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ANNA PLATTA, ANNA MIKULEC, MONIKA RADZYMIŃSKA,
GRZEGORZ SUWAŁA

VALUES IN THE CHOICE OF FUNCTIONAL FOODS - STUDIES OF SELECTED CONSUMER-RELATED QUALITY ATTRIBUTES

S u m m a r y

Background. Consumer acceptance and willingness to consume functional foods (FF) is a complex and slow process that depends on many factors. Therefore, understanding consumer responses to FF is essential. The aim of this study was to investigate the relationship between the determinants of consumers' functional food purchasing decisions and sociodemographic characteristics (gender, place of residence, income level, lifestyle). The study used a survey measurement method. A survey questionnaire (Google forms) was the research instrument. The survey was conducted among 422 young consumers, represented by members of Generation Z, in 2024 and 2025. A scale reliability analysis was performed based on Cronbach's α coefficients. The Spearman's rank correlation analysis was done to determine the strength and significance of relationships between dependent variables and independent variables. The study has certain limitations.

Results and conclusions. It was observed that people who pay attention to foods with high nutritional value show a positive correlation both with FFA (0.23) and FFR (0.22). In contrast, those with high health consciousness show a positive correlation with FFA (0.17). On the basis of the analyses performed, it was shown that there is a relationship between elements describing the lifestyle of young consumers, such as concern for health and consumption of foods with high nutritional value of the product and positive attitudes and opinions regarding functional foods. In addition, it was found that the product values related to quality, composition, health, ecological and sensory values, price, availability and diverse assortment are of greatest importance in the decision to purchase functional foods by young buyers, representatives of generation Z in Poland.

Keywords: functional foods, product values, quality attributes, attitudes, young consumers

Dr inż. A. Platta ORCID: 0000-0002-7963-1889, Faculty of Management and Quality Science, Gdynia Maritime University, 81-87 Morska St. 81-225 Gdynia; dr inż. A. Mikulec, ORCID: 0000-0002-2737-5967, Faculty of Engineering Sciences, University of Applied Science in Nowy Sącz, 1a Zamenhofa St., 33-300 Nowy Sącz; dr inż. M. Radzymińska ORCID: 0000-0003-0531-268X, Faculty of Economic Sciences, Institute of Management Science and Quality, University of Warmia and Mazury in Olsztyn, 4 Oczapowskiego St., 10-719 Olsztyn; dr inż. G. Suwała ORCID: 0000-0002-7857-2282 Department of Food Product Quality, Krakow University of Economics, 27 Rakowicka St., 31-510 Kraków, Poland.
Kontakt: e-mail: a.platta@wznj.umg.edu.pl

Introduction

Functional foods (FF) have received significant attention from researchers over the decades, particularly in the areas of food nutritional improvement and technological innovation [4, 8, 36]. The European Consensus document states that 'a food may be considered functional if it is satisfactorily demonstrated to have a beneficial effect on one or more target functions in the body, in addition to their respective nutritional effects, in a way that is relevant to improving health and well-being and/or reducing the risk of disease' [23]. The ageing of the world's population, the increased development of chronic diseases and the steady increase in life expectancy and quality of life have led to the need to develop foods with proven safety, enriched with appropriate nutrients [3, 4, 6]. Consuming foods enriched with functional ingredients (e.g. vitamins, minerals, probiotics, fiber, antioxidants and other components) can reduce the risk of developing chronic diseases and improve a person's physical and mental well-being [4, 13, 31]. The acceptance of FF also increases with belief in the health benefits of new foods, knowledge [29, 33] and the presence of a sick member in the family [33]. According to Siegrist et al. [26], cultural factors play a significant role in FF acceptance. Siegrist et al. [26] found that food neophobia had a negative impact on FF acceptance in a Chinese population sample, but the authors did not observe such a relationship in a German population sample. Therefore, caution should be taken in generalizing the results of studies on FF acceptance conducted in European countries to others [26]. Furthermore, Siró et al. [27] found that populations living in Southern Europe accept FF less unconditionally and with more reservations compared to Americans [5, 15]. Surveys among adult, educated Greeks showed that they were aware of the principles of healthy eating and considered FF as an important nutritional supplement with beneficial effects. In addition, they expressed a degree of uncertainty (concern) about the reliability of product labelling and health claims made [30]. In addition to concerns about the safety of these products, Europeans are more critical of processes that move away from traditional food production methods [15, 22]. It should also be noted that different demographic groups may prefer different functional foods [14]. Consumers' dietary choices may be influenced by their nationality. Functional food researchers should therefore note that findings from one geographical area or cultural group may not be applicable in other geographical or cultural contexts. Therefore, when marketing functional foods to consumers, socio-demographic characteristics should be carefully considered in order to reach specific consumer groups [4]. The variety of factors and the complex relationships between them make it difficult to describe general trends that would benefit researchers and functional food manufacturers when developing and marketing functional foods. According to published research, functional food product labels should accurately communicate the type of functional ingredients and their benefits for human health [11, 18, 19, 35]. Another factor that influences consumer ac-

ceptance of functional foods is advertising, especially in relation to trust and credibility [20, 25, 34]. Health professionals [25], scientists [21] or healthy-looking individuals who appear to be aware of the role of physical activity in health promotion should be employed to promote functional foods, in advertising campaigns and related promotional materials [20]. This is because consumers perceive individuals in these roles as believable and trustworthy [4].

