Black Sea Journal of Medicine and Public Health, ISSN: 2738-8654 Vol. 1, 2023, 12-17

ОПРЕДЕЛЯНЕ ИНДЕКС НА ТЕЛЕСНА МАСА И КОЛИЧЕСТВОТО МАСТНА ТЪКАН. ЗДРАВОСЛОВЕН ХРАНИТЕЛЕН РЕЖИМ

Галина Григорова[1], Галина Йорданова[2], Руска Ненкова[3]

[1]Медицински факултет, Университет „Проф. д-р Асен Златаров“, бул. „Проф. Якимов“1, Бургас 8010, България

[2]Медицински факултет, Университет „Проф. д-р Асен Златаров“, бул. „Проф. Якимов“1, Бургас 8010, България

[3]Медицински факултет, Университет „Проф. д-р Асен Златаров“, бул. „Проф. Якимов“1, Бургас 8010, България

E-mail: galinakirova@abv.bg

Резюме: *В настоящата статия е разгледано значението на енергийната калорийност в хранителни продукти и изискванята при изготвяне на хранителни режими свързани със здравословното състояние, пола, физическата активност на индивида. Определен е индекс на телесна маса и количеството мастна тъкан при учащи на възраст 20 -21 години. За здравето на човек е важна и микробиологичната безопасност на храната, която може да е причина за хранителни интоксикации.*

Целта на настоящото проучване е да се определи нормената телесна маса и количеството мастна тъкан при учащи. Да се анализира енергийната стойност на български хранителни продукти, което е базов фактор при изготвяне на хранителен режим. Анализа за наличието или отсъствието на бактерии в храните е също определящ за здравния статус на индивида. Контаминирата с бактерии храна може да даведе до различни токсикоинфесции, хранителни токсикози и инфекции. При направените изследвания се установява, че 85% от изследваните са с ИТМ и количество мастна тъкан в норма. 10 % са с наднормено тегло и 5 % са със затлъстяване II степен. Затлъстяване II степен е с много висок риск, съпроводено със съпътстващи заболявания като диабет тип 2, хипертония, сърдечно-съдови заболявания.

---

[1] Medical Faculty, Prof. Dr. Assen Zlatarov University, Prof. Yakimov Blvd., Burgas 8010, Bulgaria

[2] Medical Faculty, Prof. Dr. Assen Zlatarov University, Prof. Yakimov Blvd., Burgas 8010, Bulgaria

[3] Medical Faculty, Prof. Dr. Assen Zlatarov University, Prof. Yakimov Blvd., Burgas 8010, Bulgaria

E-mail: galinakirova@abv.bg

Ключови думи: Рационално хранене, енергийна стойност, индекс на телесна маса, мастна тъкан, бактерии в храни

DETERMINATION OF BODY MASS INDEX AND THE AMOUNT OF FATTY TISSUE. HEALTHY DIET

Galina Grigorova[1], Galina Yordanova[2], Ruska Nenkova[3]
Prof. dr. Assen Zlatarov University, Burgas, Bulgaria

Abstract: *In this article, the importance of the energy caloric content in food products and the requirements for the preparation of dietary regimes related to the health status, gender, and physical activity of the individual have been discussed. Body mass index and the amount of fat tissue in students aged 20-21 years have been evaluated. The microbiological safety of food is also of great importance for health, as it could be e reason for food poisoning. The purpose of the present study is to estimate the normal body mass, the amount of adipose tissue in students and to analyzed the energy value of Bulgarian food products, which is a basic factor when preparing a nutritional regime. The analysis for presence or absence of bacteria in food is also determining for the individual's health status. Contamination of food with bacteria can lead to various toxic infections, food poisoning and infections. During the test, it has been found that 85% of the patients are with normal ITM and amount of adipose tissue. 10% are overweighted and 5% have obesity II degree. Obesity II degree has very high health risk, accompanied by concomitant diseases such as diabetes type 2, hypertension, cardiovascular diseases.* **Keywords**: Rational nutrition, energy value, body mass index, adipose tissue, bacteria in food

