AUTOCHTHONOUS SYMBIOTIC CULTURES FOR GOAT'S MILK YOGURT OBTAINING

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Abstract: În ultimii ani în Republica Moldova tot mai mulți fermieri se preocupă cu creşterea caprelor. Avându-se în vedere valoarea biologică şi nutritivă înaltă a laptelui de capră, în Laboratorul de Biotehnologii alimentare IŞPHTA se efectuiază cercetări privind elaborarea tehnologiilor de utilizare a laptelui de capră la fabricarea iaurtului. În cadrul cercetăriilor, pentru obținerea iaurtului din lapte de capră, a fost elaborată o combinație de tulpini autohtone de bacterii lactice termofile *Lactobacillus bulgaricus şi Streptococcus thermophilus* cu proprietăți biotehnologice valoroase din Colecția Ramurală a IŞPHTA. Combinația prezintă o cultură simbiotică stabilă, cu activitate acidifiantă medie, unite în raport 1:1. Datele obținute ne demonstrează că cultura simbiotică elaborată, compusă din tulpini autohtone de bacterii lactice termofile, poate fi utilizată cu succes la fabricarea iaurtului din lapte de capră.
Key words: simbiotic culture, starter bacteria, yougurt, sheep milk.

In recent years the Republic of Moldova more farmers are concerned with goat rearing. Goat livestock is one of the highest efficiency in milk production [1]. Herd of goats currently lists about 120-130 thousand. Unfortunately, in our country goat milk is used in the food industry and is done in most cases in particular.

In terms of nutritional and dietary quality goat milk is higher than cow's milk quality. Goat milk is more homogeneous deproteinized contains more nitrogen, proteins are of better quality, with a higher content of thiamine than any other food. Thiamine refers to the most important group of vitamins of group "B", without which man can not deprive his lifetime. Goat milk has an important role in traditional medicine, it is a valuable food for children weak and those who suffer from food allergy [2].

Goat milk and dairy products play an important role in the diet of the population in developing countries. In developed countries, where the tendency to eat healthy food there is great interest in goat milk.

Goat milk is used to treat various diseases such as gastrointestinal disease, tuberculosis, poisoning with salts of heavy metals, acids, alkalis, bromine, iodine for cleansing the body from the effects of chemotherapy, as well as baby food. It also should be noted that goat milk has anti-allergic properties. In some cases it is sufficient to relieve allergy symptoms. In addition, goat milk replaces cow's milk, where the latter causes allergy. Helps treat thyroid gland. Raw goat's milk is less dangerous; goats are more resistant to disease than cows.

Goat milk should also be included in the complex therapy of all serious diseases such as gastrointestinal diseases, heart disease, liver after various operations, and atherosclerosis, burns and fractures.

As the research scientist, goat milk compared with cow's milk has a different fractional composition of proteins and virtually no cause allergic reactions and digestive disorders. It is known that α_{S1}-casein, the main protein of cow's milk, is a potent allergen

for humans. Fractional content of this protein in goat milk is 2 times lower than in the cow. Nevertheless, β-casein content is 2-3 times higher, due to which, goat milk clotting softer easily digested in the human stomach. [3]

Worldwide more people appreciate all price quality goat milk as a source of natural health leads not secondary effects.

Goat milk and goat milk products strengthen human immunity. Residents Caucasus and Balkan countries have a long life of years because goat milk included in the daily diet and believes that goat milk prolongs life. Goat milk and products he is himself the strength and health of nature. It is very useful for children and necessary for those who suffer from allergy to cow's milk. [4]

Goat milk fats decompose ferment before it is storing, boost immunity, and helps the body to stop the development of cancer diseases and atherosclerosis.

Taking into account the biological and nutritional value of goat milk high in food IŞPHTA Biotechnology Laboratory research is carried out on developing technologies using goat milk in the manufacture of various dairy products.

Yogurt is a dairy product quality acid multiple health benefits known from ancient times. These remove both its nutritional content, complete and balanced, as well as the contribution of active lactic acid bacteria, which improve digestion (including people with lactose deficiency), stimulates immunity. Yogurt has a very important role in maintaining a balanced intestinal flora [5]. In European countries there is a wide range of yoghurts from cow's milk and goat's milk as well. In Moldova occurs only cow's milk yogurt and goat milk yogurt generally no market. Based on the above, the Laboratory of Food Biotechnology research is being done on developing IŞPHTA Technology and Document technical standards for goat milk yogurt.

Used in the manufacture of yogurt mixed cultures composed of two species of lactic acid bacteria: *Lactobacillus bulgaricus* and *Streptococcus thermophilus*.

In the process of obtaining yogurt fermentation of goat milk were applied indigenous combinations of strains of thermopiles lactic acid bacteria *Lactobacillus bulgaricus* and *Streptococcus thermophilus* in the collection branch of IŞPHTA. Were originally developed and tested three combinations, which was selected biochemical properties optimal combination to achieve a requisite technological yogurt.

The combination presents a stable symbiotic culture, which consists of three strains of *Streptococcus thermophilus* and *Lactobacillus bulgaricus* two strains of medium acidifycation activity, united in 1:1 ratio basic. Technological characteristics of selected symbiotic culture are presented in Table 1.

Table 1 Symbiotic Culture features (Growing in sterilized skimmed cow's milk inoculated with 2% culture, cultivated at 42 ° C)

During curd formation	6:00 hours
Titratable acidity	98°T
Appearance and consistency curd	Smooth, firm, dense, slightly viscous, without removing the whey
Smear microscopic appearance	diplococi separated and long chains (about $^{3}/_{4}$ field), lactobacilli separated and in chains

	(about 1/4 field)

The data in Table 1 show that symbiotic culture characteristics developed technology meet the requirements of yogurt starter cultures.

