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Consumer's research for new functional bakery product development

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Producers have opportunity to retain a competitive status developing new functional products that rely on the flavourful bakery products from national cuisine in target market. The aim of our research was to demonstrate a methodology for providing data from target market that may be used as ideas for development of new functional bakery product. The study was conducted on a representative sample of 720 adolescents and young adults. In printed questionnaire respondents answered about: nutrition, food quality, nutrients, habits in food consumption and preferences. Data obtained were analyzed regarding total observed population and crossing consumers classified based on: age; sex; body mass index. The identified similarities and differences between compared groups of consumers also should be taken into account. In the further work, producer should use collected data as ideas for quality parameters in new food product's formulation modeling and to fulfill nutritive, technological and sensory quality requirements. This study indicates that the food product development should follow the principles of healthy nutrition, and ideas for products quality parameters could be identified in consumers' habits, needs and preferences.

Keywords: Consumer research, nutrition, product development, functional bakery products

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Introduction

For producers in food industry is a great challenge to achieve and retain a competitive status in the market. The development and strengthening of small and medium-sized enterprises (SMEs) is the result of changes in business systems in the world. SMEs usually offer products for regionally limited market and should ensure and retain long-term competitive position. As numerous factors determine trend of supply and demand in this area, producers should monitor the changes in the market and adapt product quality to the real consumer.

Historically, national cuisines are balancing between local specialties offering and a whole range of flavourful products with latest trends impact. However, food enjoying may be associated with improper diet and increasing risk of further development of overweight, obesity and diet-related noncommunicable diseases (Hess et al., 2011; Mazzocchi et al., 2014; WHO RCE, 2014). Family eating habits with more or less changes are retaining during life.

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Childhood and adolescent overweight and obesity are considered as major causes of development of some health problems (Krömker et al., 2015). It increased rapidly worldwide during recent decades in industrialized and developing countries (Mann et al., 2007; WHO RCE, 2014). As major determinants of differences in metabolic risk factors are identified behavioural and lifestyle factors (diet, physical activity, obesity, smoking, alcohol use), rather than genetic differences (Sanders, 2009). Based on systematic reviews of available scientific evidence and expert consultations, acquired knowledge was translated into the nutritional requirement values and nutrient-based recommendations, supporting health and nutritional well-being of populations (Oogarah-Pratap, 2007; Batrinou and Kanellou, 2009; Burlingame et al., 2009; Hess et al., 2011; Mazzocchi et al., 2014).

Young people are an interesting category of consumers today, as in future. Their growing or living away from the family home, also means more freedom for food choice (Cervellon and Dube, 2005; Unusan, 2006; Grujić et al., 2013a,b; Feldman et al., 2013; Tirelli et al., 2013). However, childhood and adolescent overweight and obesity are considered as major causes of some health problems development (Sanders, 2009; Krömker et al., 2015).

Strengthening domestic production is one of the ways for SMEs success, and it may be based on product development that relies on food from national cuisines and principles of healthy nutrition. SMEs should monitor the changes in the market and adapt product quality to the real consumer. The target group of consumers identifying should be first step for success in the food product development. The other activities include: collecting and selecting most promising idea for new product on target market; transforming qualitative customers' requirements into product quality parameters; defining products' quality criteria, including sensory attributes evaluated by descriptive and affective tests; technological process determining; the new product commercialization and marketing on target market (Benner et al., 2003; Moskowitz et al., 2006; Grujić S. and Grujić R., 2011; Castura et al., 2016).

Educational institutions may have an important role in promoting and support healthful behaviour between students (Feldman et al., 2013; Grujić et al., 2013a; Lassale et al., 2013). The consumers' preference and choice are largely based on overall product perception and related to the product sensory quality, brand name and image, packaging and labelled data, price and promotion (Gielens and Steenkamp, 2007; Bialkova and van Trijp, 2011; Bialkova et al., 2013; Ares et al., 2014). Manufacturers must identify food products sensory and nutritive characteristics that are important and attractive for consumers, transform them into real new product which could ensure consumers attention and desire to eat (Costa and Jongen, 2006; Gielens and Steenkamp, 2007; Yan et al., 2015).

