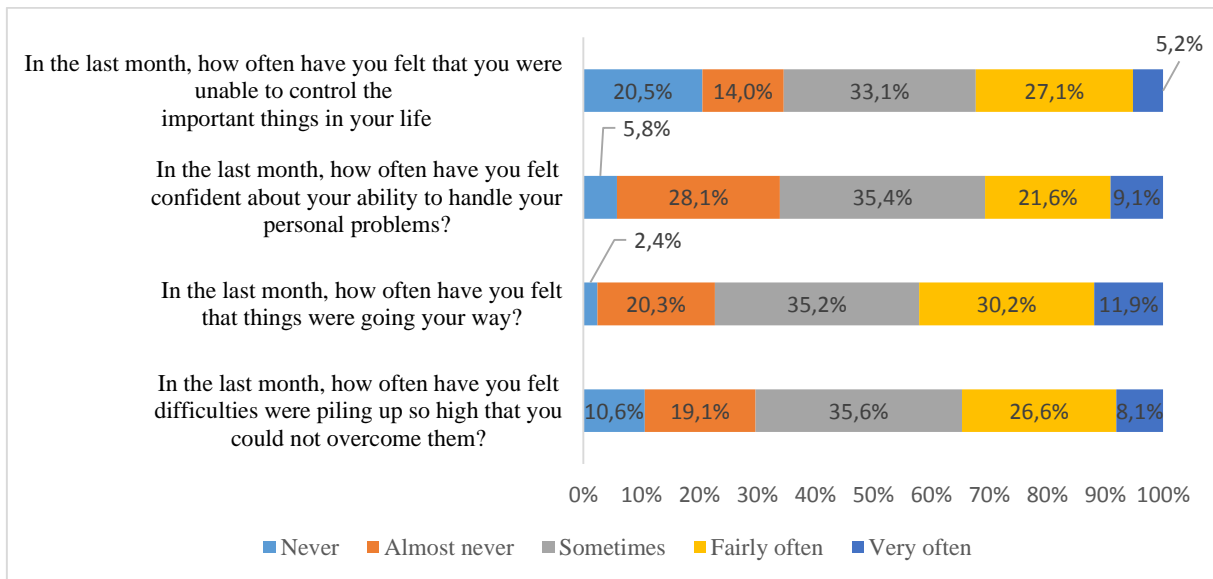


Figure 9. Characteristics of respondents in 2023 (after the pandemic) – perceived stress.

Source: own elaboration.

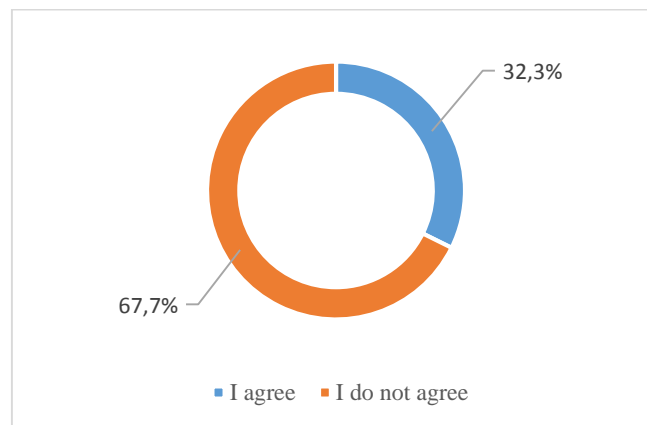


Figure 10. Characteristics of respondents in 2023 – trust.

Source: own elaboration.

On the basis of the literature review the following hypothesis were formulated:

- H1: Due to the influence of the COVID-19 pandemic consumers perceived as more important the country of origin of the food products, the domestic origin is a sign of high food quality.
- H2: The pandemic has caused the higher importance of taste as the indicator of high food quality.
- H3: Consumers indicate higher ranges (bigger frequency of indications) to the quality of food during and after the pandemic than before because of the more attention paid to the food and its connection to health.
- H4: The importance of the objective characteristics of food quality i.e. food standards and certification is of higher importance during and after the pandemic than before.
- H5: The percentage of indications of high food quality characteristics was higher among the consumers who trust other people/institutions.