Culture developed under experimental groups were prepared yogurt from pasteurized whole goat milk yogurt and lots witnesses classic cow brought to the same indices and fat mass fraction of dry matter.

Fermentation processes were carried out by means of modern control tank installation program - Sartorius Biostat A plus bioreactor and were monitored by recording continuous-time active acidity.

It is known that the optimum temperature for the development of *Lactobacillus bulgaricus* is comparatively high as the optimum temperature for growth of Streptococcus *thermophilus* (40 °C). *Lactobacillus bulgaricus* is also acidifying more energy than *Streptococcus thermophilus* [6,7]. In this connection, the time required getting a product with moderate acidity and firm but soft consistency, the technological development was important to set some parameters to direct the fermentation process for settling and establishing development *Lactobacillus bulgaricus* and *Streptococcus thermophilus* in repot 1:3-1:4. Directing was done by determining the percentage of inoculation of the mixture of milk (5% culture) and thermostatic temperature (40 ° C).

Dynamic processes active during acid is shown in Figure 1.

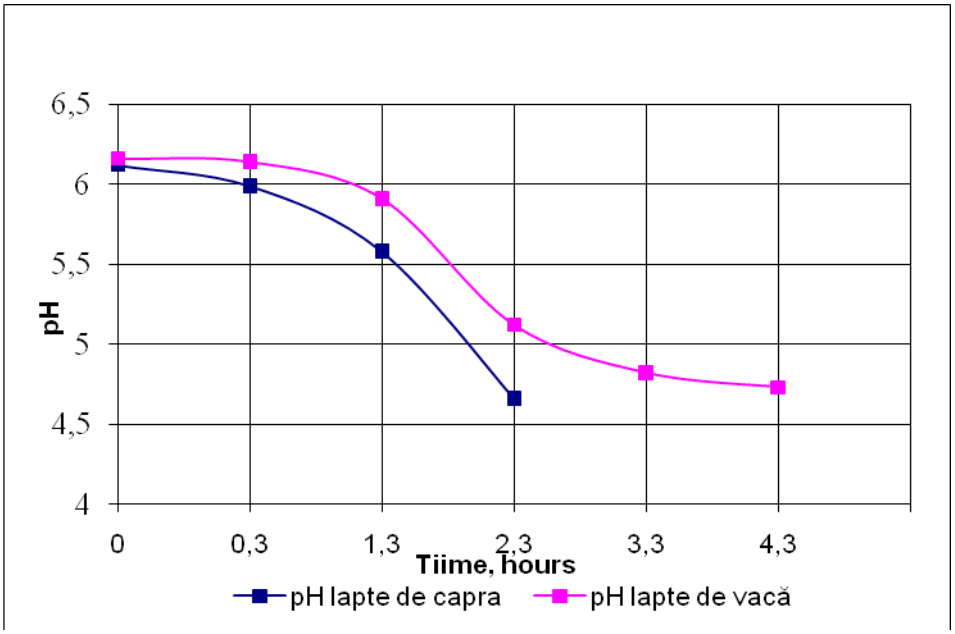

Fig. 1. The dynamics of active acidity during fermentation

Figure 1 shows that the decrease of the pH value up to 4.6 (level at which the coagulation of casein) in goat milk was produced over 2.5 hours, while in cow's milk than 4 hours. So in the process of fermentation of goat milk went faster than in the cow's milk.

Yogurt obtained was poured into containers tank containers like sales (of each 200 ml) and stored for ripening temperature 4 ± 2 °C.

Characteristic of goat milk yogurt and cow's milk are presented in Table 2

Table 2 Characteristics of yogurt from goat milk and cow milk.

Indices	**Features**		
	Goat milk yogurt	**Yogurt from cow's milk**	**Technical requirements ГОСТ Р 51311-99**
Appearance and consistency	Homogeneous, dense, without removing the whey, shiny, viscous, very fine	Homogeneous, dense, without removing the whey, shiny, slightly viscous	Homogeneous, moderately viscous
Taste and smell	Sour milk fermented specifically with pleasant aroma, odor-free goat milk	Sour milk fermented specifically with pleasant aroma	Fermented milk without foreign taste and odor
Titratable acidity, ° T	95	112	75-140
Lactic acid bacteria, UFC/1m	7×10^8	7×10^8	Min 1×10^7

The data of Table 2 it can be seen that after organoleptic and physicochemical made from goat milk yogurt with the technical conditions yogurt product called lactic acid. Unlike cow's milk yogurt, goat milk yogurt has a much finer texture, due to the fact that the fat globules of goat milk are smaller compared to cow's milk.

As a result of research found that symbiotic culture developed actively fermenting goat milk and yogurt quality obtained with the technical conditions given product. Unlike cow's milk yogurt, goat milk yogurt has a much finer texture, due to the fact that the fat globules of goat milk are smaller compared with cow's milk [1].

The data obtained demonstrates that symbiotic culture developed consisting of local strains of thermophilic lactic acid bacteria can be successfully used in the manufacture of goat milk yogurt, which is a very useful body and preferably both children and adults as well.

Goat milk can be successfully used in the manufacture of yogurt, which is a very useful and preferred body both as children and adults.

The results obtained will be developed technical and normative documents: Technology company standards and instructions that will be featured entrepreneurs in the milk processing industry.

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