The consumers' demands for healthy foods impact on increasing production of various functional food products (Chen, 2011; Hodgkins et al., 2012; Traill et al., 2014). Selection of ideas for new products should include results of research in target market, contemporary scientific research and the recommendations of competent institutions (Linnemann et al., 2006; Luchs et al., 2011; WHO RCE, 2014). Since bakery products are components of almost every meal, the SMEs have opportunity for strengthening their strategic positions in the market offering user-oriented bakery products (Benner et al., 2003; Hansen and Hamilton, 2011; Ragona et al., 2013; Bruschi et al., 2015).

Food products dissimilarity within one or more categories open unlimited space for creative new products development, for combining ingredients, nutrients content and/or

quantity, and processing methods (Grujic and Grujic, 2012; Ragona et al., 2013). The aim of our research was to demonstrate a methodology for providing data from target market that may be used as ideas for development of new functional bakery product, suitable for healthy diet. It is necessary: to investigate attitudes of consumers towards new functional product and ingredients that may contribute to healthy nutrition; and to collect data on consumers' knowledge and interest related to the specified subjects, important for selecting ideas for new food products intended for a target market. In line with it, we specify eight hypotheses to examine the impact of (a) age of respondents, and (b) the sex.

Food products dissimilarity within one or more categories open unlimited space for creative new products development, for combining ingredients, nutrients content and/or quantity, and processing methods. Despite developments in technology, design and marketing, many new food products are not successfully commercialised (Ragona et al., 2013). Previous consumers studies indicated that numerous factors interaction result in differences in the consumers' interest for new products and indicators of food products quality and safety (Cervellon and Dube, 2005, Grujić et al., 2013b).

To justify an initiative for new products development and to examine interest of the consumers in new food products, we stated hypothesis:

- **H1**: Respondents grouped based on the ages have equal interest in new food products. **H2**: Respondents grouped based on the sex have equal interest in new food products. It is known that different methods of food processing impact on foods nutritional value.
- To examine the consumers' knowledge of the food quality and health, we also tested the hypothesis: **H3**: Respondents grouped based on the ages equally prefer healthy diet.
- **H4**: Respondents grouped based on the sex equally prefer healthy diet.
- To examine the respondents knowledge on inadequate nutrition affects on the health, following hypotheses were tested: **H5**: Respondents grouped based on the ages have equal knowledge about the impact of improper nutrition on health.
- **H6**: Respondents grouped based on the sex have equal knowledge about the impact of improper nutrition on health. Young persons' knowledge on food nutritive value is related to the ability to classify food based on composition and ingredients used for manufacturing.
- To test interest of target group of consumers for selected indicators of packaged food quality, we stated hypothesis: **H7**: Respondents grouped based on the ages show equal interest in the product composition.
- **H8**: Respondents grouped based on the sex show equal interest in the product composition.

Methodology

Participants

Young adults, who attend high school or undergraduate study, are considered as consumers with formed individual eating habits, and potential users of new functional food products. For the research, respondents were selected from three regional centres in the Republic of Srpska (Bosnia and Herzegovina) with public educational institutions, as follows: students in second and third year of high school (P-group) in 3 towns; and

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students from the second or third year of undergraduate study (S-group) in higher education institutions in 5 towns.

Planned research was conducted using affective sensory tests, interviewing selected young people as a target population of consumers. A review of the persons covered by the survey and their age was made based on their individual self-reporting and filling data in printed form questionnaire. Data were analyzed regarding total observed population, and crossing the groups of consumers formed based on: (1) age; (2) sex; (3) body mass index (BMI) as an indicator of dietary habits.

Examination of differences between the respondents

The first classification was related to the grouping based on ages: (i) 360 young persons in secondary school 16-18 years old, designated as adolescents (P-group) and 360 young adults, 20-25 years old on undergraduate studies (S-group).

The second classification was based on sex: (ii) 290 male respondents (M-group) and 430 females (F-group). Adolescents (P-group) average age was: 16.72 ± 0.64 years for boys and 16.73 ± 0.63 years for girls. The average ages of young adults (S-group) were: 22.61 ± 2.27 years for males and 21.69 ± 1.41 years for women. Respondents' classification based on sex and age was made without possibility for further selection. Standard deviations within each group of respondents were calculated.

The third respondents' classification and comparison were made based on calculated values for BMI [Weight (kg)/ Height (m^2)]: Underweight = Less than 18.5 kg/m^2; Normal-weight = 18.5-24.9 kg/m^2; Overweight = 25-29.9 kg/m^2; Obese = More than 30 kg/m^2. Two groups of participants were formed for comparison: OB-group included respondents that have inadequate BMI, classified into categories of underweight, overweight and obese (as there was a relatively small number of respondents in each group); and N-group included respondents who have a normal BMI. Based on inadequate and normal BMI classification, we compared Yes/No answers on each question: (a) between all respondents (N=720); (b) between all male respondents (N_M=290); (c) between all females (N_F=430).

