

## KNOWLEDGE AND EATING HABITS REGARDING FUNCTIONAL FOOD AMONG ADULTS

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### ABSTRACT

**Background.** Functional food is a key element in the prevention and treatment of many diseases. The ingredients it contains, such as phytosterols that lower cholesterol, also have a preventive effect on type 2 diabetes, atherosclerosis and heart attack. Phenolic compounds have antioxidant, anti-inflammatory and antiviral properties. Xylo-oligosaccharides control insulin levels, and fibre lowers blood pressure, potentially reducing insulin resistance. These beneficial properties mean that there is an increasing interest in this kind of food.

**Objective.** The aim of the study was to assess the state of knowledge and behaviour regarding functional food among adults and to answer the question whether there are differences between the state of knowledge and behaviour of women and men.

**Material and methods.** The survey was conducted among 301 people, including 181 women and 120 men. The research tool was an original survey questionnaire.

**Results.** The definition of functional food is known to 42.5% of people (47.5% of women and 35% of men), while the definition of prebiotic is known to 41.9% of people (43.1% of women and 40.0% of men). For 56.2% of respondents, the factor encouraging the consumption of functional food was a healthy lifestyle, and for 54.7% of them, the product composition was the main purchase criterion. Among functional products, cereals or muesli were most often consumed for breakfast by 35% of men and 55.8% of women, 42.5% of men and 33.7% of women were eaten oils for lunch. For dinner they most often consumed fruit teas, herbal teas, herbal mixtures, this answer was given by 25.8% of men and 29.8% of women.

**Conclusions.** Knowledge of functional foods is unsatisfactory, and no differences in the knowledge of women and men have been observed. Consumption of functional food is generally low, and no differences in consumption have been observed between women and men.

**Key words:** *functional food, eating habits, nutritional knowledge, adults*

### INTRODUCTION

Functional food is this kind of food that has a proved beneficial effect on functioning of the body by reducing the risk of certain diseases, improving well-being and, consequently, increasing the quality of life of people who consume it [24]. These foods may have a beneficial effect on both one and several body functions. In addition to the ingredients normally included in its composition, it also contains additional substances or an increased concentration of one of the ingredients originally included in its composition [24].

Nowadays, there is an increasing interest in maintaining a good quality of life, and one of the methods is taking care of health. This has led to an

increase in consumer interest in functional foods. Its attractiveness arises from the possibility of application by various consumer groups, such as pregnant women, infants, children, school youth, elderly individuals, and athletes. Additionally, its preventive and therapeutic properties in the context of many diseases are appealing. [11]. The presence of phytosterols in its composition lowers cholesterol levels, preventing atherosclerosis and type 2 diabetes. [17,19]. The phenolic compounds contained in it have antioxidant, anti-inflammatory, antibacterial, antiviral and antithrombotic properties [14]. Functional food plays a crucial role in the prevention of cardiovascular diseases, protection of the central and peripheral nervous systems, increase in the number of T

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lymphocytes, and improvement of immune function. [16, 26, 27].

Additionally, it exhibits anticancer properties [9]. Polyphenols in food lower blood pressure, improve endothelial function, normalize lipid profile, and minimize the risk of cardiovascular diseases [22]. They improve the condition of blood vessels and the circulatory system by factors vasoprotective [1]. They also protect the heart during chemotherapy [6]. Resveratrol and hydroxytyrosol inhibit platelet aggregation and reduce venous inflammation [22]. Xylooligosaccharides, as components of functional food, regulate insulin secretion without increasing the glucose level in the blood, thus preventing the occurrence of insulin resistance and diabetes [20]. They exhibit prebiotic properties, supporting immunity [20]. Dietary fiber present in functional products lowers blood pressure and may contribute to reducing insulin resistance, which is a cause of arterial hypertension [12, 18]. Continuous technological progress and a regularly increasing assortment on the food market encourage consumers to increase their knowledge in this area. Thanks to this, more and more people are aware of the health benefits of choosing functional products. Due to their versatile applications and increasing interest in them, an assessment of knowledge and behaviors related to their consumption has been undertaken. The study was conducted among employees in the food industry, considering the fact that they are responsible for its production. Their awareness and behaviors in this regard are therefore significant.

The aim of the study was to assess the state of knowledge and eating habits related to functional food among adults and to answer the question whether there are differences between the state of knowledge and habits among women and men.

