1. Introduction
Nutrition is a major social problem. Changing lifestyle and reducing its level, associated with lower needs for energy and food, insufficient intake of vitamins and minerals in the human body, and at the same time separate consumption of food and biologically active substances, led to the creation of functional foods [1, 2, 3]. In accordance with the recommendations of nutritionists, modern research results the development of new products should be aimed at reducing the caloric content of food, reducing the content of sugar, salt, cholesterol in products, enriching products with vegetable proteins, dietary fibers, vitamins and micro- and macronutrients. [4, 5]. The main task of Russian food industry enterprises is to create functional food products that ensure the functioning of vital organs and systems of the human body at an optimal level, contributing to the overall resistance of the body to harmful environmental factors [6, 7]. Due to the existing shortage of essential macro and micronutrients in the diets of the population, we have studied the composition and properties of spirulina, tarragon, mint and stevia sweetener, and found a high content of useful biologically active substances necessary for the enrichment of sour milk whey drink, which is relevant and promising.
The aim of the study was to develop a technology for a fermented milk product based on raw whey enriched with spirulina, an extract of tarragon and mint herbs and stevia sweetener, studying its composition and properties.

2. Materials and methods
The objects of research are herbal ingredients: spirulina, tarragon, mint; fermented milk product developed with their addition (experience) and without (control) pant components. Basic research methods: titrimetric (determination of titratable acidity) according to 3629; acid method (determination of the mass fraction of fat) GOST R ISO 2446-2011; Kjeldahl method (protein determination); breeding method (determination of the number of lactic acid bacteria); microbiological method (determination of St. aureus, Salmonella, E. coli); method of capillary electrophoresis (determination of vitamins, minerals, amino acids). For statistical processing, the Statistica 6.0 software package was used. Analyzes were repeat three times.

3. Results of the study
At the first stage of research, the chemical composition of plant ingredients and the content of vitamins and minerals were determined (Table 1). Analysis of the table showed that plant ingredients are high in nutrients such as proteins, carbohydrates, dietary fiber, vitamins (B9, B4, A, C, K, PP) and minerals (potassium, magnesium, sodium, calcium, sulfur, iron, copper, manganese), which will allow you to get drinks with high biological value. Based on the results of scientific research, the dose, method and technological stage of applying plant ingredients, the type of microflora of the starter culture, and the technology of sour-milk whey product enriched with spirulina, tarragon, mint and stevia, taking into account the preliminary extraction of tarragon and mint, and the control of production processes, shown in figure 1.

Figure 1. Technological scheme of production of enriched dairy whey product of a functional orientation by the reservoir method.
The number of yeast and mold cells does not exceed the values regulated by the “On the safety of milk and dairy products” [7], presented for this group of dairy products. Normalized indicators and the values of the control sample, which proves its probiotic properties and the obtained fermented milk whey products were subjected to quality assessment. The results are presented in tables 2-3.

The analysis of the table showed that the nutritional value of fortified whey drinks slightly increased in terms of protein, carbohydrates, minerals, dietary fibers (0.3%) appeared, which give the product a functional orientation. The product is characterized by moderate acidity and low calorie content (25.3 kcal), has a sweet, sour-milk, refreshing taste with a pleasant aroma of mint and tarragon.

The number of lactic acid microorganisms in the enriched product significantly exceeds both the normalized indicators and the values of the control sample, which proves its probiotic properties and characterizes high functional activity. The number of yeast and mold cells does not exceed the values regulated by the “On the safety of milk and dairy products” [8], presented for this group of dairy products.

