ISSN 2304-5681

АЛМАТЫ ТЕХНОЛОГИЯЛЫҚ УНИВЕРСИТЕТІНІҢ ХАБАРШЫСЫ

Басылым 2 (123)

ВЕСТНИК АЛМАТИНСКОГО ТЕХНОЛОГИЧЕСКОГО УНИВЕРСИТЕТА

Выпуск 2 (123)

THE JOURNAL OF ALMATY TECHNOLOGICAL UNIVERSITY

Issue 2 (123)

АЛМАТЫ, 2019

UDC 637.33
IRSTI 65.63.39

FUNCTIONAL PROCESSED CHEESE: DEVELOPMENT OF NEW TECHNOLOGY

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The article presents data on the use of a dry mixture of rose hips, cranberries and turmeric for the production of processed cheese for functional purposes. The inclusion 2%, 3%, 5% of vitamin herbal supplements, increases storage capacity, improves organoleptic, physico-chemical parameters and nutritional value of processed cheese and does not require changes in the process.

Keywords: recipe, processed cheese, vitamins, herbal supplements, cranberries, rose hips, turmeric.

ФУНКЦИОНАЛДЫ БАҒЫТТАҒЫ БАЛҚЫТЫЛҒАН ІРІМШІКТІҢ ЖАҢА ТЕХНОЛОГИЯСЫН ЖАСАУ

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Мақалада функционалды бағыттағы балқытылған ірімшік өндірісінде құрғақ итмұрын, мүкжидек және куркума қоспасын пайдаланудың өндіру технологиясында нәтижелері қаралады. 2%; 3% және 5% дәрумендi өсімдік қоспасын еңгізу балқытылған ірімшіктің сақталуын ұзартады, органо-лептикалық, физика-химиялық қасиетін және тағамдық құндылығын жақсартады және технологиялық үрдісті өзгертуді талап етпейді.

Негізгі сөздер: рецептура, балқытылған ірімшік, дәрумендер, өсімдік қоспалары, мүкжидек, итмұрын, куркума.

РАЗРАБОТКА НОВОЙ ТЕХНОЛОГИИ ПЛАВЛЕНОГО СЫРА ФУНКЦИОНАЛЬНОГО НАЗНАЧЕНИЯ

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В статье рассматриваются результаты исследований технологии производства плавленного сыра функционального назначения с добавлением смеси шиповника, клюквы и куркумы. Включение 2%, 3% и 5% витаминной растительной добавки, увеличивает хранимоспособность, улучшает органолептические, физико-химические показатели и пищевую ценность плавленного сыра и не требует изменений технологического процесса.

Ключевые слова: рецептура, плавленный сыр, витамины, растительные добавки, клюква, шиповник, құркұма.

Introduction

The most important condition for preserving the health of a nation is a complete and regular supply of the body with all the necessary micronutrients: vitamins and minerals. Domestic and foreign scientists have noted inadequate intake of vitamins and some mineral substances by the population.

A promising direction in the processing of raw milk is the production of fermented milk products with the introduction of herbal ingredients containing vitamins and pectin fibers. These products have good consumer qualities, high nutritional value, and low prime cost [1].

Herbal ingredients are a source of minerals, contain essential amino acids, vitamins, pectic substances, and also play an important role in metabolic processes. According to the researchers, the total amount of mineral substances or ash in them is 0.2-0.54%. Macro, micro and ultramicroelements were found in the ash composition [2].

In this regard, the introduction of new non-traditional types of plant raw materials into the diet, containing in its composition a complex of proteins, lipids, minerals, vitamins and possessing high nutritional, taste and therapeutic properties is one of the ways to improve the structure of nutrition and improve the quality of food [3].

Using traditional food, modern requirements for the structure of functional food are almost impossible to satisfy; therefore, today it is relevant to introduce components into the diets that can reduce the negative impact of harmful food factors on human health.

When adjusting the composition of dairy products of particular interest is the combination of raw milk with components of plant origin, such as wild rose, cranberry and turmeric.

Rosehip berries contain large amounts of vitamin C (ascorbic acid), are an excellent bactericidal and good diuretic and choleretic agent, improve the function of the gastrointestinal tract [4].

Cranberries have long been used to treat blood pressure. Cranberry juice is useful for low acidity of the stomach, as well as fever and rheumatic diseases. For colds, sore throats, and coughing, cranberry juice with honey is effective.

In recent years, scientists have concluded that this miracle berry prevents the development of cancer cells. Cranberry juice is drunk with infectious diseases of the urinary tract, as well as for the prevention of the formation of stones in the kidneys and bladder [5].

The beneficial properties of turmeric are characterized by the content of vitamins K, B, B1, B3, B2, C, and microelements: calcium, iron, phosphorus and iodine.

The composition of turmeric contains essential oils and their constituent sabinen, borneol, zingiberen, terpene alcohols, felllandren, curcumin and a number of other components. It is these substances that have a healing effect on the human body. Curcumin is used for the manufacture of food supplement E100 (turmeric), which is used in the food industry for the production of mayonnaise, cheese, butter, margarine and yogurt. Turmeric gives products a beautiful yellow hue.

