

INVESTIGATION OF THE PROCESS OF FERMENTATION OF CAMEL MILK VARIOUS TYPES OF LACTOBACILLI AND BIFIDUS BACTERIAS

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Abstract

Formation of probiotic properties of dairy products depends largely on the composition of the macrobiotic of ferment, so studies are necessary for the selection of specific strains of bacteria producing a complex of biologically active substances and enzymes.

The first phase of research is to study the morphological, physiological and biochemical production and properties of different strains of lactic acid bacteria exhibited in fat-containing dairy environment.

Main basic raw material for the production of fermented milk product is developed camel milk with different fat-contents. High nutritional and biological value of camel milk, as well as the best of their digestibility compared with other types of milk will create a product that meets the physiological needs of the body's essential nutrients and energy.

In the manufacture of probiotic dairy products functionality greatest attention must be paid to bifidus bacterias and lactobacilli as main representatives of the normal intestinal microflora, providing high colonization resistance of the intestinal tract and increases the activity of the organism's immunomodulatory.

Keywords: microflora, microbiota, bifidobacterium, multiple strain starter, probiotic

The most important criterion combining separate strains mnogoshammovye leaven is the compatibility of species and strains. As possible should happen mutual stimulation starter microorganisms and antagonistic action , ie inhibition of the development of extraneous junk microbiota.

Use as a component of bacterial starter cultures of Lactococcus helps to ensure a durable bunch of high viscosity, elasticity, characterized by a high ability to rebuild the structure after mixing and prevent separation of the serum, which is a prerequisite for their use in the fermentation process (ripening) of camel milk .

A prerequisite for the production of dairy bifido contain products of co-cultivation of bifidobacteria with lactic acid bacteria, to create the necessary environment for their growth and development. Found that the greatest degree of acid and reproduction bifidobacteria promote lactic streptococc species and Lactococcus lactis.

Therefore, by combining different types of lactic acid bacteria can attach products given dietary and medical - preventive properties .

Therefore, the study we developed probiotic product functionality using natural yeasts from selected cultures of lactic, bifidobacteria and dairy yeast ferments for designing promising strains were used for biotechnological properties Bifidobacterium bifidum 4- 7b, Lb. acidophilus 015 -1k, Lb. bulgaricus 18k- 1, Lactococcus lactis 21-4, Torulopsis sphaerica 34k .

When cultured experienced starters take into account the energy of acid, lactic acid - intensity of growth, bifidobacteria and yeasts. The mother starter prepared for sterile camel milk. To do this separately grown cultures of lactic acid bacteria and bifidobacteria Bifidobacterium bifidum,

Lb.bulgaricus, Lactococcus lactis and yeast Torulopsis sphaerica before fermenting product ratio 1:0,5:0,5:0,5 made in pasteurized camel milk.

To select the optimal bacterial starters were used 5 compositions consisting of new cultures of bifidobacteria, lactobacilli, Lactococcus and yeast:

- Symbiosis bifidobacteria: Bifidobacterium bifidum 4- 7b, 8 Lactobacillus Lactobacillus acidophilus, Lactococcus lactis lactococci 18/2 (1:0,5:0,5)
- Symbiosis bifidobacteria Bifidobacterium bifidum 4- 7b, 8 Lactobacillus Lactobacillus acidophilus, Lactococcus lactis lactococci 18/2, milk yeast Torulopsis sphaerica 34u (1:0,5:0,5:0,5)
- Symbiosis bifidobacteria Bifidobacterium bifidum 4- 7b, 8 Lactobacillus Lactobacillus acidophilus, Lactococcus lactis lactococci 18/2, Torulopsis sphaerica 34u (1:1:1:0,5)
- Symbiosis bifidobacteria Bifidobacterium bifidum 4- 7b, 8 Lactobacillus Lactobacillus acidophilus (1:1)
- Bifidobacterium monoshtamm Bifidobacterium bifidum, 4- 7b .

Composition and properties of yeasts used for fermentation of camel milk are shown in table 1.

