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# CONTENTS

## BIOLOGICAL SCIENCES

<i>Пащенко А. В., Евлоев Т. А., Морозов Н. А.</i> ОЦЕНКА СОСТОЯНИЯ ПОЧВ ПАРКА «ФОРГОСТ» МЕТОДОМ БИОТЕСТИРОВАНИЯ .....	4
<i>Pashchenko A.V., Evloev T. A., Morozov N. A.</i> ASSESSMENT OF SOIL CONDITION PARK «FORGOT» METHOD OF BIOTESTING .....	4

<i>Пащенко А.В., Евлоев Т.А., Побережний Н.В.</i> ОЦЕНКА СОСТОЯНИЯ АТМОСФЕРНОГО ВОЗДУХА НА ТЕРРИТОРИИ ПАРКА «ФОРГОСТ» .....	6
<i>Pashchenko A.V., Evloev T.A., Poberezshniy N.V.</i> ASSESSMENT OF ATMOSPHERIC AIR ON THE TERRITORY OF THE PARK «FORGOT» .....	6

## VETERINARY SCIENCES

<i>Паладійчук О.Р.</i> ПРОФІЛАКТИЧНІ ЗАХОДИ МАСТИТУ У КОРИВ В СУХОСТІЙНИЙ ПЕРІОД .....	9
<i>Paladiychuk O.R.</i> THE PREVENTIVE MEASURES OF MASTITIS IN COWS DURING THE DRY PERIOD .....	9

## PHYSICS AND MATHEMATICS

<i>Дьомічев К.</i> ВИКОРИСТАННЯ СПЛАЙНІВ ПРИ МОДЕЛЮВАННІ ФУНКЦІОНАЛЬНО-НЕОДНОРІДНИХ МАТЕРІАЛІВ .....	16
<i>Domichev K.</i> USE OF SPLINES IN MODELING FUNCTIONALLY-HETEROGENEOUS MATERIALS .....	16

<i>Каримова А.И., Шарипова Р.Р.</i> ПРИМЕНЕНИЕ ДИСТАНЦИОННЫХ ТЕХНОЛОГИЙ ОБУЧЕНИЯ ВО ВРЕМЯ ПАНДЕМИИ .....	18
<i>Karimova A.I., Sharipova R.R.</i> APPLICATION OF DISTANCE TECHNOLOGIES ELEARNING DURING THE PANDEMIC .....	18

## TECHNICAL SCIENCE

<i>Барабаш В.И.</i> ВОЗОБНОВЛЯЕМЫЕ И НЕВОЗОБНОВЛЯЕМЫЕ ИСТОЧНИКИ ЭНЕРГИИ .....	21
<i>Barabash V.I.</i> RENEWABLE AND NONRENEWABLE ENERGY SOURCES .....	21

<i>Бухаров Т.А., Каримова А.И., Мигранова Е.А.</i> ТЕХНОЛОГИИ РАЗРАБОТКИ ЭЛЕКТРОННЫХ ОБРАЗОВАТЕЛЬНЫХ РЕСУРСОВ .....	23
<i>Bukharov T.A., Karimova A.I., Migranova H.A.</i> TECHNOLOGIES FOR DEVELOPING ELECTRONIC EDUCATIONAL RESOURCES .....	23

<i>Жук П.Е., Животов Д.А.</i> МОДУЛЬНЫЙ САНТЕХНИЧЕСКИЙ БЛОК ВЫСОКОЙ ЗАВОДСКОЙ ГОТОВНОСТИ .....	32
<i>Zhuk P.E., Zhivotov D.A.</i> HIGH-PERFORMANCE MODULAR PLUMBING UNIT FACTORY READY .....	32

<i>Жук П.Е., Животов Д.А.</i> АКТУАЛЬНОСТЬ ПРИМЕНЕНИЯ ГОТОВЫХ МОДУЛЬНЫХ РЕШЕНИЙ В СТРОИТЕЛЬСТВЕ .....	40
<i>Zhuk P.E., Zhivotov D.A.</i> RELEVANCE OF APPLICATION OF READY-MADE MODULAR SOLUTIONS IN CONSTRUCTION .....	40

<i>Кулаков В., Куменко Е.О., Цокур Е.С.</i> МОНТАЖНЫЕ ПРОВОДА И КАБЕЛИ .....	48
<i>Kulakov V., Kumenko E.O., Tsokur E. S.</i> INSTALLATION WIRES AND CABLES .....	48

<i>Кулаков В., Куменко Е.О., Цокур Е.С.</i> СВОЙСТВА, ВРЕД И ПРИМЕНЕНИЕ УЛЬТРАФИОЛЕТОВОГО ИЗЛУЧЕНИЯ .....	51
<i>Kulakov V., Kumenko E.O., Tsokur E. S.</i> PROPERTIES, HARM AND USE OF ULTRAVIOLET RADIATION .....	51