1. Introduction

The article examines the energy caloric value of food products, which are basic physicochemical indicators of quality and a basic factor in preparing dietary regimes. Energy sources in food are fats, carbohydrates, and proteins, their values are important when preparing a healthy dietary food regime. For the proper function of the human body, energy needs are different for each individual. Important factors are age, health status, gender, and physical activity, which are related to the regulation of energy intake. Considering this aspect, energy caloric content of food is one of the basic indicators for determining scientifically based physiological norms for the proper nutrition of the population. The European Commission considers that the mandatory nutritional information should be given per 100 g or 100 ml [1]. Food labeling is necessary to give information about the product compounds and to enable consumers and nutritionists to identify correctly the appropriate products for the individual diet. Individual food ingredients or substances used in their production can cause allergies or intolerance in some people, including to be dangerous to health. A research related to laboratory study of the energy value in various dairy food products proves that buffalo milk has the highest amount of fat. Goat's and cow's milk have the lowest fat content [2]. From a research by laboratory testing in an accredited laboratory, it has been proven that sheep's cheese has the highest fat content, and cow's and goat's yogurt have the lowest fat content. Students are advised to consume low-fat milk in order to reduce saturated fatty acids and cholesterol content. The same applies to cheese and other dairy products, which are selected with a lower fat content than products of the same group. The recommended balanced ratio of protein to fat in grams for students is 1:1. Milk and milk products, meat, fish, and eggs are some of the best sources of protein

in nutrition. When preparing a nutritional regim for athletes, the presence of greater amount of protein is of basic importance, as they are main ingredient of enzymes, hormones, and neurotransmitters, playing an important function in life processes. Proteins are the only source of nutritional nitrogen for the body. A reserch [3] presents the results of a laboratory study of protein in various food products. These data can be used in the preparation of healthy dietary regimes in dietetics. The food we consume is never or rarely sterile. It contains microbial populations whose existence depends on the microorganisms that have access to it. Microorganisms present in food originate from the natural microflora of raw materials or are imported during their extraction, storage, processing, or transportation. A major focus of food risk analysis is microbiological risk assessment. The food products offered on the market are under the subject of regular control in terms of microbiological indicators such as *Listeria monocytogenes*, *Salmonella spp*, and *Staphylococcus aureus*. *Listeria monocytogenes* is a pathogenic microorganism that causes disease in humans and animals. The bacterium is widespread in the environment and, as a psychrotroph, can multiply in contaminated food even under refrigerated conditions. Listeriosis in humans has been shown to be primarily a foodborne infection and is strongly associated with the consumption of *Listeria monocytogenes*contaminated milk and milk products [4,5,6,7]. A study [8] to determine the safety of the dairy product with respect to biological contaminants - *Listeria monocytogenes* and *Staphylococcus aureus* found the absence of these bacteria in the tested samples.

The purpose of the present study is to evaluate the normal body mass and the amount of fat tissue in schoolchildren. To analyze the energy value of Bulgarian food products, which is a basic factor in the preparation of a nutritional regime. Analysis of the presence or absence of biological contaminants in food is also decisive for the health status of the individual. Contaminated food can lead to various toxic infections.

2. Experiment

Normal body mass and amount of fat tissue in schoolchildren were assessed. Body mass index in 40 students aged 20-21 years was determined, and regimes according to the health status, gender, and physical activity of the individual were prepared. Waist circumference was measured in a standing position, along the mid-axial lines, midway between the lowest part of the chest and the iliac crest. The permissible value of the waist circumference is ≤ 90 cm for men, and ≤ 80 cm for women. Significant deviations above these values increase the risk of developing obesityrelated diseases.

3. Results and Discussion

The assessment of the normal body mass and the amount of adipose tissue was performed by: determination of body mass index, (BMI) and by determining waist circumference. The body mass index is an indicator that serves to determine a healthy weight in patients and to diagnose obesity and conditions related to malnutrition. BMI allows distinguishing conditions associated with being underweight, overweight, and obese in the elderly. Body mass index is not used to measure the fat accumulated in the body and does not give information about visceral obesity. Measuring waist circumference is an important indicator of health risks associated with body fat accumulation. Increased visceral adipose tissue has implications for metabolic complications accompanying obesity, regardless of patient weight. In order to make the food rational, balanced, and full of value, it must comply with certain principles. In addition to the principle that food must correspond to the body's energy needs, another important principle underlying rational nutrition is the principle of balance, which ensures optimal provision of the body with nutrients and biologically active

