

CALORIES IN OUR LIFE

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Summary. *I believe that in our time, the topic of calories will be of interest to many, and everyone has heard about the problem of excess weight. Nowadays obesity is one of the main problems in some countries. The USA, Great Britain and Germany for example have many people who suffer from extra weight. Not only adults face this problem, but children as well.*

Keywords: *fats, proteins, carbohydrates, nutrition, diet.*

Introduction

In the Republic of Moldova, about 50% of those over the age of 18 are overweight or obese. The proportion of people with obesity is higher in the urban environment than in the rural one. This phenomenon is more typical for women than for men. Obesity increases proportionally with age, from 1% in the 18-24 age group to 25% in the 45-65 age group, after which it decreases. The causes of obesity, doctors say, is a low intake of fruits and vegetables. A sedentary lifestyle is typical for almost 60 percent of the population of the Republic of Moldova aged 15 and over. In the Republic of Moldova, 20-25% of citizens are overweight, their body weight exceeds the normal weight by 10%. If the limits are above 10%, we are talking about obesity. In Moldova, 25-30% of citizens are obese. People become obese because they do not have a food culture. They eat two to three meals a day rather than snacking five times a day every three hours as recommended. The last snack should be four hours before bedtime. The risk of obesity increases with age because the metabolism slows down.

History: Calorie and calorimeter

Previously, any student knew what a calorie was: the amount of heat that is needed to heat one gram of water by one degree. The term "calorie" was introduced into scientific circulation by the French chemist Nicolas Clement-Desormes. However, long before the appearance of this term, the first calorimeters were designed - devices for measuring heat. The first calorimeter was invented by the English chemist Joseph Black, and he used it to determine the heat capacities of various substances, the latent heat of ice melting and water evaporation. A seemingly simple device allowed measuring the heat of many chemical reactions: the combustion of coal, hydrogen, phosphorus, black powder. In the same time placed a guinea pig in the calorimeter. The heat from her breath melted the snow in her shirt. Apparently, since then they have started talking about the fact that food burns in our body. In the 19th century, thanks to the efforts of the famous French chemist Marcelin Berthelot (1827–1907), the accuracy of calorimetric methods greatly increased and more advanced instruments appeared - a water calorimeter and a sealed calorimetric bomb. Apparently, in the thirties of the XIX century, the famous German chemist Justus von Liebig (1803–1873) conducted the first experiments with food in a similar calorimeter, who shared the ideas of Lavoisier that food is fuel for the body, like firewood for a stove. Moreover, Liebig called these firewood proteins, fats and carbohydrates. He burned food samples in a calorimeter and measured the heat released. Based on the results of these experiments, compiled the world's first food calorie tables. Chemist Wilbur Olin Atwater was the first to think of measuring the energy content of food components and came up with a scheme for calculating the calorie content of any food. He didn't have to start from scratch. Three years (1869-1871), Atwater spent in Germany, where he studied the experience of European colleagues. Here he was not only inspired by the ideas of physiological calorimetry, sown by Liebig, but also mastered some of the experimental techniques. Today he is called the father of nutrition. Atwater once worked. Indeed, the calorie content of carbohydrates (4 kcal/g), proteins (4 kcal/g), and fats (9 kcal/g) so well known to us was first experimentally obtained by Atwater.

Atwater's main factors

Atwater dreamed of making sure that the poor could buy enough food with their modest means to provide themselves with the necessary energy. However, at that time they already knew for sure that three main components of food provide energy to the body. It was here that Atwater needed a calorimetric bomb. In it, he measured how much heat is released during the complete combustion of an accurate sample of typical proteins, fats and carbohydrates. However, calorific value alone is not enough. You need to know how much of each of these components is contained in the products. Then he calculate the lipid content in the product. No analysis that allows you to determine the total amount of proteins in a particular product. However, he figured out how to determine the amount of nitrogen in food, and through it he calculated the protein content. There is a similar problem with carbohydrates: they did not know how to determine their total content in food then. Atwater burned a sample of food. Now it was not difficult to determine the total content of organic matter (the initial weight of the food minus the ashes). By subtracting fat and protein mass from this value, Atwater obtained the carbohydrate content. However, not all the food we eat is digested by our body. It turned out that on average the proportion of undigested food is no more than 10%. As a result of all these experiments and calculations, by 1896 he had developed calorie tables. At water's system proved to be remarkably versatile and enduring. But at the same time, the system is flexible and open to various additions and refinements. Atwater himself eventually added alcohol (7 kcal / g) to his scheme, rightly considering it a caloric source of energy. In the twentieth century, nutritional biochemistry developed extremely actively, allowing researchers to receive more and more new data. However, the effect of all these minor refinements was so small that many nutritionists still use Atwater's general factors. Much more serious problems of this system are connected with another.