Ranking of responses

Total numbers of Yes answers on each individual question were ranked in descending order for surveyed population, to compare importance of analyzed data associated with respondent's knowledge and interest for nutrition and new food products, data contained in questions.

Procedure and questionnaire design

A printed form questionnaire were used to obtain personal data in first part, and in second part were listed questions that contain specific information relating to the knowledge about nutrition, labelling of packaged products, some important nutrients, consumption habits and preferences in food choices. The respondents filled in questionnaire individually and spent approximately 10 minutes on it.

In the first part of the questionnaire, respondents were asked about personal data, such as are: name of their educational institution, is it secondary or higher education; year of study; individual age, sex, body mass and height, economic status. The second part of the questionnaire contained 12 questions, related to respondent's interest for nutrition and new food products with offered Yes/No answers (Table 1). First are listed questions related to respondents nutrition knowledge, habits and health status (*Q1-Q3*), and then two questions (*Q4-Q5*) related to the using of labelled data on product ingredients, followed by questions related to the principles of proper nutrition that suggesting fresh fruits, fruit juices and less beverages consumption (*Q6-Q8*). Next three questions (*Q9-Q11*) were about interest in specific nutritive ingredients (vitamins, minerals, nutritive fibres), that can improve functional properties of the new product and sometimes diminish sensory quality. At the end, they were asked about preference for new food products (*Q12*).

TABLE 1. QUESTIONS RELATED TO RESPONDENTS NUTRITION KNOWLEDGE, HABITS, HEALTH STATUS AND PREFERENCE TO NEW FOOD PRODUCTS, OFFERED IN THE QUESTIONNAIRE.

Question number	Questions offered with Yes/No answers
Q1	Do you prefer healthy diet?
Q2	Do you need a special diet because of health problems?
Q3	Can inadequate nutrition affect the health?
Q4	Do you read labelled information about ingredients used for product manufacturing?
Q5	When choosing between similar food products, do you compare labelled data?
Q6	Do you eat fruit every day?
Q7	Do you prefer to drink fruit juices (*apple, orange, cherry, etc*)?
Q8	Do you prefer to drink *light* products and beverages produced without sugar?
Q9	Do you prefer to purchase products enriched with vitamins and minerals?
Q10	Do you prefer to purchase products enriched with dietary fibres (*integral cookie*)?
Q11	Would you like to buy a product that is not particularly attractive, but has improved nutritive content?
Q12	Do you prefer to taste new food products?

Data analysis

The results of the survey were grouped accordingly. The descriptive statistics included frequencies (n; %), means and standard deviations (SD), which can be found in Table 2. We stated statistical hypothesis that there is no significant difference in the attitude toward specific information crossing the groups of consumers regarding: (1) age; (2) sex; (3) body mass index (BMI) as an indicator of dietary habits. All analyses were performed using Statistical software *3BStat* Gold Edition, Version 1.01 (Lovrić et al., 2006). Values of P below 0.05 were considered statistically significant. After answers analysis, the Statistical

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Chi-square Analysis were performed and used for testing the hypothesis and the statistical significance ($p<0.05$) of differences across the groups.

Results and discussion

The quality assurance in food industry should be directed toward meeting the needs of the daily changing market (Hansen and Hamilton, 2011), with competitiveness based on the production, quality control, distribution and use of knowledge on technological and sensory quality standards (Grujic and Grujic, 2012). Consumer's general attitudes towards food are influenced by health-related thinking, price, ethics, convenience, identity or mood (Tatlow-Golden et al., 2013; Davison et al., 2015; Krömker et al., 2015), proper diets are associated with a higher socio-economic status, knowledge and education (Lassale et al., 2013). Consumers' specific eating habits, preferences, expectations and interest in certain food products and ingredients may be indicators of the market requirements that producers should met, to avoid errors in product development. First, the target categories of consumers, users of new product were identified in our research, and thereafter their habits and preferences.

The respondents' economic status

The fact is that everyone wants some privacy when is asked about individual income or spending money. We investigated the personal economic status of respondents, because of possible impact on food choice, and found homogeneous distribution in compared groups. The pupils and students in public educational institutions included in the research are unemployed, and based on the general economic environment, it was expected to have satisfactory or low economic status.