substances in a strictly defined quantitative and qualitative ratio. Food should contain balanced proportions of essential nutrients proteins, fats and carbohydrates. When feeding adults, it is recommended that the ratio B:M:C to be 1:1:4. As individuals grow, the number of proteins can be increased, and in people having heavy physical work, the proportion of carbohydrates can be increased. When feeding elderly people, fat can be reduced. The individual approach is decisive for the preparation of a nutritional regime. Milk consumption per day should be 450 cm^3 for children from 1 to 2 years; 500 cm^3 for children from 3 to 6 years; 550 cm^3 for children aged 7 to 13, and 450 cm^3 for juniors. Important for children's nutrition are the amino acids lysine, tryptophan and histidine, which ensure growth. They are mainly obtained from cottage cheese, where they are in the most favorable ratio for absorption [9]. The microbial quality of food is of essential importance for health status of the individual. Additional inoculation of milk with microorganisms is harmful, both for its processing and for the quality of the obtained milk products. The number of microorganisms in the milk depends on obtaining high-quality and durable dairy products.. In the technology of dairy products, microbiological processes are the main link, associated with obtaining products with low content of saprophytic microflora. The higher total microbial contamination of goat, sheep and buffalo milk compared to the cow milk is due to the specific conditions of raising and milking animals [10]. The study assessed the normal body mass and the amount of fat tissue in schoolchildren. Determination of body mass index in 40 students aged 20-21 years. During the tests, it was found out that 85% of the subjects had normal BMI and amount of fat tissue. 10% are overweight and 5% are obese II degrees. Obesity II degree has a very high risk of obesity, accompanied by concomitant diseases such as type 2 diabetes, hypertension, and cardiovascular diseases.

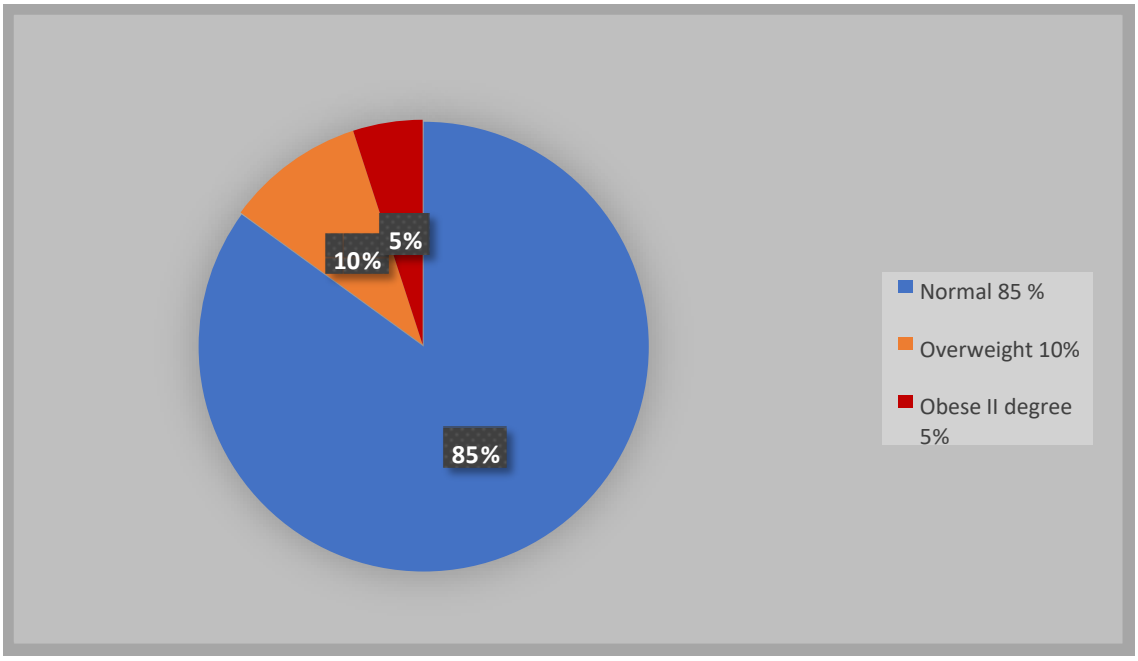

Fig. 1 Body mass index of 40 students

Waist circumference has been measured on 40 students, as an important indicator of health. 87% of students have normal values, but 13% are under the risk of developing obesity-related diseases. The data show that visceral adipose tissue is slightly higher in percentage than the measured BMI.

Accumulation of visceral adipose tissue increases the risk of adverse metabolic changes in the body twice as much compared to subcutaneous adipose tissue.