Turmeric has anti-inflammatory, anti-tumor properties, prevents the development of melanoma and metastases in cancer patients with various forms of cancer, suspends the development of Alzheimer's disease, removes amyloid plaque deposits in the brain, and can also reduce the risk of leukemia in children. These data indicate the original composition of these plants and the prospects of their use in human nutrition [6].

Objects and Methods of Research

In the laboratory of the Department of Food Processing Technologies of the Zhangir Khan University, research work was carried out on the technology of preparing dairy products with the introduction of fillers of plant origin.

The purpose of this work is to study the effect of dried plant components containing vitamins and dietary fiber on organoleptic characteristics, nutritional and biological value of processed cheese. To achieve this goal, the following tasks were defined:

- to justify scientifically the usage of vegetable raw materials in the production of processed cheese;
- to study the effect of additives on the organoleptic properties of the product;
- to investigate the effect of herbal supplements containing vitamins and pectin fibers on the regulation of consistency and the storage capacity of melted cheese;
- to determine the optimal dose and type of supplements;

In accordance with the purpose and objectives of the research, the objects of

research were: melted cheese, a dry mixture of rosehip powders, cranberries and turmeric.

Analyzing the results of research of domestic and foreign scientists, dried crushed berries of cranberry and rosehip, as well as turmeric powder, were used as herbal supplements.

Given the chemical composition and good taste of this raw material, the techno-logy and formulation of melted cheese with vegetable components have been developed. The following compositions of processed cheese samples were developed for research:

1. The control sample - composition No. 1, processed cheese without additives;

2. Composition № 2 - 2% of the herbal supplement "Vitamin";

3. Composition № 3 - 3% of the herbal supplement "Vitamin";

4. Composition № 4 - 5% of the herbal supplement "Vitamin".

Melted cheese was prepared according to traditional technology: preparation of raw materials, normalization, pasteurization, homo-genization, cooling, fermentation, ripening, mixing, production of cottage cheese, melting, adding salt - melters and vegetable additives, packaging, storage. Dried and shredded mixture of wild rose, cranberry and turmeric ("Vitamin" supplement) were introduced in the amount of 2%, 3%, and 5%, when melting the curd mass, which corresponds to the recommendations of domestic manufacturers.

Results and their Discussion

According to the results of the experiment in the control samples (composition № 1) of the obtained melted cheese without fillers, the consistency was homogeneous, moderately dense; taste and smell - delicious, slightly salty, specific for melted cheese, the color is light yellow, in the cheese are visible patches of curd. In composition № 2 with the addition of 2% dried mixture, the consistency of the cheese was homogeneous, moderately dense, tasty, with a faint taste of the vitamin additive, with a grayish-yellowish, barely noticeable color of the filler (table. 1).

Table 1 - Organoleptic characteristics of processed cheese with different content of the herbal supplement "Vitamin"

№	Sample	Taste and smell	Consistency	Appearanceandcolour
1	Control sample - composition №1	Delicious, slightly salty, specific to cream cheese	Homogeneous, moderately dense	Light yellow, In the cheese are visible patches of cheese
2	Composition №2 (2% of herbal supplement)	Very tasty, there is a weak taste of vitamin supplements.	Homogeneous, moderately dense	Grayish-yellowish, barely noticeable color filler
3	Composition №3 (3% of herbal supplement)	Very tasty, there is a significant taste of vitamin supplements.	Homogeneous, moderately dense	Grayish yellow, filler color
4	Composition №4 (5% of herbal supplement)	Sweet, sharp, strongly pronounced taste of a filler	Moderately dense	Dark yellow color with minor patches curd

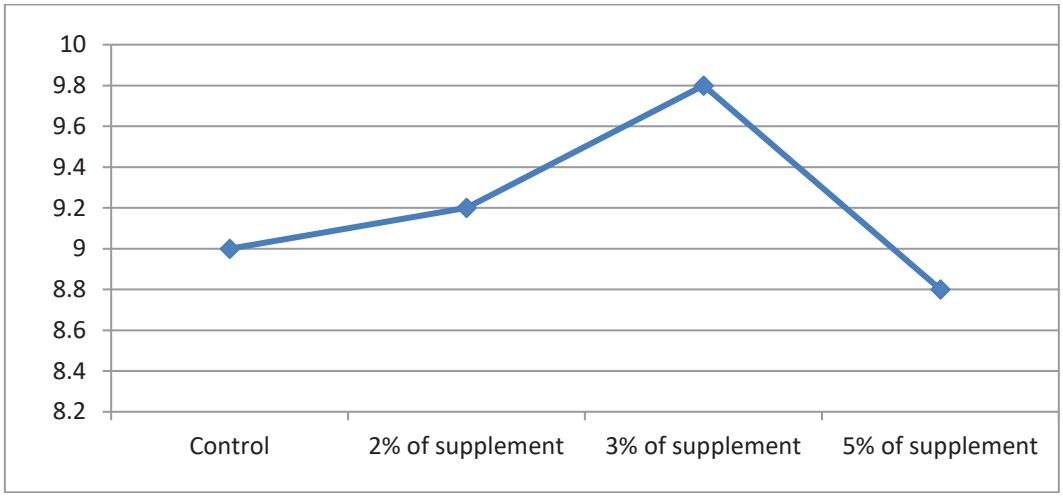
Composition №3 with the addition of 3% "Vitamin" supplement was very tasty with a sense of significant taste of the "Vitamin" supplement and the grayish-yellow color of the filler. Composition №4 (5% of the herbal supplement) was characterized by a moderately dense consistency, sweet, spicy, strongly expressed by the taste of the filler and darkish yellow with slight patches of cheese. When studying consumer sympathy, preference was given to compositions №3 and №4.