Consumer acceptance of FF is a complex and slow process that depends on many factors [9]. Consumer uncertainty and skepticism towards new functional foods can affect their acceptance of such products [10, 27, 28]. Therefore, understanding consumer reactions to FF is crucial [27]. Given that young buyers represent an important segment of particularly informed buyers [37], the aim of this study was to investigate the relationship between the values conditioning functional food (FF) purchasing decisions and the characteristics of young consumers (gender, place of residence, income level, lifestyle).

The following research hypotheses were formulated:
H1: Attitudes (FFA) and opinions (FFR) about functional foods are related to consumer characteristics such as gender, place of residence, income level and lifestyle;
H2: There is a correlation between consumers' quality characteristics, attitudes (FFA) and opinions (FFR) about functional foods and determinants of purchase decisions.

Research methodology

Subjects

The survey was carried out on a group of 422 young consumers aged between 18 and 29 (Generation Z). The selection of the survey sample was purposive. The criterion of purposefulness was the age of the respondent. The participants of the study were young people (women and men) declaring to eat all foods, not limiting the consumption of meat or animal products. Among the respondents, women accounted for 63.51 % of all respondents and men for 36.49 % of all respondents (Table 1). In terms of the size of the place of residence, the largest group comprised residents of cities with a population of 150,000 to 500,000 (27.25 %) and cities with a population of more than 500,000 (21.56 %) (tab. 1). An analysis of the respondents' economic situation showed that the majority of them (41.47 %) declared an income allowing them to cover some but not all expenses. More than one-third (31.75 %) indicated that they could afford everything and they could still save, and 13.98 % of the respondents declared that their income was only sufficient to meet basic needs (tab. 1). In terms of place of residence, by administrative division, most participants came from the Pomorskie Province (29.38%), followed by the Mazowieckie Province (13.03 %) and the Warmińsko-Mazurskie Province (11.14 %). In terms of the field of study, students studying social

sciences (52.84 %), medical and health sciences (15.88 %) and humanities (13.74 %) dominated (tab. 1). The study has some limitations. Despite the large size of the study group, the results obtained are not representative and cannot be generalized to the population of young buyers in Poland.

Table 1. Characteristics of the respondents (N = 422)
Tabela 1. Charakterystyka badanej grupy respondentów (N = 422)

Characteristics of the consumers / Cechy konsumentów	Number of people / Liczba osób	% total / % ogółu
Gender/ Płeć		
Women / kobiety	268	63.51
Men / mężczyźni	154	36.49
Place of residence / Miejsce zamieszkania		
Village/ wieś	87	20.62
City with a population of up to 50,000 / miasto o populacji do 50 tys.	65	15.40
City with a population between 50,000 and 150,000 / miasto o populacji od 50 tys. do 150 tys.	64	15.17
City with a population between 150,000 and 500,000 / miasto o populacji od 150 tys. do 500 tys.	115	27.25
City with a population > 500,000/ miasto o populacji > 500 tys.	91	21.56
Declared level of income per month / Deklarowany poziom dochodów w skali miesiąca		
Is wholly insufficient / jest całkowicie niewystarczający	19	4.50
Can only meet basic needs / pozwala zaspokoić jedynie podstawowe potrzeby	59	13.98
I/we can cover some but not all expenses / stać mnie/nas na niektóre, ale nie na wszystkie wydatki	175	41.47
I/we can afford everything / stać mnie/nas na wszystko	35	8.29
I/we can afford everything and I / we can still save/ stać mnie/nas na wszystko i jeszcze mogę/możemy zaoszczędzić	134	31.75
Province / Województwo		
Pomorskie Province / pomorskie	124	29.38
Mazowieckie Province / mazowieckie	55	13.03
Warmińsko-Mazurskie Province / warmińsko-mazurskie	47	11.14
Śląskie Province / śląskie	46	10.90
Małopolskie Province / małopolskie	21	4.98
Dolnośląskie Province / dolnośląskie	21	4.98
Wielkopolskie Province / wielkopolskie	19	4.50
Lubelskie Province / lubelskie	16	3.79
Podkarpackie / podkarpackie	14	3.32
Kujawsko-Pomorskie Province / kujawsko-pomorskie	14	3.32
Zachodniopomorskie Province / zachodniopomorskie	13	3.08
Łódzkie Province / łódzkie	11	2.61

Opolskie Province / opolskie	6	1.42
Podlaskie Province / podlaskie	6	1.42
Lubuskie Province / lubuskie	5	1.18
Świętokrzyskie Province / świętokrzyskie	4	0.95
Field of study / studiowana dziedzina nauki		
Social sciences / nauki społeczne	223	52.84
Medical and health sciences / nauki medyczne i nauki o zdrowiu	67	15.88
Humanities / nauki humanistyczne	58	13.74
Natural sciences / nauki ścisłe i przyrodnicze	33	7.82
Engineering and technical sciences / nauki inżynieryjno-techniczne	19	4.50
Agricultural sciences / nauki rolnicze	10	2.37
Arts / dziedzina sztuki	8	1.90
Theological sciences / nauki teologiczne	4	0.95

Questionnaire and data analysis

The empirical research was carried out in 2024 and 2025. The research used a survey measurement method. The research instrument was a survey questionnaire. The survey was conducted in an indirect form using the CAWI method (Google forms). All respondents gave voluntary, informed consent to participate in the study and were assured of its anonymity. Approval for the study was obtained from the University Research Ethics Committee of the Cracow University of Economics No. KEBN/71/0044/D34/2024. The first section of the questionnaire comprised the demographics, including variables such as gender, place of residence, self-assessed financial situation and field of study.

