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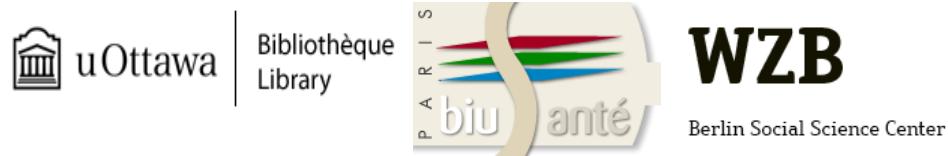
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## NUTRITION IN THE TRAINING OF STUDENT-ATHLETES

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### **Abstract**

The relevance of the study is due to the need to solve pedagogical problems of ensuring the cohesion of the sports team in preparation for the competition. The purpose of the study is to assess the awareness of students-athletes about the rules of rational nutrition. The study was conducted at the Department of Physical Education and Sport of the Ural State Economic University in the period 2017-2019. The information base of the study consists of surveys of 56 students professionally engaged in various sports. The research methodology is based on the survey method and subsequent statistical processing of data. The results show that the majority of student-athletes are aware of the basic principles of rational nutrition, but not all follow them, which leads to an increase in the percentage of body fat and a deficiency of vitamins and microelements.

### **Keywords**

Rational nutrition – Calorie – Student-athletes

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## Introduction

Numerous research projects are devoted to the study of food habits in different age groups. The study of the nutritional problems of student-athletes makes it possible to determine the influence of this factor on the preservation of health, fitness maintenance and optimum vitality. Also relevant is the issue of developing comprehensive programs and recommendations on healthy nutrition, improving the quality of life, and preserving the potential for professional sports activities. Conducting research in the field of students' awareness of the principles of healthy eating allows us to form health-saving programs and solve the issues of reducing the negative impact of eating disorders more accurately.

Diseases of the gastrointestinal tract, obesity, reduced immunological status of the body are often the consequences of the irregularity of food intake and the imbalance of the diet by components: proteins, fats, carbohydrates, vitamins, trace elements, etc.

The study was based on materials obtained during a survey of 56 students of the Ural State University of Economics at the age of 17-21 years, professionally engaged in various sports.

The research methodology is based on the survey method and subsequent statistical processing of data.

## Research background

Based on the principles and techniques presented in the works<sup>1</sup> the authors developed a questionnaire to determine the level of students' familiarity with rational eating habits and their use in everyday life.

With the help of the questionnaire method, the characteristics of the actual nutrition of students were analyzed. The questionnaires contained data on the age, place of residence, locality, traditional places of lunch for students during study days, eating habits and diet, the qualitative composition of the main food products.

According to the works of Georgiou<sup>2</sup>, Brumboiu<sup>3</sup>, Hwang<sup>4</sup> rational nutrition of students actively involved in sports should meet the following requirements:

<sup>1</sup> T. F. Heatherton; P. Nichols; F. Mahamedi y P. Keel, "Body weight, dieting, and eating disorder symptoms among college students, 1982 to 1992", American Journal of Psychiatry, Vol: 152 num 11 (1995): 1623-1629; A. Mahoney; R. A. Carels; K. I. Pargament; A. Wachholtz; L. Edwards Leeper; M. Kaplar, & R. Frutcher, "The Sanctification of the Body and Behavioral Health Patterns of College Students", The International Journal for the Psychology of Religion. Vol: 15 num 3 (2005): 221-238; R. Sakamak; R. Amamoto; Y. Mochida; N. Shinfuku y K. Toyama, "A comparative study of food habits and body shape perception of university students in Japan and Korea", Nutrition Journal. Vol: 4 num 1 (2005): 31-41; K. Silliman; K. Rodas-Fortier y M. Neyman, "Survey of dietary and exercise habits and perceived barriers to following a healthy lifestyle in a college population", Californian journal of health promotion, Vol 2 num 2 (2004): 10-19 y Z. Shi; N. Lien; B. N. Kumar y G. Holmboe-Ottesen, "Socio-demographic differences in food habits and preferences of school adolescents in Jiangsu Province, China", European Journal of Clinical Nutrition. Vol: 59 num 12 (2005): 1439-1444.

<sup>2</sup> C. C. Georgiou; N. M. Betts; S. L. Hoerr; K. Keim; P. K. Peters; B. E. Stewart y J. Voichick, "Among young adults, college students and graduates practiced more healthful habits and made

- the food ration should be optimal in quantitative terms and correspond to the caloric type of exercise.
- the diet should be complete in quality and include the necessary tissue-forming elements: proteins, fats, carbohydrates, vitamins, mineral salts, dietary fiber.
- meet the requirements of quality and have a pleasant taste, smell, and appearance.