For a more complete assessment of the quality among consumers, a tasting and questionnaire was conducted. According to the results of the survey, 16% chose control samples, 23% - 2% of the vitamin A supple-ment; 28% — 3% of the vitamin supplement and 33% - 5% of the "Vitamin"supplement. Organoleptic indicators were evaluated on a 10-point scale (table. 2)

Table 2 - The results of the scoring of melted cheese with different content of the herbal "Vitamin"supplement

№	Sample	Appearance and consistency	Taste and smell	Colour	Total
1	Control sample - composition №1	2,5	4,4	2	8,9
2	Composition №2 (2% of herbal supplement)	2,5	4,3	2	8,8
3	Composition №3 (3% of herbal supplement)	3	4,8	2	9,8
4	Composition №4 (5% of herbal supplement)	2,7	4,5	2	9,4

According to the general score, the highest score (9.8 and 9.4) received processed cheeses with a content of 3% and 5% of the vitamin A supplement. The taste and smell of processed cheeses with a content of 3% and 5% of the herbal "Vitamin" supplement were estimated at 4.8 and 4.5 points; control without additives and with a content of 2% herbal supplements received 4.4 and 4.3 points (Figure 1).



The study of prototypes of processed cheese with different content of the herbal "Vitamin" supplement showed that after 72 hours when stored at a temperature of 4 ± 2 ° C, the organoleptic characteristics remained almost unchanged from the original.

However, it should be noted that the acidity without fillers and with the introduction of 2% and 3% of the "Vitamin" supplement was slightly higher and amounted to 81 and 83˚T on the 7th day of storage; and was 75˚ T.

Conclusions

Thus, the introduction to the formulation of herbal supplements from a dry mix of cranberries, rosehip and turmeric powder in the production of melted cheese, in addition to enriching with vitamins, microelements and dietary fibers, increases storage capacity, improves the organoleptic qualities and does not require changes in the technological process of the product.

In conditions of shortage of high-quality dairy raw materials, the production of processed cheese with vegetable components will increase the nutritional, biological value, functional properties and expand the range of products.

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УДК 677.027
МРНТИ 64.29.23

КРАШЕНИЕ И АНТИМИКРОБНАЯ ОТДЕЛКА ТЕКСТИЛЬНЫХ МАТЕРИАЛОВ ЗОЛЬ-ГЕЛЬ МЕТОДОМ

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В статье изложены исследования по совмещенной технологии крашения прямыми красителями и антимикробной отделки текстильных материалов с применением золь-гель метода. Данный метод обеспечивает стабильность аппрета и высокое качество отделки. Проведена оценка цветовых и колористических показателей образцов. Выявлена возможность повышения ровноты крашения хлопчатобумажных тканей за счет увеличения концентрации жидкого стекла. Коэффициент устойчивости к микробиологическому разрушению у модифицированных текстильных материалов во всех случаях составил выше 80 %. Определены оптимальные концентрационные параметры и режимы проведения совмещенных способов крашения и антимикробной отделки хлопчатобумажных тканей.

Ключевые слова: совмещенные процессы, золь-гель метод, крашение, заключительная отделка, микробиологические повреждения.

ТОҚЫМА МАТЕРИАЛДАРЫН ЗОЛЬ-ГЕЛЬ ӘДІСІМЕН БОЯУ ЖӘНЕ МИКРОБИОЛОГИЯЛЫҚ ӨҢДЕУ

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Мақалада золь-гель әдісін қолдана отырып, тоқыма материалдарын тікелей боягыштармен бояудың және антимикробтық өңдеудің бірлескен технологиясы бойынша зерттеулер берілген. Бұл әдіс аппреттің тұрақтылығын және жоғары сапалы әрленуді қамтамасыз етеді. Үлгілердің түстік және колористикалық көрсеткіштерін бағалау жүргізілді. Сұйық шынының концентрациясын арттыру есебінен мақта-мата маталарын бояудың тегістігін арттыру мүмкіндігі анықталды. Модифицирленген тоқыма материалдарындағы микробиологиялық бұзылуға төзімділік коэффициенті барлық жағдайларда 80% - дан жоғары болды. Мақта-мата маталарын бояудың және микробқа