Heliyon 8 (2022) e11002

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Research article

Nutritional behavior and motives of college students for the choice of traditional food in the Republic of Serbia

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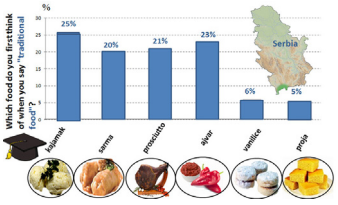
HIGHLIGHTS

- Respondents have bad habits in consuming cigarettes, alcohol and energy drinks.
- Most students consume all regular meals.
- Most respondents do not understand the significance of Body Mass Index.
- One of the main factors in choosing food is that it is not genetically modified.
- Main reasons for consuming traditional food are connection with family and taste.

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:
Eating habits
Consumer behavior
Nutrition
Body mass index
Survey questionnaire

ABSTRACT

The aim of this study was to investigate the eating behavior of college students and the reasons for consuming traditional food and to compare the motives for choosing traditional food with the research conducted in 6 European countries. This research was conducted using anonymous online questionnaires. The majority of surveyed students are physically active (75%) and live with their families (57.0%), which can have a positive impact on their diet and a lower level of consumption of "fast-food" (17.5%). Respondents have bad habits in terms of consuming cigarettes (65.0%), alcohol (73.0%) and energy drinks (75.0%). Most students consume all regular meals (73.0%). Based on the Body Mass Index (BMI) of respondents, they belong to the categories: underweight (12%), normal weight (34%), pre-weight (17%), obese (37%); however, 55.0% believed to have "ideal weight". The reasons for choose particular food are: it is not genetically modified, it tastes good, it is nutritious, it makes them happy, it was produced/packaged in an environmentally friendly and ethical way, while the price of food is not important. Connection with family (81%) and food being tasty (54%) are the main reasons for consuming traditional food. When buying traditional food, respondents (59%) generally do not check the declaration on the product. These results indicate the need to educate students about the harmfulness of cigarettes, alcoholic and energy drinks, the importance of BMI and declaration on the product. Comparing obtained results with the results in 6 European countries it can be noticed that the answers of the respondents in Serbia were the most similar to those obtained in Poland.

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https://doi.org/10.1016/j.heliyon.2022.e11002
Received 20 December 2021; Received in revised form 5 May 2022; Accepted 4 October 2022

1. Introduction

The choice of food is not determined only by its sensory characteristics. The choice of food is influenced by several factors which can be personal (e.g. knowledge, health status, specific habits and body weight), interpersonal and social determinants (e.g. religion, cultural norms) and ethical determinants (e.g. food produced/packaged according to ethical and environmental principles; Milošević et al., 2012). Consumers increasingly demand traditional food and foods with local character. Consumption of traditional food has been increasingly causing a sense of quality nutrition, sustainable production and cultural identity (Pieniak et al., 2009).

Traditions are beliefs or customs taught by one generation to the next, by word of mouth or in writing, and they play an important role in cultural identification of one nation. Each region, ethnic or religious group has specific traditions. Characteristic eating habits play an important role in the traditional habits of many nations. The use of specific raw food material and its different preparation methods has been passed on from one generation to the next and leads to the preparation/use of so-called "traditional foods" (EuroFIR, European Food Information Resource, 2009).

The term "traditional foods" is widely used in the world, but there are various definitions of traditional food. Vanhonacker and associates (2008) defined traditional food as: "…a product frequently consumed or associated to specific celebrations and/or seasons, normally transmitted from one generation to another, made with care in a specific way according to the gastronomic heritage, with little or no processing/manipulation, that is distinguished and known because of its sensory properties and associated to a certain local area, region or country." One of the definitions was given by EuroFIR (2009): traditional nutrition is an established practice and specifics that originated before the Second World War. These are traditional dishes (traditional recipes) with specific preparation and ingredients that clearly distinguish them from other similar products and categories in the use of "traditional ingredients (raw material or primary product)" or "traditional composition" or "traditional method of production and/or processing". The EuroFIR (2009) definition of traditional foods was acknowledged by the Food and Agriculture Organization (FAO, Food and Agriculture Organization of the United Nations, 2021).

Specific components and preparation methods of traditional foods are part of the folklore of one nation, culture, ethical or religious community, a country or a region. The Republic of Serbia is very rich in various products of the traditional cuisine of animal and vegetable origin as well as various cakes, breads and drinks. Rich Serbian history greatly influenced and shaped the characteristics of Serbian traditional food, as did the geographical position of Serbia. Even different regions in Serbia have their own specific traditional dishes. The gastronomic map of Serbia starts in the north, from Vojvodina region, in the heart of the Pannonian plain. This is a multinational region, where the customs of Serbs, Hungarians and Romanians mix. Meat products, wine and dough are the "holy trinity" of this region. For example, legend has it that the wine "Bermet" (from Vojvodina) was drunk by the Hazburg ruler Maria Theresa, and that this wine was served on the Titanic. The Serbian central region, Šumadija cuisine, has the least foreign influences. Meat products (prosciutto, greaves) and dairy (kajmak and cheese) products, various drinks (fruit brandy and wine) as well as various ready meals (sarma, kebabs) are traditional products of this region. Some of these dishes are associated with the legends from the Turkish conquests of this area, but from old tavern stories as well. The western parts of Serbia (Zlatar, Peštarska plateau) are known for meat (beef and pork prosciutto, bacon, roasted lamb) and dairy products (sheep and cow cheese and kajmak). In eastern Serbia, the greatest attention is paid to cereals and vegetables, while the meat is in the background. The areas along the Danube are ideal for wine production, as well as fish and caviar. On the slopes of the Homolje Mountains, lamb dishes are famous and originate from pastoral customs. The south of Serbia is known for the traditional pork dish (barbecue), as well as for the traditional dish made of paprika (ajvar) and specific cheeses. In this region as well, the ancient Turkish conquests had a strong impact on the customs of Serbian people (folklore, dance, national costumes, and food).

Traditional food and motives for its consumption are very important for all countries. For this reason, various researches are performed. For example, EuroFIR (2009) conducted research to examine the perception of traditional food in Europe in 6 European countries (Belgium, France, Italy, Norway, Poland and Spain). Their research did not include respondents from Serbia.

Consumption of traditional food is usually related to family home and customs. Since most students leave their family homes during studies, there is the question whether students then consume traditional food, or much more often the so-called "fast-food". The first aim of this paper was to assess which motives trigger college students in particular, to eat traditional food in everyday life, specifically regarding BMI, eating motivation and habits, social and economic factors, as well as in relation to the general food choice factors. The second aim of this research was to compare the motives for choosing traditional food with the research in study carried out by the EuroFIR (2009) in 6 European countries.