It is important to have a balanced diet, which is provided by an optimal qualitative and quantitative ratio of proteins, fats, carbohydrates, vitamins and mineral salts, as well as physiologically correct proportions of the main parts of nutrients - amino acids, proteins, fatty acids, starch and sugar carbohydrates, the interaction of individual vitamins with other components of the food.

For the analysis of anthropometric indices, the main parameters of anthropometry were determined: standing height, which was measured on a wooden stadiometer; weight, percentage of water and body fat, lean body mass, as well as the body build of the subject; biological age and visceral fat levels were determined using a Tanita BC-543 fat mass analyzer.

At the time of the determination of anthropometric indices on the fat mass analyzer and height meter, the subjects got up barefoot with a minimum amount of clothing.

The statistical significance of differences in sample values was determined using Student's t-test. The data in the text and in the tables are presented as the arithmetic mean and the standard deviation ( $M \pm s$ ). Differences were considered statistically significant at  $p < 0.05$ .

## Results

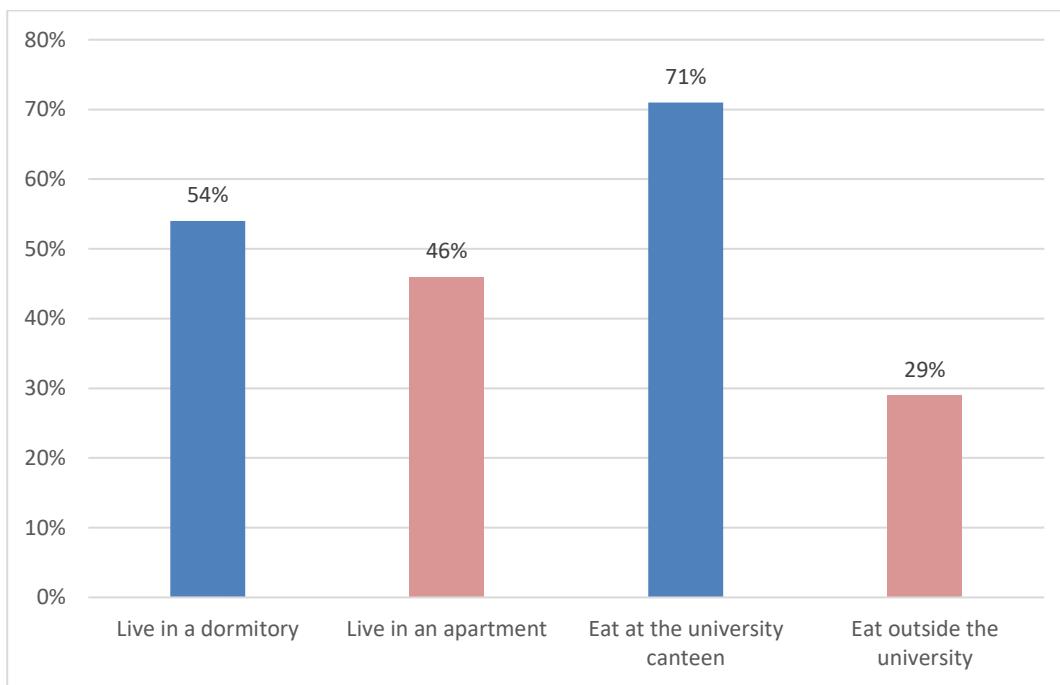
Consider the social conditions of the implementation of nutrition, figure 1.

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more healthful food choices than did nonstudents", Journal of the American Dietetic Association, Vol: 97 num 7 (1997): 754-759.

<sup>3</sup> M. I. Brumboiu; I. Cazacu; G. Zunquin; F. Manole, C. I. Mogosan; A. Porrovecchio y J. Ladner, "Nutritional status and eating disorders among medical students from the Cluj-Napoca University centre", Clujul Medical, Vol: 91 num 4 (2018): 414-418.

<sup>4</sup> J. H. Hwang; J. Y. Kim; K. A. Kim y K. W. Kim, "Status and Needs Assessment on Nutrition Management and Meal Service for Elementary, Middle High School Athletes among Athlete's Parents", Korean Journal of Community Nutrition, Vol: 24 num 1 (2019): 47-59.