TABLE 2. ANSWERS (N) ON RESPONDENTS' INDIVIDUAL ECONOMIC STATUS, COMPARED BETWEEN GROUPS FORMED BASED ON THEIR SEX AND AGES, AND CHI-SQUARE ANALYSIS

Question	Compared groups and total number of respondents (N)	Frequency of responses (n) on question in examined group and within group			χ^a	p^a
			Z	L		
		(n)	(n_Z)	(n_L)		
How would you classify your economic status? (Z = satisfactory; L= low)	Males in P-group	184	165	19		
	Males in S-group	106	98	8		
	N_M= 290				0.615	0.433
	Females in P-group	176	164	12		
	Females in S-group	254	234	20		
	N_F= 430				0.168	0.682
	P-group	360	329	31		
	S-group	360	332	28		
	N= 720				0.166	0.684
	M-group	290	263	27		
	F-group	430	398	32		
	N= 720				0.804	0.370

M = Male; F = Female; P = Adolescents; S = Young adults

[a] $\chi^2_{1;0.05} = 3.841$; $p<0.05$.

The most respondents had satisfactory economic status (Table 2) and we concluded that there are no conditions for forming sub-groups based on it, as there was no statistically significant differences between formed groups based on the ages P- and S-group ($\chi^2_{1;0.05} = 0.166$; p>0.05) and the sex M- and F-group ($\chi^2_{1;0.05} = 0.804$; p>0.05).

Consumers' interest in new food products

Consumers show preference for certain foodstuffs considering the sensory, nutritional and health quality aspects, the same as personal preference and other elements (Pescud and Pettigrew, 2010; Luchs et al., 2011; Mason et al., 2011). Teenagers and youth like to eat food that is in line with active lifestyles (Unusan, 2006), and therefore promotion of a healthy diet is important for them (WHO RCE, 2014).

TABLE 3. SUMMARY OF ANALYSED RESPONDENTS' *YES* ANSWERS ON QUESTIONS GROUPED BASED ON SEX AND AGES, AND CHI-SQUARE ANALYSIS

Question (Q_x)	*Yeas* answers for M-group (N=290)[A]		*Yeas* answers for F-group (N=429)[A]		χ^2	*Yeas* answers for P-group (N=360)[A]		*Yeas* answers for S-group (N=359)[A]		χ^2
	n_{QxM}	%	n_{QxF}	%		n_{QxP}	%	n_{QxS}	%	
Q1	251	86.55	366	85.31	0.218	303	84.17	314	87.47	1.606
Q2	56	19.31	81	18.88	0.021	88	24.44	49	13.65	**13.582***
Q3	273	94.14	416	96.97	**4.172***	341	94.72	348	96.94	1.761
Q4	191	65.86	330	76.92	**10.971***	243	67.50	278	77.44	**8.570***
Q5	136	46.90	160	37.30	**6.585***	149	41.39	147	40.95	0.015
Q6	199	68.62	281	65.50	0.759	257	71.39	223	62.12	**6.963***
Q7	190	65.52	295	68.76	0.831	255	70.83	230	64.07	3.749
Q8	144	49.66	207	48.25	0.136	206	57.22	145	40.39	**20.382***
Q9	229	78.97	359	83.68	2.584	300	83.33	288	80.22	1.167
Q10	116	40.00	246	57.34	**20.818***	172	47.78	190	52.92	1.905
Q11	166	57.24	278	64.80	**4.188***	210	58.33	234	65.18	3.569
Q12	233	80.34	364	84.85	2.491	316	87.78	281	78.27	**11.526***

M = Male; F = Female; P = Adolescents; S = Young adults

[A] Number of *Yes* answers (n_{Qxy}) on each individual question (x= 1–12), expressed in % calculated based on all *Yes* answers (N_y), given by respondents in each group (y = M-group; F-group; P-group; S-group).

* $\chi^2_{1;0.05} = 3.841$; p<0.05.

The motives for introduction of certain positive changes in established nutrition habits basically originate from consumer's desire to prolong lifespan. We found that a high percentage of all respondents prefer to taste new food products (*Q12*), showing interest in changes in diet, and food product assortment (Table 4). The findings are encouraging for planed work on food product development aimed to improve the quality of food on target market.