Unaccounted for factors

The first major drawback is that the Atwater system does not take into account the energy expenditure of digestion. For the digestion of food, we have to pay with energy. Fat is the easiest to digest, then carbohydrates, and proteins are the worst. The higher the proportion of protein in food, the higher the cost of digestion. However, not only the chemical composition of the product is important, but also its physical condition. Obviously, the body will spend more energy digesting raw food, rather than boiled, hard, not soft, consisting of large particles, not small, cold, not hot. It turns out that the calorie content of food repeatedly processed, chopped, steamed-boiled and maximally softened is higher than that of food prepared from the same products, but less intensively processed. The physical state of food is a trap for the Atwater system. Perhaps in his time there was no snow-white flour of incredibly fine grinding. But today we know that this particular flour is 100% digestible. And if we eat pastries from coarse flour, then a third of it is excreted from the body undigested. The Atwater system has another pitfall that can be called "biodiversity". We are all very different, different genetically, and therefore - biochemically and metabolically. Eating food of the same calorie content, a full person will gain more weight than a thin person. This means that we cannot assess the real nutritional value of our own diet using this system. There are more and more high-calorie products on the shelves, judging by the composition and declared calorie content on the labels. They mislead us. Meanwhile, we continue to get fat from food that is easy to digest. Can all these additional but important factors be taken into account in Atwater's system? Extremely difficult, if not impossible. Methodically, this is an incredibly difficult task. After all, it will take a huge amount of experimentation to get the actual nutritional values of specific foods, taking into account their texture, method of preparation, combinations with other products and our biochemical identity.

Can we do without calories?

How many calories does a person need? Atwater for the first time calculated the balance between the energy that enters the body with food and is consumed by a person. He confirmed that the law of conservation of energy also works in the human body: it does not disappear anywhere, but passes from one form to another. Atwater not only refuted this misconception, but also proved for the

first time: if a person does not fully use the energy that enters his body with food, then it is stored in the form of excess kilograms. Atwater studied the diets of a huge number of very different families from different walks of life. Analyzing the results, he sadly noted that people are eating more fatty and sweet things and moving less and less. Even then, he spoke about the importance of a cheap and effective diet that includes more proteins, beans and vegetables instead of carbohydrates. What to focus on? Simple rules that have stood the test of time and do not need to be adjusted: be moderate in food, move more, avoid fast food and sugary drinks, eat more vegetables and fruits, cook your own homemade food from fresh ingredients. You know all this as well as I do.

Finally, I offer you a few rules

Rule 1. Eat real food, not industrial novelties.

Rule 2: Avoid foods advertised as healthy.

Rule 3. Eat only what then spoils.

Rule 4. The whiter the bread, the faster in the coffin.

Rule 5. Eat anything if you cook it yourself.

Rule 6 Eat out of hunger, not out of boredom.

Rule 7. Eat slowly.

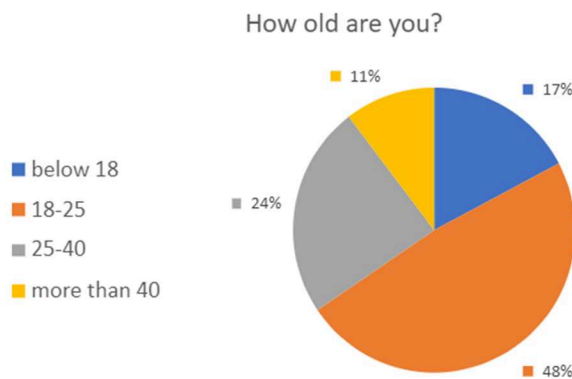
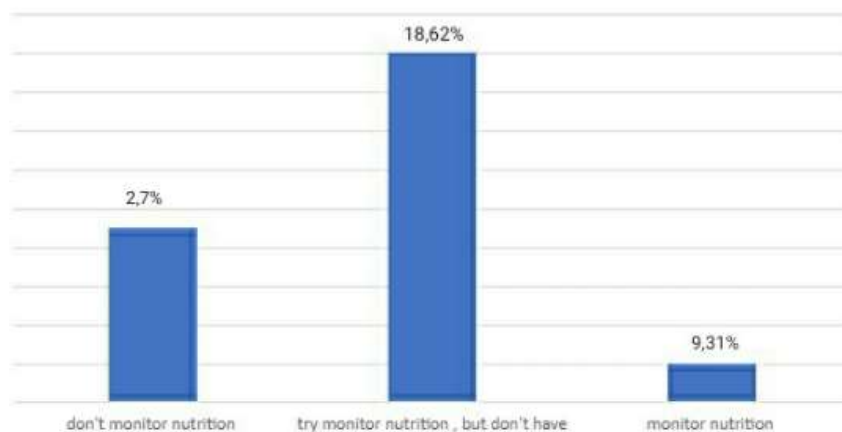
Rule 8. Eat only at the table.

Rule 9. Try not to eat alone.

Rule 10. Break the rules from time to time

Poll conducted

After interviewing 39 people, I came to the conclusion that many people are familiar with such a concept as healthy nutrition, but most do not manage to follow the diet due to lack of time.



Conclusion

In conclusion of my report, I want to say that in our time the problem of obesity is very relevant and plays an important role in the life of every person, therefore it is necessary to monitor nutrition and calories, thereby staying healthy, improving your appearance, nourishing the body with a sufficient amount of useful substances, reducing harmful ones. Even if a person is too busy at work or he is constantly distracted by some important matters, in no case should one forget about nutrition, otherwise such forgetfulness can play a cruel joke with a person with serious consequences.

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