Studied industrial properties that exhibit single and multiple strain starters of bacterial cultures in camel milk. At the same time use the same amount of leaven - 20 % and the temperature was maintained according to ripening species composition of the microbiota studied bacterial starter.

To determine the optimum technological conditions obtaining probiotic product tested 5 different types of starter cultures with different stirring speed 180, 220 rev/min at different temperatures of 300, 330, 360 ± 1°C.

Table 1. Composition and properties of yeasts used for fermentation of camel milk

Dining experiences	Aging time, hrs	Physico-chemical properties					Organoleptic parameters
		acidity, °T	pH	sugar, %	Diacetyl, mg	Acetoin, mg	
№1 B.bifidum 7/96 + Lb.acidophilus 8 + Lactococcus lactis 18/2 (1:0.5:0,5)	20	80,0±1,0	4,65±0,05	4,80	0,05	traces	Pleasant, fermented, fragrant, fermented, homogeneous
№2 Bifidobacterium bifidum 4-76+Lactobacillus acidophilus 8 Lactococcus lactis 18/2 + Torulopsis sphaerica (1:0.5:0,5:0,5)	18	75,0±1,0	4,40±0,05	4,80	0,05	traces	Pleasant, fermented, fragrant smell, carbonated, homogeneous, acidified
№3 Bifidobacterium bifidum 4-76+Lactobacillus acidophilus 8 Lactococcus lactis 18/2 + Torulopsis sphaerica (1:1:1:0,5)	18	84,0±1,0	4,24±0,05	3,00	0,14	traces	Pleasant, dairy, carbonated, uniform, yeast taste

№4 Bifidobacterium bifidum 4-76 + Lactobacillus acidophilus 8 (1:1)	21	78,0±1,0	4,32±0,05	5,30	0,08	traces	Pleasant, milk, homogeneous
№5 Bifidobacterium bifidum, 4-76	20	71,0±1,0	4,0±0,05	4,25	0,14	traces	Pleasant, dairy, homogeneous
Note: 1. Figures in parentheses - the ratio in percent of starter cultures.							

As a result, found that out of all tested combinations organoleptic and physico-chemical properties have been active leaven number 1 and number 2, which include:

Number 1 B.bifidum 7/9b, Lb.acidophilus 8, Lactococcus lactis 18/2 (1:0.5:0,5)

Number 2 Bifidobacterium bifidum 4-7b, Lactobacillus acidophilus 8, Lactococcus lactis 18/2, Torulopsis sphaerica (1:0.5:0,5:0,5)

Moreover, further microflora obtained was determined based on probiotic products camel milk (Figure 1, 2, 3, 4, 5).