5. Results

The results of the studies show that for consumers, the determinants of high-quality food are primarily (in 2020 before the pandemic): no food additives (65.4% of indications), ingredients from organic farming (47.0%), information that the food was produced in accordance with the principles of HACCP/ISO 22000 (36.8), product brand (36.8%).

The respondents consider the lack of food additives to be a determinant of high-quality products, which may be one of the reasons why the most frequently checked information on labels is the composition of the food products they buy (the answer most often mentioned in the previous question in the survey). The opinion that ingredients from organic farming are a determinant of high quality products was expressed by 47.0% of respondents. It may also confirm that the respondents attach great importance to the composition of the food they buy.

It should also be noted that for one third of the consumers (36.8%), the information confirming the production of food in accordance with the HACCP/ISO22000 principles and other certifications confirms that the food products are of high quality.

Women more often than men believed that the determinant of high-quality food was the information that the food had been produced in accordance with the principles of HACCP/ISO 22000, ingredients from organic farming and the country of origin - Poland. Men more often considered the price and the brand as an aspect of high quality. The data discussed are presented in the figure below (Table 2, Figure 11).



Figure 11. The indicators of high food quality – survey in 2020 (before the COVID-19 pandemic).

Source: own elaboration.

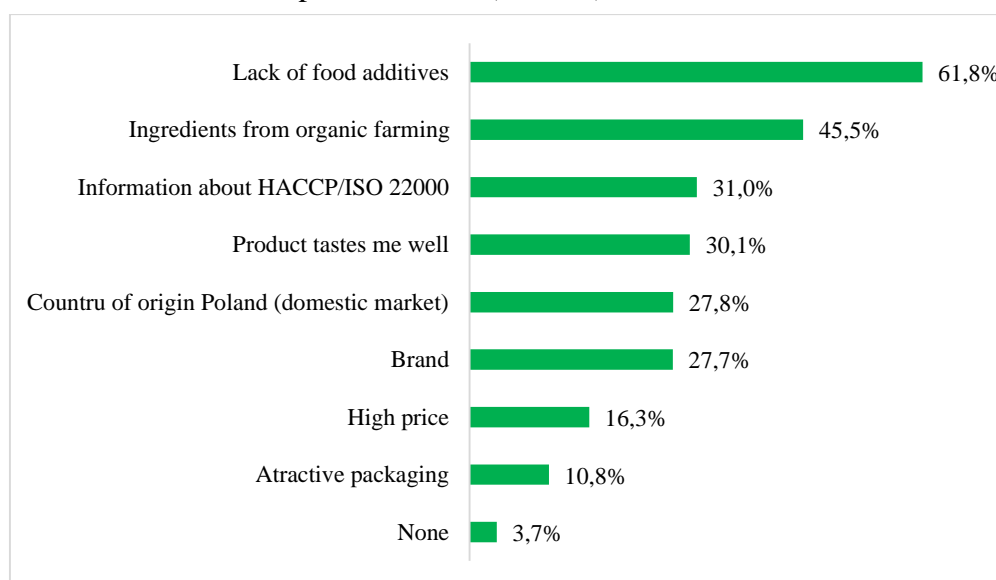
Table 2.*Results of Pearson's Chi square test in 2020 (before the COVID-19 pandemic)*

Characteristic of food	Gender		Age		Education		Role	
	Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test	
High price	0.000186	***	0.031258	*	0.540633		0.057429	
Attractive packaging	0.013627	*	0.578349		0.300517		0.001229	**
Country of origin - Poland (domestic market)	0.286168		0.001585	**	0.301932		0.052928	
Brand	0.00014	***	0.01652	*	0.020006	*	0.014233	*
Lack of food additives	0.011132	*	0.325276		1.36E-05	***	0.000217	***
Information about HACCP/ISO22000	2.43E-05	***	2.56E-05	***	0.912034		1.63E-05	***
Product tastes me well	0.160675		0.243414		0.625447		0.05784	
Ingredients from organic farming	2.51E-06	***	0.002583	**	0.015832	*	0.000765	***
None	0.745018		0.182164		0.89842		0.64847	

Source: own elaboration.

