

The Use of Marketing Instrumentarium to Ensure a Balanced Healthy Diet of Young Students

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Abstract. For the marketing research in order to study students' food preferences and their satisfaction with vitamins and nutrients the famous method of food choice questionnaire was used. This method let us learn the draw backs of their diet. While applying this instrumentarium a special analysis was held which helped to observe the possibilities of a marketing research for exploring students' preferences in the balanced diet of the educational institution. The key indicators for learning the needs and providing with healthy nutrition were determined.

The problem of rational students' nutrition is up-to-date in every country because it's an essential part of building a healthy lifestyle of students. The role of the rational nutrition is growing in the period of studying when physical and brain pressure is increasing. So that's why, to gain energy it's necessary to organize nutrition on the basis modern scientific concept of a balanced diet according to the main nutrients and other nutrilites and also the factors of young organisms.

The selection of the respondents was held by the method of multistage sampling. The research was made by means of a questionnaire survey; analysis of the sociologic information; content-analysis of the respondents' answers to open questions of the questionnaire.

The question about the level of consumption by students certain groups of traditional products and its match with the physiological norms of consumption is still a socially important question. Students' nutrition being a very important part of new generation of citizens' health demands special attentions. A certain influence on some products preferences is connected with the students' gender.

Marketing instrumentarium which was used let us learn that at this moment products' consumption for a special group of respondents does not match with the norms, especially with fruit and vegetables, but it exceeds for the consumption of sugar and pastries.

1. Introduction

Marketing researches of the demand for products and service of public nutrition are necessary for effective and strategic management. Analyzing consumers' preferences the basic criteria are being given, the quality control is being held, interconnection between paying capacity and visits of public catering enterprise.[1].

While holding the literature observation, we learnt that in universities' canteens the increase of amount healthy and affordable dishes [2, 3, 6] will let the students choose the ones that supplement vitality [4, 5] in the period of physical and mental pressure increase.

The purpose of the marketing measures that were realized is to build healthy balanced diet of students' nutrition.

Components and quantities of the dietary structure must satisfy body-nutrient need in order to produce proper material which is essential for vital processes, adaptive and protective reactions [7].

The raw material for making the living tissue and its constant updating and also the only source of energy for the human being and for the animals are organic and non-organic substances that are coming to are coming to the body with food [8].

Health is clearly not the only factor people take into account when selecting their food. It is therefore important to explore the role of other influences on food choice. In terms of food choice, various motivating factors such as taste, sensory appeal, habit, weight control, ethical concern and stress have been shown to influence food selection[9].

Given the universal role of eating and drinking in social and cultural practices, food provision inevitably plays a significant part in student life and consequently informs their subsequent evaluations. However, beyond a narrow focus on satisfaction, it is important to consider the broader impacts of on- campus food provision on students' wellbeing, which shapes their experiences and perceptions. Students' transition into and progression through higher education introduces numerous health risks [10].

The significance of this investigation is in applying the marketing instrumentarium that will allow to find out the drawbacks in providing of a balanced nutrition for students – the lack of vital nutrients in their diet, which are responsible for sustaining of the high-productive and mental health of the young people in our country.

As most students purchase food on campus, there are opportunities to intervene to improve diet quality. Our results indicate demand for healthy food and that price manipulation is an important lever for change. This information will be used for changing the local university food environment but may be useful for planning interventions at other universities [12].

Workplace eating is frequently associated with poor quality food and bad food choices, which have negative consequences [13]. Nevertheless, studies have demonstrated that workers eating in well managed staff canteens were more likely to consume healthier food, which contributed to better health [14-19]. Significantly, the majority of research on workplace eating has focused on healthy food intake rather than the ability of the foodservice environment to contribute to people's broader wellbeing.

2. Purpose and objectives of the study

The purpose of the study is to develop theoretical and methodological foundations and practical recommendations for the organization of a balanced diet of young people with increasing mental and physical activity during training.

To achieve the goal of the study, the following tasks were set:

- to form the methodological basis of the study;
- to conduct a survey to identify the degree of satisfaction of young learners balanced diet in the educational institution;
- to process the received information and to establish problems in nutrition of the studying youth;
- to formulate recommendations for a balanced, healthy diet of students at school.

3. Theoretical part

For assessment of the real consumption of the food products by the students we created a methodology of survey that allowed respondents to indicate the average daily consumption of some products. In order to do this we used the table which included 12 groups of the food products.

In the first column there is a daily physiological standard of consumption in grams or pieces (eggs), which allows the respondents to coordinate their own answers.

