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# THE INFLUENCE OF THE PRESENCE OF FATS IN THE DIET AND THE CONDITION OF THE SKIN

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## Abstract

Indicators reflecting overall diet quality are used worldwide in research. Fat is one of the most important components of human health, and is a source of energy, essential unsaturated fatty acids and fat-soluble vitamins: A, D, E and K. Essential unsaturated fatty acids are necessary for the proper development of the human body. At the same time, excessive consumption of fats leads to systemic diseases, including skin diseases.
Therefore, the aim of this study was to assess the impact of fats consumed in food by students from the Lomza University of Applied Sciences (LUAS) on the condition of their skin.
70 students from the Lomza University of Applied Sciences were qualified for the study.
The following research methods were used:

1. assessment of the subjects' body composition - performed using the InBody 770 body composition analyzer,
2. assessment of carbohydrate intake using a food diary completed by students - data prepared using the Diet 5 program,
3. diagnostic survey method using an original questionnaire , which was used to assess students' knowledge regarding the impact of food on the condition of the skin.

The obtained results were subjected to statistical analysis using non-patametric U-Mann-Whitney tests and Spearman correlation.
Conclusions

1. LUAS students are well aware of the principles of proper nutrition, and most of them apply these principles on a daily basis.
2. LUAS students are aware that their high-fat diet may have negative effects on their skin.

**Key words:** fats, diet, skin

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## Introduction

The demand for fats is inextricably linked to the body's need for fatty acids. NNCT, linoleic acid and alpha-linolenic acid, and their metabolites, such as arachidonic acid, eicosapentaenoic acid and docosahexaenoic acid are extremely important for the proper development of the body and maintaining health [1].

The amount of essential fats in the body depends on the age, physical activity and the physiological state of the person. Following the recommendations of the World Health Organization (WHO), the European Food Safety Authority (EFSA) and scientific societies around the world, the daily diet of healthy adults should provide no more than 30% of energy from fat [2].

Due to age, gender and level of physical activity, children over two years of age and teenagers are advised to consume no more than 35% of energy from fat. In the nutritional plan of infants and children under two years of age, large amounts of energy should be provided by fats [3, 4]. Almost 50% of the energy in a woman's breast milk comes from fat. And this age group needs about 40% of energy from fats [5, 6].

It is impossible not to notice the fact that people with a sedentary lifestyle are recommended to consume less fat - about 25%. Athletes, i.e. people who are physically active and a very active lifestyle, need to consume fats in the amount of 35% of dietary energy throughout the day [5, 6].

Of course, the norm of fat intake for a pregnant or breastfeeding woman is different from the norm of fat intake compared to a woman who is not pregnant or breastfeeding. In the second trimester, the number of fats consumed increased by 12 g, and in the third trimester by 16 g. For breastfeeding women, the daily norm increased by 17 g. These numbers should be taken into account depending on the woman's age, body weight and physical activity [2].

However, it is worth remembering that excessive consumption of foods containing large amounts of fat causes excessive accumulation of fat tissue, which means it increases the risk of being overweight or obesity [2, 7-10].

## Objective of the work

Indicators reflecting overall diet quality are used worldwide in research. Fat is one of the most important components

of human health; it is a source of energy, essential unsaturated fatty acids and fat-soluble vitamins: A, D, E and K. Essential unsaturated fatty acids are necessary for the proper development of the human body. At the same time, excessive consumption of fats leads to systemic diseases, including skin diseases.

Therefore, the aim of this study was to assess the impact of fats consumed by students from the Lomza University of Applied Sciences (LUAS) on the condition of their skin.

## Material and methods

70 students from Lomza University of Applied Sciences were qualified for the study.

Tab. I. Characteristics of the study group.

| **Sex** | |
|---|---|
| Female | 41 |
| Male | 29 |
| Age of respondents (mean ± standard deviation) | 23.8±4.5 |
| **Place of residence** | |
| City | 37 |
| Village | 33 |
| **Education** | |
| Primary | 3 |
| Vocational | 37 |
| Secondary | 29 |
| Higher | 41 |

The following research methods were used:

1. aassessment of the subjects' body composition - performed using the InBody 770 body composition analyzer,
2. assessment of carbohydrate intake using a food diary completed by students - data prepared using the Diet 5 program,
3. diagnostic survey method using an original questionnaire , which was used to assess students' knowledge regarding the basic principles of proper nutrition.