2. Methods and participants

2.1. Design

This research was conducted using four anonymous online questionnaires. Participants gave written consent to participate in the survey and data processing. These questionnaires are in line with the General Regulation on Data Protection of the European Union. The collected data were used exclusively for scientific purposes. This research is a part of a broader study titled "Attitudes and behavior of students in relation to food and nutrition" conducted among students of the Faculty of Agriculture, University of Belgrade, on the subject of "Food Biochemistry". Data collection was completed during May 2021.

The questionnaires were sent to the participants two times with twenty days of a break between the repetitions. After the first recipient of questionnaires, all respondents returned all four questionnaires within a 5-days period. The average number of days between the completion of the two same questionnaires was 22.8 ± 1.2.

2.2. Participants

The study sample included students of the first, second and third year of bachelor studies at the Institute of Food Technology and Biochemistry, Faculty of Agriculture, University of Belgrade. The surveyed students were selected randomly; all students had an equal chance of being selected for the sample.

2.3. Measures

In order to get a complete picture of our respondents' life habits and their health condition, as well as about the attitudes regarding general food choice factors, and motives for choosing traditional food specifically, and with the aim to determine whether food choices are related to BMI, we designed four different questionnaires.

2.3.1. Socio-demographic data (SDD) and eating habits

The modified SDD questionnaire by Stanojević et al. (2020) contained questions related to gender, age, nationality, as well as questions that can provide information about the daily habits of the respondents, their health status and habits, as well as the daily consumption of certain meals (eating habits). Furthermore, this questionnaire contained questions related to the body mass index and students' attitudes to body weight control. Students were required to circle the answer that suited the best as well as to write a specific answer to some questions. The results of this survey are presented in Tables 1 and 2 and Figures 1 and 2.

Table 1. Socio-demographic data, habits and health status of respondents (N = 200).

Characteristics	Answers	
	n	%
Gender		
male	64	32.0
female	136	68.0
Age groups (average age - 21.18 ± 1.3)		
20-23	200	100.0
Class status		
1nd year	21	10.5
2nd year	152	76.0
3nd year	27	13.5
Nationality		
Serbian	200	100.0
Physical activity		
yes, every day	34	17.0
yes, 1–2 per week	60	30.0
yes 3–4 per week	56	28.0
no	50	25.0
Leisure activities		
hobby	46	23.0
TV	36	18.0
books	40	20.0
shopping	25	12.5
a walk	42	21.0
I'm bored	11	5.5
Do you sleep well at night?		
yes	148	74.0
no	52	26.0
Do you think you are …		
ideal weight	110	55.0
skinny	26	13.0
obese	64	32.0
Are you satisfied with the shape of your body?		
yes	126	63.0
no	74	37.0
I measure body weight ...		
daily	8	4.0
per week	24	12.0
per month	42	21.0
several times a week	14	7.0
several times a month	12	6.0
very rarely	100	50.0
I suffer from chronic diseases health?		
yes	30	25.0
no	170	85.0
I live with my family in the …		
urban settlement	162	81.0
rural settlement	38	19.0
I live with my family in an agricultural household.		
yes	28	14.0
no	172	86.0
When I'm studying I live ...		
with family	114	57.0
in the dorm	24	12.0
in the apartment alone	34	17.0
in an apartment with a roommate	28	14.0
I consume cigarettes.		
yes	130	65.0
no	70	35.0
I consume alcohol.		
yes	146	73.0
no	54	27.0
I consume energy drinks.		
yes	150	75.0
no	50	25.0

N - total number of respondents. n - number of respondents who answered a certain question.

2.3.2. The food choice questionnaire (FCQ)

This questionnaire was in accordance with multidimensional measures of food choice by Steptoe and Pollard (1995) with minor changes. Namely, we kept all 9 factors important for food choice, but for reasons in order to match our research, avoid repeating certain offered answers in the FCQ questionnaire and other applied questionnaires, as well as to enter new possible answers relevant to our research, we changed some items for certain factors. The changes were as follows:

- factor 5 - Natural Content: item: "Contains no artificial ingredients" was dropped, and items added were: "It is important to me that it is "organic" food" and "It is not genetically modified food";
- factor 6 - Price: item: "Is cheap" was deleted and item: "I don't care about price" was added;
- factor 7 - Weight Control: item: "Is low in fat" was dropped, and item: "I don't care about caloric value" was added;
- factor 8 - Familiarity: item: "I want to try something new" was added, while item: "Is familiar" was mentioned in "Is familiar, but I don't eat often".
- factor 9 - Ethical Concern: items: "Is produced using ethical production methods (e.g. sustainable, animal friendly, without child labor, etc.) "and "Supports the local economy" were added (Pieniak et al., 2009).

Students indicated to what degree statements about food choices were important to them by choosing between four responses (1-not at all important; 2-little important; 3-moderately important and 4-very important). The results of this survey are presented in Tables 3 and 4 and Figure 3.

2.3.3. The questionnaire of consumer perception of Serbian traditional food products (SerbianTFQ)

A questionnaire was prepared to refer specifically to Serbian traditional food and the motives of students to consume it. The questionnaire contained 25 questions that students answered by circling the most suitable answer, or by writing the answers. The results are grouped according to the nature of the questions and presented in the form of Table 5 and Figures 4, 5, and 6.

2.3.4. The EuroFIR questionnaire of consumer perception of traditional foods (EuroFIRTFQ)

The questionnaire was prepared according to a study carried out by the European Food Information Resource (EuroFIR, European Food Information Resource, 2009), which conducted a survey by Vanhonacker et al. (2008) in order to examine the perception of traditional food in Europe. EuroFIR conducted this research in 6 European countries (Belgium, France, Italy, Norway, Poland and Spain). Their research did not include respondents from Serbia. Therefore, our respondents in this study answered on the same questions related to the perception of traditional food in order to compare the answers with the results obtained in these 6 European countries. Participants indicated a degree of

Table 2. Data on the eating habits of the respondents.