## MATERIAL AND METHODS

301 people took part in the study, including 181 women and 120 men, average age - 39.9 years. The survey was conducted at the turn of July and August 2021 among employees of food industry plants in Katowice. The inclusion criterion was employment in departments directly involved in food production and conscious consent to participate in the study, while the exclusion criteria were employment in administrative departments and lack of consent to participate in the study. All study participants expressed their consent to the use of its results.

The research tool was an original anonymous survey questionnaire consisting of 25 questions, including both single and multiple-choice questions. The first part, referred to as the specification, included questions about gender, year of birth, education, place

of residence, number of people in the household, type of occupation and department of employment, as well as the weight and height of the respondents.

The questions included in the pivotal part covered knowledge about functional food and its consumption, knowledge of understanding of definition of functional food, recognizing correct statements about it, sources of information on functional products, and understanding the definition of prebiotics and their role. Participants were also asked to self-assess their knowledge of functional food. Consumption-related questions verified information such as consumption frequency, factors influencing its consumption, place of purchase, and types of functional products consumed.

Body weight and height were used to assess participants' BMI, following WHO criteria: underweight <18.5, normal weight - 18.5-24.99, overweight 25-29.99 and obesity  $\geq 30$  [23].

Statistical analysis was performed based on procedures available in the Statistica v. 13.3 program (StatSoft Inc., Tulsa, OK, USA). The statistical significance of differences between the frequencies of qualitative variables was assessed based on the results of the Pearson *Chi*-square test, the Yates correction test and the Fisher exact test. The correlation analysis was performed based on the  $\Phi$ -Yule and V-Cramer contingency coefficient. The interpretation of the results was based on the criterion of statistical significance  $p < 0.05$ .

## RESULTS

301 people took part in the study, including 60.1% (N=181) women and 39.9% (N=120) men. The largest group were people aged 41-50, 32.6% (N=98), with secondary education, 37.9% (N=114), living in the city, 88.0% (N=265), living in multi-person households and having normal body weight, 47.2% (N=142).

### Knowledge of functional food

The answers to the question about the functional food definition, statements about it, and sources where to look for information on its daily consumption in the study group in general and taking account of gender are presented in Figures 1, 2 and 3.

When asked about the definition of functional food, respondents most often indicated the correct answer and noted that it is food that has a documented beneficial impact on health, much bigger than that resulting from the presence of nutrients considered essential. This answer was given by 42.5% of people, including more women (47.5%) than men (35.0%) (Figure 1). When asked which statement related to functional food, the respondents indicated that it is food used in the daily diet that has an additional

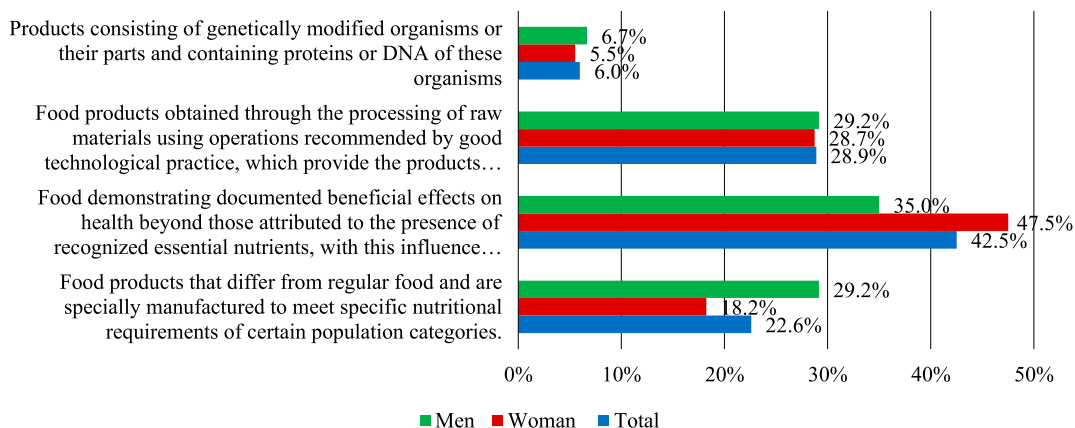


Figure 1. Knowledge of the definition of functional food, in total and by gender (N=301)