The research tool was constructed in such a way that the variables analyzed were a source of data allowing to achieve the assumed research goal and enabling verification of the research hypothesis under consideration. A set of statements adapted from studies/works by other authors was used while preparing the survey questionnaire, which ultimately contained items related to:

– Attitudes towards functional foods (FFA) (7 items): (1) "*I eat functional foods out of concern for my health*", (2) "*I enjoy eating functional foods*", (3) "*Functional foods are not tasty*", (4) "*Functional foods are too expensive to buy instead of traditional foods*", (5) "*Functional foods are not healthier than traditional foods*", (6) "*Functional foods are not generally available - you cannot buy them in every shop*", (7) "*My family and friends do not support the purchase of functional foods*". The items included on the intention scale were adapted from the study by Roininen et al. [24] and modified for the ongoing study.
– Opinions on the role of functional foods (FFR) (3 items): (1) "*It's great that today's technology makes it possible to produce functional foods that are safe for consum-*

ers", (2) "*Functional foods improve well-being*", (3) "*Functional foods help solve existing nutritional problems in the world*". The items included on the intention scale were adapted from the study by Roininen et al. [24] and modified for the ongoing study.

– Lifestyle (8 items): (1) "*I am a person committed to work*", (2) "*I am a person committed to studying*", (3) "*I am a pleasure-oriented person*", (4) "*I am a person who values convenience and speed of food preparation*", (5) "*I am a person who pays attention to the consumption of food with high nutritional value*" (6) "*I am a person who values the culinary traditions of the region of origin*",(7) "*I am a person with high health consciousness*", (8) "*I am a person with high physical activity*". The first, fifth, sixth and seventh item was adapted from Arvola et al. [2], and the others (2, 3, 4, 8) were additional.

During the survey, the respondents expressed their level of approval or disapproval of all the posted items using a five-point Likert scale, where the values means: 1- "definitely no", 2 - "no", 3 – "I do not know, I have no opinion", 4 - "yes", 5 - "definitely yes" [16].

Attitudes towards functional foods and opinions on the role of functional foods were assessed by dividing the respondents into three groups. The values of a mean and standard deviation were the criterion for the division of the respondents. Based on the sum of the scores, those with positive (Xśr+SD and above), ambivalent (Xśr-SD to Xśr+SD) and negative attitudes (Xśr-SD and below) were selected. For the scales used to assess attitudes towards functional foods, statements containing negation were recoded: FFA - statements number: 3, 4, 5, 6, 7.

With the intention of verifying the purpose of the study, the respondents were asked to indicate to what extent the 23 product-related factors presented in the survey influenced their decisions to purchase functional foods. The following factors were assessed: (1) the quality of the product, (2) the health benefits of the product, (3) the product manufacturing without the use of pesticides and fertilizers, (4) the product manufacturing without the use of synthetic additives, (5) the composition of the product, (6) the interesting, attractive taste and smell, (7) the organic origin of raw materials used in production, (8) the country of origin of the product (Poland), (9) the price, (10) the availability of the product, (11) the variety of assortment, (12) biodegradability, (13) the possibility to recycle packaging, (14) the size of packaging, (15) the reputation of a manufacturer, (16) habits, (17) a feeling of bond with the company, (18) the opinions of friends/family members, (19) the product brand, (20) free delivery, (21) sales promotion, (22) the promotion of the product by famous people, (22) advertising in media. The items were adapted from Wesołowski et al. [37], and the others (3, 6, 11, 14) were additional.

In order to find out which of the 23 factors might influence functional food purchasing decisions, the respondents were asked to indicate their answers on a bipolar, five-point scale with labels: 1 – "*definitely no*", 2 – "*no*", 3 – "*I do not know, I have no opinion*", 4 – "*yes*", 5 – "*definitely yes*" [16].

The empirical material collected was presented in the form of a percentage distribution of the answers given and selected descriptive statistics such as a median, mean, standard deviation. The empirical material collected from the surveys was subjected to a statistical analysis using the following methods:

- A scale reliability analysis based on Cronbach's α coefficients. These methods were used in the initial stage of the data analysis to assess the relevance and reliability of the scales used in the research tool. The reliability analysis for the attitudes towards functional foods (FFA) scale Cronbach's α was 0.605 and for the opinions on the role of functional foods (FFR) scale Cronbach's α was 0.698.
- The Spearman's rank correlation analysis. Using Spearman's rank correlation, the relationships between consumer characteristics (gender, place of residence, income level, lifestyle) and attitudes towards functional foods and opinions on their role were determined.
- The Exploratory Factor Analysis was used to identify and extract factors influencing the perception of functional foods. Based on the scree plot, the five most significant ones were selected for further exploratory factor analysis. The number of factors was determined based on the inflection point of the graph, indicating the optimal number of components explaining a significant proportion of the variance in the data set. Only factor loadings with a value equal to or greater than 0.5 were considered for interpreting the results of the factor analysis, which is in line with the criterion of significance adopted in the literature. Adopting such a threshold allows the identification of variables that are strongly associated with a factor, which increases the relevance and clarity of the interpretation of the factor structure [Hair et al. 2019]. The KMO measure was 0.852, indicating very good sample adequacy.
- A significance level of $p < 0.05$ was assumed for all statistical analyses. Calculations were performed using Excel 2000 and Statistica 13.3 (Tibco Software, Palo Alto, USA).