In the second column a respondent should point out the real daily consumption of the given groups of foods by the students. The average physiological rates are illustrated in the Table 1.

Table1. Average physiological rates of foodconsumption (daily per person, grams).

Food products	Rate of consumption by the students, grams
1–Breadproducts	250
2 – Potato	246
3 – Vegetables and gourds	307
4 – Fruit and berries	359
5 – Meat	177
6 – Eggs	1 piece
7 – Fish and fishproducts	56
8 – Sugar and pastries	84
9 – Vegetable oil	14
10 –Milk	138
11 – Butter	12
12 – Cheese	18

While analyzing the results we took into account the following data:

- a) The excess of the physiological norm of consumption of products within 50%;
- b) The excess of the physiological norm of consumption by more than 50%;
- c) Consumption within the physiological norm;
- d) Consumption below the physiological norm within 50%;
- e) Lagging behind the physiological norm of consumption by more than 50%;
- f) Not consuming the products.

The food choice questionnaire (FCQ) was distributed to a comparative group of 1-4h year students in timetabled lecture slots. The FCQ is a previously validated measure designed to assess ten main factors relevant to peoples’ food choices. Results indicated statistically significant differences in terms of food choice motivations between male and female students of 1-4th year.

The first objective is to examine the degree to which the factor structure of the FCQ is invariant across different populations. The second objective is to analyze the motives for food choice in different countries. The results confirm that the factorial structure of the FCQ is invariant with respect to factor configuration, factor loadings and item intercept. Sensory appeal is the most important factor among all consumers, while health, convenience and price were all among the five most important factors shaping food choice[20].

The selection of respondents was carried out by multistage sampling. The research was made by means of a questionnaire as a basic method of collection of primary information; analyses of the sociologic information; content-analyses of respondents’ answers for the open questions of the questionnaire. For the quiz we prepared a work sheet. There were 15 questions in total, 414 codes including 5 open questions - № 3, 11, 12, 13, 14.

On the first stage with the method of mechanical sample from 44 university’s departments we have chosen 11 ones. The selection step was calculated by the formula

$$K = \frac{N}{n},$$

Where N –general population,
n–sampling population.

$$K = \frac{44}{11} = 4$$

With the purpose of determination the percentage of the satisfaction from the daily necessity of the students of different ages we used the following data:

- physiological norms of consumption of certain nutrients for different age

groups of students;

- average data concerning students' diet;
- reference tables of the content of basic nutrients and the energy value of food and food products.

The data were processed with the help of the computer program SPSS 8 for Windows «Statistical package for processing sociological information».

From the common list of the departments we have chosen every fourth department. Then by the random selection method we have chosen the students from the first year of studying till the fourth. It appeared to be every fifth student. Questioning of students in the sample was carried out by continuous survey.

We questioned 723 respondents totally, 22% from this amount were male and 78% - female. The age of the respondents is in the Table 2.

Table 2. The age of the respondents.

age	under 18	18-20 years	21-23 years	Older than 23 years
%	12,5	68,6	13,6	5,3

The overwhelming majority of the surveyed people lives in families that have children of school and student age. 88,5% of respondents live in families with one child or with two children. 8,9% of the families have three children and 2,6% - 4 children.

Low level of income leads to the fact that families spend most of their money on food. According to the survey, 64,7% of the respondents spend on food more that a half of a family budget. In compliance to the international statistics such families are considered to be poor. And 12,6% of the families spend even more than 70% of their income on food.

For assessment the quality of students' nutrition we set the following objectives in our research:

- determination of the level of consumption of certain food groups;
- establishment of deviations from the physiological norm of food consumption among the students of 2 age groups: undergraduate students and senior students;
- determination of the dependence of the food patterns on gender [21].

Analyses of the results for the undergraduate students showed that the consumption of butter and vegetable oil is more consistent with the norm (63,8 and 53,2% of students respectively). Here with 23,4% of students eat more butter than normal daily, and every 8th student exceeds the norm by more than 50%. The real daily consumption of food products by the undergraduate and senior students: the norm and the excess is illustrated in the Table 3.

Table 3. Real consumption of the food products daily by the students, %.

