

## **ASPECTS OF THE DEVELOPMENT OF DAIRY FORTIFICATION PRODUCTS WITH PLANT USE FOOD ADDITIVES.**

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**Abstract.** The article is devoted to the issues of food use of renewable resources of protein-containing raw materials. domestic food market development trends regarding the development of recipes for a new sector of the dairy industry - “plant-based milk with low-quality milk” of local origin. The groups and types of protein-containing plant raw materials used are considered. The main and additional components of the recipe composition of plant milk and the accepted classification of this drink according to the nature of the raw materials are characterized; analyzed the advantages and disadvantages of the nutritional value of vegetable different types of milk and the basic requirements for its colloidal state.

**Key words:** natural milk, plant milk, sesame milk, market overview, assortment, nutritional value, technology, local raw materials, protein.

**Introduction.** Research and development based on the enrichment of dairy products with vitamins ensures a lack of vitamins in the adult and child population of Uzbekistan. It especially shows after an illness COVID-19 that a lack of vitamin D in the body, including calcium, is considered problematic. After contracting COVID-19, thousands of people experienced a negative impact of the viral disease on the deterioration of the body. The reason for the deficiency of vitamin D and

calcium in Uzbekistan is its insufficient intake from food, which due to the deficiency leads to various diseases. Maintaining optimal concentrations of circulating vitamin D in plasma reduces the risk and severity of autoimmune and cardiovascular diseases, dementia, many types of cancer, diabetes mellitus type I and II, respiratory tract infections, and also improves dental and oral health, and increases physical performance. The effectiveness of using fortified products lies in the prevention of osteoporotic fractures and a significant reduction in economic costs.

The main stages of plant milk production technology and technological methods that ensure the physical and chemical stability of the drink and its suitability for industrial use in order to ensure a long shelf life are listed. The quality of plant milk is the characteristics of potential suitability for the production of plant milk - and the most important technological properties of the finished drink, including its nutritional value.

Technological modification of food products or enrichment of food products for mass consumption with vitamins during the production process or mixtures of minerals into a food product, indicating the dose of the micronutrient introduced into the product.

The effectiveness of fortifying foods with vitamin D and calcium is presented in various analyzes and statistics from European countries. A Belgian study showed that daily consumption of 1 yogurt fortified with calcium (400 mg) and vitamin D (200 IU) is cost-effective for the prevention of osteoporotic fractures in the population over 70 years of age and in all age groups of women with low bone mineral density bones or with a compression fracture of the vertebrae.

In accordance with SanPiN 2.3.2.2804-10 Additions and changes “22 to SanPiN 2.3.2. 1078-01 “Hygienic requirements for the safety and nutritional value of food products” one serving contains from 15 to 50% of the recommended daily intake of vitamins and minerals.

For high-calorie rich foods (with an energy value of 350 kcal or more per 100g), the content of vitamins and minerals should be from 15 to 50% of the body's physiological needs per 100 kcal (1 standard serving).

In Uzbekistan, there is no legislation on the mandatory fortification of food products; some products are fortified with vitamins; a number of consumer products are subject to mandatory fortification. The unconventional properties of vitamin D and calcium appear at higher levels in the blood.

Thus, there is increasing interest in finding new ways to fortify food products with this vitamin, as well as traditionally adding vitamin D to animal feed is one of the promising options for fortifying “*bio-addition*”, based on the possibility of being contained in living organisms (cattle, chickens, baker's yeast).

When developing modern technologies, manufacturers focus primarily on the organoleptic quality indicators of cow's milk. An important characteristic is also considered to be the level of protein content in the drink, although in fact the protein content of industrial plant milk is rarely exceeds 1-1.5%.

Cow's milk is special structured colloidal system - emulsion, the nutritional value and technological properties of which are provided by the composition, ratio and properties of proteins, fats and carbohydrates.

Unlike cow's milk, vegetable milk is a suspended emulsion, not only due to the properties and composition of the named components, but also to the positive characteristics of the developed recipe. The developed fractions provide the milk drink with predominant proteins from grain legumes and oilseeds. Direct dissolution of crushed plant materials does not provide the necessary technological properties of the drink in question.

Sesame is the best source of calcium. There is much more of it per 100 grams than in milk and it is absorbed more efficiently. Used in various forms, used with honey, including sprouted for use with salad. A universal product with sesame is sesame milk.