Results

Ambivalent and positive attitudes towards functional foods predominated among the respondents (45.50 % and 39.91 %, respectively) (tab. 2). The high proportion of the respondents with ambivalent attitudes, who were unable to define their emotions towards functional foods, indicates the existence of a significant group of people who may be open to educational and promotional activities for foods from this product category. It is important to highlight the fact that the respondents had mostly positive

opinions about the role of functional foods in ensuring food security in society (tab. 3). Only 9.95 % of the respondents had negative opinions (tab. 3), indicating a relatively low level of skepticism among Generation Z representatives towards this type of food.

Table 2. Attitudes towards functional foods
Tabela 2. Postawy wobec żywności funkcjonalnej

Attitudes / Postawy	Number of people / Liczba osób	% total / % ogółu
Positive / Pozytywne	160	37.91
Ambivalent / Ambiwalentne	192	45.50
Negative / Negatywne	70	16.59

Table 3. Opinions on the role of functional food
Tabela 3. Opinie o roli żywności funkcjonalnej

Opinions / Opinie	Number of people / Liczba osób	% total / % ogółu
Positive / Pozytywne	200	47.39
Ambivalent / Ambiwalentne	180	42.66
Negative / Negatywne	42	9.95

When analyzing the correlations between FFA and FFR and consumer characteristics, positive correlations were observed with selected elements describing consumers' lifestyles. It was found that those who paid attention to the consumption of foods with high nutritional value showed a positive correlation with both attitudes towards functional foods (0.23) and opinions (0.22) about the role of functional foods in the population. It was also found that those with high health consciousness showed a positive correlation with attitudes towards functional foods (0.17) and opinions about functional foods (0.12) (tab. 4). Thus, it can be concluded that there is a relationship between health concerns and the nutritional value of the products consumed and positive attitudes and opinions towards functional foods.

When analyzing the correlations between FFA and FFR and the attributes describing functional foods, statistically significant positive correlations with attitudes and opinions were found for: product quality (0.14 and 0.12 respectively), health value of the product (0.14 and 0.18 respectively) and product composition (0.12 and 0.10 respectively). In contrast, for opinions on the role of FF, significant positive correlations were observed for: interesting, attractive taste and smell (0.14), organic origin of raw materials (0.16), product availability (0.20), variety of assortment (0.15), biodegradability (0.16), recyclability of packaging (0.11), reputation of the manufacturer (0.12) and free delivery (0.15) (tab. 5). The results obtained indicate the importance of not only the health, but also the ecological and sensory aspects of functional foods in the

decision to purchase functional foods by young buyers, representatives of Generation Z in Poland.

Table 4. Correlation between FFA and consumer characteristics
Tabela 4. Zależność między FFA i FFR a cechami konsumentów

Consumer quality characteristics / Cechy konsumentów	FFA	FFR
Gender / Płeć	0.03	0.10
Place of residence / Miejsce zamieszkania	0.02	0.04
Level of income per month / Poziom dochodu w skali miesiąca	0.05	0.14
Commitment to work / Zaangażowanie w pracę zawodową	0.05	0.01
Commitment to learning/ Zaangażowanie w naukę	0.04	0.12
Pleasure orientation / Zorientowanie na przyjemności	0.06	0.03
Appreciation of convenience and speed of food preparation / Docenianie wygody i szybkości przygotowywania posiłków	0.01	0.09
Attention to foods of high nutritional value / Zwracanie uwagi na żywność o wysokiej wartości odżywczej	**0.23**	**0.22**
Appreciation of the culinary traditions of the region of origin / Docenianie tradycji kulinarnych regionu pochodzenia	0.04	0.06
High health consciousness / Duża świadomość zdrowotna	**0.17**	**0.12**
High physical activity / Duża aktywność fizyczna	0.08	-0.06

Explanatory notes / Objaśnienia: bolded values differ significantly ($p < 0.05$) / wartości pogrubione różnią się istotnie ($p < 0.05$)

The results of the exploratory factor analysis made it possible to identify five categories of factors determining the decision to purchase functional foods by the surveyed group of young buyers (tab. 6): 1. health value and product quality; 2. price and product availability; 3. environmental aspects of the product; 4. brand and relationship with the company; 5. marketing impact.

Category 1 - health value and product quality. The product attributes that make up this category are: product quality (0.700), health value of the product (0.794), manufacture of the product without pesticides and fertilizers (0.664), manufacture of the product without synthetic additives (0.648) and product composition (0.715) (tab. 6). This category refers to aspects related to the health and quality of products, suggesting that consumers pay a lot of attention to these characteristics when buying food. Thus, it may provide an indication that manufacturers should emphasize the health and quality characteristics of functional foods offered for sale.

