

**PREPARATION OF YOGURT WITH THE ADDITION OF SWEETENERS
AND STUDY OF ITS BIOTECHNOLOGICAL PROPERTIES****Masharipova Zulhumor**Tashkent Institute of Chemical Technology Food and Wine Technology
Associate Professor of the Department of Functional Products Technology**Yuldosheva Nodira Jaxongir kizi**Tashkent Institute of Chemical Technology Faculty of Food and Wine Technology
Food Technology (Technology of Canned Meat, Fish and Dairy Products)

Master's 1st year student

Annotation. This study is devoted to the development of the technology of preparing yogurt with the addition of licorice (*Glycyrrhiza glabra*) extract and the evaluation of its biotechnological properties. The study took into account the fact that licorice is a rich source of natural sweeteners and biologically active substances, and its effect on the process of lactic acid fermentation was studied. Standard starter cultures (*Lactobacillus bulgaricus* and *Streptococcus thermophilus*) were used in the preparation of yogurt samples, and yeast extract was added at certain concentrations. The fermentation rate, acidity level, microbiological stability and organoleptic indicators of the resulting product were analyzed. The results of the study showed that the addition of yeast positively affects the growth of beneficial lactic acid bacteria, improves the taste and aroma of the product, and increases its functional properties. It was also found that the bioactive compounds contained in yeast enhance the antioxidant activity of yogurt. The results of this work expand the possibilities of effective use of yeast in the production of functional food products and serve as a scientific basis for the creation of new types of yogurt intended for healthy eating.

Keywords: yogurt, yeast, biotechnology, lactic acid bacteria, functional food, fermentation.

In recent years, the growing demand for healthy eating worldwide has led to the need to pay special attention to the development and improvement of functional food products. Functional food products not only provide the body with essential nutrients, but also play an important role in strengthening human health, boosting immunity, and preventing certain diseases. Yogurt occupies a special place among such products.

Yogurt is a product of lactic acid fermentation, characterized by the presence of beneficial microorganisms - lactic acid bacteria. Along with traditional yogurts, the development of new types of yogurts with the addition of plant extracts is relevant. In this regard, the licorice plant (*Glycyrrhiza glabra*) deserves attention as a promising natural source of raw materials.

Licorice has long been used in folk medicine as a medicinal plant. Its root contains glycyrrhizin, flavonoids, saponins, and other biologically active substances that have anti-inflammatory, antioxidant, and immunomodulatory properties. The main objective of this study is to develop a technology for preparing yogurt with the addition of licorice extract and to scientifically study its biotechnological properties.

The main objective of this article is to study the process of preparing yogurt with the addition of licorice extract and its biotechnological parameters. To achieve this goal, the following tasks were set:

- study the biological and technological properties of licorice;
- develop a technology for preparing yogurt with the addition of licorice extract;
- evaluate the effect of licorice extract on the fermentation process;
- analyze the physicochemical and microbiological parameters of yogurt;
- determine the organoleptic properties of the product.

Biological and chemical properties of licorice[1]

Licorice is a perennial plant belonging to the legume family, the root of which is mainly used in the food and pharmaceutical industries. Licorice root contains up to 6–10% glycyrrhizin, which has a sweet taste several times sweeter than sucrose. Therefore, shirinmia is of interest as a natural sweetener.[2]

In addition, shirinmia contains flavonoids, polysaccharides, essential oils and minerals. These compounds can have a positive effect on the activity of microorganisms and stimulate the fermentation process. The antibacterial properties of shirinmia limit the development of some harmful microorganisms and create a favorable environment for beneficial bacteria.

The process of making yogurt consists of pasteurization of milk, cooling, addition of starter cultures and fermentation. The main starter bacteria are *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus thermophilus*. These bacteria convert lactose into lactic acid, creating the characteristic taste and texture of the product. [6]

The efficiency of the fermentation process depends on the composition of the milk, temperature, time and the presence of additives. The addition of licorice extract can directly affect this process and change the growth activity of bacteria.

In the research, cow's milk was used as raw material for the preparation of yogurt. The milk was first pasteurized at a temperature of 85–90 °C and then cooled to 42–45 °C. After that, a certain amount of starter cultures and licorice extract were added to the milk.

Licorice extract was used in different concentrations (0.5%, 1% and 1.5%) and their effect on the fermentation process was compared. The mixture was fermented in a thermostat for 6–8 hours. After fermentation was completed, the product was cooled and made ready for further analysis.[1]

The acidity level, pH value and dry matter content of the obtained yogurt samples were determined. The results of the study showed a slight increase in acidity in the samples with the addition of shirimiya extract. This is explained by the activation of the activity of lactic acid bacteria.

The pH values remained within the normal range during fermentation, ensuring the stability of the product. The shirimiya extract also had a positive effect on improving the overall structure and viscosity of the yogurt.[4]

As a result of microbiological analyses, it was found that the number of beneficial lactic acid bacteria in yogurts with the addition of shirimiya was higher than in the control samples. This indicates that shirimiya has prebiotic properties. At the same time, the development of harmful microorganisms was not observed, which confirms the safety of the product.

The taste, smell, color and consistency of the yogurts were evaluated using a special tasting method. The yogurts with the addition of shirimiya had a mild sweet taste, creating a natural pleasant taste without artificial sweeteners. In particular, the sample with the addition of 1% shirimiya extract received the highest rating.[5]

Yogurt with the addition of licorice has a number of beneficial properties for the body. It helps to normalize the intestinal microflora, strengthens immunity and has an antioxidant effect. In addition, such yogurt can serve as a natural alternative product for consumers seeking to reduce sugar consumption.

In conclusion, the conducted studies have shown that the preparation of yogurt with the addition of licorice extract is technologically and biotechnologically feasible. Licorice stimulates the activity of lactic acid bacteria, improving the quality indicators of the product. The resulting yogurt has a high biological value and can be recommended for wide consumption as a functional food product.

The results of this study serve as a scientific basis for the development of new types of natural and healthy products in the field of food biotechnology.

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