In general, most commercial brands of plant-based milks, creamers and milk drinks have fairly low or very low protein content - (from 1-1.2...1.5% to less than

0.5%). By the way, it is the low protein content and its inferiority compared to proteins of animal origin that are the leading reason for the legislation of European countries banning the use of the word “*milk*” in relation to analogue drinks obtained from raw materials of plant origin. Only soy milk is characterized protein content, relatively comparable in level to cow's milk, however, in terms of amino acid composition, peanut proteins are considered more complete. Cereals are relatively more valuable consider oat milk, both in terms of the amino acid composition of proteins and the presence of  $\beta$  - glycan, among the oilseeds, sesame and flaxseed milk are of greatest interest - in due to the presence of several raw materials at once antioxidant components.

In recent years, many other applications of ultrasound have been developed in the areas of food technology and functional materials.

This includes, but is not limited to:

- synthesis of nano- and micro functional materials for use in catalytic processes and biomedicine;
- encapsulation and delivery of nutrients and functional materials in food matrices;
- food emulsions with high nutritional value.

Ultrasound improves and accelerates technological processes, technologies and specialists who work in the food industry have long been familiar with amazing ability. Scientific research and practical experience have shown that the use of ultrasonic devices allows significantly intensify such technological processes as:

- dispersion;
- emulsification;
- coagulation;
- homogenization;
- oxidation;
- recovery;
- impregnation;

- dissolution;
- spraying;
- drying, etc.

In the food industry, ultrasound is used for sterilization, pasteurization and homogenization of products. Ultrasound helps dissolve milk in water faster.

In modern society, the trend towards a healthy lifestyle is gaining momentum. It has been proven that fermented milk drinks play a very important role in dietary, therapeutic and gerodietetic nutrition, because they contain nutritional value and biologically active substances.

Human nutrition, which plays a huge role in his life and is the source of people's vital energy, is fundamental in the formation and maintenance of public health, as well as one of the most important factors in intellectual activity.

That is why improving the quality of food is currently one of the main problems of humanity.

It is very important to follow the principles of proper and nutritious nutrition, as this is the key to good health and well-being at different ages. But it is important not only to follow a diet, excluding "bad foods" from the diet, but also to consume healthy and high-quality products. It is important to remember that fermented milk products are an essential component of a proper and balanced diet.

Proposed recipe for adding sesame milk to yoghurts intended for baby food. Plant milk is deficient in calcium and vitamin E, therefore most of the plant milk products sold are enriched with vitamin and mineral premixes before final homogenization, and therefore these drinks are also considered in the functional segment. Unfortified plant milk as a source of certain physiologically functional components, for example: sesame milk - lingam's, peanut milk - polyphenolic compounds, rice milk - phytosterols, oat milk  $\beta$ -glycan, almond milk - tocopherols and arabinose.

Aromatic substances were previously added in powder form, but are now introduced in the form of extracts. Extracts are more convenient and cheaper than powdered spices - one kilogram of extracts replaces 30 kilograms of powdered

spices. But uniform distribution in small quantities spices are almost impossible. And thanks to ultrasound, it was possible to obtain stable emulsions, which even after two weeks they do not lose their aromatic properties. Such emulsions can also be used in the canning industry, as they do not cause corrosion of cans.

The dietary properties of plant milk include the protein content of the amino acid arginine, which is believed to stimulate the secretion of hormones that regulate the production of insulin and the body's sensitivity to it. This justifies the recommendation of consuming plant-based milk for those predisposed to diabetes.

**Conclusion.** People with lactose intolerance cannot drink cow's milk, but plant milk, especially milk from legumes and nuts, may cause food allergies, up to anaphylactic shock. The allergen, both in soy and in the kernel of nuts, is the protein of the raw materials used. Abuse of plant milk, which contains food additives such as gums and carrageenan, can provoke intestinal inflammation. Using the example of almond, rice and bean milk, it has been clinically confirmed that a complete transition in nutrition to milk of plant origin, especially in childhood, provokes pathology kidneys (especially for almond milk characterized by elevated oxalate levels calcium), leads to urinary disorders and severe protein deficiency, manifested in hypoalbuminemia, food allergies and dermatitis and accompanied by poor weight gain.

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