Table 5. Correlation between FFA and FFR and functional food characteristics
Tabela 5. Zależność między FFA i FFR a cechami opisującymi żywność funkcjonalną

Product attributes / Atrubuty produktu	FFA	FFR
Product quality / Jakość produktu	**0.14**	**0.12**
The health value of the product / Walory zdrowotne produktu	**0.14**	**0.18**
Product manufacturing without the use of pesticides or artificial fertilizers / Wytwarzanie produktu bez użycia pestycydów i nawozów sztucznych	0.02	**0.11**
Product manufacturing without the use of synthetic additives/ Wytwarzanie produktu bez użycia syntetycznych substancji dodatkowych	0.06	0.07
Product composition / Skład produktu	**0.12**	**0.10**
Interesting, attractive taste and smell / Ciekawy, atrakcyjny smak i zapach	0.04	**0.14**
Organic origin of raw materials used in production / Ekologiczne pochodzenie surowców wykorzystywanych do produkcji	0.03	**0.16**
Country of origin of the product (Poland) / Kraj pochodzenia produktu (Polska)	-0.03	0.01
Price / Cena	-0.07	0.03
Product availability / Dostępność produktu	0.06	**0.20**
Variety of assortment / Różnorodność asortymentu	0.00	**0.15**
Biodegradability / Biodegradowalność	0.03	**0.16**
Recyclability of packaging / Możliwość recyklingu opakowania	-0.04	**0.11**
Pack size / Wielkość opakowania	-0.06	-0.02
Reputation of the manufacturer / Reputacja producenta	0.01	**0.12**
Habit / Przyzwyczajenie	-0.01	0.08
Sense of loyalty to the company / Poczucie więzi z firmą	-0.03	0.04
Opinions of friends or family members / Opinie znajomych lub członków rodziny	-0.05	0.08
Product brand / Marka produktu	-0.03	0.09
Free delivery / Darmowa dostawa	-0.01	**0.15**
Sales promotion / Promocja sprzedaży	0.00	0.09
Famous people promoting the product / Promowanie produktu przez znane osoby	-0.03	0.07
Media advertising / Reklama w mediach	-0.02	0.07

Explanatory notes / Objaśnienia: bolded values differ significantly ($p < 0.05$) / wartości pogrubione różnią się istotnie ($p < 0.05$)

Category 2 - the price and availability of the product. Product-related attributes included in this category were: interesting, attractive taste and smell (0.500), price (0.741), product availability (0.722) and variety of assortment (0.561) (tab. 6). These factors indicate that consumers pay attention to availability, variety and affordability when purchasing functional foods. This may indicate the need to increase the range, optimize prices and distribute functional foods widely.

Table 6. Categorization of product attributes conditioning young buyers' FF purchasing decisions
Tabela 6. Kategoryzacja atrybutów produktów warunkujących podejmowanie decyzji zakupowych FF przez młodych nabywców

Product attributes / Atrybuty produktu	Category / Kategoria					Specificity / Swoistość
	1	2	3	4	5	
Product quality / Jakość produktu	**0.700**					0.475
The health value of the product / Walory zdrowotne produktu	**0.794**					0.332
Product manufacturing without the use of pesticides or artificial fertilizers / Wytwarzanie produktu bez użycia pestycydów i nawozów sztucznych	**0.664**					0.306
Product manufacturing without the use of synthetic additives / Wytwarzanie produktu bez użycia syntetycznych substancji dodatkowych	**0.648**					0.371
Product composition / Skład produktu	**0.715**					0.395
Interesting, attractive taste and smell / Ciekawy, atrakcyjny smak i zapach		**0.500**				0.559
Organic origin of raw materials used in production / Ekologiczne pochodzenie surowców wykorzystywanych do produkcji			**0.541**			0.454
Country of origin of the product (Poland) / Kraj pochodzenia produktu (Polska)			0.439			0.732
Price / Cena		**0.741**				0.394
Product availability / Dostępność produktu		**0.722**				0.400
Variety of assortment / Różnorodność asortymentu		**0.561**				0.496
Biodegradability / Biodegradowalność			**0.868**			0.185
Recyclability of packaging / Możliwość recyklingu opakowania			**0.768**			0.346
Pack size / Wielkość opakowania				0.328		0.782
Reputation of the manufacturer / Reputacja producenta				0.469		0.627
Habit / Przyzwyczajenie				0.484		0.608
Sense of loyalty to the company / Poczucie więzi z firmą				**0.779**		0.394
Opinions of friends or family members / Opinie znajomych lub członków rodziny				0.486		0.629
Product brand / Marka produktu				**0.741**		0.378
Free delivery / Darmowa dostawa				0.423		0.577
Sales promotion / Promocja sprzedaży					0.420	0.624
Famous people promoting the product / Promowanie produktu przez znane osoby					**0.835**	0.252
Media advertising / Reklama w mediach					**0.873**	0.227

Explanatory notes / Objaśnienia: bolded values differ significantly ($p < 0.05$) / wartości pogrubione różnią się istotnie ($p < 0.05$)

Category 3 - environmental aspects of the product. This category included product attributes such as the organic origin of raw materials used in production (0.541), biodegradability (0.868) and recyclability of packaging (0.768) (tab. 6). This indicates that for consumers, environmental issues are an important criterion for product selection. So, sustainable consumption is important for young buyers in their purchasing decisions.

