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ОДЕСЬКА НАЦІОНАЛЬНА АКАДЕМІЯ ХАРЧОВИХ ТЕХНОЛОГІЙ

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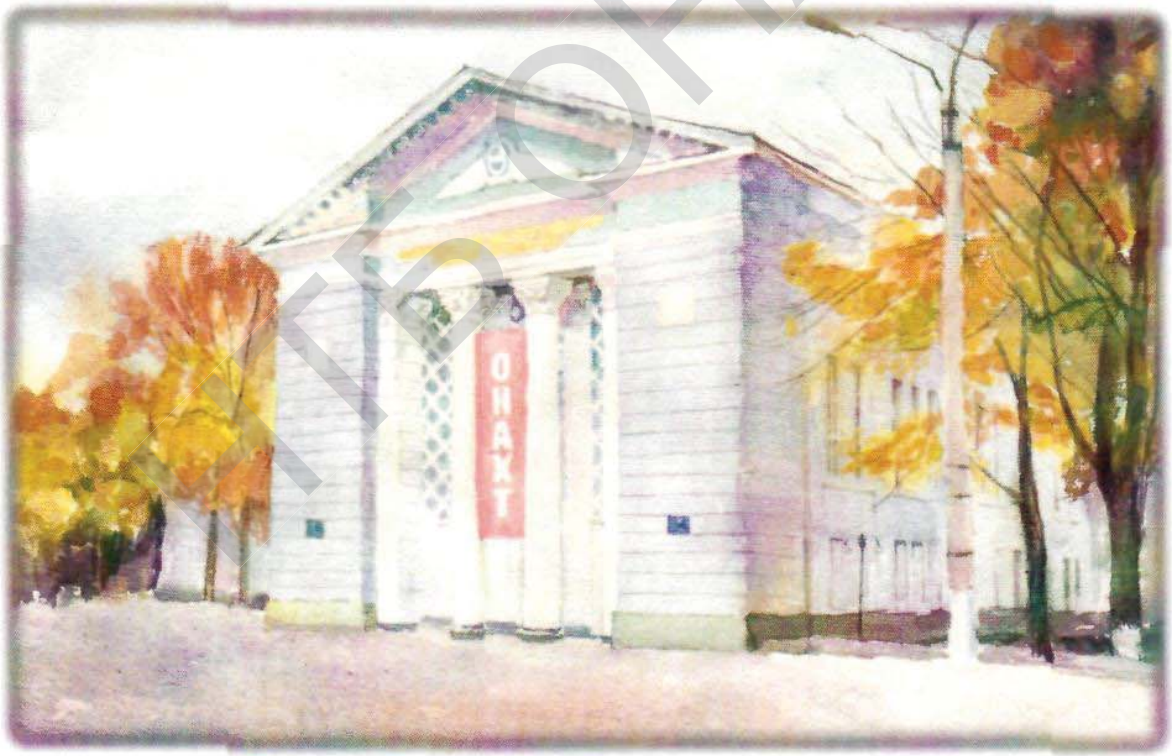

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ТЕХНОЛОГІЧНІ АСПЕКТИ ВИРОБНИЦТВА ХАРЧОВИХ ПРОДУКТІВ ЛІКУВАЛЬНО-ОЗДОРОВЧОГО НАПРЯМКУ

ТЕХНОЛОГІЯ М'ЯСНИХ, РИБНИХ І МОРЕПРОДУКТІВ

IMPORTANCE OF POLYUNSATURATED FATTY ACIDS (PUFA) IN THE COMPOSING OF HEALTHY DIET

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"Let food be the medicine and medicine be the food" (Hippocrates). More than two thousand years ago, ancient Greeks noticed that the best way of treatment is consuming natural medicines that come to our organisms with food. Nowadays vast majority of people in developed countries are keen on healthy food. For example, they prefer food enriched with omega-3 fatty acids. Unfortunately, in Ukraine many people still thinks that healthy nutrition is a whim. Thus, education and healthcare workers have task to explain why this issue is important.

Although PUFA have been known to be essential for normal growth since 1930s, understanding of their role has rapidly grown in the last decades of XX century. The research conducted in 1970s shown that Eskimo living in Greenland who consume wide range of products, which contain omega-3 e.g. fish, seals, whale's fat, do not suffer from heart attacks. However, Eskimo who immigrated to Denmark suffer from heart disease as well as local population do. Later there was research named "Seven countries" shown that people who live in Japan and Crete who have diet rich in omega-3 (fish, soybean, canola) has incredible long life term. The Canadian Food Inspection Agency has recognized the importance of DHA omega-3: "DHA, an omega-3 fatty acid, supports the normal physical development of the brain, eyes and nerves primarily in children under two years of age."Then clinical researches proofed that PUFA can reduce the risk of coronary heart disease, which is the first causes of death in rich countries.