**Figure 1**  
**Social conditions of nutrition for surveyed student-athletes**  
Source: Compiled by the authors

The results of the students' survey showed that 54% of the respondents live in a dormitory, which negatively affects the possibilities of self-cooking, 46% live in a separate apartment and can cook.

Meanwhile, the proportion of respondents who prefer to eat in the canteen of the university during the day is higher than the proportion of those living in the dormitory, such behavioral habit is characteristic of 71% of the students surveyed. Among the reasons for refusing to use the university canteen, respondents noted the low quality of food.

The next question of the questionnaire is aimed at determining the percentage distribution of the diet during the day. As noted in the works<sup>5</sup>, <sup>6</sup> daily ration of energy value should be distributed as follows: breakfast - 30-35%, lunch - 45-50%, dinner - 10-15%, the time between breakfast and lunch, lunch and dinner be 5-6 hours, between dinner and bedtime – 3-4 hours. These periods allow the digestive system to effectively digest and assimilate the main amount of ingested food.

<sup>5</sup> C. Arcan; D. Neumark-Sztainer; P. Hannan; P. Van Den Berg; M. Story y N. Larson, "Parental eating behaviours, home food environment and adolescent intakes of fruits, vegetables, and dairy foods: longitudinal findings from Project EAT", Public health nutrition, Vol: 10 num 11 (2007): 1257-1265.

<sup>6</sup> S. R. Davy; B. A. Benes y J. A. Driskell, "Sex differences in dieting trends, eating habits, and nutrition beliefs of a group of midwestern college students", Journal of the American Dietetic Association, Vol: 106 num 10 (2006): 1673-1677.



Figure 2

The percentage distribution of the diet during the day among surveyed students-athletes  
Source: Compiled by the authors

The study revealed that the rational distribution of meals is typical only for 15 % of student-athletes participated in the survey. Most of them shift the main meal to dinner, which causes a negative reaction from the gastrointestinal tract and deterioration of health in general.

The next stage of the analysis was to identify the awareness of student-athletes about the principles of rational nutrition, figure 3.

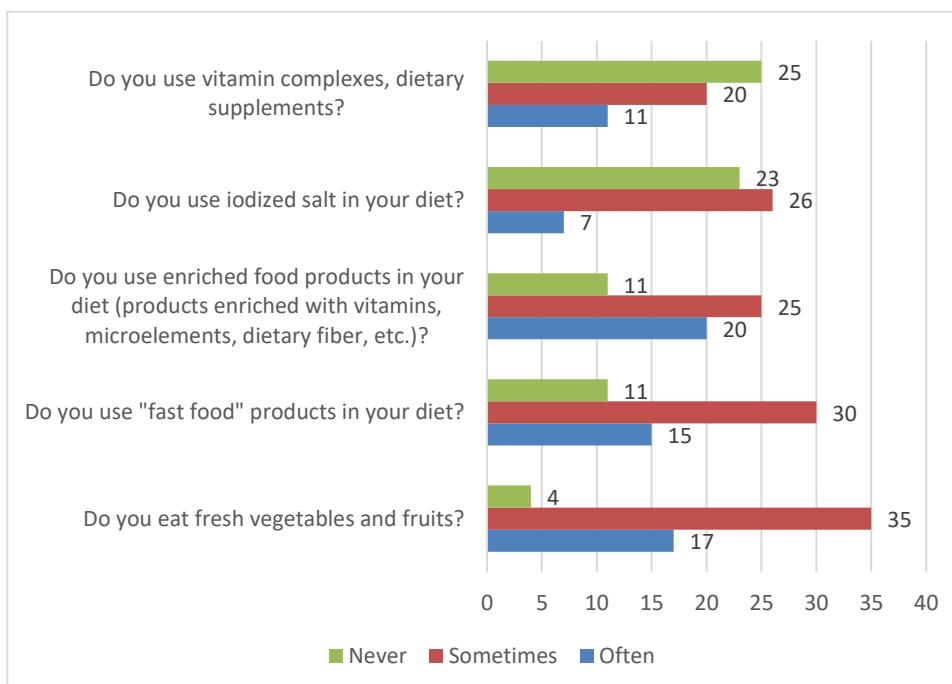


Figure 3

The results of the answers of students-athletes about the principles of rational nutrition  
Source: Compiled by the authors

Based on the results of the survey, it can be concluded that the majority of respondents possess sufficient information about the principles of a balanced nutrition, the majority uses fresh vegetables and fruits, foods enriched with vitamin complexes and nutritional supplements in the diet. At the same time, 41 out of 56 surveyed students often or sometimes use fast food in their diets and 25 out of 56 respondents do not use vitamin complexes and biologically active food supplements.