Questions	Answers	
	n	%
$N_1 = 200$		
Have you ever consulted a nutritionist?		
yes	34	17.0
no	166	83.0
I apply a special diet.		
yes	36	18.0
no	164	82
Do you use diet on your own initiative?		
yes	54	27.0
no	146	79.0
My favorite food is ...		
meat and meat products	50	25.0
a fish	30	15.0
vegetables	22	11.0
fruit	28	14.0
sweets	25	12.5
salty snacks	20	10.0
milk and dairy products	22	11.0
pasta	3	1.5
My favorite drink is ...		
water	93	46.5
natural juices	30	15.0
wine	29	14.5
brandy	10	5.0
whiskey	10	5.0
a beer	8	4.0
tea	6	3.0
coffee	5	2.5
energy drinks	9	4.5
I consume more often ...		
traditional food	165	82.5
"fast-food"	35	17.5
Do you have regular meals?		
yes	146	73.0
no	54	27.0
Do you have breakfast regularly?		
Yes	128	64.0
no	72	36.0
Do you have lunch regularly?		
yes	130	65.0
no	70	35.0
Do you have dinner regularly?		
yes	144	72.0
no	56	28.0
Do you have regular mid-morning snacks?		
yes	112	56.0
no	88	44.0
Do you have regular mid-afternoon snacks?		
yes	91	45.5
no	109	54.5
Do you have regular late-nigh snacks?		
yes	11	5.5
no	189	94.5
$N_2 = 114$		
*My dinner is rich with…		
lipids	11	9.6
carbohydrates	50	43.9
proteins	53	46.5
*I usually have dinner…		
around 6–7pm	40	35.1
around 9–10pm	66	57.9
after midnight	8	7.0

N_1 - total number of respondents. n - number of respondents who answered a certain question.

* This question was only applied to students who answered that they had a regular dinner ($N_2 = 114$).

perception about traditional food by choices on a seven-point scale ranging from 1 (I absolutely disagree) to 7 (I absolutely agree). The results are presented in the form of Table 6.

2.4. Statistical analysis

Descriptive statistics for quantitative measures (mean, standard deviation, or pooled standard deviation - *Pooled std*) of two repetitions as well as qualitative measures (percentage) were calculated first. Correlation coefficients among some of the parameters were computed by means of Pearson correlation coefficient ($p < 0.05$). The multiple-range test by Tuckey was used for compared means ($p < 0.05$). Statistica software version 8.0 (StatSoft Co., Tulsa, Oklahoma, USA) was applied for statistical analysis.

3. Results and discussion

3.1. Socio-demographic data and eating habits of the respondents

The study sample included 200 students between the age of 20 and 23 (the average age was 21.18 ± 1.3 and all were of Serbian nationality. The sample was composed of 136 females (68.0%) and 64 males (32.0%; Table 1). A significant number of respondents are physically active (75%) however 25% of respondents are not engaged in physical activity. This can be a problem because physical activity and nutrition are major determinants of disease and health. They are associated with the risk of hypertension, coronary heart disease, type 2 diabetes, colon cancer, osteoporosis, obesity and even premature mortality (WHO, 2003). On the other hand, the results of the survey indicate good results in terms of leisure activities and good sleep during the night. Namely, 94.5% (Table 1) of respondents state that they are active in their free time, while only 5.5% of respondents are bored. Boredom can lead to higher energy intake as well as consumption of larger amounts of carbohydrates, proteins and fats (Moynihan et al., 2015). A significant number of surveyed students sleep well at night (74.0%; Table 1), which is good, since the diet can significantly affect good/bad sleep during the night (Stanojević et al., 2020).

The majority of surveyed students live with their families (57.0%; Table 1), which can have a positive impact on their diet and a lower level of consumption of the so-called "fast-food" (17.5%; Table 2). However, the conducted survey indicates the bad habits of the surveyed students in terms of consuming cigarettes (65.0%), alcohol (73.0%) and energy drinks (75.0%; Table 1). This implies that it is necessary to provide students with appropriate education in order to point out the harmfulness of such habits. However, the good thing is that most students' favorite drink is water (46.5%) not alcoholic or energy drinks (Table 2). The favorite food of the surveyed students is meat and meat products (25.0%), then fish (15.0%), fruits (14.0%) and vegetables (11.0%), as well as sweets (12.5%; Table 2).

Table 3. Food choice questionnaire (FCQ).

It is important to me that the food I eat on a typical day has the following characteristics:	Importance assessment (1–4*)	SD
Factor 1 - Health		
Keeps me healthy	3.53	0.02
Is nutritious	3.65	0.02
Is high in protein	3.23	0.02
Is good for my skin/teeth/hair/nails etc.	3.12	0.01
Is high in fibre and roughage	2.89	0.02
Contains a lot of vitamins and minerals	3.48	0.02
Factor 2 - Mood		
Helps me cope with stress	2.85	0.01
Helps me to cope with life	3.05	0.03
Helps me relax	3.15	0.04
Keeps me awake/alert	2.69	0.02
Cheers me up	3.16	0.01
Makes me feel	3.51	0.02
Factor 3 - Convenience		
Is easy to prepare	3.00	0.02
Can be cooked very simply	2.84	0.02
Takes no time to prepare	2.69	0.02
Can be bought in shops close to where I live or work	3.03	0.02
Is easily available in shops and supermarkets	3.36	0.05
Factor 4 - Sensory Appeal		
Smells nice	3.16	0.02
Looks nice	2.84	0.01
Has a pleasant texture	3.18	0.03
Tastes good	3.77	0.05
Factor 5 - Natural Content		
Contains no additives	2.86	0.02
Contains natural ingredients	3.18	0.03
It is important to me that it is an “organic” food	2.26	0.02
It is not a genetically modified food	3.92	0.02
Factor 6 - Price		
Is not expensive	2.88	0.03
I don't care about price	3.54	0.05
Is good value for money	2.67	0.03
Factor 7 - Weight Control		
Is low in calories	2.30	0.03
Helps me control my weight	2.62	0.02
I don't care about caloric value	2.37	0.02
Factor 8 - Familiarity		
Is what I usually eat	2.96	0.03
Is familiar, but I don't eat often	2.34	0.03
Is like the food I ate when I was a child	2.27	0.02
I want to try something new	3.38	0.03
Factor 9 - Ethical Concern		
Comes from countries I approve of politically	1.67	0.01
Has the country of origin clearly marked	1.77	0.02
Is produced/packaged in an environmentally friendly way	3.51	0.02
Is produced using ethical production methods (e.g. sustainable, animal friendly, without child labour, etc.)	3.50	0.02
Supports the local economy	3.37	0.02

Importance assessment: 1–1.99-not at all important; 2–2.99-little important; 3–3.99- moderately important and 4-very important. Total number of respondents = 200.