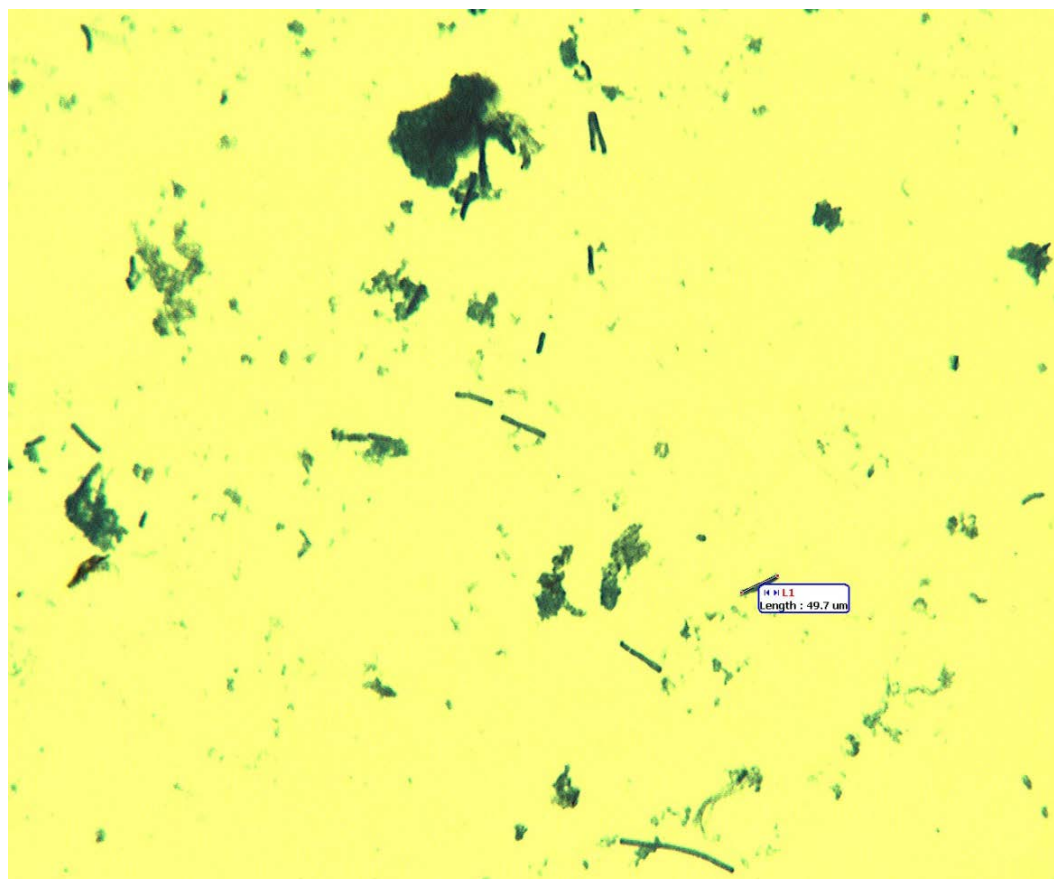


Figure 1. Multiple strain starter number 1 (Bifidobacteria Lactobacilli + Lactococcus)

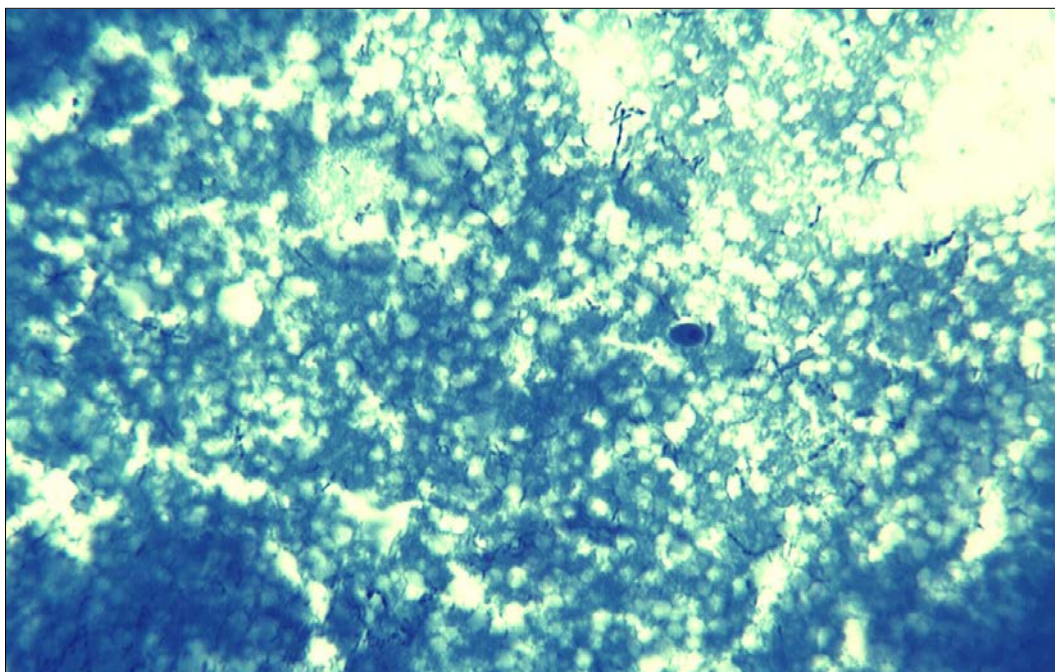


Figure 2. Leaven number 3. Multiple strain starter (Bifidobacteria + Lactobacilli + Lactococcus + Yeasts)

