

**OPTIMIZATION OF SATURATED FATTY ACIDS AND
UNSATURATED FATTY ACIDS AT THE GRAIN, FLOURS AND
BAKERY PRODUCTS**

**OPTIMIZAREA ACIZILOR GRAȘI SATURAȚI ȘI NESATURAȚI
LA CEREALE, FĂINURI ȘI PRODUSE FAINOASE**

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***Abstract:** Through research I am pursuing the identification of balanced food resources of energy and the nutrient. Thus, the experiment concerned the determination of saturated fatty, monounsaturated and polyunsaturated fatty acids to the grain and edible flours obtained there from.*

Studies on grain and flours from watching : millet contains 2,23% linoleic acid and oleic acid 0.72%, wheat contains significant amounts of linoleic acid (0,92-1.00%) and oleic acid (0.25-0,48%), rye 0,99% linoleic acid and oleic acid 0.2%. This unsaturated lipids and their retention after heat treatment influences the quality of their famous bakery and nourishing for the human body.

INTRODUCTION

The choice of foodstuffs by consumers is made after a series of principles that affect the health of the individual and finally provides a normal human body well. It was considered that "the body knows what i need" by the food and choice of the individual human is made on the principle of "self selection principle instinctively. This principle is dependent on the sensory characteristics of food, and they do not reflect the full amount of nutritional and biological processes. Food safety is a component of food security, human nutrition, and refers to the three requirements which must be satisfied by the unprocessed foodstuffs, processed or partly processed: -have intrinsic nutritional value which is

expressed by the quantity and quality of the nutrients, which provide energy; -have a nutritional value; -have safety, providing the overall quality of the food. Main refine carbohydrate, fat and protein – provide energy and nutritional needs of the body. The human body's energy needs are those for basal metabolism, thermoregulation feed consumption and professional activity. Basal metabolism is influenced by age , body mass and energy expenditures and food consumption are greater for food with high protein content. (1)

The choice of foodstuffs by consumers is made after a series of principles that influence individual health and finally provides a normal human body well. It was considered that "the body knows what it needs" and the choice of food by the human individual is made on the principle of "self selection principle instinctively. This principle is dependent on the sensory characteristics of food, and they do not reflect the full amount of nutritional and biological processes. The principle of specific cultural model, after which people have traditional favorites, being interested in the foods they like. The principle of food "rational" through which food is chosen on rational scientific principles by which it seeks to attain the objective of preserving health. Diet food represents the quantity of foods consumed by time, as rich in plant to stimulate intestinal peristalsis. However, the use of the principle of the body knows what it needs, it may constitute a scientific criterion for human nutrition. Functional foods are those that reduce the risk of disease and determine: the growth and development of infants, children, adolescents, optimize metabolism, mainly for the control of obesity and diabetes, the body's defense against oxidative stress, cardiovascular system, gastrointestinal tract health, promotion of mental performance. (2) Food safety is a component of food security, human nutrition and cover the three requirements which must be satisfied by the unprocessed foodstuffs, processed or partly processed: to have intrinsic nutritional value which is expressed by the quantity and quality of nutrients, which provide energy, to have a nutritional value as high as biodisponibility, innocuity, giving the overall quality of the food. Main trofine carbohydrate, fat and protein – provide energy and nutritional needs of the body.(3) The human body's energy needs are those for basal metabolism, thermoregulation feed consumption and professional activity. Basal metabolism is influenced by age, body mass and energy expenditures and

food consumption are greater for food with high protein content. Professional activity, especially the physical energy costs increased greatly in relation to the size of the effort, the pace of work, the duration of physical activity. Fatty acids are important biological high senior, being the components of fats. They may be: butyric acid – saturated palmitic, stearic acid, and unsaturated double bond-oleic acid, linoleic acid, two double bonds, linoleic or linoic, with three double bonds-linolenic acid, with four double bonds-arachidonic acid.(4)

MATERIALS AND METHODS

Therefore scientific research aimed at identifying which have a high content of unsaturated fatty acids. For the practical application I used laboratory equipment and modern methods of determination of the essential elements tracked through the study.