Most students consume all regular meals (73.0%): breakfast (64.0%), lunch (65.0%) and dinner (72.0%; Table 2). Respondents showed a division in consuming snacks during the day. Namely, mid-morning (56.0%) and mid-afternoon snacks (45.5%) are consumed by about half of the respondents, while late-night snacks are consumed by a small number of respondents (5.5%; Table 2). Figure 1 show the social moment of consuming individual meals. The results indicate that eating alone is the dominant form of consuming almost all meals, except lunch and dinner, which are most often consumed with the family. These results are in partial agreement with the results of a study of dietary motivation at Kansas State University (United States) where it was noted that only dinner is consumed in the family, while all other meals are eaten alone (Phan and Chambers, 2016). The way food is consumed is becoming increasingly important today. Namely, modern and traditional eating is not only characterized by what people eat but also by how they eat (Sproesser et al., 2019). In our study, a difference was noted among the respondents in the schedule of dinner consumption as well as in the nutritional composition of dinner. Namely, most respondents state that the most common dinner time is at 9–10 pm (57.0%) and that their dinner is rich in protein (46.5%) and carbohydrates (43.9%; Table 2). Consumption of carbohydrates for dinner can positively affect mood because it secretes serotonin and it can affect good sleep (Muscogiuri et al., 2020). However, frequent and dominant consumption of carbohydrates for dinner can lead to many side effects, such as: the risk of developing obesity, which can often be combined with diabetes, heart and lung diseases, therefore one can fall into a “vicious circle” (Muscogiuri et al., 2020).

3.2. Body mass index of the respondents

A large number of studies indicate the connection between diet and obesity with the appearance of various diseases. For example, new studies indicate an association of COVID-19 with high body mass index, sarcopenic obesity, and impaired general nutritional status, as well as with comorbid conditions (Graf et al., 2016; Peng et al., 2020). The Body Mass Index of the surveyed students is presented in Figure 2. The results were classified according to WHO (1997) recommendations for adult weight. WHO-recommendations also include an assessment of the risk of co-morbidities depending on BMI. The obtained results indicated that 12% of the respondents are in the underweight category and they are at low risk of co-morbidities, but the risk of other clinical problems increased. A significant number of students (34%) have a BMI corresponding to the normal weight category. According to the WHO recommendation (1997), their risk of co-morbidities is average. The results were worrying about the fact that more than half of the surveyed students (54%) have a BMI$\geq$25 kg/m^2 and belong to the overweight group (17% of respondents belong to the pre-weight group; while as many as 37%; of respondents belong to the obese group) (Figure 2). Their risk of developing co-morbidities is increased. However, a significant number of students do not suffer from chronic diseases (85.0%) and more than half of the respondents are satisfied with their body shape (63.0%) and believe that they have “ideal weight” (55.0%; Table 1). Although previous research indicates that students are aware of the risks that can lead to obesity, as well as diseases that can occur as a result of being overweight (Simić and Stanojevuć, 2020), these results indicate the need to educate students and increase the awareness of the importance of BMI in order not to enter the “vicious circle” of ignorance that can lead to metabolic disorders and later to various diseases. In support of this were the results that as many as 83.3% of respondents never consulted a nutritionist, 82.0% of respondents did not apply any special diet, although 27.0% of surveyed students used a self-initiated diet, which is not recommended (Table 2). In addition, half of the surveyed students (50.0%; Table 1) stated that they very rarely measured their body weight. The possibility of overweight occurrence is positively associated with the importance associated with the weight control during food purchasement. On the other hand, overweight is negatively associated with the price of food products and subjective health (Pieniak et al., 2013). In explaining why factor of “good taste” in the choice of traditional food are important to them, students stated that consuming delicious food is associated with forgetting worries and problems as well as helping

Table 4. Intercorrelations between Food Choice Questionnaire factors.

Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Factor 2	-0.54							
Factor 3	0.68	-0.98						
Factor 4	0.97	-0.14	-0.03					
Factor 5	0.99	-0.49	0.63	-0.78				
Factor 6	0.86	-0.04	0.22	-0.98	0.89			
Factor 7	0.56	0.039	-0.23	-0.97	0.62	0.90		
Factor 8	0.33	-0.97	0.92	0.37	0.26	-0.20	-0.60	
Factor 9	-0.92	0.82	-0.91	0.45	-0.87	-0.60	-0.20	-0.66

A correlations are significant at $p < 0.05$. Factor 1-Health; Factor 2-Mood; Factor 3- Convenience; Factor 4-Sensory appeal; Factor 5-Natural content; Factor 6-Price; Factor 7-Weight control; Factor 8-Familiarity; Factor 9-Ethical concern.

alleviate negative feelings (e.g. learning obligations). And all of that could very often be associated with binge-eating, which resulted in weight gain. Therefore, the value of BMI for a significant number of students was in the "overweight" range (Figure 2). Similar results were reached by Boggiano et al. (2014) studying the motives of student nutrition at the University of Alabama at Birmingham.

3.3. Motives for food choice

The 9 factors for food choice and the importance assessment and standard deviations of all 40 items are displayed in Table 3. The students rated the item related to genetically modified food with the highest rating of importance (3.92). This result is in accordance with the research conducted in Serbia in 2019 at the request of the European Food Safety Agency (EFSA, 2021), when 46% of respondents in Serbia said that they were most concerned about the possible presence of genetically modified organisms in food. This concern of respondents in Serbia was significantly higher compared to respondents living in European Union (27%). Given that Serbia has zero-tolerance for GMO production and food trade, these results are expected (LGMO, 2009).

The students marked the following items as very important factors when choosing food: the food tastes good (3.77), it is nutritious (3.65) and it makes them happy (3.51; Table 3). It was unexpected that the students had rated the importance of the item "not to worry about the price of food" (3.54) as Serbia is a relatively poor country (Table 3). This result differs from the results of a survey conducted at the request of EFSA (2009), when as many as 61% of respondents in Serbia singled out the price of food as one of the most important factors when buying food.

It is very positive that the students rated certain items belonging to the factor 9 (ethical concern), such as that the food was produced/packaged in an environmentally friendly way (3.51) and that it was produced in an ethical way (3.50) with high marks of importance; as well as the fact that they want to support the local economy in their food choices (3.37; Table 3), which can have a direct impact on the frequency of consuming the traditional food.

The analysis of average factor scores showed the highest rating of importance for the factor which refers to health (3.32), followed by sensory aspects of food (3.24; Figure 3). Correlation analysis showed a very strong relationship between these two factors ($r = 0.97$). A similar correlation was observed between the assessments of importance related to the health factor and the importance of the natural composition of the food ($r = 0.99$; Table 4). The lowest average factor score was recorded for the factor related to weight control (2.43; Figure 3), which was in line with the relatively poor BMI results where 54% of respondents belonging to the overweight group were recorded (Figure 2). These results are in accordance with the results of the research of Milošević and associates (2012), who examined the importance of certain factors in the choice of food (grades 1–5) in the territory of the former state of Yugoslavia. Their research for the Republic of Serbia recorded the highest rating of importance for the factors of sensory appeal (4.44) and the health and natural composition of food (4.24).