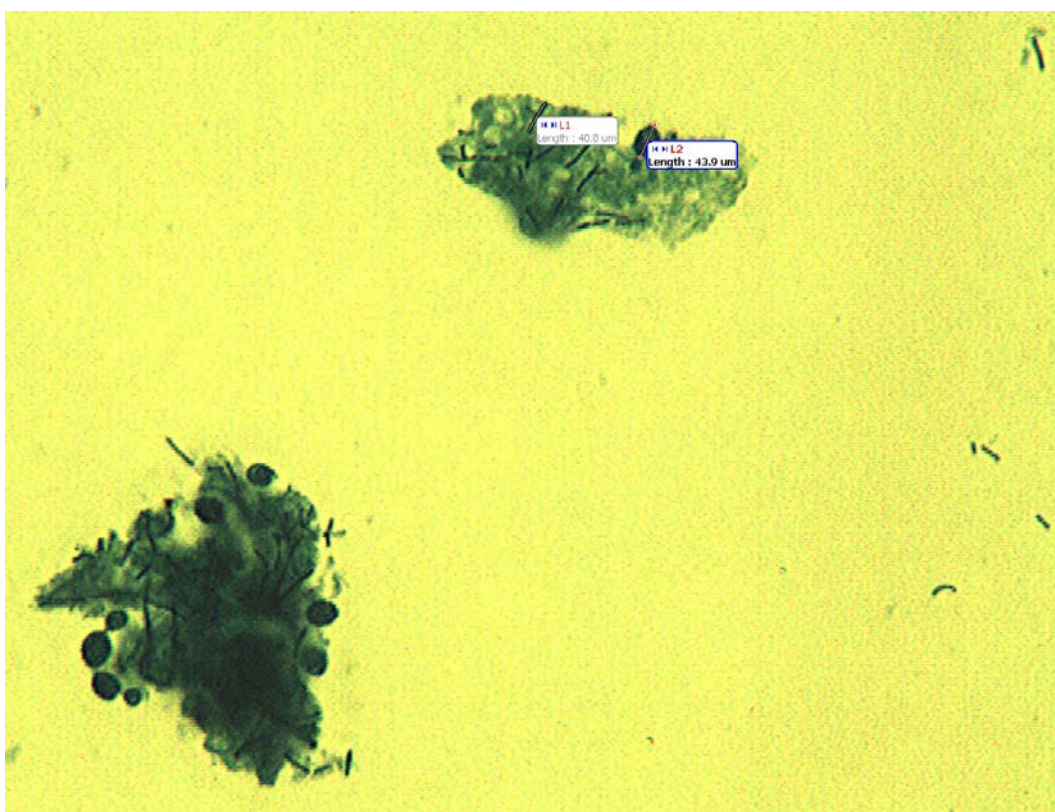


Figure 3. Starter number 4. Multiple strain starter (Bifidobacteria + Lactobacilli + Lactococcus Yeasts)

