

**The distinctive feature of kefir production covers the usage of natural by its microbiological composition symbiotic starter – “kefir grains”. The microscopic microtomic shears of kefir grain show the close baculiform threads which form the grain stroma holding the rest microorganisms – Lactobacillus kefir producing polysacharide**

## The basic microflora of kefir starter

Name	The strain name
<b>Homofermentative Lactococcus</b>	<b>Lactococcus lactis subsp.lactis</b>
<b>Lactobacillus (thermophilic &amp; mesophilic)</b>	<b>Lb.kefiranofaciens</b> <b>Lb.casei, Lb.hefirgranum</b> <b>Lb. brevis, Lb. Kefir</b> <b>Lb.parakefir</b> <b>Lb.acidophilus Lb.rhamnosus</b>
<b>Heterofermentative Lactococcus &amp; Leuconostoc</b>	<b>Lactococcus lactis subsp. lactis</b> <b>biovar diacetylactis</b> <b>Leuconostoc mesenteroides</b> <b>Leuconostoc mesenteroides</b> <b>subsp.dextranicum</b>
<b>Yeast</b>	<b>Saccharomyces sereviasiae</b> <b>Kluveromyces marxianus var.</b> <b>Marxianus Candida kefir</b>
<b>Acetic acid bacteria</b>	<b>Acetobacter aceti</b>

<b>The culture name</b>	<b>Number of cells</b>		
	<b>After fermentation</b>	<b>After ripening</b>	<b>After storage</b>
<b>Lactococcus</b>	<b><math>5 \cdot 10^9</math></b>	<b><math>5 \cdot 10^9</math></b>	<b><math>10^7</math></b>
<b>Aromaforming bacteria</b>	<b><math>5 \cdot 10^7</math></b>	<b><math>5 \cdot 10^7</math></b>	<b><math>5 \cdot 10^6</math></b>
<b>Lacobacillus</b>	<b><math>10^7</math></b>	<b><math>10^7</math></b>	<b><math>10^6</math></b>
<b>Yeast</b>	<b><math>5 \cdot 10^3</math></b>	<b><math>10^4</math></b>	<b><math>10^4</math></b>
<b>Acetic acid bacteria</b>	<b><math>10^2</math></b>	<b><math>10^3</math></b>	<b><math>10^3</math></b>

**“Koumys” is fermented dairy product of mixed lactic acid and alcohol fermentation produced from mare’s milk.**

**Mare’s milk differs from cow’s milk by more lactose content (6,5%), but by less fat (1,5%) and protein (1,9%) content.**

**Protein consist mainly from whey proteins.**

**The studies showed that *Kluvermyces maxianus* should be selected not only by their fermentation energy, antibiotic activity and organoleptic properties but by the reducing characteristics.**

**Yeast production-valuable cultures are the cultures with strong reducing properties which create in milk the reconstituted conditions favorable for yeast growing and alcohol formation.**

**Koumys starter composed L.bulgaricus and lactose fermenting yeast.**

**To intensify koumys medical properties L.acidophilus was introduced into the starter.**

**The optimal conditions for koumys production are as follows:**

- **Initial pH: 3,9-4,1;**
- **Aeration (continuous agitation at the beginning of fermentation : 30-60 min);**
- **Ripening temperature: 26-28° C.**

**The composition of the finished koumys:**

- **Milk sugar: 2-3%;**
- **Fat: 1,5%;**
- **Protein: 1,9;**
- **Lactic acid: 0,6-0,9%;**
- **Alcohol: 1-2%**

# The composition of fermented dairy products microflora

<b>The product name</b>	<b>The culture name</b>
<b>Koumys</b>	<b>Lb.bulgaricus</b> <b>Lb.acidophilus</b> <b>Lactose fermenting yeast</b> <b>(Klyvermyces maxianus)</b>
<b>Airan, Tan</b>	<b>Lb.bulgaricus</b> <b>Sr.thermophilus</b> <b>Yeast</b>
<b>Kurunga, Asra , Dovga</b>	<b>Lb.bulgaricus</b> <b>Str.thermophilus</b> <b>Yeast</b>
<b>Tarag</b>	<b>Lb.bulgaricus</b> <b>Kefir starter</b>