In general, in addition to factors related to health and sensory characteristics of food, for the surveyed students as important factors in food choice were also the mood they get from food (3.07) and natural food content (3.06), Figure 3.

3.4. Motives for the choice of traditional food

According to the obtained results, the surveyed students did not associate traditional food with healthy food (only 8% of respondents believe that traditional food is healthy), which is in accordance with the answer that only 11% (Table 5) of respondents would choose traditional food precisely because of nutritional value. However, a significant number of respondents (85%) said that traditional food can be both energetically and nutritionally valuable (Table 5). As an explanation of this statement, the respondents stated that most traditional Serbian foods were primarily energy-rich, but that there were (although a much smaller number) traditional foods that were also nutritionally valuable. Consistent with the high importance of good taste (3.77; Table 3) in the assessment of food choice factors and traditional food, students stated that traditional food reminded them of something tasty (54%) and that the specific taste of traditional food (50%) was one of the most important features when choosing this food (Table 5).

A significant number of respondents stated that traditional food was related to the history/legend of a particular location (89%; Figure 4) and reminded them of home and family (81%; Figure 5) and that this is one of the reasons for consuming traditional food (59%; Table 5); furthermore, a significant number of respondents (29%; Table 5) was informed about the nutritional value of traditional food in the family. Also, a significant number of respondents (33%, Table 5) stated that this information was obtained from the Internet.

Consistent with the low results on the importance of food prices (2.88) and getting good food value for a certain price (2.67) in the general selection of food (Table 3), and in the selection of traditional food, only a small number of respondents said that the price was important (7%) and that the relationship between quality and price was important (only 4%; Table 5). What worried the respondents when choosing traditional food was hygiene during preparation (59%) as well as microbiological correctness (16%) and the presence of genetically modified constituents (13%; Table 5). Health concern, sensory appeal, mood and food safety concern as well as time or money saving and availability and familiarity are important factors in the choice of traditional food for other peoples (Ou et al., 2014). Sensory appeal is also pointed out by Blešić and associates (2021) as the most important criterion for the selection of traditional food, followed by health concern and familiarity.

When buying traditional food, the majority of respondents (59%; Figure 4) stated that they did not check whether the product had a designation of origin and a geographical identity. However, the vast majority of respondents (85%; Figure 4) feel that fraud is possible in the market in terms of the authenticity of traditional food. Most of the respondents think that innovations in the production of traditional food are

Table 5. Student responses to the part of the SesbianTFQ questionnaire that referred to students' perception of Serbian traditional food (N = 200).

Questions	Answers	
	n	%
Traditional food reminds me on…		
healthy food	16	8
tasteful	44	54
safe food	-	-
always the same quality	4	2
multigenerational use	24	12
the region where I grew up	16	8
exclusively Serbian food	28	14
support to local food producers	4	2
I opt for traditional food because ...		
nutritional value	22	11
reasonable prices for a certain quality	8	4
known method of preparation	46	23
great availability	6	3
common uses in my family	118	59
When I decide on traditional food, it is important to me ...		
origin of raw materials for its preparation	44	22
nutritional value and food safety	34	17
the price	14	7
specific taste	100	50
whether it is "trendy" on social media	-	-
religious beliefs	8	4
ethical attitudes and affiliation	-	-
The main source of information on the nutritional value of traditional food is ...		
television	14	7
Internet	66	33
the family	58	29
social networks	20	10
doctor (nutritionist, dietitian ...)	20	10
food fairs	-	-
professional journals and the scientific public	22	11
local seller	-	-
When choosing traditional food, I am most worried…		
hygiene during preparation	118	59
use of additives	10	5
use and residues of pesticides, antibiotics and hormones	14	7
the presence of genetically modified constituents	26	13
microbiological correctness	32	16
Which of the following statements do you agree with?		
Traditional food is rich in biologically active components.	6	3
Traditional food is primarily rich in energy.	24	12
Traditional food can be both energetically and nutritionally valuable.	170	85

N - total number of respondents. n - number of respondents who answered a certain question.

necessary today (59%) in terms of energy (31%) and nutritional (28%; Figure 4) value, and that the characteristics of traditional food would be closer to the needs of modern man. However, those respondents who felt that innovation should not be introduced into the traditional food production process (41%) stated that this would change the authenticity and sensory characteristics (37%) as well as the price (4%; Figure 4).

A significant number of respondents answered that they did not care whether traditional food was produced using "organic" production (46%) but it was very important to them whether "eco-friendly" packaging was used (55%; Figure 5). The majority of respondents answered that they did not prepare traditional food themselves (65%) and that they did not check the composition of the traditional food on the declaration when buying it (76%, Figure 5). These results indicated the need to educate students on the principles of "organic" production and the importance of the declaration when buying food.

Most students answered that they felt the greatest desire/need to consume traditional food when they were abroad (67%) and that Serbian traditional food was similar to the traditional food of some other countries (52%; Figure 5). The first claim may be related to nostalgia for home and family, while the second claim may be related to the history and conquest of Serbian territory by foreign armies in the earlier period.

There were approximate results obtained when asked which food the respondents think of first when they say "traditional food" (Figure 6A). 25% of students answered kajmak (a type of dairy product, similar to spread, but rich in milk fat), 23% answered ajvar [a product made of roasted red peppers; Leskovac Home Made Ajvar is (under number AO 904) recognized by the Lisbon Agreement on the International Protection of Designations of Origin (Lisbon Express, 2012); Leskovac is a town in southern Serbia]. While 21% of the surveyed students first thought of prosciutto (a product made of smoked pork) and 20% of sarma (a dish made of boiled cabbage and minced meat). A very small number of respondents thought of vanilice (6%; traditional cookies made of specially prepared dough, combined with a coating of jam) and proja (5%; traditional bread prepared only with corn flour, water and salt). When asked which traditional food was primarily nutritionally rich, the largest number of surveyed students answered ajvar (31%; Figure 6B). While the largest number of surveyed students answered that greaves (34%; Figure 6C) were primarily energy-rich food, and 38% (Figure 6D) answered that caviar was energy and nutrition rich food (which is mostly produced on the banks of the Danube in the region of Kladovo where there is a lot of fish – carp; Kladovo is a city in western Serbia).

3.5. Relationship of consumer perception of traditional food products in Serbia and Europe

Several studies have been conducted on the attitude of consumers towards traditional food in several different European countries (Vanhonacker et al., 2008; EuroFIR, European Food Information Resource,

Table 6. Consumer perception of traditional food products in Serbia.