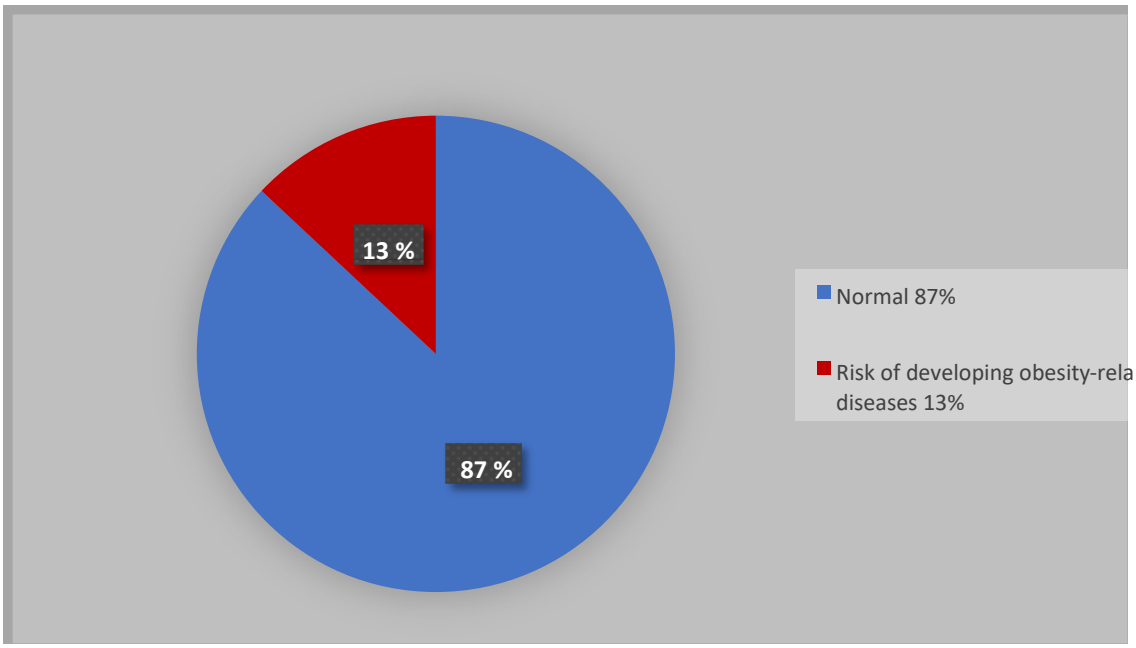

Fig. 2. Waist circumference measured in 40 students

4. Conclusions

From the research done, it is concluded that the students have a good control over the normal body mass and the amount of fat tissue. Losing excess weight is important because it significantly improves metabolic disorders.

The right diet, regular physical activities, consumption of quality food products, help to reduce the normal weight and have good health control.

5. Literature

1. Gogov, Y., S. Chomakova, D. Popova, Lilova, Yurukov. Labeling the nutritional value of meat products, 2015.
2. Grigorova, G. Determining the nutritional and energy value of dairy products. Requirements of regulation EC 1169/2011. International Scientific Conference "Education, Science, Economy and Technologies" Industrial Technologies, volume 1, volume IV, pages 80-84, 2017.
3. Grigorova, G. Determination of protein in foods. Proteins are an important ingredient in rational nutrition, International Scientific Conference "Education, Science, Economy and Technologies" Industrial Technologies, volume 1, volume VIII, 2021, pages 27-29
4. Schlech, W. F. Foodborne listeriosis. Clinical Infectious Diseases, 31, 770-775, 2000.
5. Seyoum, E. T., D. A. Woldetsadik, T. K. Mekonen, H. A. Gezahegn & W. A. Gebreyes. Prevalence of *Listeria monocytogenes* in raw bovine milk and milk products from central highlands of Ethiopia. Journal of Infection in Developing Countries, 9, 1204-1209, 2015.
6. Aurora, R., A. Prakash, S. Prakash, D. B. Rawool & S. B. Barbuddhe. Comparison of PI-PLCbased assays and PCR along with in vivo pathogenicity tests for rapid detection of pathogenic *Listeria monocytogenes*. Food Control, 19, 641-647, 2008.

7. Kalorey, D. R., S. R. Warke, N. V. Kurkure, D. B. Rawool & S. B. Barbuddhe. *Listeria* species in bovine raw milk: A large survey of Central India. Food Control, 19, 109–112, 2008.
8. Grigorova, G. Microbiological analysis of dairy products in accordance with the requirements of Regulation (EC) No. 1441/2007, the International scientific conference "Education, science, economy and technologies" Industrial Technologies, volume 1, volume VII, p .71-73, 2020. ISSN 1314-9911.
9. Nesterova, V. Food hygiene and food legislation, 2014.
10. Grigorova, G., G. Yordanova. Interlaboratory comparios for the detection of *Salmonella* in skimmed-milk powder. International Scientific Conference „Industrial Technologies“, volume V (1), pages 117-120, 2018.