Information about the production process in accordance with HACCP/ISO 22000 principles was especially important for consumers at the age between 50 to 70 years old. Young consumers much less often paid attention to this information as the indicator of high quality of food products. Information for HACCP/ISO 22000 principles was important for consumer who made all purchase decisions.

Information about the lack of food additives was particularly important for consumers with higher education, consumers with lower education less often paid attention to this information. Lack of food additives was also important for consumers who make most of the food purchase decision. For them the information about the organic origin of the ingredient was more important than for other groups of consumers. The lower the decisiveness of food purchase was, the lower indications of the importance were (Table 2).

**Figure 12.** The indicators of high food quality – survey in 2022 (during the pandemic).

Source: own elaboration.

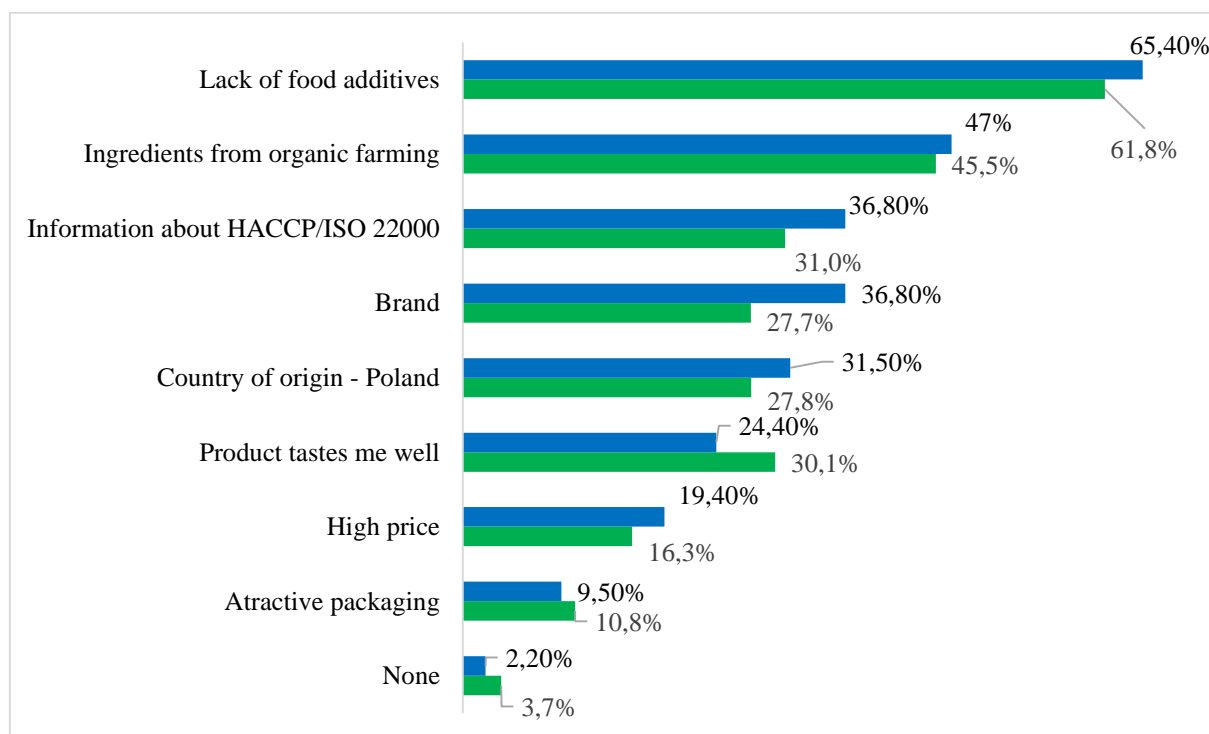


Figure 13. The indicators of high food quality – the comparison of the results in 2020 (before the pandemic – in blue) and in 2022 (during the pandemic – in green).