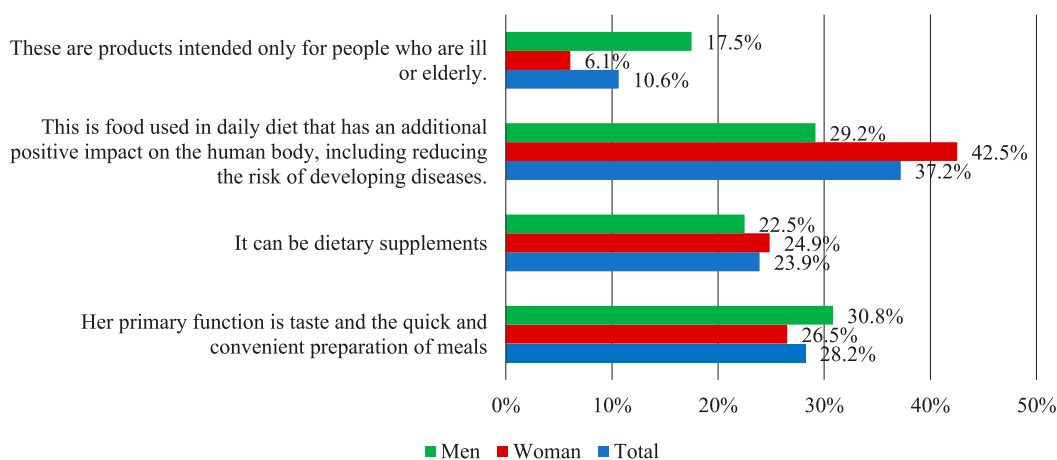


Figure 2. Responses to the question which statement pertains to functional food, total and by gender (N=301)

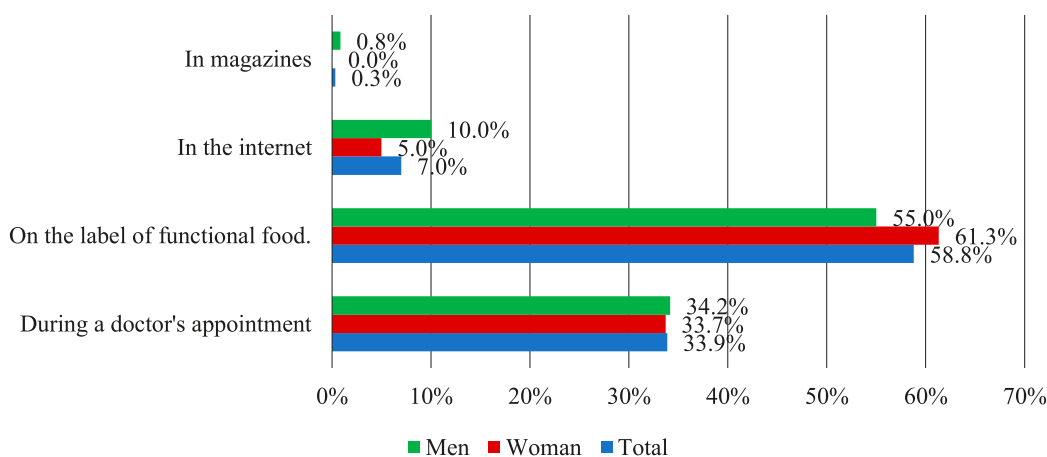


Figure 3. Responses to the question where to look for recommendations for daily consumption of functional food, total and be gender (N=301)

positive effect on the human body, moreover, it reduces the risk of disease development. This answer was given by 37.2% of people, including more women (42.5%) than men (29.2%) (Figure 2). When asked where to look first for recommendations on the daily consumption of functional food, the respondents most often indicated that this information should be included in a functional food label; this answer was

given by 58.8% of people, including more women (61.3%) than men (55.0%) (Figure 3).

Answers to questions about the definition of prebiotics and their functions in functional foods in the studied group in general and taking account of gender are presented in Figures 4 and 5.