Food products	Norm and its excess,% (undergraduate students)			Norm and its excess,% (senior students)		
	With in the norm	Excess of the norm within 50%	Excess of the norm more than 50%	With in the norm	Excess of the norm within 50%	Excess of the norm more than 50%
1–Bread products	38,3	14,9	14,9	22,8	12,0	8,9
2 – Potato	34,0	21,3	21,3	36,7	17,7	8,9
3–Vegetables and gourds	19,1	34,0	12,8	30,7	10,8	9,5
4 – Fruit and berries	25,5	38,3	12,8	18,4	26,6	5,7

5 – Meat	27,7	36,2	19,1	21,5	31,0	17,1
6 – Eggs	40,4	38,3	4,3	47,5	24,1	10,1
7 – Fish and fish products	23,4	38,3	14,9	33,5	7,6	13,3
8 – Sugar and pastries	31,9	31,9	6,4	28,5	28,5	16,5
9 – Vegetable oil	53,2	19,1	4,3	39,2	12,0	5,1
10 – Milk	21,3	36,2	14,9	24,7	25,3	15,8
11 – Butter	63,8	10,6	12,8	38,6	6,3	16,5
12 – Cheese	46,8	14,9	17,0	36,7	9,5	24,7

About the half of the students (46,8%) doesn't go beyond the physiological norm of the cheese consumption, 40,4% of students keep the egg consumption rate. All the other products are consumed by the undergraduate students with the large deviation from the norm. The biggest mismatch is noticed in the group of vegetables and gourds, their consumption coincides the norm only with 19,1% of students.

Together with this, in the diet of 42,6% of undergraduate students potato consumption rate is exceeded and 21,3 % of students the excess is more than 50%. More than half students (55,3%) eat more meat than they need, and 19,1% of them exceed the norm by 1,5 times. Sugar and pastries are consumed more than the norm (38,3%).

As students grow older, their diet changes noticeably. The share of overconsumption of potatoes, bread products, vegetables and fruits, fish and milk is decreasing.

At the same time, there is a group of students in whose diet the physiological norms of sugar, pastries, butter(16,5%), cheese (24,7%) and egg (10,1%) consumption are exceeded by 1,5 times.

Following the questionnaire, the share of students who don't get enough products is much lower than the share of students who consume products in excess. A significant shortfall (more than 50%) was noted for such products as fruits, berries (12.8%), butter and vegetable (10.6%), fish and fish products (8.5%). Within 50% of the students receive less vegetables and melons (23.4%). milk (21.3%), meat and meat products (14.9%).

Eggs are full excluded from the diet of 14,9% of undergraduate students, and 4,3% of students don't consume vegetables and gourds. The real consuming of products by the undergraduate and senior students per day: non-receipt and non-consumption are presented in Table 4.

Table 4. Real consuming of food by the students per day: non-receipt and non-consumption (%).

Food products	Non-receipt and non-consumption, (undergraduate students)			Non-receipt and non-consumption% (senior students)		
	Don't consume	Less than normal limits by 50%	Less than normal limits within 50%	Don't consume	Less than normal limits by 50%	Less than normal limits within 50%
1 – Bread products	-	17,0	14,9	1,3	20,9	34,2
2 – Potato	-	6,4	17,0	1,3	7,6	27,8
3 – Vegetables and gourds	4,3	6,4	23,4	2,5	25,3	21,5

4 – Fruit and berries	-	12,8	10,6	0,6	25,3	23,4
5 – Meat	-	2,1	14,9	0,6	3,8	25,9
6 – Eggs	14,9	-	2,1	17,1	-	1,3
7 – Fish and fish products	2,1	8,5	12,8	9,5	19,6	16,5
8 – Sugar and pastries	-	8,5	21,3	1,3	7,6	17,7
9 – Vegetable oil	8,5	10,6	4,3	6,3	8,2	29,1
10 – Milk	2,1	4,3	21,3	9,5	5,7	19,0
11 – Butter	2,1	10,6	-	17,1	6,3	15,2
12 – Cheese	2,1	6,4	12,8	8,2	9,5	11,4

Among senior students, the number of people who don't eat enough of many necessary products is noticeably increasing. Besides, a group of students who total excluded certain products from their diet is being formed. For example, 17,1% of students don't eat butter and eggs, 9,5% - don't eat fish and milk, 8,2% of students don't eat cheese, 6,3% don't consume vegetable oil, 2,5% of students don't eat vegetables.

Comparing the data from the tables 3 and 4, we come to a conclusion, that dietary disturbance of the undergraduate students has a tendency to exceed the normal limits. At the same time violation of the norm of food consumption of the students is connected with the lack of basic food products.

The correspondence of the bread consumption by the students to the physiological norms is shown in the Fig. 1.