Source: own elaboration.

Table 3.

Result of Pearson's Chi square test in 2022 (during the COVID-19 pandemic)

Characteristic of food	Gender		Age		Education		Role	
	Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test	
High price	0.008676	**	0.000386	***	0.486650		0.405122	
Atractive packaging	0.479626		0.035428	*	0.422816		0.015847	*
Country of origin - Poland (domestic market)	0.930273		0.040003	*	0.598476		0.010056	*
Brand	0.000124	***	0.242920		0.560309		0.336595	
Lack of food additives	7.0878E-05	***	0.059713		0.002859	**	0.053719	
Information about HACCP/ISO22000	0.008947	**	0.013336	*	0,107173		0.206587	
Product tastes me well	0.000890	***	0.094431		0.276898		0.556512	
Ingredients from organic farming	1.16743E-05	***	0.304724		0.164229		0.014617	*
None	0.047618	*	0.194039		0.556790		0.019090	*

Source: own elaboration.

Table 4.
Perceived Stress and high food quality characteristics

Characteristic of food	1		2		3		4	
	Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test	
High price	5.70661E-05	***	0.884437		0.002744	**	2.98351E-08	***
Attractive packaging	2.75934E-06	***	0.532302		0.074305		7.07778E-12	***
Country of origin - Poland (domestic market)	0.424425		0.054425		0.004021	**	0.863514	
Brand	0.665937		0.148687		0.151124		0.451190	
Lack of food additives	0.009769	**	0.014460	*	0.127312		4.33785E-05	***
Information about HACCP/ISO22000	0.038765		0.015701	*	0.023064	*	7.59487E-05	***
Product tastes me well	0.684356		0.568118		0.151960		0.488693	
Ingredients from organic farming	0.750270		0.119117		0.363808		0.208468	
None	0.223955		0.285542		0.001199	**	0.110177	

1. In the last month, how often have you felt that you were unable to control the important things in your life?
2. In the last month, how often have you felt confident about your ability to handle your personal problems?
3. In the last month, how often have you felt that things were going your way?
4. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Source: own elaboration.

Based on the answers, the level of stress of each of the participants was determined, which is the arithmetic mean of the answers given to all of the above-mentioned questions. Before calculating the mean, the rating scale for two questions was reversed so that a low rating (answer 1 - never) meant a positive (expected) state, and a high rating (answer 5 - very often) indicated its opposite. For the purposes of the analysis, the following division of respondents in terms of the perceived level of stress was adopted:

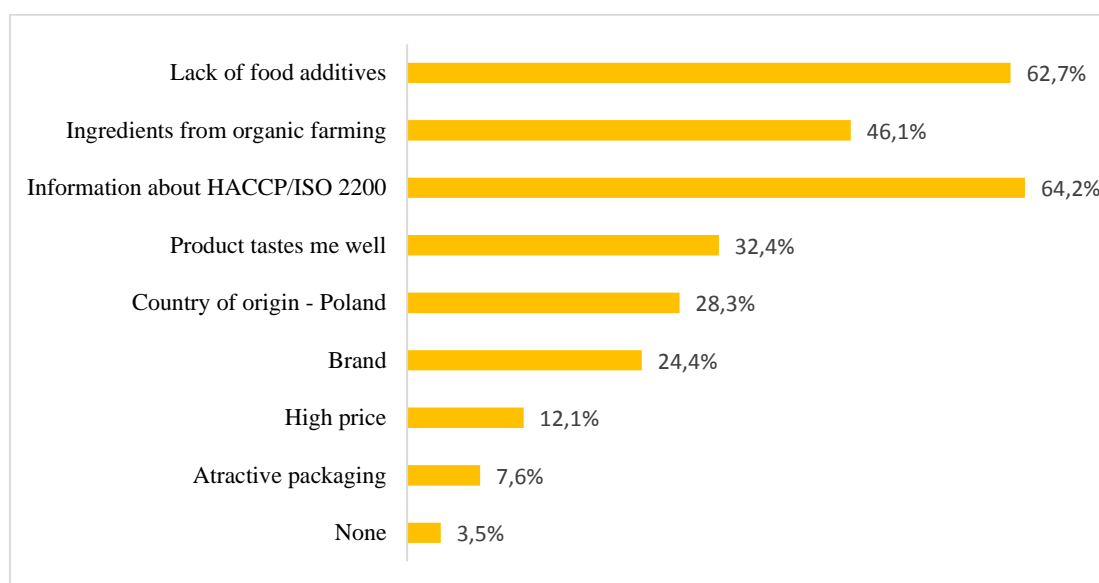
- very low - average from 1 to 2;
- low - average above 2 to 3;
- moderate - average above 3 to 4;
- high - average above 4.