In the question about the definition of a prebiotic, respondents most often indicated that they are

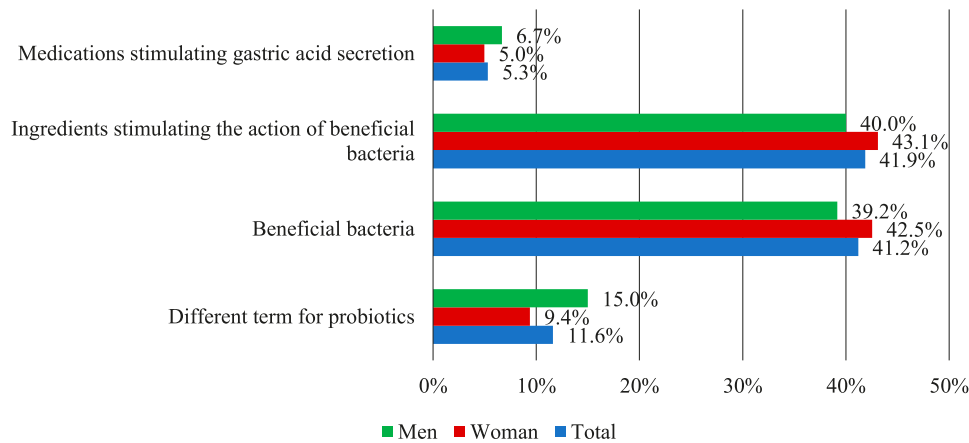


Figure 4. Knowledge of the definition of prebiotics, total and by gender (N=301)

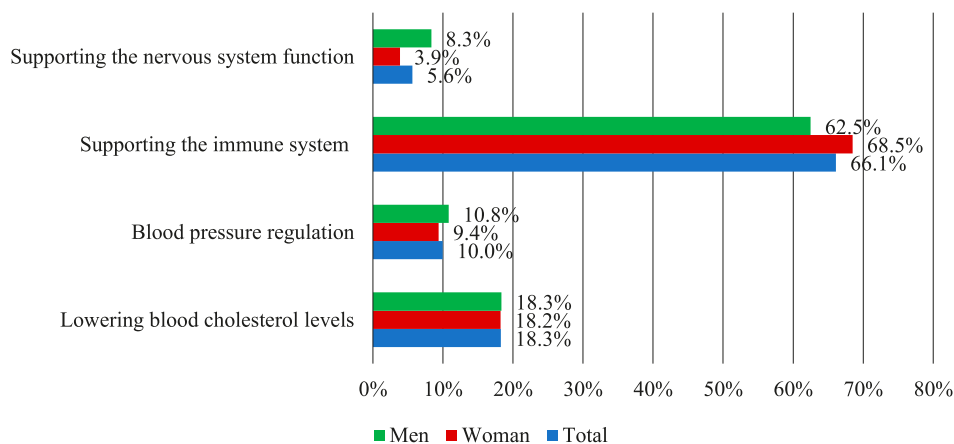


Figure 5. Knowledge of the role of probiotics in functional food, total and by gender (N=301)

ingredients that stimulate the action of health-promoting bacteria; this answer was given by 41.9% of people, including slightly more women (43.1%) than men (40.0%) (Figure 4). The surveyed people most often pointed out that the role of probiotics is to support the human immune system; this answer was given by 66.1% of the respondents, including more women (68.5%) than men (62.5%) (Figure 5).

When asked how the surveyed people assessed their knowledge of functional food, 44.5% marked a unsatisfactory level, more men (50.8%) than women (40.3%) indicated such a response. An analysis of gender differences in the level of knowledge regarding functional foods showed a higher level of knowledge among women compared to men, but these differences are not statistically significant ( $p=0.14$ ).

### Habits related to functional food

The answers to the question about the frequency of consumption of functional food and the health factors encouraging its consumption in the study group in general and by gender are presented in Table 2. The respondents most often indicated that they did not consume functional food (33.2%), this answer was

given by more men (40.0%) than women (28.7%). The analysis mostly did not reveal statistically significant gender differences in the frequency of consumption of functional products; only the frequency of functional product consumption (daily or several times a week) was slightly ( $p=0.07$ ) higher among women (Table 2). To the question about factors encouraging food consumption, 203 individuals responded, and among the factors, the most frequently indicated was leading a healthy lifestyle (56.2%). This response was more commonly chosen by men (59.7%) than women (54.2%). No significant differences were observed in the frequency of indicating individual health factors that encourage the consumption of functional products (Table 2).

The answers to the question about features, apart from a price, taken into account when choosing functional food and about a place of purchase of functional food, in the surveyed group in total and taking into account gender, are presented in Table 3.

