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## ЭКОЛОГИЧЕСКИЙ МОНИТОРИНГ

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### ECOLOGICAL FOODS AS MAJOR HEALTH QUALITY AND WELL-BEEING DETERMINANTS IN HUMANS

#### Summary

The following thesis presents a strict relation between health and nutritional behaviour. It has been proven that in an attempt to stay health more and more people, including Poles, resort to organic food. The main reason for purchasing food from ecological farms is, above all, trying to avoid the health risk related the consumption of conventional food. Organic food guarantees high nutritional value owing to the environmental conditions of production of agricultural products, along with the method of production, different from that typical food. All these factors are enough of guarantee of the organic food's quality and healthiness. The functional properties of organic food quality it as food which contributes human health, playing on essential preventory part of the human nutrition.

The above-mentioned properties are a result of containing a vast range of ingredients owing to which food organic the status of functional food. The ingredients such as vitamins (particular vit. C), mineral ingredients, NNKT and also a more advantageous aminoacid structure of protein, are be found much more frequently in ecological food, rather than in conventional food.

#### Ecological foods as major health quality and well-beeing determinants in humans

It has been scientifically proved that our lifestyle seriously affects our health – this is the proved thesis of scientists from Karolinska Institute in Stockholm [21].

There can also be no denying that etiological civilisational diseases are partly caused by wrong nutrition.

The studies conducted by the American Centre for Disease Control [3] also proved the most important factors affecting human health are food and proper nutrition.

According to the Centre's evaluation, the human health condition depends:

- in 53% on lifestyles, human behaviours, including nutritional behaviours,
- in 21% on environment,
- in 16% on genetical factors,
- in 10-15% on the condition of health care.

Szponar and Respondek [23] note that among the most serious diseases caused by improper nutrition are:

- diseases of the circulatory system, including arteriosclerosis, heart attack, hypertension, brain stroke,
- a substantial majority of neoplasms, newgrowths and instances of cancer,
- some of the diseases of the digestive system,
- osteoporosis,
- caries,
- insuline-dependent diabetes,
- obesity,
- anemia because of the lack of magnesium,
- hyperlipidemia,
- some degenerative diseases of the motor system,
- height and weight deficiencies in children and youths,
- delay in growth and physiological development,
- subclinical vitamin deficiencies of antioxidant qualities,
- low concentration and the consequent study difficulty because of malnutrition,
- low general systemic immunity and resistance,
- low birth weight of infants constituting one of the major reasons contributing to the death rate of children up to 1 year of age,
- food poisonings and contagious diseases transported via foods,
- severe, mild or chronic reactions to the presence in foods of natural toxic substances,
- alcoholism and the health consequences of the addiction.

From the above-mentioned groups of diseases, disease units and imbalances in health condition, only a small amount is included in the birth/death statistics according to the cause. About the epidemiology of the remaining we may only infer on the basis of part-data obtained from more or less representative population studies [23].

It must be stressed here that the vast majority of chronic and incurable diseases has a genetical base, as our genes may carry the coded tendencies to neoplasm/newgrowth diseases, coronary disease, hypertension, diabetes, asthma, Alzheimer's disease, psychiatric diseases, obesity, and many others. However, thanks to the early discovery of these predispositions (owing to the almost complete, 100% examination of each person's individual and unique genetical code), proper preventive measures may be taken. As has been contemporarily proved, the fact that a person is the carrier of mutated genes no longer means developing a particular disease.

It bears stating here with satisfaction that an important breakthrough has taken place all over the world, including our country, with regards to the social awareness of problems related to nutrition and health, as well as the direct relationships between them. Studies conducted at the Warsaw's School of Trade have shown that 65% of young managers fear that a disease might cross their professional plans, whereas 75%

believe that this might be avoided thanks to a proper lifestyle, so also – proper nutritional behaviours. Thus, it gradually begins to happen more often that a healthy lifestyle is being viewed as a factor determining social standing [24].

A poll conducted in the USA by a group of professors from the University of Illinois in Chicago has shown that the following percentage of Americans perceive:

- a strict relationship between one's diet and health condition (59,34%),
- a partial relationship (30%),
- does not perceive this relationship (11%) .

According to CBOS data, in Poland the questions of proper nutrition interest 68% of respondents, but only 27% always or often buy food enriched in, for example, vitamins [24].

It may be ascertained that taking care of one's health has become a fact within our society. Moreover, it stems not only from medical issues – health has become a kind of good which is worth investing in, as it helps in finding a better job, enhances the prospects of a fast professional promotion, as well as allows for self-education and self-development.