Most of the surveyed consumers (59.6%) were characterized by a low sense of stress. People with a high level of perceived stress constituted only 1.8% of the surveyed consumer group, while very low level of stress concerned 19.1% of the respondents. The perceived level of stress of the remaining respondents was described as moderate (19.5% of all respondents) (Table 4).

Table 5.*Level of perceived stress and high food quality perception*

Characteristic of food	Level of perceived stress- percentage of answers				
	Total	Very low	Low	Moderate	High
High price	16.3	10.2	17.7	18.0	17.1
Attractive packaging	10.8	5.2	12.8	10.5	5.7
Country of origin - Poland (domestic market)	27.9	29.0	27.7	27.8	17.1
Brand	27.7	29.2	27.5	26.5	31.4
Lack of food additives	61.8	71.0	58.3	62.2	74.3
Information about HACCP/ISO22000	31.0	40.5	29.1	28.5	20.0
Product tastes me well	30.1	31.9	30.2	27.8	31.4
Ingredients from organic farming	45.4	50.1	43.4	47.6	42.9
None	3.7	2.3	4.6	2.6	0.0

Source: own elaboration.

**Figure 14.** The indicators of high food quality – survey in 2023 (after the pandemic).

Source: own elaboration.

For consumers whose the average perceived stress was high the most often mentioned indicators of high food quality were lack of food additives and ingredients from organic farming. So these indicators that are connected with the influence of health (most food additives are perceived to have the negative impact as well as the usage of pesticides (Table 5). This situation was observed both in 2022 and in 2023 (during and after the pandemic).

In 2022 according to the majority of the surveyed consumers (61.8%), the indicator of high-quality food products is the lack of food additives. More than every fourth survey participant believes that the determinant of high-quality food is (Figure 12, Figure 13):

- the presence of ingredients from organic farming (45.5% of respondents),
- production in accordance with the principles of HACCP / ISO 22000 (31.0%),
- appropriate taste - "whether I like the product" (30.1%),
- country of origin - Poland (27.8%),
- brand (27.7%).

Relatively the least number of participants chose attractive packaging (10.8%) and high price (16.3%) as a indicator of high-quality food. It is worth noting, however, that the high price was a feature indicated by more than every third respondent (34.2%), whose household budget does not exceed 200€ per person. Among the more affluent people, the high price was chosen by a significantly smaller percentage of respondents (11-20%). Moreover, people who admitted that they generally do not trust other people relatively less frequently considered attractive packaging as a determinant of high-quality food (6.9% of people who trust other people indicated this factor) (Figure 16).

Over the last two years (2020-2022), a clear change of opinion has been observed in the perception of the brand as a determinant of high food quality. In survey (2022), 27.7% of consumers considered the brand as a determinant of high-quality food, while the percentage of respondents who expressed such an opinion in 2020 was 36.8%. However, the participants of (2022) study more often indicated the taste of the product ("whether I like the product") and the attractive packaging (Figure 11-13).