Item	Importance assessment (1–7*)	SD
1. When I think about traditional food, I think about food products that my parents and grandparents already ate	6.83	0.03
2. I consider traditional food as well-known food	5.92	0.02
3. The availability of traditional food is strongly dependent on the season	5.45	0.05
4. According to me, traditional food is typically something one can eat very often	5.31	0.01
5. Traditional food has an authentic recipe	5.94	0.03
6. To me, a traditional food product is associated with specific sensory properties	6.68	0.06
7. Traditional food has an authentic origin of raw material	5.28	0.03
8. A traditional food product is typically produced „in grandmother's way"	5.61	0.02
9. Traditional food has an authentic production process	5.56	0.07
10. The key steps of the production of traditional food must be done locally	4.69	0.03
11. When it comes to food products, for me traditional food means natural, low processed	3.67	0.05
12. A traditional food product must contain a story	6.75	0.05
13. When I think about traditional food, I think about special occasions and/or celebrations	5.03	0.03

Total number of respondents = 200. SD - standard deviation of two replicates. The questionnaire was taken from Vanhonacker et al. (2008).

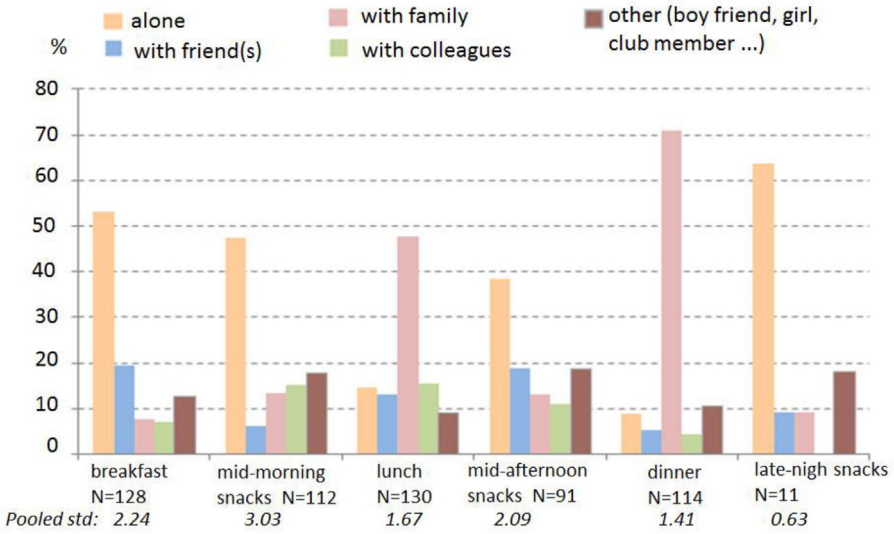


Figure 1. Student responses to the part of the Socio-demographic data. Social moment of consuming certain meals. N - Total number of respondents who responded to consuming each special meal (Table 2). *Pooled std* - Pooled standard deviation of two replicates.

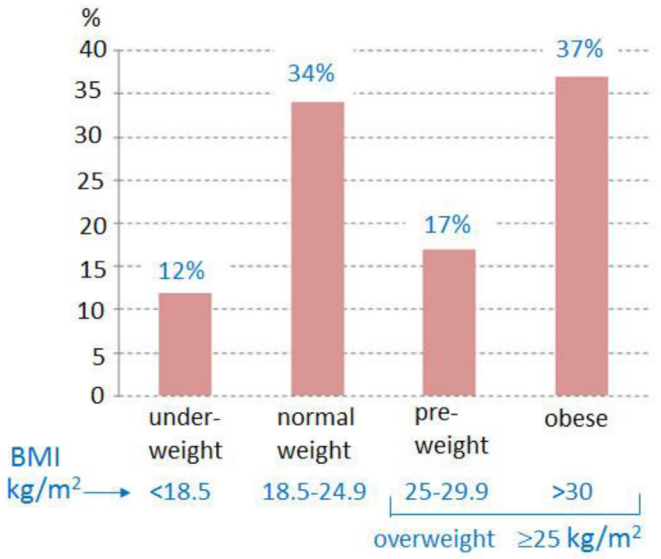
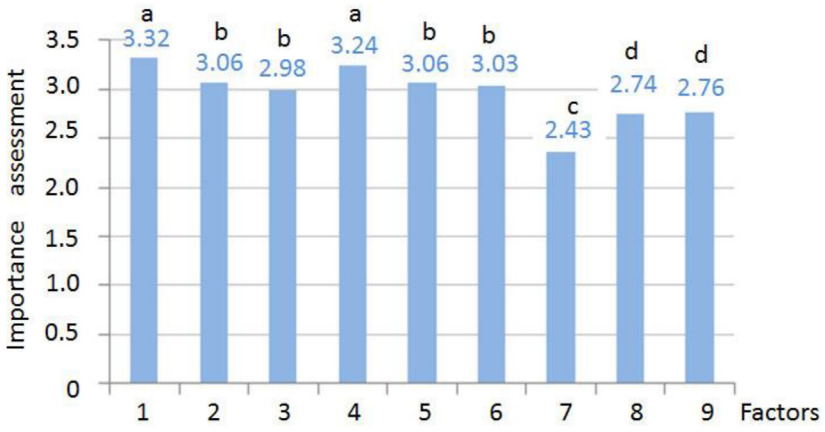


Figure 2. Student responses to the part of the Socio-demographic data. Distribution of the Body Mass Index (BMI) among participants. Data is expressed as percentage of mean. Pooled standard deviation - *Pooled std* = 2.57, of two replicates and total number of respondents, N = 200.



2009; Pieniak et al., 2009). Comparing the results of the questionnaire conducted among Serbian students (Table 6) with the results obtained from research in Belgium, France, Italy, Norway, Poland and Spain (Vanhonacker et al., 2008), we noticed significant differences in the statements under numbers 1, 6, 11 and 12 (Table 6) as follows:

- 1, which refers to the association to the family when thinking of traditional food; respondents in Serbia rated this statement with a very high score of 6.83, the closest to the score obtained in Poland (6.14), while other countries had scores of 5.84–6.10;
- 6, which refers to the association with specific sensory characteristics of traditional food; respondents in Serbia rated this statement with a very high score of 6.68; the highest score of other surveyed countries on this association was given by respondents in Poland (5.95), while other countries had scores of 4.93–5.73;
- 11, which refers to the association that traditional food is natural/low processed; respondents in Serbia rated this statement with a lower score of 3.67, compared to other countries that rated this statement with a score of 4.40–5.17; this is understandable, given that the vast majority of traditional dishes in Serbia are prepared by significant application of heat treatment;
- 12, which refers to the association with the claim that traditional food must contain a legend/story; respondents in Serbia rated this statement with a very high score of 6.75; the highest score of other surveyed countries on this association was given by respondents in Poland (6.16), while other countries had scores of 3.90–5.51.