# The composition of fermented dairy products microflora

The product name	The culture name
<b>Quark, Cottage cheese</b> <b>Sour cream, Prostokvasha</b>	<b>L.lactis subs.lactis</b> <b>L.lactis subs.lactis biovar cremoris</b> <b>L.lactis subs.lactis biovar diacetylactis</b>
<b>Low-fat Sour cream</b>	<b>L.lactis subs.lactis</b> <b>L.lactis subs.lactis biovar cremoris</b> <b>L.lactis subs.lactis biovar diacetylactis</b> <b>Str.thermophilus</b>

**The starters composing Lactococcus are used for quark, sour cream and cottage cheese production. The multi strains starters requiring to consider the antagonistic interaction between strains for their development are used for these products manufacture. This group of microorganisms is the most sensitive to unfavorable conditions. Thus while creating these starters composing Lactococcus the selection according to their resistance to polyvalent phages, rotation in the starters and homogenous population of cells.**

**Growing together with Lactococcus Str. thermophilus have the ability to grow at significantly low temperatures comparing to optimal for this species. It was stated that the most favorable temperature for the starters comprising Lactococcus and Str. thermophilus is 32° C that guarantee the curd with proper viscous properties, good reconstitution and water holding capacity. Using these starters guarantees the curd possessing good water holding capacity. Thus these starters are used for the manufacture of the fermented dairy products by stirred method and different kinds of low fat sour cream.**

<b>The product name</b>	<b>The culture name</b>
<b>Acidophilin</b>	<b>L.acidophilus</b> <b>L.lactis sub. lactis</b> <b>L.lactis sub. lactis biovar diacetylactis</b> <b>Kefir starter</b>
<b>Acidolact</b>	<b>L.acidophilus</b> <b>Str.thermophilus</b>
<b>Biolact</b>	<b>L.acidophilus</b>
<b>Bioyogurt</b>	<b>L.bulgaricus</b> <b>Str.thermophilus</b> <b>L.acidophilus</b>

**The technology of fermented dairy products manufacture with bifidobacteria comprises two ways:**

- creation of the products containing bifidobacteria monoculture (one-two-three strains composition) ;**
- development of the products by introduction of living culture of bifidobacteria cultivated on sterile milk with growing matters or bacterial concentrate introduced in the process of inoculation by lactic acid bacteria.**

<b>Product name</b>	<b>Culture name</b>
<b>Bifilin, Bifilin-M</b>	<b>Bifidobacterium Adolescentis</b>
<b>Bifilin-lacto</b>	<b>Bifidobacterium adolescentis, Lb.acidophilus, Str. thermophilus</b>
<b>Biorjazenka Bioyogurt</b>	<b>Bifidobacterium adolescentis Str.thermophilus, L.bulgaricus</b>
<b>Biokefir</b>	<b>Bifidobacterium adolescentis Kefir starter</b>
<b>Bio sour cream</b>	<b>Bifidobacterium adolescentis, L.lactis sub.lactis L.lactis sub.lactis biovar cremoris</b>
<b>Actifilin</b>	<b>Bifidobacterium adolescentis L.lactis sub.lactis biovar cremoris L.lactis sb.lactis biovar diacetylactis, L.casei</b>

- **The symbiotic starter comprising *P.freudenreichii* subsp. *Shermani*, *L.lactis* subsp. *diacetylactis*, *A.aceti* which ferment milk within 5-6 hrs while the cultures composing this starter are growing very slow. Propionic acid bacteria fermented milk for 5-7 days, aroma forming lactic acid bacteria - for 24-36 hrs, acetic acid bacteria - for 10-14 days.**

<b>Product name</b>	<b>Culture name</b>
<b>Tonus</b>	<b>P.freudenreichii</b> <b>subsp.shermanii,</b> <b>L,lactis subsp.lactis</b> <b>biovar,diacetylactis</b> <b>A.aceti</b>
<b>Bifiton</b> <b>Bifitonchik</b>	<b>P.freudenreichii</b> <b>subsp.shermanii,</b> <b>L.lactis subsp.lactis</b> <b>biovar.diacetylactis,</b> <b>Acetobacter aceti,</b> <b>Bifidobacterium</b> <b>adolescentis</b>