Caring about our health is a factor determining harmonious development and smooth functioning of our organisms at each and every stage of our life. As put by Roger Williams: «The greatest hope for longevity may only exist if right from the onset of foetal life till the old age our nutrition is at all times of highest quality» [21].

The complex problems of proper nutrition of people in all ages are met by ecological foods and their assets. The chances and prospects of ecological foods will be determined by the consumers themselves.

In caring for one's own health and that of one's family, the Polish society begins to more and more often take notice of ecological food as a guarantee of a high nutritional and health quality, and because of that, as constituting an important factor in the preventive measures taken to guard and protect our health. Among the motives speaking for the obtaining of ecological food, what is frequently stressed is the reduction of health risk which accompanies the consumption of foods from industrial growing. The afore-mentioned factor has been marked as the most prominent one in the studies of environment-friendly attitudes conducted among the citizens of Sweden (EFBs) [13].

Therefore, it seems justified to stress and accentuate those among the properties of ecological foods which strengthen the human organism. Today, in the circumstances of a growing interest in foods free from chemical contamination and of a guaranteed, highest, quality, it is vital to acknowledge those of these foods' assets which allow to consider them as foods promoting the health of the community and performing preventive functions in people's diet.

The wholesomeness of ecological food is actually one of the four fundamental rules of IFOAM, along with ECOLOGY, JUSTICE, and SOLICITUDE, which determine ecological agriculture on a world scale [16].

Organic food means:

1. food produced on farms in possession of a lawful certificate (that is, in optimal environmental conditions and through nature-friendly and environment-harmonious methods),
2. food processed in ways protecting as many as possible of its nutritional values,
3. food produced and stored without preservatives, artificial colourants and other food additives, directed to sale in a biologically-processable package (i.e., milk and other dairy products may be sold only in glass packages [17,26,27]).

It may be inferred, then, from the definition of ecological food, that two most significant factors guaranteeing the high quality of ecological food products are fulfilled. They are:

1. Environmental conditions of the production of land produce.
2. The method of production.

In ecological agriculture, these two factors do not pose any threat to the produced food; in fact, they alone constitute a guarantee of the food's quality. It has its reflection in the system of ecological foods production control. What is subject to control is not only the product itself, but also the method of its production. The control is concerned with the evaluation of the environmental conditions within a homestead and processing plant, as well as with ascertaining that the requirements of ecological production are fulfilled, also in the scope of packaging, storing, and transporting. The results of this control determine the acquiring of a certificate alongside the criteria in accordance with the Directives of Council No. 2092/91 and 1804/1999 [4,5] as well as, in a broader context, with the acts on ecological agriculture of the EU countries [17,26,27].

In light of the reasoning presented above, a thesis on ecological food safety may be formulated with confidence. The thesis consists in:

1. Product Safety:
  - safety, safety against the toxicity of foods,
  - safe, nutritious products,
  - safety of declaration (all components of a product are officially declared),
  - safety of label (understood as *eco-labelling*.)
2. Safety of the agrarian-comestible system:
  - safety of the supplies,
  - safety of distribution,
  - safety of clarity and neighbourhood,
  - safety of the consumer's influence on food production,
  - safety of information on the process of food production (certificate of an accreditation unit),
  - safety, lack of negative influence of the production practice on people and other live organisms, climate and environment [4,5].

Ecological food is characterized in exactly the same ways as other types of foods (also conventional foods). This means that we determine the food's sensoric (organoleptic) quality, nutritious value, health quality; however, we also do speak of this food's unique properties, such as vitalizing functions and its primordiality [22].

To the above-mentioned properties of ecological food we should also add its functional properties which are the result of its containing a number of ingredients making it possible to count this type of food in among other functional foods in the context of probably the most universal definition from the EU FUFLOSE document from 1999:

*«For food to be defined as functional, it has to be proven to have a benevolent influence on one or more functions of the organism, above and apart from the comestible effect, which enhances the health condition, improves one's general well-being, and works to reduce the risk of diseases. Functional food must resemble in appearance conventional food, and it must prove its benevolent actions in portions which are expected to be normally consumed together with diet – functional food is not pills, but one of the constituents of a healthy diet» [25].*

The goal of this paper is to discuss exactly such qualities of ecological food in light of modern literature. It is vital today, in the era of a marked growth in interest in chemical contamination-free food the quality of which is guaranteed to be highest possible, to point to its other assets which make it possible to consider this food as promoting human health and acting as an important preventive measure.

