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PRODUCTION OF FORTIFIED FOOD PRODUCTS FOR CHILDREN BASED ON CEREAL BRAN

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Annotation. This article explores the scientific and practical aspects of producing fortified food products for children based on grain germs. Grain germs have high biological value and contain proteins, vitamins, minerals, and essential fatty acids. These components play a crucial role in the growth and development of children. The paper analyzes production technologies, raw material selection criteria, and methods for improving product quality. Additionally, the nutritional and functional properties of fortified foods are evaluated to ensure their effectiveness in supporting healthy child nutrition.

Keywords: grain germ, child nutrition, fortified foods, biotechnology, nutritional value, vitamins, healthy diet.

Аннотация. В данной статье рассматриваются научные и практические аспекты производства обогащенных продуктов питания для детей на основе зародышей зерна. Зародыши зерна обладают высокой биологической ценностью и содержат белки, витамины, минералы и незаменимые жирные кислоты. Эти компоненты играют важную роль в росте и развитии детского организма. В работе анализируются технологии производства, критерии выбора сырья и методы повышения качества продукции. Также оцениваются питательные и функциональные свойства обогащенных продуктов, предназначенных для детского питания.

Ключевые слова: зародыши зерна, детское питание, обогащенные продукты, биотехнология, пищевая ценность, витамины, здоровое питание.

Annotatsiya. Ushbu maqolada don murtaklari asosida bolalar uchun boyitilgan oziq-ovqat mahsulotlarini ishlab chiqarishning ilmiy va amaliy jihatlari yoritilgan. Don murtaklari yuqori biologik qiymatga ega bo‘lib, tarkibida oqsillar, vitaminlar, minerallar hamda essensial yog‘ kislotalari mavjud. Mazkur komponentlar bolalar organizmining o‘sishi va rivojlanishida muhim ahamiyat kasb etadi. Maqolada ishlab chiqarish texnologiyalari, xomashyo tanlash mezonlari hamda mahsulot sifatini oshirish usullari tahlil qilingan. Shuningdek, boyitilgan mahsulotlarning oziqaviy va funksional xususiyatlari baholanadi.

Kalit so‘zlar: don murtagi, bolalar oziq-ovqati, boyitilgan mahsulotlar, biotexnologiya, oziqaviy qiymat, vitaminlar, sog‘lom ovqatlanish.

INTRODUCTION.

ISSN 3030-3907

Today, strengthening the health of children, ensuring their proper growth and development is one of the most urgent tasks facing society. In particular, due to the modern lifestyle, environmental problems and malnutrition, various nutritional deficiencies are increasing among children. Therefore, the need to produce food products for children with high nutritional value, enriched with biologically active substances is increasing.

Cereal bran (i.e., the embryonic part of the grain) is distinguished by its rich chemical composition. They are a natural source of proteins, vitamins, minerals, antioxidants and essential fatty acids. Therefore, products made from cereal bran are extremely beneficial for the children's body.[3; 74]

This article analyzes the theoretical foundations, technological processes and beneficial properties of the production of enriched food products for children based on cereal bran.

Cereal bran is the most valuable part of the grain, which is rich in biologically active substances. They contain the following important components: Proteins - provide growth and repair of tissues in the children's body. Vitamins - especially B vitamins (B1, B2, B6), vitamin E are found in large quantities.

Minerals - contain elements such as iron, zinc, magnesium, phosphorus. Essential fatty acids - are necessary for the cardiovascular system and brain development. Antioxidants - protect the body from harmful free radicals.

The high nutritional value of cereal grains allows them to be used as an important component in children's nutrition. These products are especially important for preschool and school-age children.

Food products produced for children should be not only nutritious, but also healthy and safe. Fortified products are foods that are additionally supplemented with vitamins, minerals and other biologically active substances.

The advantages of enriched products based on cereal bran are as follows:

Eliminates nutritional deficiencies

Strengthens immunity

Supports mental and physical development

Improves the digestive system[3; 56]

Such products play an important role in providing microelements, which are especially necessary for a rapidly growing organism.

The production of food products based on cereal bran includes several stages:

1. Selection and preparation of raw materials. High-quality grains are selected. They are cleaned and, if necessary, moistened.

ISSN 3030-3907

2. Separation of the bran. The outer shell of the grain is separated and the bran part is separated. This process is carried out using special technological equipment.

3. Drying and grinding. The bran is dried and ground into powder. This extends their shelf life.

4. Enrichment process. If necessary, additional vitamins or minerals are added.

5. Production of the finished product. Various products are prepared based on the obtained raw materials:

children's porridge

cookies and bakery products

drinks and purees

Methods for improving product quality[1; 245]

The following methods are used to improve the quality of products made from cereal bran:

Fermentation technology - improves the digestibility of the product

Microencapsulation - helps preserve useful substances

Improvement of packaging technologies - allows for long-term storage of the product

In addition, strict adherence to sanitary and hygienic requirements is important in the production of products.

Beneficial properties of products based on cereal bran

These products have the following positive effects:

Strengthen immunity

Improves brain function

Provides energy

Regulates digestion[2; 310]

In particular, vitamin E and omega fatty acids play an important role in the development of the nervous system of children.

Products made from cereal bran are widely used in developed countries. For example:

Special cereal mixtures for children are produced in the USA and European countries

Functional food products are widely developed in Japan and South Korea

These experiences show that it is possible to create high-quality and useful products using innovative technologies.

Grain production in Uzbekistan is widely developed, which creates great opportunities for the production of products based on grain cereals. By using local raw materials, it is possible to:

ISSN 3030-3907

produce import-substituting products
improve children's health
increase economic efficiency

Also, there is an opportunity to create new innovative products through the development of scientific and research work.

There are a number of problems in this area:
lack of technological equipment
lack of scientific research
lack of information among consumers
Solve them for work:
introduction of modern technologies
expanding scientific research
it is necessary to strengthen public awareness[4; 134]

In conclusion, the production of fortified food products for children based on cereal bran is one of the current trends today. Cereal bran has high nutritional value and plays an important role in the proper development of the child's body. By improving the production technologies of these products, developing scientific research and implementing them in practice, it is possible to improve children's health.

In the future, by developing this area, there is an opportunity not only to raise a healthy generation, but also to bring the food industry to a new level.

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