The obtained results were subjected to statistical analysis using non-patametric U-Mann-Whitney tests and Spearman correlation.

## Results

I70% of respondents eat properly or usually properly. 30% eat poorly.

Almost 36% of respondents answered the question: What food products do you choose when reaching for a snack between meals? answered that these are carbohydrate products, naturally rich in sugar (fruits and grain snacks). Over 41% of respondents choose carbohydrate and sweetened products for snacks: sweets, rolls, or sweet snacks. For a snack, 37% of respondents eat salty snacks - chips, pretzels, crisps, over 45% eat dairy snacks - yogurts, cottage cheese, or dairy desserts, almost 13% choose others. Over 31% of respondents do not snack between meals.

Over 94% of respondents indicated that they drink 1 to 1.5 litres of fluids or more a day. Only slightly over 5% of respondents indicated that they drank less than a litre of fluids.

Almost 39% of respondents indicated vegetable oils (e.g. rapeseed, sunflower, olive oil, etc.) as the main source of fat in their diet, almost 36% - animal fats (butter, lard) and 30% - fatty meat and fish. Over 7% of respondents indicated nuts as the main source of fat in their diet, and over 4% indicated oil seeds (e.g. linseed or sunflower seeds).

To the question: How do you assess your health condition? 90% of respondents responded positively, including 63% that it was good and 27% that it was very good. 10% of respondents answered that their health condition was poor.

To the question: Do you follow any special diet? almost 96% of respondents answered no. Over 3% of respondents answered yes.

When asked whether the food consumed has an impact on the condition of the respondent's skin, 73% of respondents answered yes, and 27% said no.

Over 49% of respondents gave a positive answer to the question Do you have any psychological discomfort resulting from the condition of your skin? including almost 3% of respondents who said that they definitely had . Over 51% of respondents answered that they definitely did not have any mental discomfort resulting from the condition of their skin.

Respondents were asked whether only a proper diet would reduce the discomfort associated with the condition of their skin? 40% of them answered yes, and 60% said no.

When asked whether proper care and prevention as well as a proper diet will reduce the discomfort associated with the condition of the skin of the respondents, exactly the opposite to question 9, 60% of respondents answered yes, and 40% said no.

19.18 9.73 6.5 51.9
27.03 8.42 11.2 50.4

discolorations, and 14.3% have acne. 8.5% of respondents struggle with dilated capillaries and 5.7% with enlarged skin pores.

Tab. 2. Analysis of fat tissue mass and its amount in % in the study group.

| | Mean | Standard deviation | Minimum | Maximum |
|---|---|---|---|---|
| Fat tissue mass | 19.18 | 9.73 | 6.5 | 51.9 |
| Amount of body fat in % | 27.03 | 8.42 | 11.2 | 50.4 |

In the study group, there was no correlation between the amount of fat in the diet and the mass of adipose tissue in the body of the subjects. The Mann-Whitney test showed that male respondents statistically (p=0.0389) consume significantly more grams of fat in food.

## Discussion and discussion of the results

Nowadays, scientists believe that the total intake of fats in the diet cannot exceed 30% of energy (i.e. 1500 Kcal can contain no more than 50 g of fat per day). Moreover, this amount of lipids supplied is intended to cover the body's needs in terms of essential fatty acids. According to the recommendations of the European Food Safety Authority, the level of fatty acid consumption should be as low as possible, while ensuring the adequate nutritional value of the diet. In the current "Nutrition Standards for the Polish Population" from 2017, it is recommended that the amount of energy obtained from these acids should not exceed 6% of the nutritional value of the daily diet. Such standards were adopted in accordance with the recommendations of the American Heart Association [11].