### Table 1. Nutritional value and vitamin-mineral composition of plant ingredients.

| Components             | Content per 100 grams of product | Recommended daily allowance |
|------------------------|----------------------------------|----------------------------|
|                        | spirulina | tarragon | mint                      |                               |
| The nutritional value  |          |          |                          |                               |
| Proteins, g            | 57.5±0.04 | 1.5±0.02 | 3.75±0.02                | 76.0                          |
| Fats, g                | 7.7±0.02  | 0.01±0.02| 0.94±0.02                | 56.0                          |
| Carbohydrates, g       | 20.3±0.03 | 5.0±0.03 | 6.89±0.03                | 219.0                         |
| Alimentary fiber, g    | 3.6±0.02  | 0.5±0.02 | 8.0±0.02                 | 20.0                          |
| Ash, g                 | 6.2±0.03  | 1.0±0.02 | 1.76±0.02                | –                              |
| Moisture, g            | 4.7±0.02  | 92.0±0.04| 78.7±0.04                | 2273.0                        |
| Macronutrients, mg     |          |          |                          |                               |
| Calcium                | 120.0±0.01| 40.0±0.03| 243.±0.04                | 1000.0                        |
| Magnesium              | 195.0±0.02| 30.0±0.03| 80.0±0.03                | 400.0                         |
| Sodium                 | 1048±0.04 | 70.0±0.04| 31.0±0.02                | 1300.0                        |
| Potassium              | 1363±0.04 | 260.0±0.05| 569.±0.04               | 2500.0                        |
| Phosphorus             | 118.0±0.01| 50.0±0.03| 73.0±0.03                | 800.0                         |
| Sulfur                 | 574.7±0.02| 10.2±0.02| 37.5±0.02                | 1000.0                        |
| Micronutrients, mg     |          |          |                          |                               |
| Iron, mg               | 28.5±0.02 | 0.5±0.02 | 5.08±0.03                | 18.0                          |
| Zinc, mg               | 2.0±0.01  | 0.47±0.02| 1.11±0.02                | 12.0                          |
| Copper, mg             | 6.1±0.02  | 0.008±0.01| 0.33±0.02               | 1.0                            |
| Manganese, mg          | 1.9±0.02  | 0.96±0.02| 1.18±0.02                | 2.0                            |
| Selenium, mg           | 0.007±0.01| 0.005±0.01| –                       | 0.055                          |
| Vitamins:              |          |          |                          |                               |
| β-carotene, mg         | 0.34±0.02 | 0.025±0.01| –                       | 5.0                            |
| Vitamin A (RE), mg     | 29.0±0.03 | –         | 212.±0.04                | 900.0                          |
| Vitamin B1 (thiamine), mg | 2.38±0.02 | 0.03±0.02| 0.08±0.02                | 1.5                            |
| Vitamin B2 (riboflavin), mg | 3.67±0.02 | 0.03±0.02| 0.27±0.02                | 1.8                            |
| Vitamin B4, choline (mg) | 66.0±0.03 | 11.4±0.03| –                       | 500.0                          |
| Vitamin B5 (pantothenic), mg | 3.48±0.02 | 0.24±0.02| 0.34±0.02                | 5.0                            |
| Vitamin B6 (pyridoxine), mg | 0.36±0.01 | 0.29±0.02| 0.13±0.02                | 2.0                            |
| Vitamin B9 (folic kt), mg | 94.0±0.03 | 33.0±0.04| 114.±0.04               | 400.0                          |
| Vitamin C, mg          | 10.1±0.02 | 10.0±0.03| 31.8±0.03                | 90.0                           |
| Vitamin E (TE), mg     | 5.0±0.02  | 0.24±0.02| –                       | 15.0                           |
| Vitamin K, phylloquinone, mg | 25.5±0.03 | 0.24±0.02| –                       | 120.0                          |
| Vitamin N (biotin), mg | 0.002±0.01| –         | 0.05                     |
| Vitamin PP, mg         | 12.8±0.02 | 0.5±0.02 | 1.71±0.02                | 20.0                           |
products. Pathogenic microorganisms (BGKP, Staphylococcus aureus, Salmonella) were not found in the samples of developed products.

**Table 2. Qualitative indicators of dairy products.**

| Indicators                                | Prototype          | Control sample |
|-------------------------------------------|--------------------|----------------|
| Nutritional and energy value              |                    |                |
| Mass fraction of protein, %               | 0.8±0.02           | 0.6±0.02       |
| Mass fraction of fat, %                   | 0.5±0.02           | 0.5±0.02       |
| Mass fraction of carbohydrates, %         | 4.4±0.03           | 4.3±0.03       |
| Mass fraction of ash, %                   | 0.42±0.02          | 0.40±0.02      |
| Mass fraction of dietary fiber substances, % | 0.30±0.02          | –              |
| Calorie content, kcal                     | 25.3               | 24.1           |

**Organoleptic indicators**

| Appearance and consistency                | Inhomogeneous opaque liquid containing small flakes and with a slight precipitate of the introduced ingredients, disappearing with stirring | Inhomogeneous opaque liquid containing fine protein flakes with a slight precipitate that disappears with stirring |
| Color                                     | Heterogeneous light turquoise                        | Heterogeneous greenish yellow |
| Taste and smell                           | Sweet, sour-milk refreshing taste and smell, with a light aroma of herbs - tarragon and mint | Sweet, sour-milk refreshing taste and smell, with a pronounced whey aftertaste and smell |

**Table 3. Microbiological indicators.**

| Name of indicator                           | Norm according to TR TS 033/2013 | Actual value |
|---------------------------------------------|----------------------------------|--------------|
| Lactic acid microorganisms, CFU / cm³ (g), not less (at the end of the shelf life) | 1*10⁷                            | 1.6*10⁷      | 4.2*10⁷      |
| Product weight cm³ (g) in which BGKP (if-forms) not allowed | Staphylococci S. aureus | 0.1           | not detected | not detected |
| Pathogenic (including salmonella)           | 1.0                             | 25           |              |
| Yeast, CFU / cm³ (g), not more than         | 50                              | 18           | 23           |
| Mold, CFU / cm³ (g), not more than          | 50                              | 22           | 20           |

4. Conclusion

In the course of the research, the composition and properties of spirulina, tarragon and peppermint were studied, and it was found that they have high nutritional value, and give the fermented milk whey product prebiotic properties and increase the biological value. It was found that the organoleptic, physico-chemical and microbiological parameters of the enriched product are significantly higher than the control sample, in addition, dietary fiber appeared. It should be noted that the resulting drinks have dietary and medicinal properties that have a beneficial effect on the human body, due to the fact that in the fermentation process the starter microflora containing lactic acid bacteria, acidophilic and **Bulgarian bacilli**, thermophilic streptococcus, bifidobacteria and milk yeast develop, and such substances are formed, like lactic acid, ethyl alcohol, carbon dioxide, vitamins, enzymes and antibiotics (nisin, lactolin,
diplococcin, streptomycin, etc.), which have a bacteriostatically and bactericidal effect on putrefactive and pathogenic microflora of the human intestine.

Thus, the enrichment of fermented milk whey product with plant ingredients contributes to an increased content of nutrients, vitamins, minerals and the appearance of dietary fiber, which in combination gives the developed product a functional orientation and high organoleptic properties.

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