Category 4 - brand and relationship with the company. The product attributes that were evaluated in this category were a sense of loyalty with the company (0.779) and the product brand (0.741) (tab. 6). From this part, it can be inferred that functional food manufacturers should place an emphasis on building long-term relationships with young buyers (representatives of Generation Z) of functional foods, with their customers, and building a positive image.

Category 5 - marketing impact. This category included product features such as famous people promoting the functional food product (0.835) and media advertising (0.873) (tab. 6). This result indicates that marketing activities have a significant influence on the purchasing decisions of young consumers. Based on that, it should be concluded that investing in advertising, promotion and cooperation with people influencing young buyers' opinions on functional food can be an effective marketing tool for shaping consumer preferences.

With regard to the first category of factors relating to health value and product quality, significant positive correlations were observed between positive attitudes and opinions towards functional foods and product quality (0.14 and 0.12 respectively), the health value of the product (0.14 and 0.18 respectively) and product composition (0.12 and 0.10 respectively). Gender significantly, positively correlated with all functional product attributes from 0.13 for product quality to 0.22 for product manufacturing without the use of synthetic additives. It was found that it was women who showed greater sensitivity to the composition, environmental performance and quality of products. Place of residence (0.13) and income level (0.11) correlated positively with the health value of the product. This indicates that people living in larger cities and with higher income are more likely to pay attention to the health aspects of functional foods.

In addition, an income level was also significantly correlated with the evaluation of product composition (0.11) (tab. 7). This indicates that there is a positive relationship between the level of income per month and knowledge of the composition of products and their impact on human health.

Table 7. Correlation between health value and product quality (1 category of factors) and consumer characteristics

Tabela 7. Korelacja pomiędzy wartością zdrowotną i jakością produktu (1 kategoria czynników) a cechami konsumentów

Product attributes / Atrybuty produktu	FFA	FFR	Gender / Płeć	Place of residence / Miejsce zamieszkania	Level of income per month / Poziom dochodu w skali miesiąca
Product quality / Jakość produktu	**0.14**	**0.12**	**0.13**	0.05	0.01
The health value of the product / Walory zdrowotne produktu	**0.14**	**0.18**	**0.18**	**0.13**	**0.11**
Product manufacturing without the use of pesticides or artificial fertilizers / Wytwarzanie produktu bez użycia pestycydów i nawozów sztucznych	0.02	**0.11**	**0.18**	**0.10**	0.00
Product manufacturing without the use of synthetic additives / Wytwarzanie produktu bez użycia syntetycznych substancji dodatkowych	0.06	0.07	**0.22**	0.07	0.02
Product composition / Skład produktu	**0.12**	**0.10**	**0.20**	0.08	**0.11**

Explanatory notes / Objaśnienia: bolded values differ significantly ($p < 0.05$) / wartości pogrubione różnią się istotnie ($p < 0.05$)

For the second category of factors relating to price and product availability, positive opinions on the role of FF significantly correlated with interesting, attractive taste and smell (0.14), perceived product availability (0.20) and variety of assortment (0.15). Gender also correlated significantly with price (0.10), availability (0.16) and variety of assortment (0.22). The results indicate that women attach more importance to price, availability and variety of functional products. Level of income per month positively correlated only with interesting, attractive taste and smell (0.14), suggesting that more affluent consumers pay more attention to the sensory attributes of products (tab. 8).

For the third category of factors relating to the environmental aspects of the product, positive consumer opinions were associated with higher ratings for the organic origin of raw materials used in production (0.16), biodegradability (0.16) and recyclability of packaging (0.11). Gender again showed significant correlations, as women valued both the organic origin of raw materials used in production (0.20), biodegradability (0.19) and recyclability of packaging (0.18) to a greater extent than men (tab. 9). This underlines the increasing importance of environmental aspects in the evaluation of functional products, especially among women.

Table 8. Correlation between price and product availability (2nd category of factors) and consumer characteristics

Tabela 8. Korelacja pomiędzy ceną i dostępnością produktu (2 kategoria czynników) a cechami konsumentów

Product attributes / Atrybuty produktu	FFA	FFR	Gender / Płeć	Place of residence / Miejsce zamieszkania	Level of income per month / Poziom dochodu w skali miesiąca
Interesting, attractive taste and smell / Ciekawy, atrakcyjny smak i zapach	0.04	**0.14**	0.08	-0.01	**0.14**
Price / Cena	-0.07	0.03	**0.10**	0.03	0.02
Product availability / Dostępność produktu	0.06	**0.20**	**0.16**	0.04	0.02
Variety of assortment / Różnorodność asortymentu	0.00	**0.15**	**0.22**	0.00	0.07

Explanatory notes / Objaśnienia: bolded values differ significantly ($p < 0.05$) / wartości pogrubione różnią się istotnie ($p < 0.05$)

For the fourth category of factors related to brand and company loyalty, no significant correlations were observed (tab. 10). The result may indicate that purchasing decisions for functional foods are based on an objective assessment of product attributes rather than brand or company loyalty.