The methods used to measure the contents of fatty acids of vegetable products was analysis with Soxhlet VELT – Series SER148/6 system and the finally results was monitoring with the atomic spectroscopy. Determination of fat extraction method is made with a mixture of solvents which were : glacial acetic acid, methanol, chloroform. Separation of classes of lipids on column chromatography SPE is based on the principle of the separation of the various classes of lipids (NL, PL, GL) which are eluted in order of succession with different polarities of eluents. Eluents used were : (petroleum ether, chloroform, a mixture of acetone, chloroform and acetone-methanol mixture, mixture of methanol, chloroform-methanol-water, α -naftol, solution of ethanol 2%, sulfuric acid with concentration of 95%.(5)

RESULTS AND DISCUSSION

The experimental research watching approach the following: the identification of oleaginous raw materials resources containing essential fatty acids in the highest quantity; the settlement of total quantity of lipids and omega3, omega6 fatty acids; the conception of new technological recipes for food with high content of essential fatty acids; the determination of proportion of omega3/omega6 to the studied recipes; the application of

thermal treatments, the test of food obtained through research in case of technological transfer; deviations registered with reference to the initial design.

The results were: provision of new technological recipes proposal for food with optimum nutritional level of essential fatty acids, technological transfer of innovative technologies recipes.

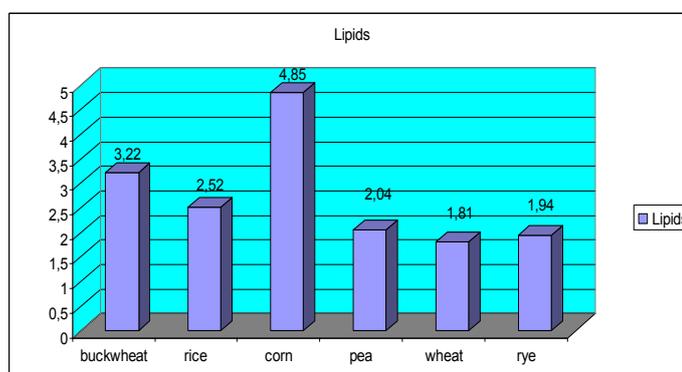


Fig 1. -Fat content in raw vegetable

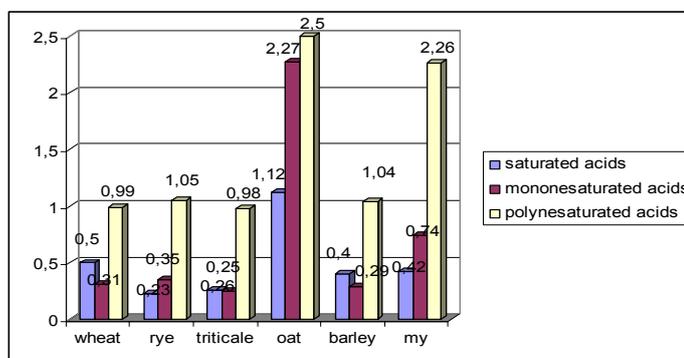


Fig. 2 – Dynamics of fatty acids from vegetable raw materials

In Figures 1, 2 notice that the highest lipid content we have at the corn product 4,85 g/100 g and buckwheat product with 3,22 mg/100 g , rice and peas is the average values-2,52 - 2.04 g/100 g , and wheat and rye were the

lowest of the 1.81-1.94 g/100 g product. As regards the content of saturated fatty acids, the largest proportion of oats and wheat he occupies. Monounsaturated acids are present in a significant proportion of oats, barley, and polyunsaturated acids are most significant in proportion to the oat, barley, triticale, rice.