Figure 3. Average Food Choice Questionnaire factors scores. 1–9 – Factors of food choice: Factor 1-Health, Factor 2-Mood, Factor 3-Convenience, Factor 4-Sensory appeal, Factor 5-Natural content, Factor 6-Price, Factor 7-Weight control, Factor 8-Familiarity, Factor 9-Ethical concern. Pooled standard deviation - *Pooled std* = 0.05, of two replicates and total number of respondents, N = 200. Means values for individual food choice factors with different roman letters are significantly different ($p < 0.05$).

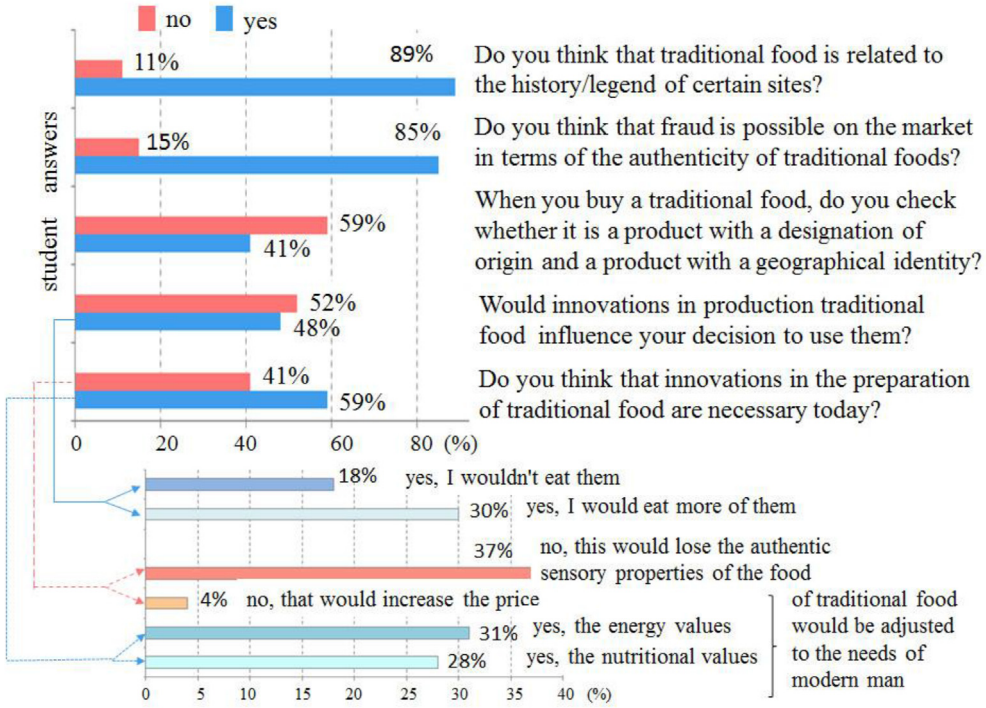


Figure 4. Student responses to the part of the SerbianTFQ questionnaire that referred to students' opinions on the connection between traditional food and legends/ geographical origins and possible applications of innovative procedures in traditional food production. Data is expressed as a percentage of the mean. Pooled standard deviation *Pooled std* = 2.57, of two replicates and total number of respondents, N = 200.

Respondents in Serbia gave similar assessments of importance to other offered statements in this questionnaire as in other European countries that participated in this type of research. However, it can be noticed that the answers of the respondents in Serbia were the most similar to those obtained in Poland.

3.6. Limitations and importance of the study and future lines of work

Self-reporting of BMI has been used in this study which is a limitation of the study. Namely, Spencer et al. (2002) concluded that respondents with moderate obesity estimate their BMI more accurately than

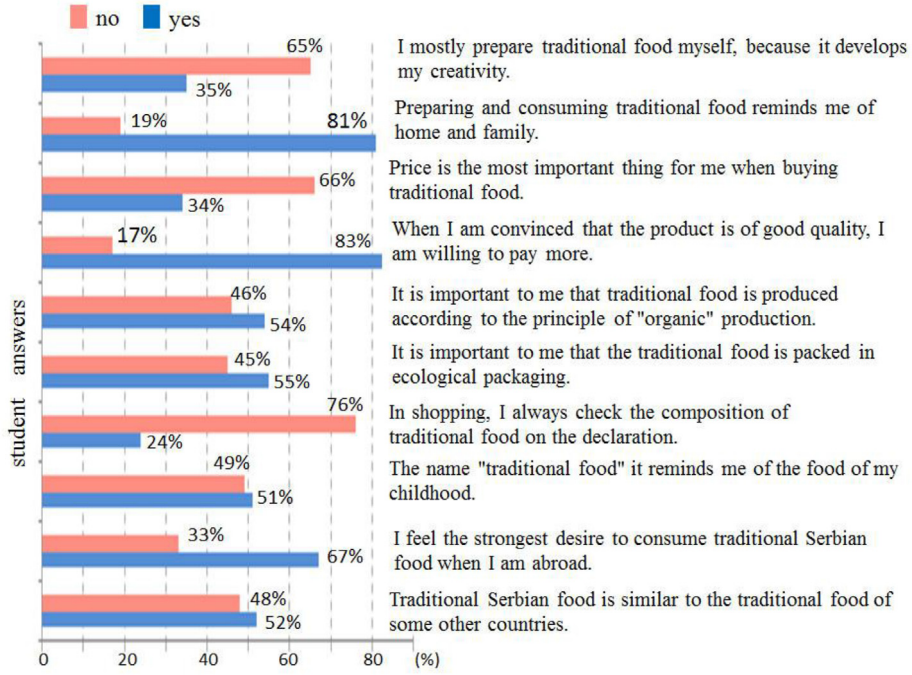


Figure 5. Student responses to the part of the SerbianTFQ questionnaire that referred to students' opinions on the connection between traditional foods and factors that are important to them when deciding to consume traditional food. Pooled standard deviation - *Pooled std* = 3.60, of two replicates, of two replicates and total number of respondents, N = 200.

