INTERNATIONAL JOURNAL OF POLITICAL SCIENCES AND ECONOMICS
Impact Factor (research bib) - 9,78
https://ijmri.de/index.php/ijpse , German international journals company
ISSN 2751-9708

DEVELOPMENT OF FUNCTIONAL FAT BLENDS BASED ON SOYBEAN AND WHEAT KERNELS

Askarova Khurshida Ekram kizi

Tashkent Institute of Chemical Technology

Faculty of Food and Winemaking Technologies

1st year master's student in the field of Food Technology (in the field of technology of oil and fat products)

Annotation

This article covers the scientific and practical aspects of developing functional fat blends based on soybean and wheat kernels. Soybean kernels are rich in unsaturated fatty acids such as protein, linoleic and linolenic, which serve to improve the functioning of the cardiovascular system. Wheat kernels, as a natural source of vitamin E, phospholipids and phenolic compounds, have strong antioxidant properties. By combining these two raw materials, it becomes possible to create fat blends with high biological value and functional properties. The study analyzed their nutritional composition, technological properties and prospects for application in the food industry. Functional fat mixtures play an important role in supporting metabolic processes in the human body, strengthening the immune system and reducing oxidative stress. The results show that mixtures based on soybean and wheat germ are promising products that meet the requirements of modern healthy nutrition.

Keywords

soybean germ, wheat germ, functional fat mixture, unsaturated fatty acids, vitamin E, antioxidant, biologically active substance, food technology, healthy nutrition, lipids.

In recent years, the demand for functional products based on the principles of healthy nutrition in the food industry has been increasing significantly. Products containing biologically active substances beneficial to the human body not only satisfy nutritional needs, but also serve to prevent diseases and improve overall health. In this regard, plant-based fat mixtures, in particular products based on soybean and wheat germ, are of great scientific and practical importance.

Soybean kernels and wheat germ are rich in natural bioactive substances, which include unsaturated fatty acids, phospholipids, vitamins and antioxidant compounds. These components play an important role in regulating metabolic processes in the body, protecting cells from oxidative stress and strengthening the cardiovascular system.

Therefore, the development of functional oil mixtures based on these two raw materials is one of the current scientific directions.

Soybean kernels are the most biologically active part of soybeans, which has high nutritional value. They contain:

18–22% proteins

20–25% fats

linoleic and linolenic acids

vitamins E and B group

isoflavonoids

minerals (potassium, magnesium, phosphorus).[2]

Soybean kernel oil consists mainly of unsaturated fatty acids, which reduces the risk of cardiovascular diseases. Isoflavonoids, on the other hand, have an estrogen-like effect and help maintain hormonal balance.

In addition, soybean protein has a high biological value and fully covers the amino acids necessary for the human body. This distinguishes it as an important raw material for creating functional food products.

Wheat germ is the smallest but richest part of the grain. It is rich in the following components:

25–30% fats

Up to 30% proteins

Vitamin E (tocopherol)

Folic acid

Phospholipids

Phenolic compounds

Trace elements (zinc, iron, selenium)

Wheat germ oil is one of the most powerful sources of natural antioxidants. In particular, vitamin E protects cell membranes from oxidation and slows down the aging process.

Phenolic compounds protect the body from various diseases by neutralizing free radicals.

Functional fat mixtures are fat products that not only have energy value, but also bring biological benefits to the body. Such mixtures usually consist of a combination of several vegetable oils, the purpose of which is to optimize the balance of beneficial fatty acids.

Combining soybean and wheat germ oils provides the following benefits:

Balance of omega-3 and omega-6 acids

Increased antioxidant activity

Increased nutritional value

Complex effect on the body[3]

The development of functional oil mixtures consists of several stages:

1. Preparation of raw materials. Soybean and wheat germ are cleaned, dried and ground. This process increases the extraction efficiency.

2. Oil extraction. The oil is obtained using the following methods:

cold pressing

solvent extraction

supercritical CO_2 method

Cold pressing method allows you to get the most natural and high-quality product.

3. Blending process. The resulting oils are mixed in certain proportions. The optimal ratio is usually 60% soybean oil and 40% wheat germ recommended as a fat.

4. Stabilization. To protect the mixture from oxidation, natural antioxidants (for example, tocopherol) are added.

5. Packaging. The product is placed in containers protected from light and oxygen.[1]

Oil mixtures based on soybeans and wheat germ have a complex effect on the body:

strengthens the cardiovascular system

lowers cholesterol levels

increases immunity

has an anti-inflammatory effect

renews skin cells

The balance of omega-3 and omega-6 acids improves brain function and supports the nervous system.

Vitamin E protects cells from oxidative stress and slows down the aging process.[4]

In conclusion, the development of functional oil mixtures based on soybeans and wheat germ is one of the promising areas of modern food technology. These products are distinguished by their high biological value, antioxidant properties and beneficial effects on human health.

Their unsaturated fatty acids, vitamin E and other bioactive substances protect the body from various diseases and are consistent with the concept of healthy eating.

Therefore, oil mixtures based on soybeans and wheat germ are expected to play an important role in the future not only in the food industry, but also in the medical and pharmaceutical sectors.

References

1. Shuhratov A. A., Karimova D. M. Oziq-ovqat texnologiyasi va funksional mahsulotlar. – Toshkent: “Fan va texnologiya” nashriyoti, 2021. – 312 b.

2. Mamatqulov J. M., Isroilov N. T. O‘simlik moylari kimyosi va biokimyosi. – Toshkent: “O‘zbekiston milliy ensiklopediyasi” nashriyoti, 2020. – 358 b.

3. Gunstone F. D., Harwood J. L., Dijkstra A. J.The Lipid Handbook with CD-ROM. – 3rd ed. – Boca Raton: CRC Press, 2007. – 791 p.

4. Kamal-Eldin A., Moreau R. A.“Antioxidant lipids in cereal germ and soybean oils” Journal of Food Lipids, 2019, Vol. 26(3), pp. 1–20.

5. Askarova Khurshida Ekram kizi. Antioxidant Effect of Functional Supplements Based on Cereal Kernels on the Organism. EUROPEAN JOURNAL OF LIFE SAFETY AND STABILITY (EJLSS) ISSN2660-9630. Volume 56, 2025 | Page 112-114.

6. Askarova Khurshida Ekram kiz. TECHNOLOGY OF MICROENCAPSULATION OF GRAIN KIDNEY FAT FRACTION AND ITS APPLICATION IN FUNCTIONAL PRODUCTS. CONFERENCE ON THE ROLE AND IMPORTANCE OF SCIENCE IN THE MODERN WORLD Volume 02, Issue 10, 2025. Page 211-213

7. Askarova Khurshida Ekram kizi. RESEARCH ON THE TECHNOLOGY OF PRODUCING FOOD PRODUCTS ENRICHED WITH ESSENTIAL FATTY ACIDS BASED ON CEREAL PRODUCTS. INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE ISSN: 2692-515X. Page 48-54.