Regardless of these facts, a statistically significant difference ($\chi^2_{1;0.05} = 11.526$; p<0.05) was found between the consumer's preference to taste new food products (Q12) when grouped based on the ages, and the null hypothesis **H1** was rejected (Table 3), but difference between M- and F-group wasn't significant ($\chi^2_{1;0.05} = 2.491$; p>0.05) and there was insufficient evidence to reject the null hypothesis **H2.** The identification and understanding of real interest, needs and expectations of consumers is essential for the

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successful consumers' driven food products development (Costa and Jongen, 2006; Linnemann et al., 2006; Gielens and Steenkamp, 2007; Grujić et al., 2013a, b).

TABLE 4. SUMMARY OF ANALYSED *YES* ANSWERS ON QUESTIONS FOR ALL RESPONDENTS (N=719) RANKED IN DESCENDING ORDER, AND Z-TEST

Question	*Yeas* answers (n_{Qx}) on question (N=719)		
(Q_x)	n_{Qx} [B]	% [B]	% [C]
Q3	689[a]	12.38	95.83
Q1	617[b]	11.08	85.81
Q12	597[bc]	10.72	83.03
Q9	588[c]	10.56	81.78
Q4	521[d]	9.36	72.46
Q7	485[e]	8.71	67.45
Q6	480[e]	8.62	66.76
Q11	444[f]	7.98	61.75
Q10	362[g]	6.50	50.35
Q8	351[g]	6.31	48.82
Q5	296[h]	5.32	41.17
Q2	137[i]	2.46	19.05
Sum[A]	**5567**		

[A] Sum of *Yes* answers (n_{Qx}) on each individual question calculated for column (N=5567)
[B] Number of *Yes* answers (n_{Qx}) on each individual question (x = 1–12) expressed in % calculated for column, based on sum of all 719 respondents *Yes* answers (N = 5567).
[C] Number of *Yes* answers (n_{Qxy}) on each individual question (x = 1–12) expressed in % calculated based on possible number of *Yes* answers (N_y = 719).
[a-i] Values in the same column with different lower case superscripts differ significantly from each other calculated for Z-test ($p<0.05$).

Consumers' nutrition knowledge, habits and health status

Young people were selected as target group for our research, as present and future consumers on the food market. They are engaged in selection and purchasing food products mainly for them (Kowalczuk, 2007). The links between children's food education, food knowledge and their diet were proven (Tatlow-Golden et al., 2013). During the growing, they learn what and how to eat mainly from family, school educational program and publications, and thus form eating habits which may represent health-related risk (Cervellon and Dube, 2005; Kowalczuk, 2007; Tirelli et al., 2013; Krömker et al., 2015). The results of investigating respondents preference for healthy diet (*Q1)* were encouraging because the most of total respondents included in the research showed basic knowledge on nutrition (Table 4), a relatively large number of respondents grouped based on the ages, from P- and S-group prefer healthy diet and there was no statistically significant difference ($\chi^2_{1;0.05} = 1.606$; $p>0.05$) between the compared groups (Table 3), nor between male M- and female F-group ($\chi^2_{1;0.05} = 0.218$; $p>0.05$), so null hypothesis **H3** and **H4** weren't rejected.

Analysis showed that a relatively large number of young people need a special diet because of health problems (*Q2*) (Table 4), and significant difference ($\chi^2_{1;0.05} = 13.582$; $p<0.05$) was found between consumers grouped based on the ages (Table 3) and there was no significant difference between consumers grouped based on the sex ($\chi^2_{1;0.05} = 0.021$; $p>0.05$). Also, it is encouraging that most of respondents included in the research know that **proper nutrition** is important for the human body health (question *Q3*), as there was

no significant difference in answers ($\chi^2_{1;0.05} = 1.761$; $p>0.05$) between P- and S-group (Table P3). As the respondent's ages had no influence on their knowledge on the correlation between nutrition and health, the null hypothesis **H5** wasn't rejected. Contrary, hypothesis **H6** should be rejected, because of significant difference between M- and F-group answers ($\chi^2_{1;0.05} = 4.172$; $p<0.05$), as the girls showed more knowledge on nutrition and health, unlike the boys.

Differences between the respondents classified based on BMI

Actively weight managing is important for consumers' health (Visschers et al., 2013). The aim of our research was also to examine the impact of weight status (BMI) on the difference between the attitudes of consumers towards new functional products. The distribution of respondents (n) classified into categories based on established BMI (kg/m^2), grouped based on sex (M-Male; F-Female) and age (P-adolescents; S-young adults) are shown in Table 5.