Looking at top 10 causes of death provided by WHO, we can see that ischemic heart disease is the biggest world killer. Deaths due to Alzheimer's disease and other dementias more than doubled between 2000 and 2015, making it the 7th leading cause of global deaths in 2015. These reasons became so widespread because of aging population in the most of developed countries. They are not so important in the poor countries where people die in young age due to lower respiratory infections and diarrheal diseases. Different types of cancer are also widespread cause of death. Thus, there were researches that shown that some PUFA can decrease rate of heart and mental problems and some types of cancer or at least improve quality of life of patients who suffer from these diseases. However, results are still controversial due to publication bias.

Consumption of omega-3 fatty acid bigger than 1 gram daily for at least a year might protect from cardiac death, sudden death, and myocardial infarction in people who have a history of cardiovascular disease, also appear to decrease the risk of stroke. Moreover, it lower blood pressure (systolic and diastolic) and stimulate blood circulation and increase the breakdown of fibrin, a protein involved in blood clotting and scar formation.

Omega-3 fatty acids supplements can decrease risk of breast cancer and may help improve appetite, weight, and quality of life in people with advanced cancer and and cachexia. There are also evidence of that PUFA has effect like non-steroidal anti-inflammatory drugs. Omega-3 fatty acids can be helpful in case of depressions, including ones in bipolar disorder.

Results of researches about PUFA's effect on mechanism of Alzheimer's disease are still unclear, but some positive dynamic was noticed.

Animals do not produce PUFA, so content of it in meat is due to consumption products rich in polyunsaturated fatty acids. For example, such fish as herring and sardines, obtain it from microalgae and plankton. The richest plant sources of PUFA are flax and hemp. Their seeds or oil can be eaten. If they (or other sources of omega-3 fatty acids) are added to animals' feed, their meat and other products (milk, eggs) will be rich in PUFA.

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PRACTICAL ASPECTS OF ADDING POLYUNSATURATED FATTY ACIDS (PUFA) IN DAILY DIET

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In the first part of XX century, fish fat was recommended for children because its importance for healthy growing has been already discovered. But storage conditions used to be impropriate, so fish fat had bad taste and was kind of nightmare for children. Nowadays there are a lot of other dietary recourses of PUFA. It can be taken in form of food supplement capsules but their benefit for health is doubtful because in result of processing double bonds in polyunsaturated fatty acids can be displaced or destroyed so they turn into another substances and lose their useful properties. Animals cannot produce PUFA; therefore their meat can be rich in polyunsaturated fatty acids only due to consumption of some plants. For instance, such fish as herring has significant amount of omega-3 in their meat because they obtain it from microalgae and plankton in their diet. The richest plant sources of omega-3 are flax and hemp, in particular, their seeds. It can be taken in form of seeds or oil. Moreover, if you add them into feed for other animals, their meat, milk and eggs will be enriched in PUFA.

The Institute of Medicine in USA published a system of Dietary Reference Intakes claimed that for alfa-Linolenic acid (one of the n-3 fatty acids) adequate intake is 1.6 grams/day for men and 1.1 grams/day for women. They also set tolerable limit for omega-3 fatty acids of 3 grams per day of combined DHA and EPA, with no more than 2 from dietary supplements. However, different organizations give different recommended quantity for PUFA consumption. For example, The European Food Safety Authority approved a claim "EPA and DHA contribute to the normal function of the heart" for products that contain at least 250 mg EPA + DHA. The World Health Organization recommends regular fish consumption (1-2 servings per week, equivalent to 200 to 500 mg/day EPA + DHA) as protective against coronary heart disease and ischemic stroke. The American Heart Association made trials where patients consumed about 1000 mg/day which decreased risk of the heart problems.

There is also issue of contamination in fish oil supplements which is rich on omega-3 fatty acids. Fish's body accumulate heavy metals like mercury and lead and also some dioxins and furans. However, heavy metal toxicity from consuming fish oil supplements is highly unlikely, because heavy metals selectively bind with protein in the fish flesh rather than accumulate in the oil. An independent test in 2005 of 44 fish oils on the US market found all of the

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