<b>Мишин Е.В.</b>	
МОДЕРНИЗАЦИЯ ГРАДИРНИ НОВО-САЛАВАТСКОЙ ТЭЦ.....	53
<b>Mishin E.V.</b>	
MODERNIZATION OF THE COOLING ROOM OF THE NOVO-SALAVAT CHPP.....	53
<b>Рассадкин Н.А., Шорников Д.А., Агго С.Д., Пляшко А.Н.</b>	
ВЛИЯНИЕ РАЗЛИЧНЫХ ФАКТОРОВ НА УПРАВЛЯЕМОСТЬ АВТОМОБИЛЯ .....	55
<b>Nikolay R.A., Shornikov D.A., Aggo S.D., Plyashko A.N.</b>	
INFLUENCE OF VARIOUS FACTORS ON VEHICLE HANDLING.....	55
<b>Solomon A.</b>	
SCIENTIFIC JUSTIFICATION AND DEVELOPMENT OF SOUR MILK PRODUCT USING BARLEY SEEDLINGS AND ROSE SYRUP .....	57
<b>Никитина Я.В., Волкова М.А., Козина А.С., Ильин И.А.</b>	
СИСТЕМА ПИТАНИЯ ДВИГАТЕЛЯ .....	65
<b>Nikitina Ya.V., Volkova M.A., Kozina A.S., Ilyin I.A.</b>	
ENGINE POWER SUPPLY .....	65
<b>Жмакин Н.А., Кубряк Е.И., Ткачук Ю.С.</b>	
ТОРМОЖЕНИЕ АВТОМОБИЛЯ .....	67
<b>Zhmakin N.A., Kubryak E.I., Tkachuk Yu.S.</b>	
VEHICLE BRAKING .....	67

блокируются передние управляемые колеса. Это может привести к потере управляемости автомобиля. При торможении на дорогах с коэффициентом сцепления больше оптимального ( $\varphi_x > \varphi_{\text{опт}}$ ) у автомобиля первыми доводятся до юза задние ведущие колеса, что может привести к заносу.

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### SCIENTIFIC JUSTIFICATION AND DEVELOPMENT OF SOUR MILK PRODUCT USING BARLEY SEEDLINGS AND ROSE SYRUP

#### **Abstract.**

*State policy in the field of healthy nutrition is a timely and vital task, because inadequate nutrition for the physical needs of the body today poses a threat to national security. The unsatisfactory state of health of the population of Ukraine, as evidenced by the employees of many medical institutions, requires constant consumption of fermented milk products by the population. These are products that: are derived from natural ingredients and contain a large number of biologically active substances; can and should be included in the daily diet of man; when used should regulate certain processes in the body (for example, stimulate immune responses, prevent the development of certain diseases, etc., in other words, are designed to improve the health of the consumer and reduce the risk of disease).*

*Proper nutrition, taking into account living conditions, work and traditions ensures the sustainability of the internal environment of the human body, the activities of various organs and systems.*

*In recent years, the nutritional status of the population of Ukraine is characterized by negative trends, both in relation to energy adequacy and in relation to the chemical composition of rations. Insufficient intake of vitamins, minerals and trace elements causes significant damage to health, resulting in reduced physical and mental performance, resistance to various diseases, increased negative effects on the body of adverse environmental conditions, harmful factors of production, emotional stress and stress. This leads to rapid wear and tear of the body, reduces active human performance.*

*The modern concept of positive nutrition includes the creation of technology for the production of qualitatively new food products with targeted changes in the chemical composition that meets the physiological needs of man - functional foods.*

*Functional products are products that occupy a place between products of general consumption, those that are part of the diet of the main groups of the population, and products that have a therapeutic purpose. Such products have a positive effect on the human body, because they contain physiologically functional food ingredients that have a biologically significant effect on the organs and systems of the human body in part or in whole, including - on the digestive system.*

*Experts attribute the positive effect of fermented milk products on the human body to the presence of physiologically active functional ingredients that are able to exert various types of physiological effects. The main among them are: positive effect on the metabolism of various substrates; protection against compounds characterized by oxidative activity; positive effect on the cardiovascular system; positive effect on the physiology of the gastrointestinal tract; positive effect on the state of the intestinal microflora; physiological effects on the state of the immune system, etc.*

**Keywords:** *rose hip syrup, fermented milk products, lactic acid bacteria, germinated barley grains.*

The role of fermented milk functional products is growing worldwide. The amount of information on the need for special diets for the prevention and treatment of certain diseases is increasing, which is a determining factor that enables the food industry to develop and market new functional dairy products that can actively influence metabolic processes in the body, prevent or restore them violation.