The surveyed people indicated that the ingredients of the product is a feature they take into account when choosing the food; this answer was given by 54.7% of people, more women (59.5%) than men (45.8%).

Table 1. Gender-based differences in functional food knowledge (N=301)

	Total	Women	Men	Test; p Correlation coefficients
	N(%)	N(%)	N(%)	
Level of knowledge of functional food				
Unsatisfactory	134 (44.5)	73 (40.3)	61 (50.8)	Fi=5.46 p=0.14 V <sub>c</sub> =0.13
Satisfactory	89 (29.6)	53 (29.3)	36 (30.0)	
Good	72 (23.9)	51 (28.2)	21 (17.5)	
Very good	6 (2.0)	4 (2.2)	2 (1.7)	

N – number of observations; Fi – Fisher's exact test; p – level of statistical significance; Vc – V Cramer's contingency coefficient

Table 2. Functional food consumption frequency (N=301) Health factors encouraging functional food consumption (N=203)

	Total	Woman	Men	Test; p Correlation coefficient	
	N (%)	N (%)	N (%)		
Frequency of consumption of functional products					
Daily	14 (4.7%)	9 (5.0%)	5 (4.2%)	$\chi_y^2 = 10.07$ p=0.07 V <sub>c</sub> =0.18	
Several times a week	57 (18.9%)	40 (22.1%)	17 (14.2%)		
Several times a month	60 (19.9%)	39 (21.5%)	21 (17.5%)		
Once a month	22 (7.3%)	9 (5.0%)	13 (10.8%)		
Less than once a month	48 (16.0%)	32 (17.7%)	16 (13.3%)		
Not at all	100 (33.2%)	52 (28.7%)	48 (40.0%)		
Health factors encouraging the consumption of functional food (max 3 answers)					
Possible answers	Total (N=203)	Woman (n=131)	Men (n=72)		
The presence of own or family members' chronic diseases	41 (20.2%)	26 (19.9%)	15 (20.8%)		
Food allergies or intolerances to certain food ingredients in oneself or family members	49 (24.1%)	31 (23.7%)	18 (25.0%)		
Preventive action against chronic diseases	84 (41.4)	57 (43.5%)	27 (37.5%)		
Weight loss	81 (39.9%)	46 (35.1%)	35 (48.6%)		
Leading a healthy lifestyle without any specific reasons.	114 (56.2%)	71 (54.2%)	43 (59.7%)		
Other, e.g. the desire to improve physical performance	3 (1.5%)	2 (1.5%)	1 (1.4%)		
Most frequently indicated health factors					
Prevention against chronic diseases	No	119 (58.6%)	74 (56.5%)	45 (62.5%)	$\chi^2=0.69$ p=0.41 $\Phi =0.06$
	Yes	84 (41.4%)	57 (43.5%)	27 (37.5%)	
Weight loss	No	122 (60.1%)	85 (64.9%)	37 (51.4%)	$\chi^2=3.53$ p=0.06 $\Phi =0.13$
	Yes	81 (39.9%)	46 (35.1%)	35 (48.6%)	
Healthy lifestyle	No	89 (43.8%)	60 (45.8%)	29 (40.3%)	$\chi^2=0.58$ p=0.45 $\Phi =0.05$
	Yes	114 (56.2%)	71 (54.2%)	43 (59.7%)	

N - number of observations;  $\chi_y^2$  – Chi square test with Yates correction;  $\chi^2$  – Chi square test result; p – level of statistical significance; Vc – V Cramer's contingency coefficient;  $\Phi$ -Yule'a – Mean Square Contingency Coefficient

The analysis did not reveal statistically significant differences between genders in terms of the frequency of indicating individual features of functional products taken into account when purchasing them. When purchasing functional food, a similar percentage of women and men took into account a product content, information about health benefits and a recommendation from friends.

To the question of where they purchase functional food, respondents most frequently indicated supermarkets or shopping centers (54.0%), with more men (59.1%) than women (51.2%) providing such responses (Table 3).

The surveyed people indicated that they most often eat cereals or muesli for breakfast (47.5%), this answer was given by more women (55.8%) than men (35.0%)

and vegetable oils for dinner (37.2%), this answer was given by more men (42.5%) than women (33.7%). The respondents most often consume fruit, herbal teas and herbal mixtures for dinner (28.2%), a comparable percentage of women (29.8%) and men (25.8%), and chocolate between main meals (31%), this answer was given by more women (31.5%) than men (30.3%).