In the study, 70% of LUAS students declared that they eat a balanced diet or usually eat a balanced diet. Unfortunately, 30% of respondents are aware that they eat poorly.

Consumption of dairy products is often associated with negative effects due to their naturally high levels of saturated fatty acids. However, recent studies have shown that milk lipids have putative bioactivity against chronic inflammation. Inflammation triggers the onset of several chronic diseases, including cardiovascular disease, type 2 diabetes, obesity and cancer. Scientists are conducting research on the anti-inflammatory properties of milk lipids found, for example, in milk, yogurt and cheese, and their impact on human health: their protective effect and their role in pathology. Dietitians are also considering the impact of changing the lipid profile in dairy products - by using ruminant feeding strategies to enrich milk or by selecting lipids in products. New suggestions for future research on bioactive lipids and dairy products in relation to the new field of metabolomics and epidemiological studies are also important [12]. All respondents taking part in the study indicated that for snacks they often choose food products rich in fats, especially saturated fats, including dairy products. Over 31% of respondents do not snack between meals. It was also shown that almost equally (39% and 36% of respondents, respectively) indicated vegetable oils (e.g. rapeseed, sunflower, olive oil, etc.) and animal fats (butter, lard) as the main source of fat.

When asked about the assessment of their health condition, 90% of respondents answered positively, including 63% that it was good and 27% that it was very good. Unfortunately, 10% of respondents answered that their health condition was poor.

Almost 96% of respondents do not follow any special diets, but as many as 73% of respondents see the impact of the food they eat on the condition of their skin. 40% of respondents believe that only a proper diet will reduce the discomfort associated with the condition of their skin, and 60% of respondents believe that proper care, prevention and a proper diet will reduce the discomfort associated with the condition of their skin. Unfortunately, almost 40% of respondents struggle with skin problems (blackheads, discolorations, acne, dilated capillaries, and enlarged skin pores).

The analyses of the obtained results showed that in the study group there were no correlations between the amount of fat in the diet and the mass of adipose tissue in the body of the subjects. The Mann-Whitney test showed that the surveyed men statistically ($p=0.0389$) consume significantly more grams of fat in food than women.

Still, some of the most important, but also very controversial, issues in nutrition concern guidelines related to the quality and quantity of lipids in the diet. That is why it is important to make changes to guidelines and to evolve dietary recommendations. Over the years, the scientific community has become obsessed with calories in the diet, rather than focusing on the quality of the food that makes up the diet. Therefore, some authors point to the importance of dietary assessment focusing on dietary patterns rather than single isolated nutrients. This approach is proposed in the latest Dietary Guidelines for Americans.

The abundance of fat in the diet increases the risk of being overweight, obesity, and various metabolic disorders and diseases that are closely related to diet. The list of such disorders is quite extensive: abnormal levels of lipids and lipoproteins in the blood, type 2 diabetes, insulin resistance, increased levels of uric acid in the blood, hypertension, ischemic heart disease, thrombosis, stroke and cancer of various organs such as the colon and mammary glands [ 13]. Recently, it has emerged that the tumour microenvironment is rich in a diverse range of lipids, the abundance of which increases with tumour progression and plays a role in promoting tumour growth and metastasis. The pro-tumour roles of lipid absorption, metabolism and synthesis as well as the therapeutic potential of directing lipid metabolism in cancer are described. Moreover, new insights are emerging about the pronounced immunosuppressive effects of lipids in the tumour microenvironment. Lipids threaten the anticancer milieu in which metabolic adaptation to lipid metabolism is associated with immune system dysfunction. Research is also ongoing into the differential effects of common dietary lipids on cancer growth, which may reveal the role of specific dietary patterns in combination with traditional cancer therapies. Understanding the relationship between dietary lipids, cancer and immune cells is important in the context of obesity, which may reveal the possibility of using diet in the treatment of cancer [14] as well as other systemic diseases.

## Conclusions

1. LUAS students are highly aware of the principles of proper nutrition and most of them apply these principles on a daily basis.
2. LUAS students are aware that their high-fat diet may have negative effects on their skin.

## Literature

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