OPTIMIZATION OF THE NUTRITIONAL OPTIMAL REPORT OF SATURATED AND NONSATURATED FAT ACIDS IN ECOLOGICAL EDIBLE OILS

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Abstract

The importance of the edible oil consumes outcomes of the content of lipids and glycerides with high biological value. The best report ω6/ω3 is 5:1.The research implies the study of the corn and palm oils, coconut, ground nuts and olive oils for establishing the content of fat saturated and non saturate acids as well as the best nutritional report saturated/nonsaturared fat acids.

The experimental component of the paper aims to compare the quantities of vegetal oil obtained from vegetables and fruits with the vegetal oil obtained from primary oleaginous materials as well as the content of saturated and non saturated fat acids which are influencing the quality of the nutritional value of the edible oils.(Blec, N.,2005).

Depending on the extraction efficiency of the oil obtained from vegetables and fruits it will be established the production effectiveness of these products as finite goods.

The research team will estimate if the nutritional value of the oils extracted of vegetables and fruits can constitute a transfer of technological innovation towards the industrial production process of these types of primary materials, specifying the achievement conditions.

Key words: optimal report of saturated and nonsaturated acids.

The lipids represent an energetic reserve of the organism on long term with double calories values than the carbohydrates and the proteins. Each organism is re synthesizing its own lipids, either that obtained from the food, or from the carbohydrates and even from the proteins. The lipids are getting into the constitution of the cell components, especially in the cell membrane, in combination with other substances. The assimilation process of the fats begins by their emulsion under the action of the pancreatic lipase. The minuscule micelles of the hydrolyze products are entering in the cells of the intestinal wall, the short chain fat acids are going directly into the blood circuit and those with short chain are re synthesizing the triglyceride.(Burzo, I., Toma S., Dobrescu A., 1999).

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MATERIAL AND METHOD

The research implies the study of the corn, coconuts, grounds nuts, palm and olive oils for establishing the content of fat saturated and non saturate acids as well as the best nutritional report saturated/nonsaturared fat acids.

The optimal report ω 3/6 is considered to be 5:1, which is 5 g ω 6 at 1g ω 3 per day. In the ordinary alimentation of population the report 10:1 is unfavorable.(Mogos,V. 2006) That is why it is highly recommended to eat great quantities of marine fish, rich in fat acids ω3. Human body can not create double connections beyond C9, that is why the acids with more double connections must be introduced in the human body by food. They are considered to be essential fat acids (F vitamins). CLA (Conjugated Linoleic Acids) are fixed into the cells wall and they have an antioxidant role. Each human body re-synthesis itself its own lipids, either the ones coming from alimentation or coming from glucide or protide. That is why, sweets are gaining weight, the human body transforms the extra mass of glucide from alimentation, non-valuable from an energetic point of view, in lipids. Lipids are found also into the composition of the cells components, especially into the cells membrane. Conjugated Linoleic Acids (CLA) are fixed into the cell wall having as its role to destroy free radicals contribution to the licosaide synthesis, fat acids with a longer chain and more double connections, important into the cell adjustment(Burzo, I., Toma S., Dobrescu A., 1999). Lipids from the sun flower contains 84% non saturated fat acids and 16% saturated fat acids. Among fat acids the highest percent is occupied by the linoleic acid(Niac, C., 2004).

We made the experimentals with Soxhlet VELT SER 148 which reduced the time of extraction by 20-80%.

RESULTS AND DISCUSSIONS

The quality of the oil obtained from corn is determined by the presence of fat acids in the following proportion: poly-non-saturated (C20:4 – arahidonic acid-5.89%), mono-non-saturated (linolenic acid C18:3- 58.4%, oleic acid 23.9% and linoleic acid 6,2%), saturated (palmitic acid C 16:0 – 7,9%, and stearic acid C18: 0 – 6%).(*fig. 1*)

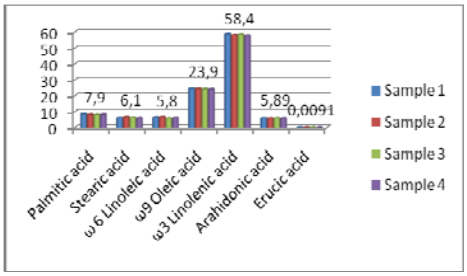

Figure 1 **The dynamic of fat acids at the corn oil**

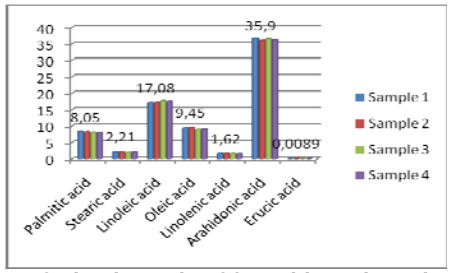

Figure 2 **The dynamic of fat acids at the palm oil**

The quality of palm oil is owned in a great measure to the content of linoleic acid 17,08%, which gives a non-corresponding smell and its instability. In order to improve the quality of palm oil it is necessary to reduce the content of saturated fat acids, respectively into palmitic acid and fat poly-non-saturated acids (linoleic acid) which determines oxidative instability. We can be observed that palm oil has registered 35,9% arahidonic acid but it is a smaller percent than corn oil (*fig. 2*)