TABLE 5. SUMMARY OF NUMBERS OF THE RESPONDENTS (N) CLASSIFIED BASED ON BMI (KG/M^2), THEIR SEX (M = MALE; F = FEMALE), AND AGES (P = ADOLESCENTS; S = YOUNG ADULTS), CHI-SQUARE ANALYSIS, AND Z-TEST

Compared groups and total number of respondents	Number of respondents within the group and interval and Z-test									
	M-group	F-group	Z-test[a]	p[a]	M in P-group	M in S-group	Z-test[a]	p[a]	F in P-group	F in S-group
Total number of respondents (N)	**290**	**430**			**184**	**106**			**176**	**254**
Underweight (n_1)	13	50			12	1			22	28
			-3.328	0.001						
Normal-weight (n_2)	216	355			148	68			140	215
			-2.623	0.009			3.063	**0.002***		
Overweight (n_3)	57	19			21	36			10	9
			6.526	0.000			-4.654	**0***		
Obese (n_4)	4	6			3	1			4	2
χ^2		**49.621***				**24.692***				3.242
p[b]		**0***				**0***				0.356

M = Male; F = Female; P = Adolescents; S = Young adults;
[a] Z-test; *p<0.05; [b] $\chi^2_{3;0.05} = 7.815$; *p<0.05.

Analysis of the respondents' distribution based on BMI revealed that there were 8.75% underweight, 10.56% overweight, 1.39% obese and 79.30% normal-weight respondents included in the research, with significant difference between M- and F-group ($\chi^2_{3;0.05} = 7.815$; $p<0.05$), between P- and S-group males with normal-weight, and between overweight (Table 5). There was no significant difference between females in P- and S-group. For all obese respondents and underweight males in P- and S-group, comparison between groups weren't possible, because the number of respondents in one of the groups was lower than five.

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As relatively small numbers of respondents were classified into underweight, overweight and obese subjects' categories, we marked them as inadequate BMI (OB-group) and compared their Yes/No answers given for each question *Q1-Q12* (Table 1) with respondents with normal BMI (N-group): (a) between all respondents (N=720; N_{OB}=149; N_N=571); (b) between all males (N_M=290; N_{MOB}=74; N_{MN}=216); (c) between all females (N_F=430; N_{FOB}=75; N_{FN}=355), but there was no significant difference and BMI impact on answers.

Labelled data and food choice

We focused on evaluation of consumers' general knowledge on selected parameters important in functional food development and relevant for labels use in food choice (Table 4). A high percentage of the total surveyed respondents (Table 4) were interested in labelled information on ingredients used for the product manufacturing (*Q4*), with significant differences between P- and S-group responses ($\chi^2_{1;0.05} = 8.570$; $p<0.05$), as well as between the answers that gave respondents in M- and F-group, ($\chi^2_{1;0.05} = 10.971$; $p<0.05$), influencing on the null hypothesis **H7** and **H8** rejection (Table 3). The difference in the respondents' ages and sex affect on the interest in quality of product ingredients.

Analysis of all responses (Table 4) showed that less than half of young consumers understand and compare labelled data on similar products (*Q5*), there were no significant difference ($\chi^2_{1;0.05} = 0.015$; $p>0.05$) between the respondents answers grouped based on the age, however significant difference ($\chi^2_{1;0.05} = 6.585$; $p<0.05$) was detected between compared groups classified based on the sex (Table 3). Consumers with higher nutrition knowledge are more likely to use the data on the labels when shopping, and other need additional education about the meaning of labelled information on food products, and how to use them.

Consumption of fruits, fruit juices and beverages

A diet based on a wide range of foods may ensure adequate amounts of essential nutrients and protect against some chronic noncommunicable diseases (WHO RCE, 2014; WHO, 2015). Among other, it is recommended to include fruit and vegetables in regular diet, to lower risk of some diseases. We asked respondents whether they eat fruit everyday (*Q6*) and found that a significant number of respondents respect the principle of a healthy diet (Table 4), more affirmative answers were in P- than in S-group (Table 3) and the difference was significant ($\chi^2_{1;0.05} = 6.963$; $p<0.05$), but between M-group and F-group wasn't ($\chi^2_{1;0.05} = 0.759$; $p>0.05$), as shown in Table 3. Our results confirmed the theory that researches of consumers' preference for products, may provide relevant information (Bower and Ferguson, 2008; Grujić et al., 2013b; Carr et al., 2015; Soederberg Miller and Cassady, 2015).