Proper nutrition, taking into account living conditions, work and traditions ensures the sustainability of the internal environment of the human body, the activities of various organs and systems.

In recent years, the state of nutrition of the population of Ukraine is characterized by negative trends, both in relation to energy adequacy and in relation to the chemical composition of rations [9]. Insufficient intake of vitamins, minerals and trace elements causes significant damage to health, resulting in reduced physical and mental performance, resistance to various diseases, increased negative effects on the body of adverse environmental conditions, harmful factors of production, emotional stress and stress. This leads to rapid wear of the body, reduces the active capacity of man [6,7].



The modern concept of positive nutrition includes the creation of technology for the production of qualitatively new food products with targeted changes in the chemical composition that meets the physiological needs of man - functional foods [8].

Functional products are products that occupy a place between products of general consumption, those that are part of the diet of the main groups of the population, and products that have a therapeutic purpose. Such products have a positive effect on the human body, because they contain physiologically functional food ingredients that have a biologically significant effect on the organs and systems of the human body in part or in whole, including - on the digestive system [14].

Functional food products, in comparison with traditional, differ in special structure and properties taking into account technological specifics of their reception. There are three main categories (groups) of functional products:

traditional products that naturally contain a large amount of physiological and functional ingredient or group thereof;

traditional products, which technologically reduce the content of harmful substances to the health of the components;

traditional products that are further enriched with functional ingredients through various technological techniques.

The technologies of the first group of products exclude the use of antibiotics, hormones, pesticides, etc.

The second group includes functional foods that exclude cholesterol, animal fats with a high content of fatty acids, hydrogenated oils containing trans isomers of fatty acids, low molecular weight carbohydrates (sucrose), sodium, the source of which is table salt, etc. [11]. Excessive consumption of these food ingredients is harmful to health and is a risk factor for disease, especially cardiovascular. The technological solution for obtaining functional products of this group is the experimental extraction or destruction of such ingredients.

The third group - enriched functional products. Enriched functional products are products that are obtained by adding to traditional foods one or more physiologically functional food ingredients in order to prevent or correct their deficiency that exists in the human body.

Technological features of enrichment of traditional food products depend on the prescription composition, physical and mechanical properties (taking into account thermal and chemical resistance), technological conditions of obtaining the finished food product [19, 20].

The need to create functional foods was associated with: environmental degradation, air pollution, water bodies, soil, the use of pesticides and fertilizers in agricultural areas, antibiotics and biostimulants - in animal husbandry [21, 22].

Of great interest are the drinks they are considered as the optimal food product that can be used to enrich the human diet, which includes biologically active sub-

stances, essential nutrients. All this in general has a positive effect on the functional state, metabolism and immune system of the body [23].

Fermented milk drinks containing lactic acid microorganisms and bifidobacteria are classified as functional foods. According to accepted terminology, products with probiotic properties are called, and the microorganisms present in them are called "probiotics".

Thus, fermented milk drinks in the human diet are an important factor in the prevention and treatment of various diseases. Scientists pay special attention to the development and use of functional milk drinks containing microorganisms-probiotics, which act as suppliers of nutrients in balanced quantities and have a preventive effect on the human body. At the same time, in food technologies widely used additives of plant origin that improve the organoleptic, structural and mechanical properties of products, give products a therapeutic and prophylactic focus.

Due to its full composition, milk can be the optimal raw material for creating functional foods.

The most common functional dairy products include traditional fermented milk products (kefir, fermented milk, varenets, sour milk, acidophilus, etc.). Their systematic use contributes to the maintenance and restoration of microbial ecology in the human body, especially the gastrointestinal tract [14].

Digestibility of fermented milk products is higher than digestibility of milk. It increases due to the effect of fermented milk products on the secretory function of the intestine, with more intense secretion of enzymes by the glands of the digestive tract, also as a result of partial breakdown of proteins into simpler substances, in particular amino acids.

Fermented milk products contain vitamins necessary for the normal functioning of the body. The microflora of fermented milk products synthesizes vitamins C, B1, B2.

Fermented milk products contain live microorganisms, including probiotics, which in the human body create unfavorable conditions for the development of pathogenic and pathogenic microflora.

Probiotic - a functional food ingredient in the form of useful for humans (non-pathogenic and non-toxicogenic) living microorganisms, which provides systematic human consumption directly in the form of drugs or dietary supplements, has a beneficial effect on the human body as a result of normalizing the composition and increasing normal biological activity intestinal microflora.

In the process of lactic acid bacteria, a complex of biologically active substances (enzymes, lactic and acetic acids, antibiotics) accumulates. Dietary fermented milk products improve metabolism, stimulate the secretion of gastric juice, stimulate appetite.

Rehabilitation of the human body and ensuring its active life through the use of fermented milk products with functional properties is a new promising area in medicine and nutrition as part of it.