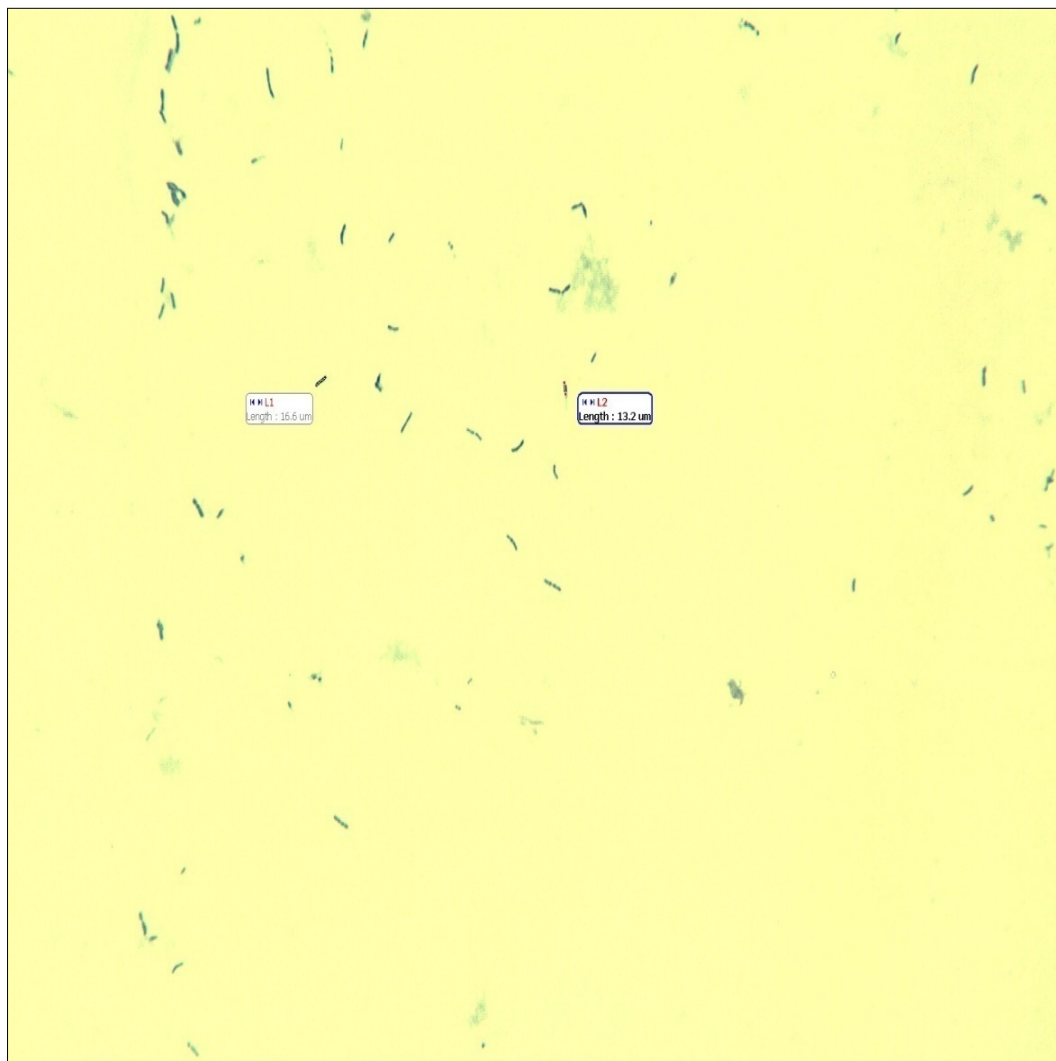


Figure 5. Starter number 5. One strain starter (Bifidobacteria).

As a result, found that out of all tested combinations organoleptic and physico- chemical properties have been active starter number 1 and number 2, which include:

Number 1 B.bifidum 7/9b, Lb.acidophilus 8, Lactococcus lactis 18/2 (1:0.5:0,5)

Number 2 Bifidobacterium bifidum 4- 7b, Lactobacillus acidophilus 8, Lactococcus lactis 18/2, Torulopsis sphaerica (1:0.5:0,5:0,5).

CONCLUSION

As a result, found that out of all tested combinations organoleptic and physico-chemical properties have been active leaven number 1 and number 2, which include: № 1 B.bifidum 7/9b, Lb.acidophilus 8, Lactococcus lactis 18/2 (1:0.5:0,5)

Number 2 Bifidobacterium bifidum 4- 7b, Lactobacillus acidophilus 8, Lactococcus lactis 18/2, Torulopsis sphaerica (1:0.5:0,5:0,5) showed that effective growth of bifidobacteria are whey concentrate with oligosaccharides .

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