Statistically significant differences were observed in the frequency of consumption for breakfast cereals and muesli ( $p < 0.001$ ) as well as yogurts ( $p = 0.01$ ). A similar, significant relationship was noted for the frequency of yogurt consumption ( $p = 0.03$ ) and fruit, herbal, and herbal blend teas ( $p = 0.03$ ) as snacks between meals. For each of the mentioned products, the frequency of consumption was higher in the female group (Table 4).

Table 3. Gender-based analysis of determinants and purchase locations (N=203)

<i>Criteria apart from price that guide you when choosing functional food (max 3 answers)</i>					
		Total (N=203) N (%)	Woman (N=131) N (%)	Men (N=72) N (%)	
Product composition		111 (54.7)	78 (59.5)	33 (45.8)	
Taste and smell		78 (38.4)	45 (34.4)	33 (45.8)	
Info on the health benefits of product		88 (43.6)	60 (45.8)	28 (39.4)	
Content of additional nutrients		57 (28.1)	37 (28.2)	20 (27.8)	
Recommendations of friends		81 (40.1)	49 (37.7)	32 (44.4)	
Product brand		15 (7.4)	7 (5.3)	8 (11.1)	
Nice packaging		14 (7.0)	7 (5.4)	7 (9.9)	
Advertising and marketing		8 (3.9)	7 (5.3)	1 (1.4)	
Other e.g. fashion		3 (1.5)	2 (1.5)	1 (1.4)	
		Total N (%)	Woman N (%)	Men N (%)	Test; p Correlation coefficient
<i>Most frequently indicated characteristics of products</i>					
Product composition	No	92 (45.3)	53 (40.5)	39 (54.2)	$\chi^2=3.52$ $p=0.06$ $\Phi=0.13$
	Yes	111 (54.7)	78 (59.5)	33 (45.8)	
Information about the health benefits of specific products	No	114 (56.4)	71 (54.2)	43 (60.6)	$\chi^2=0.76$ $p=0.38$ $\Phi=0.06$
	Yes	88 (43.6)	60 (45.8)	28 (39.4)	
Recommendations of friends	No	121 (59.9)	81 (62.3)	40 (55.6)	$\chi^2=0.88$ $p=0.35$ $\Phi=0.07$
	Yes	81 (40.1)	49 (37.7)	32 (44.4)	
<i>Place where you most often buy functional food</i>					
Small shops near the place of residence		56 (27.7)	43 (32.8)	13 (18.3)	$\chi_y^2=5.59$ $p=0.13$ $V_c=0.16$
Supermarkets or shopping centers		109 (54.0)	67 (51.2)	42 (59.1)	
Stores specializing in functional food		18 (8.9)	11 (8.4)	7 (9.9)	
Online stores specializing in functional food		19 (9.4)	10 (7.6)	9 (12.7)	

N - number of observations;  $\chi^2$  - Chi square test result;  $\chi_y^2$  - Chi square test with Yates correction; p - level of statistical significance;  $V_c$  - V Cramer's contingency coefficient;  $\Phi$ -Yule'a - Mean Square Contingency Coefficient

Table 4. Common functional product consumption across meals (N=203)