According to Japanese researchers, the use of lacto- and bifidobacteria in probiotics and in functional foods at the beginning of the XXI century will half displace the existing market of chemical drugs and thus

provide an opportunity to solve the problem of healthy microbial ecology. Given that probiotic cultures do not take root in raw milk, which is not their natural habitat, the growth of probiotic cultures is activated by the introduction of stimulants - prebiotics [12].

The key point in the characterization of prebiotic substances is their selective action on beneficial inhabitants of the intestine. First, the useful representatives of the microflora include lactobacilli and bifidobacteria. Prebiotic - a functional food ingredient in the form of a substance or complex of substances that provides a systematic human consumption of food has a beneficial effect on the human body as a result of selective stimulation of growth and increase the biological activity of normal intestinal microflora. The main types of prebiotics are: polysaccharides, polyalcohols, amino acids and peptides, enzymes, organic low molecular weight and unsaturated higher fatty acids, antioxidants, plant and microbial extracts useful for humans.

Prebiotics, reaching the colon, begin to create benefits for the growth and reproduction of only beneficial bacteria, there is a selective stimulation of the growth of resident bifidobacteria in the human gastrointestinal tract. Thus, the use of fermented milk products in the diet, enriched with prebiotic and biotic crops will significantly improve the quality of human nutrition.

The value of fermented milk products in functional nutrition is primarily due to the unique composition of the microflora, nutritional and biological value of products [22].

Speaking about the nutritional value of fermented milk products, it is necessary to consider in detail the nutrients that are part of it.

The dominant carbohydrate of fermented milk products is lactose. The effect of lactose on fermented milk products on the human body with its intolerance is significantly different from the effect on the body of this category of people lactose milk.

The high degree of digestibility of carbohydrates in fermented milk products means that this product can be considered as a useful source of energy for its consumers.

Milk proteins are biologically complete. Both serum proteins (a-La and C-Lg) and caseins contain all essential amino acids. Milk protein contains almost all vital and essential amino acids: albumin, globulin, lysine, arginine, casein, valine, leucine, and is almost completely stored in dairy products [23].

Fermented milk proteins are completely digested in the human digestive tract, and the first stages of protein breakdown to some extent already occur under the influence of yeast enzymes of the microflora.

The degree of protein breakdown depends on the type of bacteria, but a small amount of amino acids and peptides are always formed at the stages of preparation of fermented milk products. Proteins before entering the digestive tract are already in a coagulated state and when ingested form a loose, tender clot. Thus, fermented milk products are an excellent source of easily digestible whole protein.

The fat content in fermented milk products ranges from 0.1 to 10%.

Although most consumers are now concerned about healthy eating and often choose low-fat foods, we must not forget that lipids are an integral part of a balanced diet [24]. The human body needs lipids due to the following circumstances: the deposition of fats, consisting of saturated fatty acids, is a reserve energy material of the body, as well as protection for vital organs, structural lipids along with proteins are involved in the construction of animal cell membranes. has for brain cells.

Speaking of the benefits of high-fat dairy products, it should be noted that milk fats contain an extremely wide range of fatty acids.

The content of vitamins in fermented milk product can vary depending on the type of product, the method of its production, the type of additives and flavorings, yeast microflora. The approximate content of vitamins in the fermented milk product as yogurt and whole milk are shown in table 1.

In comparison with natural whole milk, fermented milk products, as a rule, are characterized by a high content (per unit mass of product) of inorganic substances.

Table 1

**Vitamin content in yogurt and whole milk (all indicators are given per 100 g of product)**

Storage	Whole milk	Yogurt			
		defatted	fatty	low fat	low-fat fruit
Retinol, mg	52	1	28	8	10
Carotene, mcg	21	-	21	5	4
Thiamine, (Vi), mcg	30	40	60	50	50
Riboflavin (B2), mcg	170	170	270	250	210
Pyridoxine (Wb), mcg	60	60	100	90	80
Cyanocobalamin, (B 12)	0,4	0,4	0,2	0,2	0,2
Vitamin C, mg	1	1	1	1	1
Vitamin D, mcg	0,03	-	0,04	0,01	0,01
Vitamin E, mcg	90	-	50	10	10
Folic acid, mcg	6	5	18	17	16
Nicotinic acid, mcg	100	100	200	100	100
Pantothenic acid, mcg	350	320	500	450	330
Biotin, mcg	1,9	1,9	2,6	2,9	2,3
Choline, mg	12,1	4,8	-	0,6	-

Fermented milk products are a source of calcium for people with lactose intolerance. Calcium, which is found in fermented milk products, is much better absorbed by the body. Phosphorus, magnesium and zinc are also present in significant quantities in fermented milk products.