Table 9. Correlation between environmental aspects of the product (3rd category of factors) and consumer attributes

Tabela 9. Korelacja pomiędzy ekologicznymi aspektami związanymi z produktem (3 kategoria czynników) a cechami konsumentów

Product attributes / Atrybuty produktu	FFA	FFR	Gender / Płeć	Place of residence / Miejsce zamieszkania	Level of income per month / Poziom dochodu w skali miesiąca
Organic origin of raw materials used in production / Ekologiczne pochodzenie surowców wykorzystywanych do produkcji	0.03	**0.16**	**0.20**	0.04	0.05
Biodegradability / Biodegradowalność	0.03	**0.16**	**0.19**	-0.03	-0.02
Recyclability of packaging / Możliwość recyklingu opakowania	-0.04	**0.11**	**0.18**	0.02	-0.02

Explanatory notes / Objaśnienia: bolded values differ significantly ($p < 0.05$) / wartości pogrubione różnią się istotnie ($p < 0.05$)

Table 10. Correlation between brand and company loyalty (4th category of factors) and consumer characteristics
Tabela 10. Korelacja pomiędzy marką i relacją z firmą (4 kategoria czynników) a cechami konsumentów

Product attributes / Atrybuty produktu	FFA	FFR	Gender / Płeć	Place of residence / Miejsce zamieszkania	Level of income per month / Poziom dochodu w skali miesiąca
Sense of loyalty to the company / Poczucie więzi z firmą	-0.03	0.04	0.04	0.01	-0.03
Product brand / Marka produktu	-0.03	0.09	0.02	0.00	0.03

Explanatory notes / Objaśnienia: bolded values differ significantly ($p < 0.05$) / wartości pogrubione różnią się istotnie ($p < 0.05$)

Regarding the fifth category of factors concerning marketing impact, significant negative correlations were found between place of residence and promotion of the product by famous people (-0.10) and media advertising (-0.10) (tab. 11). This means that the larger the city of residence, the less importance is attributed to marketing messages. Residents of large cities show a greater distance towards the influence of advertising and celebrities or influencers on their purchasing decisions, which may indicate higher consumer consciousness.

Table 11. Correlation between marketing impact (5th category of factors) and consumer characteristics
Tabela 11. Korelacja pomiędzy oddziaływaniem marketingowym (5 kategoria czynników) a cechami konsumentów

Product attributes / Atrybuty produktu	FFA	FFR	Gender/ Płeć	Place of residence / Miejsce zamieszkania	Level of income per month / Poziom dochodu w skali miesiąca
Famous people promoting the product / Promowanie produktu przez znane osoby	-0.03	0.07	-0.07	**-0.10**	-0.09
Media advertising / Reklama w mediach	-0.02	0.07	-0.04	**-0.10**	-0.05

Disscussion

The literature reports that studies on consumer attitudes towards functional foods indicate the complexity of factors influencing acceptance and purchase choices, especially among representatives of Generation Z [12]. On the basis of our own research, it was shown that among young consumers (representatives of Generation Z), those with ambivalent and positive attitudes towards functional foods predominate, while those with negative attitudes represent only about 16 %. The dominant opinions about the role of functional foods are positive and ambivalent, confirming the low level of skep-

ticism towards this product category. This distribution of attitudes and opinions suggests the openness of the surveyed young consumers to functional foods. Gender is an important factor differentiating attitudes and opinions towards functional foods. Women, more often than men, have positive attitudes and are interested in health issues, product quality attributes and sustainable production. Our research does not overlap with consumer surveys in Finland. Urala and Lähteenmäki [32] found that men and women in Finland did not differ in their attitudes towards functional foods.

The results of our study regarding the importance of health concern as an important determinant of functional food acceptance are confirmed by studies on Norwegian and Finnish consumers' attitudes and intentions regarding the consumption of functional foods [7, 32]. In these studies, the authors showed that utilitarian nutritional values related to hunger satisfaction [7] and health concerns [7, 32] clearly outweighed hedonistic (taste) nutritional values as the explanatory basis for Norwegian consumers' attitudes towards consuming functional foods. Also, our study confirmed that the ecological and sensory characteristics of products primarily influenced young consumers' opinions about the role of functional foods. This may indicate that these elements shape young consumers' overall positive perception of functional foods. Marketing and brand loyalty do not significantly influence the attitudes and opinions of the surveyed young functional food purchasers, suggesting that young consumers make purchasing decisions mainly based on the specific product characteristics rather than the product image. Those living in larger cities and with higher incomes are more particular about the health-promoting properties and composition of products, confirming the link between a socioeconomic status and nutritional consciousness. The research conducted indicates the multidimensionality of factors influencing young consumers' acceptance of functional foods, which is confirmed by Baker et al. [4]. Based on a review of published studies, Baker et al. [4] identified five main categories of determinants of consumer acceptance of functional foods: product characteristics, sociodemographic characteristics, psychological characteristics, consumer behavior and physical characteristics of the product. The literature also states that consumer attitudes towards functional foods are unstable, and that functional foods may be approaching the status of conventionally healthy foods in the future (The functional foods may be approaching the status of conventionally healthy foods) [32].