Considerable interest respondents expressed for fruit juices consumption (*Q7*) and healthy eating habits (Table 4), the difference between P- and S-group answers wasn't significant ($\chi^2_{1;0.05} = 3.749$; $p>0.05$), the same as between M- and F-group ($\chi^2_{1;0.05} = 0.831$; $p>0.05$). Fruit juices provide vitamins, minerals, soluble fibres, other various compounds and sugars, but free sugars, added to foods and beverages in manufacturing, contribute to increased sugar intake in the diet (WHO RCE, 2014; WHO, 2015). Consumers may have different attitudes towards the products with reduced energy content, achieved with partial

or total replacement of sugar with non-energy sweeteners. The term *light* product and beverages produced without sugar (*Q8*), we used in our research as synonyms to examine consumer interest for specified category of new products and find that approximately half of all respondents answered positively (Table 4). The difference between P- and S-group answers on question *Q8* was significant ($\chi^2_{1;0.05} = 20.382$; $p<0.05$), but there was no significant difference ($\chi^2_{1;0.05} = 0.136$; $p>0.05$) between compared M- and F-group (Table 3).

The busy lifestyles are changing consumers' dietary habits, and increases preference towards functional foods with added vitamins, minerals or nutritive fibres (Chen, 2011; Hess et al., 2011; Wills et al., 2012; Sonnenberg et al., 2013; Tirelli et al., 2013; Bugge, 2015). Product appearance is also important, but sometimes happens that product nutritional enrichment reduces sensory quality (Visschers et al., 2013), however healthy diets don't necessarily require consumption of less tasty food (Barreiro-Hurlé et al., 2010). The product's unattractive appearance could compensate its nutritive quality and positive impact on health, as the food-added value. Our analyse showed that a high percent of respondents (Table 4) confirmed interest in products with improved nutritional composition that aren't particularly nice (*Q11*), and the difference between adolescents and young adults answers wasn't significant ($\chi^2_{1;0.05} = 3.569$; $p>0.05$), while between M-group and F-group was significant ($\chi^2_{1;0.05} = 4.188$; $p<0.05$).

Consumer knowledge on food quality, health, and attitude to functional foods are important topics for investigation (Grunert et al., 2011; Hess et al., 2011; Nocella and Kennedy, 2012; Grujić et al., 2013a, 2013b; Visschers et al., 2013; Mazzocchi et al., 2014; Wansink et al., 2014). Preference for healthier functional food enriched with vitamins and minerals (*Q9*) expressed a relative large part of all respondents (Table 4), and difference between P- and S-group answers wasn't significant ($\chi^2_{1;0.05} = 1.167$; $p>0.05$), as well as between M- and F-group ($\chi^2_{1;0.05} = 2.584$; $p>0.05$) (Table 3).

Dietary fibres are substances with health benefits (Ötles and Ozgoz, 2014). We examined the young consumers' knowledge and interest in new bakery product enriched with dietary fibres as functional ingredients (*Q10*) and integral cookies used as synonym for it and find that half of respondents included in the research prefer these products (Table 4), the difference between P- and S-group answers wasn't significant ($\chi^2_{1;0.05} = 1.905$; $p>0.05$) but between M- and F-group was significant ($\chi^2_{1;0.05} = 20.818$; $p<0.05$), since females expressed more interest for those products than males (Table 3). Researches regarding consumers and attitudes towards functional food, similar to ours, showed different willingness to use it (Chen, 2011; Hess et al., 2011), considering nutrition information when choose food products with the functional ingredient (Wills et al., 2012) or with benefit to health and fitness (Sonnenberg et al., 2013; Stewart-Knox et al., 2013). Consumers prefer special food quality to stay healthy and the food industry, dieticians and educators should help them to select products suitable for nutrient- or food-based diets (Sanders, 2009; Franczak et al., 2015; Lassale et al., 2013).

Ranking the importance of analyzed data

The importance of the analyzed data contained in each question, also were compared ($p<0.05$) by ranking of the total number of affirmative (*Yes*) answers on 12 questions, on the level of total population of respondents (N=719) included in the research and shown

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in Table 4. Overview of the answers also was expressed in % calculated based on: (i) total sum of *Yes* answers grouped by the column; (ii) possible number of *Yes* answers (N_y=719).