The first mention of the use of germinated seeds in food was found in China. More than five thousand years ago, Chinese peasants already ate seedlings. Indian yogis and long-lived Himalayas attached great importance to wheat germ as a nutrient in the winter.

Seedlings are called grain or bean with short roots (length for different species of plants is different), but without leaves.

Sprouted seeds contain an extremely wide range of nutrients, vitamins and trace elements and, in addition to the overall positive effect on the human body, have a specific health effect.

Using seedlings for food, a person receives nutrients in the most accessible form, the active enzyme system of the plant, macro- and micronutrients and a huge amount of antioxidants. This whole complex of nutrients is organically integrated into the living tissue of the plant and is in balanced quantities and ratios. Such a rare combination of useful properties of this product determines its ability to restore people's true health [30].

Seedlings of most crops contain fiber. This product is not digested in the stomach, but plays a key role in the regulation of the intestine. Its lack leads to stagnation, constipation, cancer of the rectum. Absorbing water, fiber provides plasticity of the intestinal contents and does not injure its walls. In addition, fiber is able to bind and excrete toxins, metabolites, radionuclides and heavy metals. However, the main role of fiber is that it is a substrate for the natural intestinal microflora - prebiotics. Propagating on its surface, microorganisms increase their mass. This additional virtual organ displaces pathogenic, putrefactive microbes and serves as an additional source of vitamins, amino acids (including essential), nucleic acids. The absence of dysbacteriosis is a guarantee of high immunity and functional human health [20].

Sprouted seeds are a health product. At their regular consumption under the influence of the most various useful for the person substances, and also energy of the germinating seeds there is an improvement of an organism, getting rid at the same time of many illnesses. The introduction of seedlings in the diet stimulates metabolism and hematopoiesis, increases immunity, compensates for vitamin and mineral deficiency, normalizes acid-base balance, helps cleanse the body of toxins, intensive digestion, increases potency, slows down the aging process.

Barley is a natural vitamin and mineral complex that gives strength and strengthens memory. Barley has

collected all the nutrients that a person needs for normal life and good health. In addition, barley - the champion in the content of natural calcium, potassium, manganese and iron, magnesium, iodine, bromine, cobalt, strontium, etc. [11].

Barley grain contains vitamin A, B vitamins, vitamins D, E, PP and a wide range of trace elements.

Barley contains a protein that is superior to wheat in its nutritional value. Barley is a real natural "doctor". It cleanses the body of toxins and toxins. 5 - 6% barley grain consists of fiber, which is necessary for the stomach and intestines. Fiber normalizes digestion and removes from the body all harmful breakdown products. It is known that food is low in dietary fiber, does not promote satiety and leads to overeating.

Barley grains contain natural antibacterial substances that have antiviral effects. In folk medicine, a decoction of barley and pearl barley is used in inflammatory diseases of the stomach and intestines, as a tonic after surgery on the abdominal organs and to relieve cough [29].

Rosehip (Latin *Rosa*) - a genus of wild plants of the family Rosaceae. It has many cultural forms, bred under the name Rose. Rose hips are used as an infusion, syrup, extract, powder, in the treatment of diseases caused by a lack of ascorbic acid and some other vitamins, anemia and depletion of the body, atherosclerosis, as a means of increasing the body's resistance to local and general infectious and intoxication processes (scarlet fever, diphtheria, pneumonia), accelerates bone fusion in fractures, used for uterine bleeding, liver stones, kidney stones, decreased gastric secretion, affect bone marrow function and general metabolism in the body. Rose hips are a leader among wild plants in the content of natural biologically active substances: ascorbic acid, carotenoids, vitamins B2, K, P, E, flavonoids, carbohydrates, pectin and tannins, organic acids and sterols. Due to the high biological activity of the fruit is widely used in the food industry for vitaminization of various dishes.

Due to the unique biochemical composition of rose hips enrichment of fermented milk product with rose hip syrup, given it is promising and appropriate, as the product is further enriched with vitamin C and other biologically valuable substances.

The syrup has a peculiar sweet taste, characteristic of rose hips, contains related vitamins, pectin and fruit acids, which enhance the action of ascorbic acid in the body.

To prepare the syrup from rose hips, aqueous extraction is carried out from whole fruits, to a dry matter content of not less than 10%. Sugar is added at the rate of 1.7 - 2 kg of sugar per 1 liter of extract. Ascorbic acid, if necessary, make an additional calculation of its content in the finished product 4 mg per 1 ml of syrup.