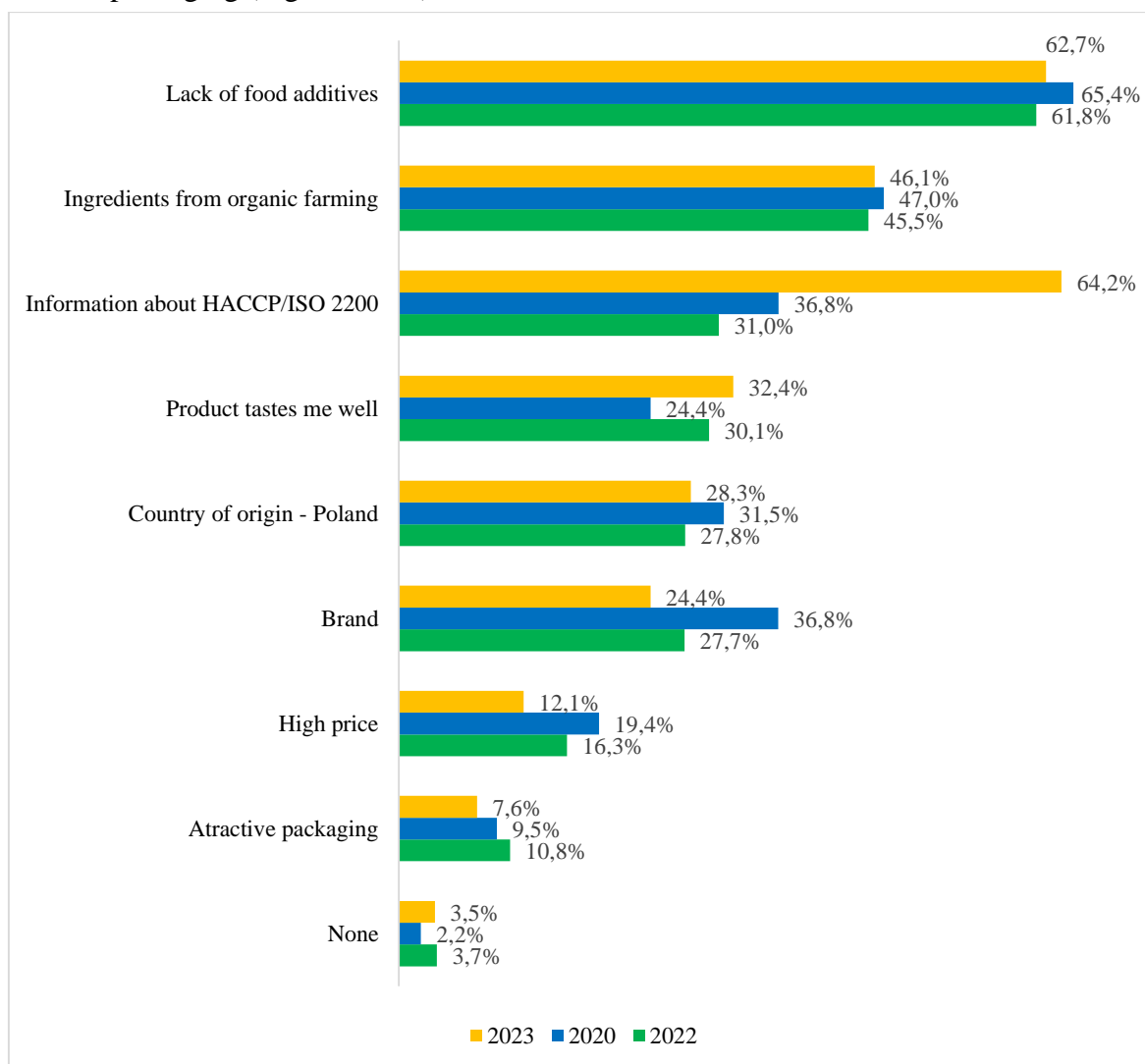


Figure 15. The indicators of high food quality – the comparison of the results in 2020 (before the pandemic – in blue) and in 2022 (during the pandemic – in green), and in 2023 (after the pandemic - in orange). Source: own elaboration.