Analysis showed a high level of knowledge on health and nutrition (*Q3)* ranking it on the first place (Table 4). On the second place, significantly different from first ($p<0.05$), was healthy diet preference (*Q1),* followed by significantly expressed interest for new food products (*Q12*). We compared the numbers of answers relating to the healthy food products specified in the questionnaire and concluded that the most expressed were preference towards food enriched with vitamins and minerals (*Q9*); fruit juices (*Q7*); fresh fruit (*Q6*) followed by products enriched with nutritive fibres (*Q10*); *light* products and soft drinks without sugar (*Q8*); more than half of the respondents prefer healthy food that is not particularly nice (*Q11*). Identified differences are indicators of respondents' interest in nutrition and new food products quality characteristics. A relatively large number of respondents included in the research are familiar with the principles of proper nutrition, meeting the recommended higher intake of fruits, vegetables, fibres and whole grains. A significant part of respondents read the labelled information products' ingredients (*Q4*), but fewer respondents compare labelled data (*Q5*). Information collected in the research gave more precise picture about examined population of consumers, as future buyers of new food products.

SMEs are usually oriented towards the local market and that is why their production should be based on products that rely on the traditional cuisine of the region. The intention for work on new functional bakery products development for target group of consumers confirmed finding that 83.03% of the total consumers included in the research were interested in new food products (Table 4); 95.83% know that proper nutrition is important for the health; 85.81% prefer healthy diet; 72.46% were interested in ingredients used for the product manufacturing; 66.76% eat fruit every day; 67.45% consume fruit juices showing basic knowledge regarding healthy eating. Also, 81.78% respondents prefer products enriched with vitamins and minerals; 50.35% showed interest in bakery product enriched with dietary fibres; 48.82% prefer *light* products and beverages manufactured without sugar; and 41.17% understand, use and compare the information labelled on similar products.

This study indicates that SMEs should ensure and retain long-term competitive position using appropriate information from target market on consumers' knowledge on food quality and nutrition, dietary habits and behaviour for new functional product development, suitable for healthy diet. For success, is not enough just to make high quality products. It is clear that appropriate information on the new product is necessary to encourage and motivate consumers to purchase it. Advertising should emphasize the benefit from new functional food in the form of health care and enjoyment in the food consumption. Food producers should select package design layout that would attract consumer attention, help to find relevant information and stimulate the healthy food choice. Likewise, educational programmes on nutrition and food quality may contribute to improving of the consumers' dietary habits and behaviour.

Conclusion

Small and medium-sized enterprises have opportunity for progress through the new food products developing that rely on the basic characteristics of food from national cuisine in the target market, but according to the principles of healthy nutrition. The research demonstrates a methodology for providing data from target market, regarding new

functional bakery product development, used as example. The results of our research are encouraging for planed work on product development aimed to improve food quality on target market. As first should be emphasized that 83.03% of the total consumers included in the research wish to taste new food products. Also, a high percentage of all respondents expressed interest in positive changes in nutrition habits, diet and food product assortment.

Analysis showed a high level of consumers' knowledge on health and nutrition (95.83% respondents) and 85.81% of all respondents prefer healthy diet. These results are supported with the data that 72.46% respondents were interested in ingredients used for the product manufacturing, and the most expressed were preference towards food enriched with vitamins and minerals (81.78% respondents), fruit juices (67.45% respondents), 66.76% respondents eat fruit everyday, followed by 50.35% interested in bakery products enriched with dietary fibres. Lower interest was expressed for *light* products and soft drinks without sugar (48.82% respondents). Also, interesting is that more than half of the respondents prefer healthy food that is not particularly nice, but only 41.17% respondents understand, use and compare the information labelled on similar products. Data were analyzed regarding total observed population and crossing consumers classified based on: age; sex; body mass index. The identified similarities and differences between compared groups of consumers, in preferences or interest for quality parameters, should be used in new products modelling for future buyers.

The findings confirmed opportunity for new functional products development, with increased content of fruit and dietary fibres, and with limited content of sugar. In the further work, producer should select the model product and modify formulation to fulfil nutritive, technological and sensory quality requirements identified as ideas for product's quality parameters. As final activity, the product quality should be evaluated with consumers from target market, to confirm success in the new product development. Advertising should attract attention and motivate consumers on purchasing, emphasizing enjoyment in every bite of the food and the benefits from the healthy food choice.

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