Table 2

## Chemical composition of rose hips

Nutrients	Number
Dry matter,%	32-55
Sahara,%	8-20
Pectic substances,%	2,7-4,3
Cellulose,%	4,0
Tannins and dyes,%	1,5-3,9
Essential oil,%	0,04
Minerals, mg / 100g	
calcium	16-28
sodium	5-6
potassium	23-51
magnesium	6-8
phosphorus	13
Iron	1-3,6
nutrients	-
Vitamins, mg / 100 g	-
Ascorbic acid (C)	670-3800
Thiamine (B)	0,05
Riboflavin (B2)	0,33-0,88
Folacin (Sun)	0,1-0,25
Niacin (PP)	0,6
P-carotene (A)	2,0-2,6
Phylloquinone (K)	0,6-1,2

Creating a fermented milk product from germinated barley grains and rose hip syrup is promising and appropriate given the unique composition of the components.

Organoleptic properties of samples with different mass fractions of germinated grains are presented in table 3.

Table 3

## Investigation of organoleptic properties of samples with different mass fraction of germinated grains

Sample	Taste and smell	The color of the clot	Consistence
Control	Pure sour milk, without foreign tastes and smells	White	Dense clot, homogeneous consistency
Mass fraction of grains 2%	Pure sour milk, without foreign tastes and smells	White	Dense clot, homogeneous consistency
Mass fraction of grains 4%	Sour milk, with a slight "vegetable" taste of grains	White with slightly creamy shade	Dense clot, homogeneous consistency
Mass fraction of grains 6%	Sour milk, with a slight "vegetable" taste of grains	White with cream shade	Dense clot, homogeneous consistency
Mass fraction of grains 8%	Sour milk, with a pronounced "vegetable" taste of grains	Creamy	The clot is dense with a slight separation of serum, homogeneous

The most pleasant sour-milk taste with a light "vegetable" taste of grains and a good consistency with a dense clot, without separation of whey have samples with a mass fraction of grains of 4% and 6%.

To determine the optimal organoleptic properties of the sample, a tasting of the studied samples was performed. Tasting was conducted on a five-point scale among the staff of the Department of Food Technology and Microbiology. The maximum number of points according to the tasting scored a sample with a mass fraction of germinated barley grains of 6%.

Rose hip syrup has a firming effect and stimulates non-specific resistance of the body, enhances tissue regeneration, reduces vascular permeability, participates in carbohydrate and mineral metabolism, has anti-inflammatory properties, is used to prevent hypovitaminosis, immunodeficiency. Organoleptic properties of the product with different mass fraction of rose hip syrup are presented in table 4.

Table 4

**Investigation of organoleptic properties of a product with different mass fraction of rose hip syrup**

Sample	Taste and smell.	Color	Consistence
Control	Sour milk with a light vegetable flavor of grains.	White with a cream tint	Clot dense, homogeneous consistency.
Mass fraction of rose hip syrup 5%	Sour milk, with a light vegetable taste of germinated grains and a taste of rose hips, sweet.	White with a cream tint	The clot is dense, homogeneous consistency.
Mass fraction of rose hip syrup 10%	Sour milk, with a light "vegetable" taste of grains and a taste of rose hip syrup, sweet.	White with a cream tint	The clot is dense, homogeneous consistency with insignificant serum separation

In the study, a sample with a mass fraction of rose hip syrup of 10% has better organoleptic properties compared to other samples.

To select the optimal mass fraction of the introduced rose hip syrup, a tasting was performed, at which the tested samples were presented.

Rose hips are a real source of natural nutrients and trace elements of natural origin, which can have an incredible effect on the human body.

Rose hips are used as an infusion, syrup, extract, powder in the treatment of diseases caused by a lack of ascorbic acid and some other vitamins, depletion of the body, atherosclerosis, as a means of increasing the body's ability to fight local and general infectious and intoxication. processes that accelerate bone fusion in fractures, used for uterine bleeding, in the presence of liver stones, urolithiasis, decreased gastric secretion, affect bone marrow function and overall metabolism in the body [8].

Heat treatment, storage and biochemical processing lead to the destruction of most of the vitamin C that could be obtained from food. Even more it burns in the body under the influence of stress, smoking and other sources of cell damage.

In the course of the study, a study was conducted on the effect of the method of application of rose hip syrup on the stability of vitamin C.

The objects of the study were samples of normalized milk 2.5% fat, fermented with yogurt leaven, enriched with germinated barley grains and rose hip syrup.

The content of vitamin C in the syrup was 300 mg per 100 ml.

The determination was performed according to GOST 306272-98. Dairy products for baby food. Methods of measuring vitamin C (ascorbic acid).

The mass fraction of vitamin C in the test samples is shown in table 5.