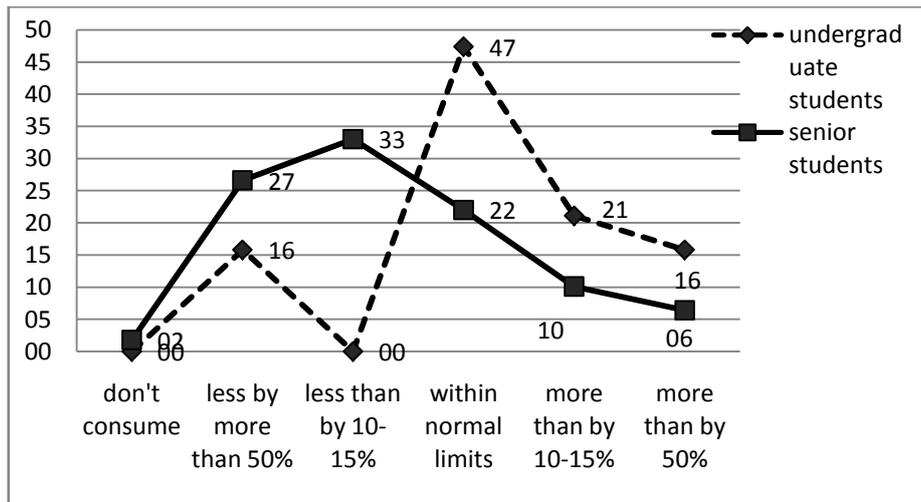


Figure 1. Correspondence of the bread consumption by the students to the physiological norms.

The same situation happens with the consumption of potato by women. If 63% of the female undergraduate students exceed the normal limits of potato consumption, only 5% don't eat enough of

it. But these numbers in regard to senior female students becomes 21 and 41%. The correspondence of potato consumption by the female students to the physiological norms is shown in the fig. 2.

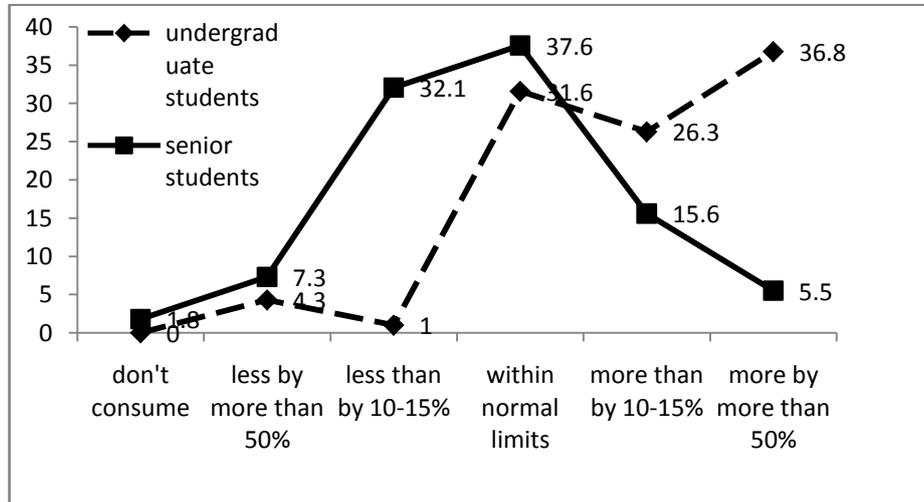


Figure 2. The correspondence of potato consumption by the female students to the physiological norms.

As young men become older, they eat less vegetables and gourds. Thus, the diet of younger students lags behind the norm in this type of product in 38.8% of respondents, and the diet of senior students - already 49.3%. Even more obvious is the age-related decline in the consumption of much-needed body food among the girls. 21% of undergraduate students don't consume enough vegetables and gourds and among the senior students this number is more than twice increasing - 52.3%.

Male and female students, both, don't eat enough fruit and berries, especially senior students. Non-receipt of such foods reaches 59.7% among the girls and 46.8 among the boys. Thus, half of the common number of students is deprived of the necessary source of energy and vitamins.

Speaking about meat, there is a tendency that is increasing with the age differences of the students. It is more noticeable among the male students. The consumption of meat is 3 times decreasing among the senior students according to the physiological norm. At the same time, the share of students who consume too much of meat is increasing (from 45.1 to 52.3%), as well as the number of those who don't eat enough of meat (from 19.3 to 35.8%).

The egg consumption by the students of both genders become more and more balanced with aging. Although the overeating of these products prevail over malnutrition. The fish consumption is changing a lot with aging. More than half of the undergraduate students of both genders eat more fish products than they should. While researching the second age group, specifically senior students, they decrease the fish consumption abruptly. As a result, 41.7% of male and 47.7 of female students consume less fish than normal limits, and every 8th male and every 12th female do not eat fish at all.

The proportion of students who consume confectionery above the norm increases with age, especially by girls. The proportion of sweets exceeding the physiological norm increases by more than 50% by boys 2 times, and by girls 3 times.