As a result of the identified nutritional disorders, most students experience a deficiency of vitamin B5, whose function is to participate in the synthesis of energy at the cellular level, which is necessary for physical activity.

As noted in the work<sup>7</sup>, the lack of this vitamin can be characterized by a decline in performance, sleep disturbances and nervous system disorders. Also, not sufficient replenishment of iodine deficiency, typical for Ural region for student-athletes, may lead to the risk of problems of the cardiovascular, bone, digestive systems, obesity, neurological disorders, as well as possible lag in physical and mental development according to work<sup>8</sup>.

Next, an assessment was made of the balanced diet of student-athletes since the content of each food element and their quantitative ratio determine the balance of nutrition. Any nutrient abnormalities can cause body dysfunction and lead to several diseases according<sup>9</sup>.

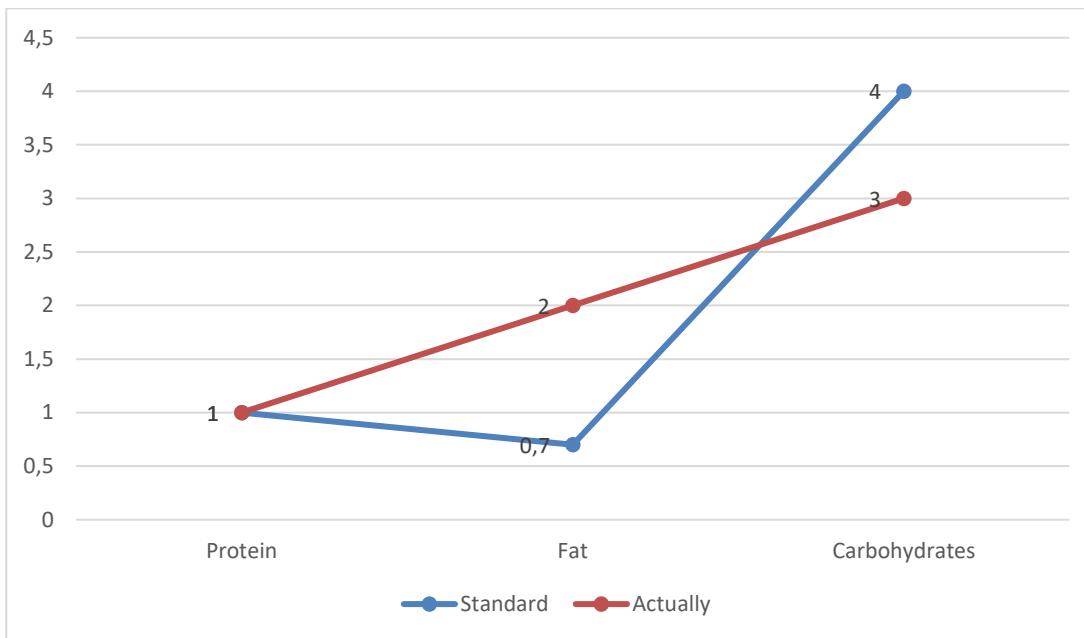
As noted in the work<sup>10</sup> the formula of balanced diet ratio should consist of proteins, fats, carbohydrates suggests that 1 gram of protein accounts for 1 gram of fat and 4 grams of carbohydrates, for people carrying significant physical activity this ratio should be as follows – 1 gram of protein should account for 0.7 grams of fat and 4 grams of carbohydrates. The results of the analysis of the diet of student-athletes are shown in figure 4.

<sup>7</sup> S. Deshpande; M. D. Basil y D. Z. Basil, "Factors influencing healthy eating habits among college students: An application of the health belief model", Health marketing quarterly, Vol: 26 num 2 (2009): 145-164.

<sup>8</sup> C. C. Georgiou; N. M. Betts; S. L. Hoerr; K. Keim; P. K. Peters; B. E. Stewart y J. Voichick, "Among young adults, college students and graduates practiced more healthful habits and made more healthful food choices than did nonstudents", Journal of the American Dietetic Association, Vol: 97 num 7 (1997): 754-759.