		Total	Woman	Men	Test; p Correlation coefficient
		N (%)	N (%)	N (%)	
Most commonly consumed functional products for breakfast					
Cereals and muesli	No	158 (52.5)	80 (44.2)	78 (65.0)	$\chi^2=12.52$ $p<0.001$ $\Phi =0.20$
	Yes	143 (47.5)	101 (55.8)	42 (35.0)	
Yogurts	No	167 (55.5)	90 (49.7)	77 (64.2)	$\chi^2=6.09$ $p=0.01$ $\Phi =0.14$
	Yes	134 (44.5)	91 (50.3)	43 (35.8)	
Crispbread and waffles	No	216 (71.8)	133 (73.5)	83 (69.2)	$\chi^2=0.66$ $p=0.42$ $\Phi =0.05$
	Yes	85 (28.2)	48 (26.5)	37 (30.8)	
Most commonly consumed functional products for lunch					
Low-fat enriched cheeses, curds and kefir	No	273 (90.7)	166 (91.7)	107 (89.2)	$\chi^2=0.55$ $p=0.46$ $\Phi =0.04$
	Yes	28 (9.3)	15 (8.3)	13 (10.8)	
Juices, nectars, and multivitamin fruit drinks	No	249 (82.7)	148 (81.8)	101 (84.2)	$\chi^2=0.29$ $p=0.59$ $\Phi =0.03$
	Yes	52 (17.3)	33 (18.2)	19 (15.8)	
Vegetable oils	No	189 (62.8)	120 (66.3)	69 (57.5)	$\chi^2=2.39$ $p=0.12$ $\Phi =0.09$
	Yes	112 (37.2)	61 (33.7)	51 (42.5)	
Most commonly consumed functional products for dinner					
Crispbread and waffles	No	230 (76.4)	141 (77.9)	89 (74.2)	$\chi^2=0.56$ $p=0.46$ $\Phi =0.04$
	Yes	71 (23.6)	40 (22.1)	31 (25.8)	
Fruit teas, herbal teas, herb blends	No	216 (71.8)	127 (70.2)	89 (74.2)	$\chi^2=0.57$ $p=0.45$ $\Phi =0.04$
	Yes	85 (28.2)	54 (29.8)	31 (25.8)	
Low-fat enriched cheeses, curds, and kefir	No	244 (81.1)	142 (78.5)	102 (85.0)	$\chi^2=2.01$ $p=0.16$ $\Phi =0.08$
	Yes	57 (18.9)	39 (21.5)	18 (15.0)	
Most commonly consumed functional products between main meals					
Yogurts	No	228 (75.7)	129 (71.3)	99 (82.5)	$\chi^2=4.95$ $p=0.03$ $\Phi =0.13$
	Yes	73 (24.3)	52 (28.7)	21 (17.5)	
Fruit teas, herbal teas, herb blends	No	218 (72.4)	123 (68.0)	95 (79.2)	$\chi^2=4.54$ $p=0.03$ $\Phi =0.12$
	Yes	83 (27.6)	58 (32.0)	25 (20.8)	
Chocolate	No	207 (69.0)	124 (68.5)	83 (69.7)	$\chi^2=0.05$ $p=0.82$ $\Phi =0.01$
	Yes	93 (31.0)	57 (31.5)	36 (30.3)	

N - number of observations;  $\chi^2$  - Chi square test result; p - level of statistical significance;  $\Phi$ -Yule'a - Mean Square Contingency Coefficient

## DISCUSSION

Nowadays, there is an increase in consumer's awareness of health issues. The consequence of which is an increased interest in functional food, which helps to meet this task, both in terms of improving health as well as improving the quality and length of

life. The analysis of my own research results showed that 42.5% of the respondents pointed to the correct answer defining functional food as food having a documented beneficial effect on health beyond that resulting from the presence of nutrients considered essential. In turn, in a study conducted by Demir Hüly among students of nutrition and dietetics, 46.3% of

fourth-year students associate functional food with functional products and 43.9% with food products that have a beneficial effect on the body. However, in the first-year group, 25.6% associate it with food products that have a beneficial effect on the body, 23.0% with functional products, and 41% did not answer this question [10]. Meanwhile, in the study by Balogh et al. [5] conducted among 168 consumers, 91.7% of them indicated the correct definition of functional food as one that has detectable positive effects on one or more important body functions. However, in the first-year group, 25.6% associate it with food products that have a beneficial effect on the body, 23.0% with functional products, and 41% did not answer this question [10]. Meanwhile, in a study by Balogh et al. conducted among 168 consumers, 91.7% of them indicated the correct definition of functional food as one that has detectable positive effects on one or more important body functions [5].