The consumption of milk by young students decreases with age. Thus, the proportion of young men who consume less milk than the physiological norm or do not use it increases from 19.4 to 28.4%, by girls from 31.6 to 37.6%.

The consumption of butter by the growing older fewer and fewer matches to the physiological norm. Both boys and girls have an increasing share of insufficient and excessive consumption of oil. Especially noticeable increases the number of students who consume butter more than 1.5 times.

If we talk about the regularity of meals, we can draw the following conclusions, namely the results of the survey show that this parameter is actually 31% of those who eat regularly (three to four times a

day-breakfast, lunch, dinner), 30% of respondents eat "when as". The proportion of respondents eating irregularly, often without lunch (breakfast or dinner) is 39%.

By the study of the role and place of food it was found that students who eat at home with their parents are 39% - for breakfast and 42% for dinner, the proportion of students, who prepare breakfast in a hostel or an apartment, was 32%, lunch 18%, dinner 41%.

These results show that students are mostly at lunchtime at the University and eat student canteens, student buffets and other catering facilities of the University academic buildings.

For a number of respondents it was difficult to answer the question about the place of food. Their number and the number of those, who do not eat for breakfast, were 20% , 14% for lunch, 8% for dinner. The share of students, who eat in canteens and buffets of educational buildings, was 46%.

During the survey, data were obtained on the preferences and requests of students in the selection of main dishes for their meals.

The first place belongs to the drinks. The demand of them is 64%. At the second place are cakes with 56%, the third place takes pastry - 48%, the fourth place is occupied the second courses - 42%, cold snacks take the fifth place with 36%. At the sixth place dairy products are located with 18%, the last place is given to the first food - 12%.

Nowadays the question of the dietary nutrition is the most important and sensitive. However, about 43 % of the respondents do not think that it is necessary to follow the dietary nutrition. The number of students, who need the dietary nutrition for medical reasons, makes 13%. It turned out, a number of young people hold the opinion that they need the dietary nutrition, but they did not address to doctors, or they would like to eat dietary products. The share of both is 33%. 11% of students did not think about this question.

4. Conclusion

The market research allowed to establish:

- consumption by students of not fully food corresponds their physiological standards, compliance makes from 19 to 64% on different types of products;
- the most essential deviations from physiological norm of consumption towards short-reception are noted on group of vegetables and fruit, and increase - potatoes;
- the diet of junior students is more balanced, than a diet of students of older years;
- consumption of sugar and confectionery at student's age exceeds physiological norm more than by 1,5 times;

Also the complex evaluation of the current state of students' nutrition were realized in the university's buildings and in the dormitories.

On the basis of the questioning which is carried out among students and the analysis of the day food allowances of the studying youth data on the actual food of students are obtained.

As the results showed, the greatest percent of satisfaction of students of different age groups, established on carbohydrates (from 92,6 to 117% of physiological norm of consumption), and junior students use carbohydrates more than norms. The need for proteins (from 70 to 87,7%) and fats (from 65,4 to 85%) is much less satisfied. Accordingly, it is necessary to enter into the diet dishes rich in proteins and fats (dairy, fish and meat products). From mineral substances the highest percent of satisfaction is in iron (from 82 to 88,7%) and magnesium (from 84 to 95%). Apparently, it is explained by considerable consumption by students of meat products (cutlets, meatballs, fillet, goulash, etc.) and also the corn products (porridges, rice, bread) rich with iron and also vegetables in the form of first courses and salads. The Low interest of satisfaction of students need is at all ages for calcium (from 35,0 to 40,0%) and phosphorus (from 59,5 to 68,0% of physiological norm of consumption). Thus, to fill the body's needs for calcium and phosphorus, it is also necessary to introduce dairy, fish and seafood for a balanced diet

Concerning the vitamins it should be noted that the percent of satisfaction at all age groups does not correspond the physiological standards. Vitamin A requirement is satisfied only for 21,5-30,2%. It is explained by small consumption of dairy products, in particular oils cow, cheeses. Also low interest

of satisfaction is in B1 and B2 vitamins (according to from 65,2 to 83% and from 41,7 to 53%), in PP vitamin (from 44,7 to 59%). The percent of vitamin C makes from 47,5 to 55,4%. There are practically no fresh fruits in the canteens and buffets and there are not enough salads from fresh vegetables in the menu.

On the basis of the conducted research using marketing instrumentarium to provide students with a balanced healthy diet, it is necessary to develop a menu with the inclusion in the diet of a larger range of dairy, meat, fish and seafood, fresh fruits and vegetables.

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