Table 5

**The content of vitamin C in the test product**

Name	The amount of vitamin C
Sample №1, with germinated barley grains without syrup (control sample)	3,9
Sample №2, with rose hip syrup added to fermentation at a fermentation temperature of 42 ° C	195,6
Sample №3, with rose hip syrup, introduced after fermentation at a temperature of 40 - 42 ° C (up to mixing the finished clot)	215,4
Sample №4, with rose hip syrup, made after fermentation at a temperature of 20 - 22 ° C (after mixing the finished clot)	236,6
Sample №5, with rose hip syrup, introduced at a temperature of 10 –12 ° C (immediately before bottling the product)	284,2

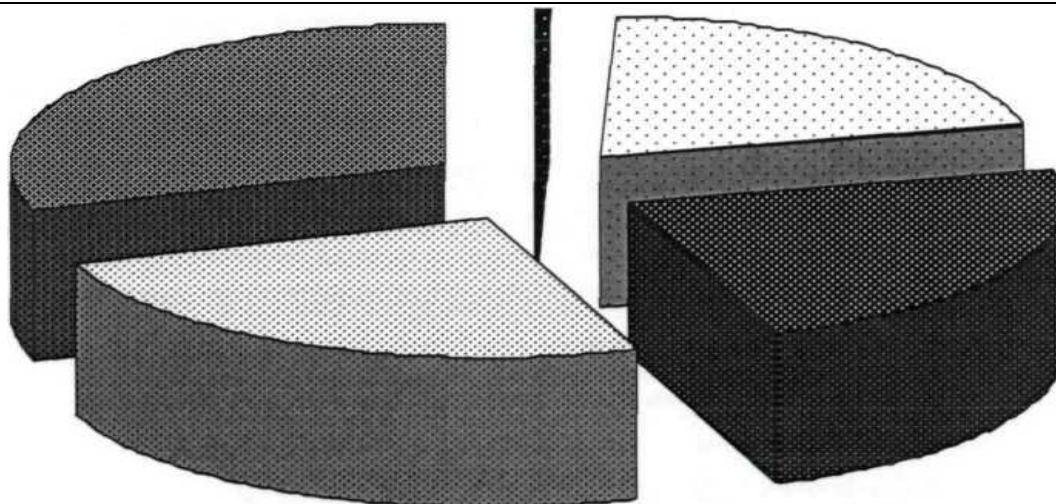


Fig. 1. The content of vitamin C

Analyzing the obtained results, we can conclude that the maximum content of vitamin C was observed in sample №5.

Thus, to enrich the fermented milk product with vitamin C, it is recommended to make rose hip syrup, which is enriched with the additive, immediately before bottling the product in consumer containers at a temperature not exceeding 10 °C.

This mode of application allows you to maximize the preservation of vitamin C in the product, and thus increase its nutritional value.

A new technology for the production of fermented milk product was developed. When developing a new technology, the fermented milk product includes components that give the product functional properties.

The technological process of obtaining a fermented milk product with germinated barley grains and rose hip syrup was carried out in the sequence:

For the production of sour milk product with rose hip syrup use milk not lower than the first grade according to DSTU 3662-2018. Accepted by quality milk is taken by quantity, cleaned, cooled and reserved at a temperature of  $(4 \pm 2)$  °C for not more than 12 hours.

For the production of fermented milk product, milk is normalized by mass fraction of fat and SZMZ. To prepare the yogurt mixture, first normalize the mass fraction of fat by mixing whole milk with skim milk or cream, then carry out the normalization of dry matter. In accordance with the recipe is the mixing of skimmed milk powder with normalized milk. The process of normalization of milk by mass fraction of fat and dry matter is carried out in a dedicated tank. The normalized mixture is stirred for 10 - 15 min, then cooled to a temperature of 8 °C and incubated for 1 h to swell the proteins.

The normalized mixture, heated to  $(43 \pm 2)$  °C, is cleaned on centrifugal milk cleaners. Homogenize the normalized mixture at a temperature of 70 - 75 °C and a pressure of 11-13 MPa.

Pasteurize the mixture at a temperature of  $(92 \pm 2)$  °C for 5 minutes or at  $(87 \pm 2)$  °C for 8 minutes. After pasteurization, the mixture is cooled to the fermentation temperature  $(40 \pm 1)$  °C. Storage of unfermented mixture is not allowed to prevent the development of residual microflora [28].

Fermentation and fermentation of the mixture is carried out in tanks with a cooling jacket, equipped with stirrers, which provides uniform mixing of the fermented mixture and the finished clot. Fermentation of the mixture is carried out at a temperature of  $(40 \pm 1)$  °C for 5.5 - 6.0 h with a composition of fermentation cultures in an amount that provides the initial concentration of viable cells  $10^6$  CFU / cm<sup>3</sup>. The end of fermentation is determined by the formation of a strong clot and acidity.

After fermentation, stirring is carried out for 15-30 minutes with parallel cooling of the product. In the product partially cooled to a temperature of 20 - 25 °C, rose hip syrup is added in the amount of 5% by weight of the finished product. The temperature of the syrup should be 20 - 25 °C. Stirring of the product enriched with syrup is carried out for 10 - 15 minutes and serve the finished product for packaging. The packaged product is cooled in a refrigerator to a temperature of  $(4 \pm 2)$  °C. It can be stored at this temperature for no more than 14 days.