As has been remarked earlier, ecological food contains many ingredients which account for this food's status of functionality. Moreover, when compared with conventional food, the functional contents are on much higher levels.

Most studies of land produce cultivated ecologically present evidence of higher levels of the following substances:

- some vitamins (especially C),
- mineral ingredients,
- NNKT,
- Amino-acid richer protein [18,19,20].

Among vegetables, there are also ones which share the above-presented features. It is especially worth noting here potatoes and white cabbage.

Higher levels of vitamin C (26,6 mg/100 g of fresh mass – 20,9% higher) were detected by Rembalkowska [18,19,20] in ecological-farm-potatoes, while conventional potatoes contained only 22 mg/100 g of fresh mass. This has a particular significance if we take into account the fact that conventional potatoes constitute a major contribution to the general national diet.

White cabbage is another ecological vegetable with a higher level of vitamin C. In 100 g of white cabbage, 45 mg of vitamin C has been discovered, which 34% more than in conventional cabbage (34 mg, 30%) [18,19,20].

Vitamin C performs a variety of important protective functions:

1. it ensures the proper functioning of immune system and relieves stress,
2. it blocks the growth of carcinogenic nitrosamines, thus reducing the negative influence of nitrates on the human body,
3. it has antioxidant properties which fight the symptoms of the so-called oxidant stress (oxidant shock) – free radical diseases [1].

Therefore, ecological vegetables may be successfully used in neoplastic prophylaxis, as well as combating other diseases caused by improper nutrition.

When it comes to the levels of precious mineral ingredients in foods, it has been observed that:

1. cherries, blackberries, spinach, carrots, savoy cabbage have more iron,
2. savoy cabbage, carrots, potatoes, lettuce, blackberries, and leeks have more magnesium,
3. potatoes, celery, carrots, savoy cabbage, spinach, as well as cherries and blackberries have more phosphorus,
4. carrots, potatoes, spinach, savoy cabbage have more potassium,
5. potatoes, carrots, savoy cabbage, spinach, cherries and blackberries have more calcium [18,19,20].

As for the functional properties of these mineral ingredients (calcium, magnesium, iron), it has been ascertained that they positively affect:

1. the proper mineralization of bones,
2. metabolic regulation,
3. immune system stimulation.

American studies on ecological food have proved that such fruit and vegetables as strawberries, American berry (marionberry), corn, tea fruits, contain from 19 to 60% more flavonoids. Flavonoids constitute the greatest group of antioxidants and affect human organisms in a wide range of positive ways:

1. anti-neoplastic action,
2. properties blocking oxidant stress (free radical diseases),
3. anti-stress action,
4. UVA and UVB-protective action,
5. geroprotective action (preventing circulatory diseases in elderly people) [1,15].

Wine produced from ecological substances was also characterized by higher levels of flavonoids [15]. Similar effects have been observed by the producers of a national tincture made from ecological ARONIA, produced on an 18-hectar-plantation at an ecological farm in Kotlina Klodzka [12]. ARONIA is a South American shrub whose fruits are a source of many a precious active substance (ANTOCYJANY), vitamins (C, B2, B6, PP, P, E, carotene), microelements (Mo, Mn, Cu, B, J, Co), and dietary fibre and pectins. The production of the tincture in ecological conditions increases the levels of these substances.

According to latest studies, functional properties also has conjugated linoleic acid. It is a natural component of animal foods, present in the fat of cow milk, dairy products, and meat of ruminants. It is believed to:

1. have anti-neoplastic properties (against breast cancer, intestine cancer, liver cancer),
2. help maintain proper weight (through stimulating the metabolic processes, increasing muscle mass, reducing the amount of fat),
3. help prevent circulatory system diseases like arteriosclerosis,

4. help prevent diabetes (through the normalization of glucose metabolism),
5. modulate immune system [9,11,14].

It has been confirmed that the source of CLA (OKTADEKAINOWY ACID) is the milk of cows pastured on ecological pastures, especially during the first stage of grass growth (young grass). Milk obtained from cows in these conditions is usually two times richer in CLA than conventional milk [6,14].

Functional properties are also to be found in PUFA and NNKT which:

1. help prevent circulatory system diseases
2. alleviate food allergies
3. help the immune system to function properly [14].

Owing to the presence of these substances, ecological meat may be viewed as another instance of functional food. It has been confirmed in many studies that ecological beef and veal have substantially higher levels of PUFA, whereas ecological poultry contains more n-3 NNKT [9,14].

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