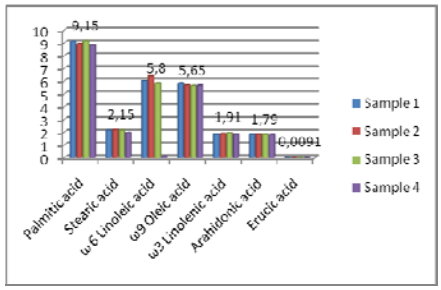

Figure 3 **The dynamic of fat acids at the coconut oil**

The quality of the oil is determined by the composition in fat acids. A higher content of linoleic acid decrease the stability of the oil, while a higher content of erucic acid has a negative nutritive effect.

Amelioration researches are watching the obtaining of some types of raw materials having the desired composition of fat acids (*fig. 3*).

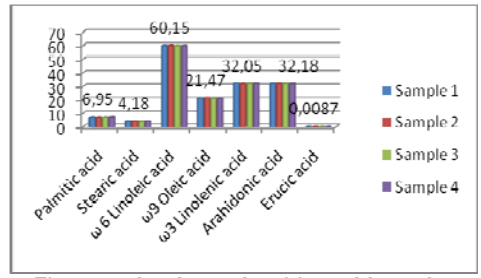

Figure 4 **The dynamic of fat acids at the groundnuts oil**

The samples of grounds nuts oil had the following proportion: mono-non-saturated (linoleic acid 60.15%, linolenic acid 32.05%, arahidonic acid-32.18% and olei acid – 21.49%), saturated (palmitic acid 6.95%% and stearic acid 4.18%) (*fig. 4*).

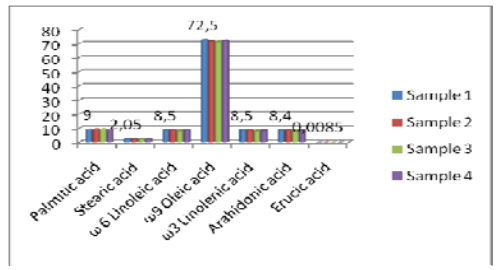

Figure 5 **The dynamic of fat acids at the olive oil**

At the olive oil samples we had registering the following proportion: mono-non-saturated (linoleic acid 8.5%, linolenic acid 8.5%, arahidonic acid-8.4% and olei acid – 72.5%), saturated (palmitic acid 9.0%% and stearic acid 2.05%) (*fig.5*).

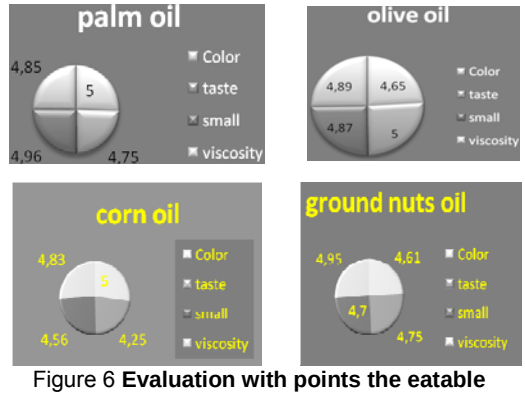

Figure 6 **Evaluation with points the eatable vegetable oils**

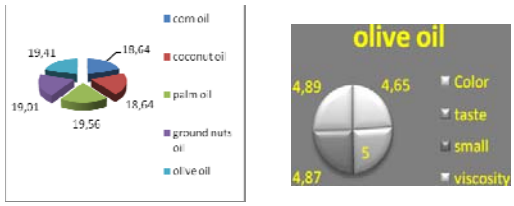

Figure 7 **Evaluation with points the eatable vegetable oils**

In order to check up the obtained results, the final products were tested – vegetable oil obtained from sun flower, soya and rape on a group of 150 of consumers from the north – east region of Romania(*fig.6., 7*) (Radu,Steluţa, 2010).

CONCLUSIONS

At the corn, palm , coconut, ground nuts and olive oils we have establishing the content of fat saturated and non saturate, and the following nutritional reports ω 3/6 : 10.07 : 1for the corn oil, 10.54: 1 for the palm oil, 3:1 for the coconut oil, 1,857:1 for the ground nuts oil, and 1:1 for the olive oil.

We can concluded that the ground nuts oil, coconut and olive had an optimal report.

The palm, corn oil had an important nonsaturated fats but these give an instability of samples.

The use of vegetable oils from a mixture of coconut, palm and olive is the perfect solution for optimization of the quality in case of eatable oils for human consumption.

Testing of those fiveth categories of oils and of samples taking into study by the consumers obtained the following score: 18.64 points for coconut oil, 19.01 points for ground nuts oil, 19.41 points for the corn and olive oils and 19.56 points for palm oil. We can see that palm oil is the most known vegetable eatable oils and the best of them, following by the corn and olive oils (*fig. 7*).

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