Organoleptic characteristics of the produced samples of fermented milk product with rose hip syrup.

Table 6

**Organoleptic characteristics of fermented milk product with rose hip syrup**

Indicator	Characteristic
Appearance and consistency	Homogeneous, moderately viscous, with a broken clot, without the release of serum on the surface of the product
Taste and smell	Sour milk, without foreign tastes and smells, with the corresponding taste and aroma of the made syrup, moderately sweet
Color	The expressed cream, caused by color of the entered filler - syrup, is uniform on all weight of a product

The results of research on the quality of fermented milk product enriched with rose hip syrup indicate that they meet the requirements of existing regulations for the production of fermented milk products with fillers on physico-chemical and organoleptic indicators, and their microbiological indicators differ from those presented. Articles in DSTU 4343: 2004.

To ensure the normal functioning of the human body, food must include substances called essential factors of nutrition. These substances are not synthesized by the body's enzyme systems, but are necessary for the normal course of metabolism.

Determination of nutritional value, ie a set of properties that meet the physiological needs of man in nutrients (proteins, fats, carbohydrates, vitamins, macro- and micronutrients), is mandatory in the development of new types of product. Based on the chemical composition of the developed new types of fermented milk products, their nutritional and energy value were calculated.

Rosehip syrup is a rich source of vitamins and minerals, its introduction into yogurt increases the content of vitamin C several times, also increases the mass fraction of iron compared to the content of the same element in a regular fermented milk product, enriches with other valuable components. (tannins, organic acids, etc.).

The use of rose hip syrup as a source of biologically active substances allowed to obtain a fermented milk product with good taste, nutritional and dietary properties.

The developed technology allows to improve the nutrition structure of the population through the use of functional ingredients, promotes the adaptation of the human body to adverse external conditions, meets the physiological needs of man in nutrients, as well as expand the range of symbiotic products in the consumer market.

#### Conclusions:

The developed technology allows to improve the structure of the population's nutrition through the use of functional ingredients that help the human body to adapt to adverse external conditions, and meet the physiological needs of man in nutrients. And the use of rose hip syrup as a source of biologically active substances will allow to obtain a fermented milk product with good taste, nutritional and dietary properties.

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### СИСТЕМА ПИТАНИЯ ДВИГАТЕЛЯ

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### ENGINE POWER SUPPLY

#### **Аннотация.**

*В данной работе исследуется предназначение системы питания двигателя, рассматриваются основные функции. Проводится аналогия между системой распределенного впрыскивания и центрального.*

#### **Abstract.**

*In this paper, the purpose of the engine power supply system is investigated, the main functions are considered. An analogy is drawn between the distributed injection system and the central one.*

**Ключевые слова:** *система питания, горючая смесь, рабочий цикл, дозирование топлива, кислородный датчик, карбюратор.*

**Key words:** *power supply system, combustible mixture, duty cycle, fuel metering, oxygen sensor, carburetor.*

**Система питания** должна обеспечивать получение на всех режимах работы двигателя требуемых мощностных и экономических показателей при допустимой токсичности отработавших газов. Обычно это достигается при совместной работе систем питания, впуска, наддува и регулирования. К системе питания предъявляются следующие требования: обеспечение на всех режимах работы двигателя необходимого состава и количества горючей смеси. Быстрое и плавное изменение состава смеси при переходе двигателя с одного режима работы на другой. Обеспечение равномерного распределения состава смеси по цилиндрам, надежный пуск и быстрый прогрев холодного двигателя, надежный пуск горячего двигателя.

Сохранение стабильности регулировок в процессе эксплуатации, коррекция работы системы питания при изменении сопротивления воздушного фильтра, температуры и давления окружающей среды, технического состояния в процессе эксплуатации.

Основными функциями системы питания являются: хранение запаса топлива, приготовление горючей смеси (дозирование топлива и воздуха, их смешение), подача в цилиндр компонентов горючей смеси в определенный момент рабочего цикла, регулирование состава и количества горючей смеси.

**Система распределенного впрыскивания** обеспечивает подачу топлива с помощью электромагнитных форсунок в зону впускных клапанов (рис 1.). Бензин из бака всасывается электрическим бензонасосом и нагнетается через фильтр тонкой очистки в магистраль. Регулятор поддерживает постоянное избыточное (относительно давления воздуха во впускном трубопроводе) давление топлива на входе в индивидуальные электромагнитные форсунки, подающих его в зону впускных клапанов.

Избыток топлива из регулятора возвращается обратно в бак. При использовании двух впускных клапанов на цилиндр форсунка впрыскивает топ-

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