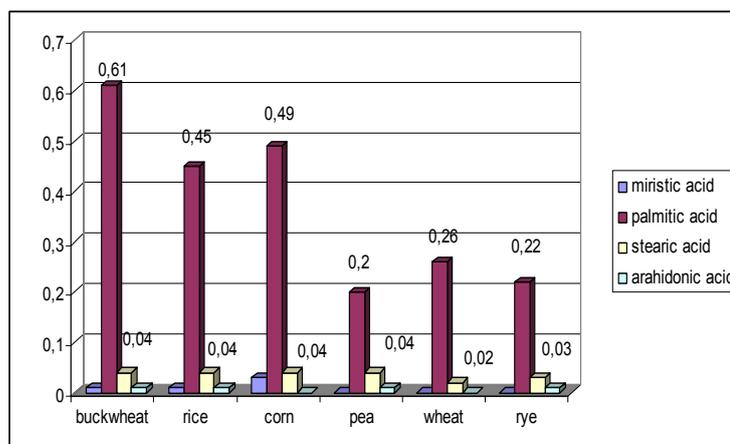


Fig 3. –Dynamics of saturated acids from grains

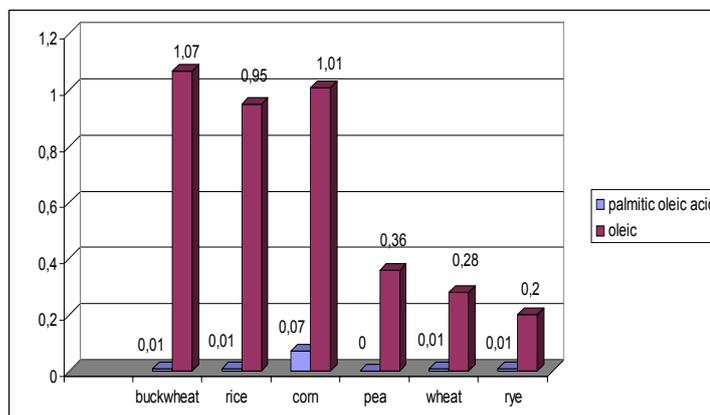


Fig.4 - Dynamics of unsaturated fatty acids

From fatty acids saturated palmate acid has a great weight to 0,61g at the buckwheat, peas 0,49 g, g/100 g, rice 0,45 g/100 g. Stearic acid has a weight of 10 times less. In the case of unsaturated palmate oleic-acid is present only in the proportion of 0,01-0,07 g/100 g of the product, and oleic acid from 0,2 g/100 g of the product up to 1.07 g/100 g product. The most important cereals with high content of oleic acid are: rice, peas and buckwheat. (figures 3,4)

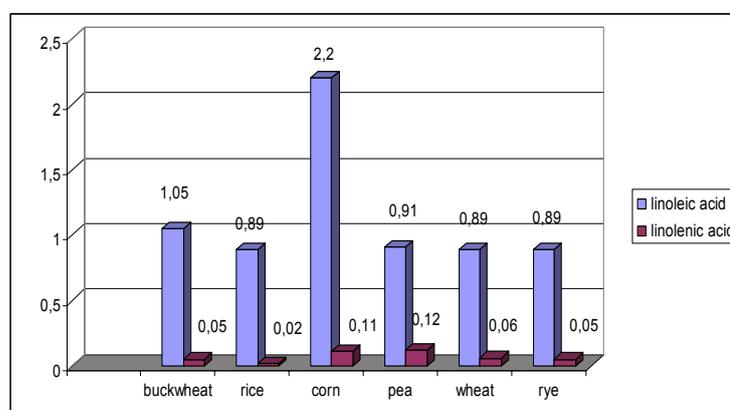


Fig. 5- The dynamics of polyunsaturated fatty acids

If you notice the polyunsaturated fatty acids that peas is in first place with 2,2 g/100 g linoleic acid, followed by buckwheat with 1,05 g/100 g linoleic acid, peas with 0,91 g/100 g linoleic acid, other cereals and leguminouses with a 0.89 g/100 g linoleic acid. (figure 5)

Table 2

Pearson correlation of coefficients

Raw material	r1	r2	r3	r4	r5
Buckwheat	0,31754	-0,08772	-0,07489	0,54733	0,0215912
Rice	0,31485	-0,0813	-0,07475	0,54641	0,022171
Corn	0,24668	-0,28919	-0,03013	0,9867	-0,00301
Pea	0,19448	-0,35759	-0,06701	0,9865	-0,042936
Rye	0,20358	-0,35375	-0,06635	0,98632	-0,042082
Wheat	0,12756	0,151602	-0,11143	0,93942	-0,054547
Oat	0,17449	0,513428	-0,30873	0,92539	-0,168161
Barley	0,93864	0,529961	0,450039	0,91353	0,7670736

My	-0,82772	0,618459	0,066229	0,99837	0,1230596
Grain	1	1	1	1	1

CONCLUSIONS

1. Cereals, wheat studied buckwheat, rye, corn, triticale, oats, barley, rice, peas are important sources of unsaturated fatty acids.
2. As a result of the determinations have shows the follows: palmitic acid has a great weight to buckwheat 0, 61g/g, peas 0,49g/100 g and rice 0,45 g/100 g.
3. In the case of unsaturated oleic-acid palmate is present only in the proportion of 0,01-0,07 g/100 g and oleic acid from 0,2 g/100 g of the product up to 1,07g/100 g product. The most important cereals with high content of oleic acid are: rice, peas, buckwheat.
4. In the case of polyunsaturated fatty acids that peas is in first place with 2,2 g/100 g linoleic acid, being followed by the buckwheat with 1,05 g/100 g linoleic acid, peas with 0,91 g/100 g linoleic acid.
5. It follows that the cereal and vegetable raw materials are important sources of omega 3, omega 6.
6. So that, we recomand the consum of rice, peas, buckwheat flours and the bakery products manufactured after new technological recipes which included the these raw materials.
7. Another recomandation referring at the corn flours and which be used in a new nutritive products.

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