The results of the third survey (after the pandemic, 2023) show the growing importance of the information of HACCP/ISO 22000 and other quality and safety certification as the indicators of high food quality (Figure 14, Figure 15). As other authors show (Zanetta et al., 2022; Ali et al., 2021; Liu et al., 2021; Niewczas-Dobrowolska, 2023; Bolek, 2020; Borda et al., 2021; Wu et al., 2021) the meaning of food certification has been increasing. It may be also correlated with the lower trust after the pandemic as the food certification show the level of good quality and safety, and has the objective character.

The second mostly mentioned high food quality indicator is lack of food additives, after this – ingredient from organic farming and the taste of the product. On the basis of the comparison of the results of these three surveys it can be concluded that the lack of food additives, the ingredients from the organic farming remain very important. The higher importance of the certification was observed as well as the higher importance of the food taste when to compare results during and after the pandemic with the results before the pandemic. The brand has been evaluated lower as well as the food packaging and the price.

Consumers' perceptions of the characteristics of high-quality food differed by gender. Women more often considered the lack of food additives, ingredients from organic farming and the compliance of production with the HACCP/ISO 22000 principles as distinguishing features of high-quality food. The opinion of men emphasized the importance of the brand and taste, i.e. whether they liked the product (Table 3). The same situation remain in 2023.



Figure 16. Trust and the high food quality indicators.

Source: own elaboration.

One consumers characteristics was very different between 2022 and 2023 (during and after the pandemic). It was the attitude toward trust. It shows the complete opposite situation. In 2022 most of the respondents (65.6%) agreed that they trust other people/institutions (Figure 8). However, in 2023 only 32.2% agreed the trust other people/institutions (Figure 10). Other reports/article also show that the pandemic caused the crisis of trust (Deloitte, 2020). Perhaps this lower level of trust may be caused by other external factors (not only by the pandemic) such as the war in Ukraine, lack of food security or the growing rate of inflation.

6. Discussion

Changes in consumer behavior in times of current threats are mainly the result of the consumer's perception of the crisis itself rather than its practical effects. As highlighted by El Bilali (2020) and McKinsey and Company (2020), the immediate impact of the pandemic varies from country to country and depends on, among other things, the epidemiological situation, the form and timing of the containment and retreat, and the level of socio-economic development prior to the COVID-19 pandemic. As indicated by numerous sources presented in this paper, the long-term impact of COVID-19 on consumers is projected, which not only has changed their consumption behavior but also affected their personal lives by determining their daily routines.

The COVID-19 pandemic had and has had the impact on various aspect of our lives. It was unexpected and expanded globally, impacts the entire food chain (Barman et al., 2021). Global restriction, limitations influenced the food chain from farm to fork (Galanakis, 2020) and also influenced consumer behavior decreased shopping trips, stockpiling, online shopping, increased stress and anxiety etc. (Accenture, 2020; Ahmed et al., 2020; Akter, 2020; Lazzarini, Putoto, 2020), food consumption patterns and diets (Abbas et al., 2020; Heck et al., 2020). During the pandemic emotions such as stress, anxiety, depression have been reported by many authors. They influence consumers choices and perceptions (Albott et al., 2020; Elbay et al., 2020; Pedrozo-Pupo et al., 2020).

Shen et al. (2020) showed in their research some relationships between the perceived level of stress and food choices/characteristics. The total effect between perceived stress and health of food was no significant. The lack of the significance of the relationship was also observed for the sensory appeal, weight control, ethical concerns. However, in case of food convenience, natural content, price and familiarity the total effect was observed. As Gruner et al. (2022) stated consumers with stronger negative emotional reactions to the pandemic were more likely to change their attitudes or behavior.