The results of our own research showed that 37.2% of people indicated that functional food is one that, when used in the daily diet, has an additional positive effect on the human body, including reducing the risk of disease development. This is consistent with the results of the research by the Interactive Market Research Institute, conducted among 1,000 people over 15 years of age, where a similar answer was given by 50% of respondents, characterizing functional food as used in a daily diet and having an additional positive effect on the human body, including reducing the risk of developing a disease. [21]. Author's research shows that the largest percentage of respondents (43.2%) rate their knowledge of functional food as sufficient. In turn, the results of the study by Zabrocki and Suszek show that 50.7% of the people participating in the study describe their level of knowledge as rather small and fragmentary [28]. As the results of our own research show, 41.9% respondents most often indicated the correct definition of a prebiotic. Students of the Medical University of Wrocław demonstrated greater knowledge in this area, with 85% correctly defining prebiotics [13]. Also in the study by Turgul Ersak et al. conducted among obstetricians, 61.8% of them working for less than 12 years and 60% of them working for 12 years or more were able to define prebiotics correctly as compounds that stimulate the growth and activity of beneficial microorganisms [25]. In our own study, 66.1% of respondents declared that the main function of probiotics is to support the human immune system. As a comparison, in the study by Jamy-Kmieciak et al., 52.4% of people gave correct answers, stating that probiotics have an immunological and digestive protective function [13]. However, in the study by Babin et al. conducted among students and lecturers of Sechenov University in Moscow, it was shown that the surveyed people knew that probiotics

have a beneficial effect on digestion (98% of lecturers and 95% of students), were aware of the role of probiotics in the functioning of the immune system (93% of lecturers and 85% of students), in the fight against obesity (72% of lecturers and 66% of students) and in the prevention of respiratory (76% of lecturers and 56% of students) and urinary tract infections (65% of lecturers and 63% of students). However, they are less likely to associate the impact of probiotics on heart health (52% of lecturers and 56% of students) [4]. According to the study by Betz et al. conducted among patients from hospitals in Chicago, 60% of those who knew the correct definition of probiotics believed that they had a beneficial effect on heart [7].

The author's study shows that most people do not consume functional food. However, taking into account the fact that only 42.5% of respondents are able to indicate the correct definition of functional food, its consumption at least several times a month by 43.5% of all the respondents can be considered sufficient. This result contradicts the findings of a study conducted by Akhter and Dil Bahadur, where 37% of the participants indicated that they consume functional food daily

According to the author's research, the factor encouraging people to consume functional foods is the desire to lead a healthy lifestyle (56.2% of responses) and to take preventive measures against chronic diseases (41.4% of responses). In turn, in the study by Krupa and Dec, the most frequently mentioned factors were health care, affordable price and taste; such answers were given by 51% and 39% of people, respectively [15]. Altun et al. conducted a study on a group of 550 dietitians who graduated from the Faculty of Nutrition and Dietetics of universities in Turkey. As the authors showed, during the COVID-19 pandemic, 38.5% of them consumed functional food to maintain intestinal health, 36.8% wanted to lead a healthy lifestyle and 34.9% to protect themselves against COVID-19 [3].

Our own research indicates that, when choosing functional products, the composition of the product is of the utmost importance, in addition to price - this answer was given by 54.7% of respondents. Similar results were obtained in research by the Market Research Institute, where the same answer was given by 49% of respondents [21]. According to our own research, the majority of individuals obtain information about functional food from labels on the packaging of such food (58.8%). Quantitative research by Krupa and Dec conducted among customers of grocery stores also shows that the most frequently indicated source of information about the biological value of these products are the labels on the packaging [15]. As our own research shows, 54.0% of individuals most commonly purchase functional food in supermarkets



or shopping centers. However, in a study by Deborah et al. conducted among a group of 427 Italian consumers, as many as 90% indicated supermarkets as the place of purchase for this type of food [8].

Our own research, similar to a study conducted by the Interactive Market Research Institute, indicates variations in the consumption of functional products depending on the type of meal. Both studies show that the most frequently consumed products for breakfast are cereals or muesli. For lunch, people most often choose vegetable oils, juices, nectars and multivitamin drinks. However, for dinner, crispbread and wafers are preferred, and between main meals, chocolate, juices, nectars, multivitamin drinks, and yogurts are reached for [21]. In contrast, in the study by Krupa and Dec, fruit and vegetable preparations, probiotic yoghurts, cereals and bakery products were indicated as the most commonly consumed products. However, in this study the consumption of these products was not divided in relation to meals [15].

## CONCLUSIONS

Knowledge of functional foods is unsatisfactory, and no differences in the knowledge of women and men have been observed.

The consumption of functional food is generally low, and no differences in its consumption have been observed between women and men.

It seems important to continue spreading nutritional education regarding the role of functional food in both prevention and treatment of many diseases.

### Conflict of interest

*The authors declare no conflict of interest.*

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