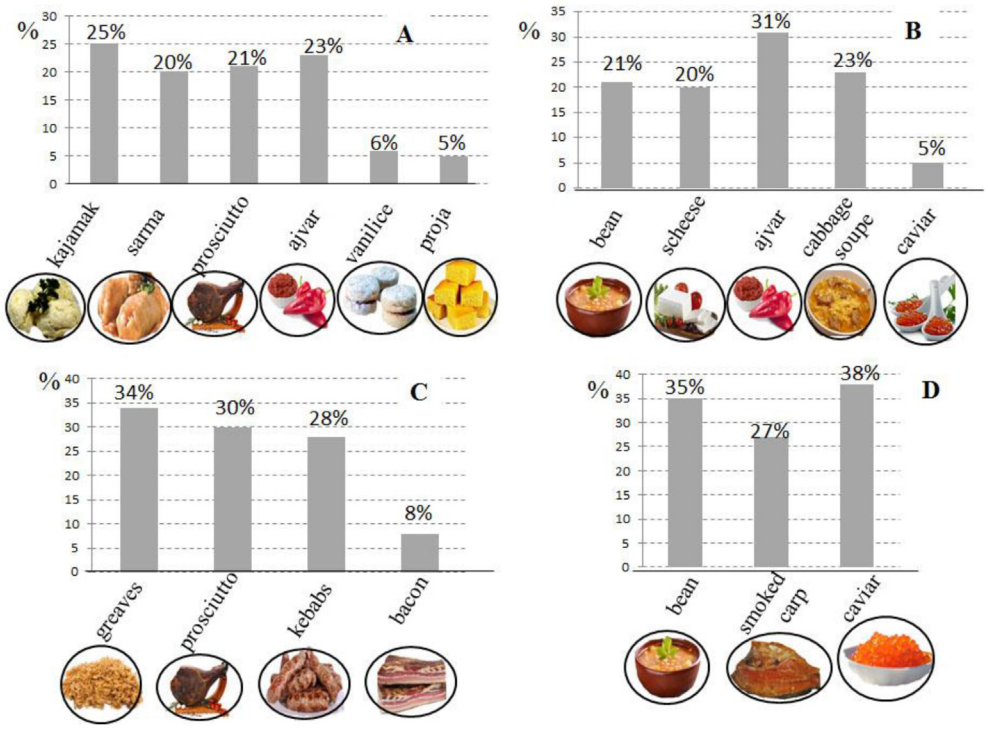


Figure 6. Student responses to the part of the SerbianTFQ questionnaire that addressed the following questions: **A**-Which food do you first think of when you say "traditional food" ? Pooled standard deviation - *Pooled std* = 3.11, of two replicates (total number of respondents, N = 200). **B**-List one traditional food that you think is primarily nutritionally valuable. Pooled standard deviation - *Pooled std* = 3.44, of two replicates (N = 200). **C**-Name one traditional food that you think is primarily energetically valuable. Pooled standard deviation - *Pooled std* = 5.17, of two replicates (N = 200). **D**-Name one traditional food that you think is both nutritionally and energetically valuable. Pooled standard deviation - *Pooled std* = 4.69, of two replicates (N = 200).

respondents with high obesity. Further, students can be confused about consumption of traditional food in terms of whether their consumption was recommended or not. On one hand, consumers' perceptions of traditional foods are related to good taste, daily consumption, natural origin, family habits, and recognizable food that can be a part of the strategies for the prevention of obesity and weight loss. On the other hand, traditional foods are commonly high-energy food with excess amounts of lipids which can lead to overweight. The students came to the conclusion that the solution to this dilemma is the amount of food consumed.

The importance of this study is reflected primarily in the design of ethical research, in terms of recommending the concepts of right and wrong behavior in nutrition. A sensitive sample such as the student population is also important in this study. Research is of great importance, both from a theoretical and a practical point of view. From a theoretical point of view, cross-section and analysis of life habits in the process of feeding the student population, can contribute to new ones knowledge and setting standards for future research in this field. From the practical aspect, the current state of the student population in this area of behavior can also serve for the formation and development of health prevention strategies in the future. The possibility of following the trend of life habits in the diet of the student population in the future, gives our research the potential of national importance, which in comparison with similar results from other countries, may have global significance.

Among other things, the significance of this study is reflected in the possibilities of the design of epidemiological research based on the results of this study. Namely, future research could be focused on analyzing the associations between eating behaviors and motives for choosing traditional foods and risk factors for health disorders in the student population.

4. Conclusion

This research provides answers to two basic research questions: 1) what are the eating habits of college students and what are the motives of college students for consuming traditional food and 2) the comparative overview of motives for choosing traditional food in Serbia with other European countries.

Examinations aimed at the behavior of college students in nutrition point to the following conclusions. The majorities of surveyed students would rather consume traditional food than "fast-food". There are registered bad habits of the surveyed students in terms of consuming cigarettes, alcohol and energy drinks. However, the good thing is that most students' favorite drink is water not alcoholic and energy drinks. The favorite food of the surveyed students was meat and meat products and most students consume all regular meals, where eating alone is the dominant form of consuming almost all meals, except lunch and dinner. According to BMI, more than half of the surveyed students belong to the overweight group, yet the same number of respondents believes they have "ideal weight" and very rarely measure their body weight. Students marked the following items as very important factors when choosing food: the food is not genetically modified, it tastes good, it is nutritious, it makes them happy, it is produced/packaged in an environmentally friendly way and it is produced in an ethical way, and the price of food is not important to them.

Examinations focused on the motives of college students for choosing traditional food point to the following conclusions. Respondents stated that sensory characteristics (good taste) were their main reason for consuming traditional food; in addition, traditional food had its own story/legend and connected them with the family. Most of the respondents did not associate traditional food with health, but a large number of respondents thought that some Serbian traditional dishes could be both energetically and nutritionally valuable. When buying traditional food, respondents generally do not check the declaration on the product. The vast majority of respondents felt that fraud was possible in the market in terms of the authenticity of traditional food. Most of the respondents thought that innovations in the production of traditional food are necessary today in terms of energy and nutritional value, and that the characteristics of traditional food would be closer to the needs of modern man. However, those respondents who felt that innovation should not be introduced into the traditional food production process stated that this would change the authenticity and sensory characteristics

as well as the price. Students did not care whether traditional food was produced using "organic" production.

Comparing the results of the questionnaire conducted among Serbian students with the results obtained from research in Belgium, France, Italy, Norway, Poland and Spain it can be noticed that the answers of the respondents in Serbia were the most similar to those obtained in Poland.

In general, these results indicated the need to educate students and increase knowledge on the issues: harmfulness of cigarettes, alcoholic and energy drinks, the importance of BMI and declaration on the product, so as to avoid entering the "vicious circle" of ignorance that can lead to metabolic disorders and later to various diseases.

Declarations

Author contribution statement

Slađana Stanojević: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Milica Pešić, Danijel Milinčić: Performed the experiments.

Aleksandar Kostić: Analyzed and interpreted the data.

Mirjana Pešić: Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

Dr Sladjana P Stanojević was supported by the Ministry of Education, Science and Technological Development of Republic of Serbia, grant number 451-03-9/2021-14/200116 and 451-03-68/2022-14/200116.

Data availability statement

Data will be made available on request.

Declaration of interest's statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

Acknowledgements

The authors thank students on participating in this research.

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