As many researchers indicate the COVID-19 pandemic influence food choices in three main issues: (1) consumers pay more attention to healthy food choices in order to protect themselves and their immune system, hence the increased demand for functional food, (2) more attention

is given to food safety to prevent the spread of the coronavirus in the food chain, (3) fears about food availability (Rodríguez-Pérez et al., 2020; EIT Food..., 2020; Pressman et al., 2020; Chiwona-Karlun et al., 2021; OECD..., 2010; Dudek, Spiewak, 2022).

On the basis of the results the hypothesis can be verified as follows:

H1: Due to the influence of the COVID-19 pandemic consumers perceived as more important the country of origin of the food products, the domestic origin is a sign of high food quality.

The H1 was verified negatively. Looking at the results of these three surveys (before, during and after the COVID-19 pandemic) the importance of the domestic origin wasn't indicated mostly more frequently. It shows the growing importance of the food certification and remain the importance of the lack of food additives and the ingredients from the organic farming as the indicators of the high food quality.

H2: The pandemic has caused the higher importance of taste as the indicator of high food quality.

H2 was verified true. Yes, taste of the food (answer if the food tastes me well) was indicated more often during and after the pandemic than before it. It may be caused by the fact that taste is the source of pleasure that was needed as the escape from the problems regarding the pandemic or the fact that the COVID-19 virus results in the lack of smell and taste so many consumers started to value more the taste of food.

H3: Consumers indicate higher ranges (increased frequency of indications) to the quality of food during and after the pandemic than before because of the more attention paid to the food and its connection to health.

It is difficult to answer unequivocally. The hierarchy of high food quality indicators based on the frequency of indications in general is similar before and during and after the COVID-19 pandemic. The top four characteristics before the pandemic are: lack of food additives, ingredients from organic farming, information about HACCP/ISO and the brand. During the pandemic the hierarchy looks almost the same except for the fourth place that was the taste. After the pandemic the importance of the four top food quality indicators in descending order is: information about HACCP/ISO 2200, lack of food additives, ingredient from organic farming and the taste of food. It may be caused by the connection with health but also with the need for pleasure as well as the lower level of trust.

H4: The importance of the objective characteristics of food quality i.e. food standards and certification is of higher importance during and after the pandemic than before.

Yes and no. The only one high food quality characteristics that was chosen more frequently during the pandemic than before was the taste of the food – “if the food tastes me well” what shows the subjective perception. On the other hand, when to compare the results before and during the pandemic with after the pandemic it is shown that the importance of food standards as the indicators of high food quality has increased what represents the objective characteristic.

H5: The percentage of indications of of high food quality characteristics was higher among the consumers who trust other people/institutions.

Not always. The consumers who trust other people/institutions usually less frequent indicated the high food quality characteristics. This problem needs further studies. Maybe it was caused by the fact that if they trust other people/institutions, they do not need to pay attention to many characteristics of food as others are responsible for food quality. This situation changed after the pandemic when the level of trust was much lower. Then the most consumers paid attention to food certifications.

7. Conclusions

The COVID-19 pandemic has changes our reality. It has been the source of stress for many people around the world. Due to the restrictions implemented for many of us the obvious buying behavior was unable, i.e. the access to shops, restaurants etc. As this research shows the taste of food has increased in its importance as the indicator of high quality of food. Perhaps because of a greater appreciation of the taste of food, as COVID-19 often caused the taste to disappear, or the taste of food is a source of pleasure, which helps to relieve tension and stress caused by, among others, the pandemic. Still (before the pandemic and during and after it) the three most popular characteristics of high food quality are: lack of food additives, ingredients from organic farming, information about HACCP/ISO 22000 while the brand of products has lost importance and has given way to taste. However, after the COVID-19 pandemic the importance of the information about HACCP/ISO 22000 has increased what shows the importance of the role of hygiene, food safety and the need for the information consumers can trust. The level of perceived stress and trust trust in other people and institutions, and their impact on perceptions of high-quality food were also examined. It was shown that consumers who are characterized by the high average perceived stress as well as consumers who generally do not trust other people or institutions most often mentioned lack of food additives and ingredients from organic farming and food certification as the indicators of high food quality.

Acknowledgments

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