As identified by Halicka et al. [12], the key determinants of the decision to purchase functional foods by adults representing Generation Z living in Polish cities are taste, price and health aspects of products [12]. Also Makowska et al. [17] showed that, among Polish consumers, the most important factors in food choice are product quality (69.0 %), price (68.6 %) and information on product composition (41.0 %). Younger generations, including Generation Z, place more emphasis on the price of the product compared to older generations, suggesting that affordability is key for this demograph-

ic group [17]. The analysis of the results of our own study showed similar correlations. Based on Spearman's rank correlation, gender, and to a lower level, place of residence and income level, were found to differentiate the purchase factors of functional foods by the studied group of young purchasers. Women, residents of larger cities and those with higher incomes proved to be more discerning about the health values and quality of functional foods. Marketing and loyalty factors, on the other hand, have a limited influence on young buyers' functional food purchase decisions. Significant differences by gender and place of residence were also observed related to the perceived importance of attributes associated with functional food purchase decisions. Women indicated a significantly greater role of characteristics related to food quality and organic production in their purchase decisions. This implies that women take a more conscious approach than men to choosing functional foods for consumption, guided by health and environmental concerns. In addition, it was shown that for residents of large cities, the health qualities of the product and its composition were important when choosing functional foods for consumption, and that they did not consider marketing factors. Thus, it can be estimated that young women and residents of larger cities constitute the group most open to functional foods. Summarizing the results of the analyses conducted, it was found that factors related to the health value of the product, quality, availability and environmental aspects are of key importance in the decision to purchase functional foods by young buyers (representatives of Generation Z in Poland). In the context of the environmental aspects of products, our study is in line with the research of Andruszkiewicz and Wierzejski [1], who showed that young consumers of Generation Z in Poland and Germany are increasingly environmentally conscious, which translates into their purchasing preferences. However, despite the increasing awareness, the organic food market in Poland is growing slower than in Germany, which may be due to differences in income and the level of organic education [1].

Conclusions

1. The article showed that there is a relationship between elements describing young consumers' lifestyles, such as concern for health and consumption of foods with high nutritional product value and positive attitudes and opinions about functional foods.
2. There is a relationship between young consumers' characteristics, attitudes and opinions about functional foods and product factors determining purchase decisions. Product attributes related to quality, composition, health, organic and sensory characteristics, price, availability and diverse assortment are of greatest importance in the purchasing decisions of young buyers, representatives of Generation Z in Poland. In contrast, the influence of marketing activities or the relationship with the brand or company was insignificant in the study group.

3. The acceptance of functional foods by young consumers is a combination of factors related to quality, price, health and environmental aspects. Producers should therefore emphasize the transparency of ingredients, highlight health benefits and include ecological aspects in order to respond effectively to the expectations of this consumer group.

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WARTOŚCI W WYBORZE ŻYWNOŚCI FUNKCJONALNEJ - STUDIA WYBRANYCH CECH JAKOŚCIOWYCH ZWIĄZANYCH Z KONSUMENTEM

S t r e s z c z e n i e

Wprowadzenie. Akceptacja i gotowość do spożycia żywności funkcjonalnej (FF) przez konsumentów jest złożonym i powolnym procesem, który zależy od wielu czynników. Dlatego zrozumienie reakcji konsumentów na FF ma kluczowe znaczenie. Celem badania było zbadanie związku między wartościami warunkującymi podejmowanie decyzji zakupowych żywności funkcjonalnej a charakterystyką socjodemograficzną (płeć, miejsce zamieszkania, poziom dochodów, styl życia). W badaniach wykorzystano metodę pomiaru sondażowego. Instrumentem badawczym był kwestionariusz ankiety (formularze Google). Badania przeprowadzono wśród 422 młodych konsumentów, przedstawicieli pokolenia Z, w 2024 i 2025 roku. Przeprowadzono analizę rzetelności skali w oparciu o współczynniki α Cronbacha. Do ustalenia siły oraz istotności związków między zmiennymi zależnymi a zmiennymi niezależnymi przeprowadzono analizę korelacji rang Spearmana. Badanie ma pewne ograniczenia.

Wyniki i wnioski. Zaobserwowano, że osoby zwracające uwagę na żywność o wysokiej wartości odżywczej, wykazują dodatnią korelację zarówno z FFA (0.23), jak i z FFR (0.22). Natomiast osoby o dużej świadomości zdrowotnej wykazują dodatnią korelację z FFA (0.17). Na podstawie przeprowadzonych analiz wykazano, że istnieje związek między elementami opisującymi styl życia młodych konsumentów, takimi jak troska o zdrowie i spożywanie żywności o wysokiej wartości odżywczej produktu a pozytywnymi postawami i opiniami dotyczącymi żywności funkcjonalnej. Ponadto stwierdzono, że największe znaczenie w podejmowaniu decyzji o zakupie żywności funkcjonalnej przez młodych nabywców, przedstawicieli pokolenia Z w Polsce, mają wartości produktowe związane z jakością, składem, walorami zdrowotnymi, ekologicznymi, sensorycznymi, ceną, dostępnością i różnorodnym asortymentem.

Słowa kluczowe: żywność funkcjonalna, wartości produktowe, cechy jakościowe, postawy, młodzi konsumenci