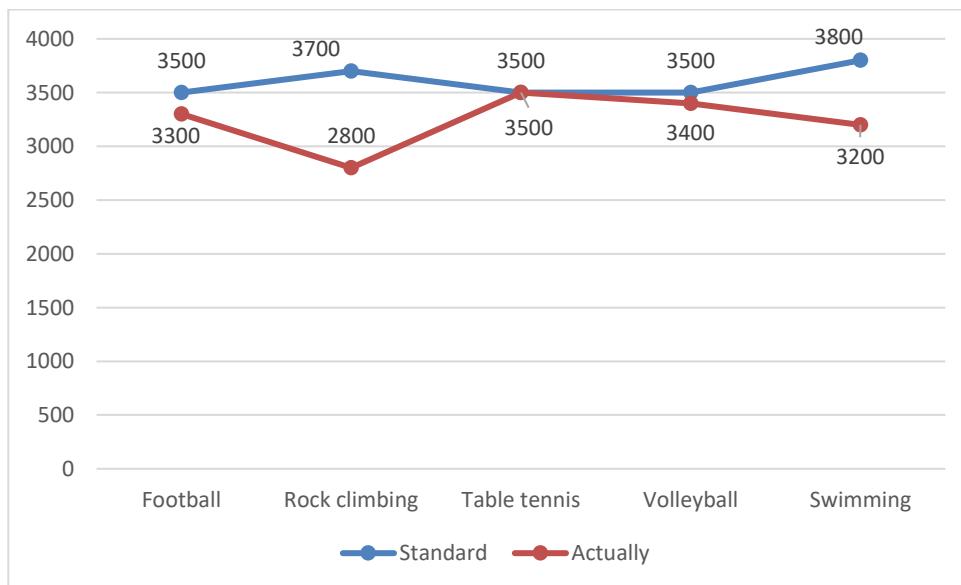
<sup>9</sup> H. S. Lee; J. Lee y J. J. Paik, "A Study of Food Habits, Physical Status and Related Factors of College Students in Chuncheon", Korean Journal of Community Nutrition, Vol: 3 num 1 (1998): 34-43; M. O. Monneuse; F. Bellisle y G. Koppert, "Eating habits, food and health related attitudes and beliefs reported by French students", European journal of clinical nutrition, Vol: 51 num1 (1997): 46-49 y J. S. You; Y. J. Choi; K. J. Chang y H. Chyun, "A study on prevalence of obesity, eating habits and lifestyles of 5th grade students in Inchon", Korean Journal of Community Nutrition. Vol: 2 num 1 (1997): 13-22.

<sup>10</sup> K. Ganasegeran; S. A. Al-Dubai; A. M. Qureshi; A. A. Al-Abed; A. M. Rizal y S. M. Aljunid, "Social and psychological factors affecting eating habits among university students in a Malaysian medical school: a cross-sectional study", Nutrition Journal, Vol 11: num 1 (2012): 48.



**Figure 4**  
Comparison of the surveyed student-athletes diet with the standard.  
Source: Compiled by the authors

As a result of the analysis, it can be concluded that there is an imbalance in the main tissue components, there is a significant excess of fats and a lack of carbohydrates in the average diet, which indicates the irrereplaceability of the body's main source of energy – carbohydrates. For people who actively exercise at high energy consumption and lack of carbohydrate in the diet there is an intense splitting of fats, which leads to their reduction. Next, we consider the parameters of caloric intake of student-athletes, depending on the sports, figure 5.



**Figure 5**  
Comparison of caloric intake of the daily diet for the surveyed student-athletes by sports/  
Source: Compiled by the authors

As can be seen in the figure for almost all sports, there is a discrepancy between the daily caloric intake and the reference value, which can lead to adverse consequences. A necessary condition for specialized nutrition of student-athletes should be a rational mode, considering the training and competitive loads during the day. As noted above, the first requirement for a specialized nutrition is the correct compensation of the body's energy consumption.

## **Conclusion**

Thus, in the course of the study, the following problems of organizing the rational nutrition of student-athletes were revealed: first, the nutrition of students is not balanced in the main tissue-forming elements, there is a deficiency of carbohydrates, which are the main source of energy when performing physical exercises. Secondly, due to the refusal of vitamin complexes and bioactive supplements, there is a deficiency of vitamins, iodine, which can lead to a number of disorders in the nervous and cardiovascular systems, inhibition of immunity, memory problems, etc. As a recommendation, we can note the need to adjust the diet, the rejection of fast food products and the active inclusion in the diet of fresh vegetables and fruits, seafood, eggs. It is also necessary to actively promote among students the principles of a healthy lifestyle. A balanced diet is of great importance for students who are actively involved in sports, as it ensures the preservation and strengthening of health, the achievement of high results, as well as a rapid and complete recovery from various training and competitive loads.

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