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## Some ways of increasing biochemical properties of sour-milk bacteria in preparation of drinks

In article is investigated the sour-milk bacteria which are widely used in production and their influence on a human. Especially *Str.lactis*, *Lb. Bulgaricum* and yeast, a type of *Torulopsis Sk* added in drink and their biochemical composition was investigated. Results of addition of lemon acid and improvement of diagnostic indicators are demonstrated. Features of sour-milk bacteria are confirmed. Results of biochemical experiences with biologically active drinks for this purpose are shown. In article results of influence on a human body of positive and negative properties are presented. In vitro the lemon is added instead of aroma producing bacteria for to improve the composition of vitamins is added.

*Key words:* biotechnology, microbiology, microflora, streptococcus, staphylococcus.

The traditional biotechnology of milk products is historically based on the widely usage of clear wart microfloras used as the ferment and biopreparations. According to this theory, the role of natural microfloras is special in the development of new biopreparations in innovative level. Drinks with biological active mixture are spread with the aim of accelerating the work of normal microflora in human body. But, the sour-milk bacteria after the mixture with sour-milk products in intestine forms acid medium which influences on the living of microorganisms which reject the development of spoiled bacteria [1]. Antibiotics (for example, staphylococcus and other microorganisms) can be in the structure of sour-milk drinks that develop non-useful microfloras. Silver properties can be isolated from acidophilic sticks, milk and creme streptococcus, bifidus bacteria. But the role of products which the structure is enriched with acidophilic sticks and bifidus bacteria has been increasing according to wide usage of antibiotics in medicine [1, 2]. On the contrary, bacteria and groups of ferments, also streptococcus that isolates natural aroma included in the structure of the meal as BAA (biological active additives), which taken in artificial way than adding natural types of bacteria and ferment that are useful to human body dietetically [3].

### *The methods and objects of the research*

According to this, in laboratory, lemon acid is added instead of bacteria that divides aroma, we considered the structure of the drink with the participation of special sour-milk bacteria and having low amount of oil. The most of the present medicinal drinks is made from milks having the low amount of oil. Even the national drink kymyz which is useful to human body is going to be prepared from the milk of cow. One of the disadvantages of this drink made in laboratory is a lot of isolation of carbonic acid in summer time. Therefore, while preparing this kind of drink the amount of sugar should be low (3 %). This rejects the spirituous ferment process [2,3]. This drink is used in medicinal aim, degreasing milk is added instead of diluting the milk with water, the most important bacteria in the structure of ferment while conducting the sour-milk fermenting process have been used: *Str.Lactis*, *Lb.Bulgaricum*, *Torulopsis Sk* strain. *Str.Lactis* — bacteria as balloon situated in twos or beads, it is developed in +30 -35 °C temperature. In the ferment medium it forms acid until 1 %. Also *Lb.Bulgaricum* is the stick which does not move with the length 4–5 micron, the normal temperature to be developed is 40–48 °C temperature. In the medium it forms acid until 3,0–3,5 %. It is stable to acid medium. And among the ferments related to *Torulopsis Sk* strain is actively used in preparation of milk drinks. Sour-milk bacteria such as balloon and stick, they don't move, it doesn't form spore and it lives in airy and non-airy places. But all groups of bacteria don't form sour-milk in the same amount. Some types of them is unstable (such as balloon) to oxide medium. And in the medium sour-milk bacteria such as the stick can gather oxide (1,5–2 %) in some amount. Sour-milk bacteria ferments mono- and disaccharides, and it doesn't differentiate starch and other complex polysaccharides. It is defined that some other types of this bacteria form antibiotics which destroy microbes of stomachache [2].

It is definite that the lemon acid keep the colloidal condition of warts of clear sour-milk bacteria in ferment structure and the equality of the salts in the structure of milk. According to literary information, we aimed at the influence of lemon acid on quick preparation of drink ferment, conservation period, also isola-

tion of oxide and aroma. We included lemon acid in the amount of 0,03 %, 0,1, 0,15, 0,2, 0,3, 0,4, 0,5, 0,6 and 1 % to the ferment which prepared beforehand at one time and period. The biochemical indicators of the drink have been defined on the first, second, fourth, sixth, eighth and twelfth days. Controls have been conducted three times. While observing, for the ferment drink has been taken which comprises these ferments and with non-addition of lemon acid. The results of observation are given in the pictures below.

*The result and analysis of the work*

Carbonic acid is mostly isolated when the lemon acid is added to the drink, the quality of taste increases and stops to ferment beforehand. As the suitable capacity it is 0.3 %.

When the lemon acid is added in the capacity of 0,4 %, 0,5 %, 0,6 % and 1 %, the quality of taste of the drink can be lowered, acidity is increased and the precipitations of lime have appeared. As the experiment showed, the amount of sugar in drink that the lemon acid has been added 0,3 % is less utilized in ferment medium, the acidity is lowered and gas will be isolated (Figure 1).

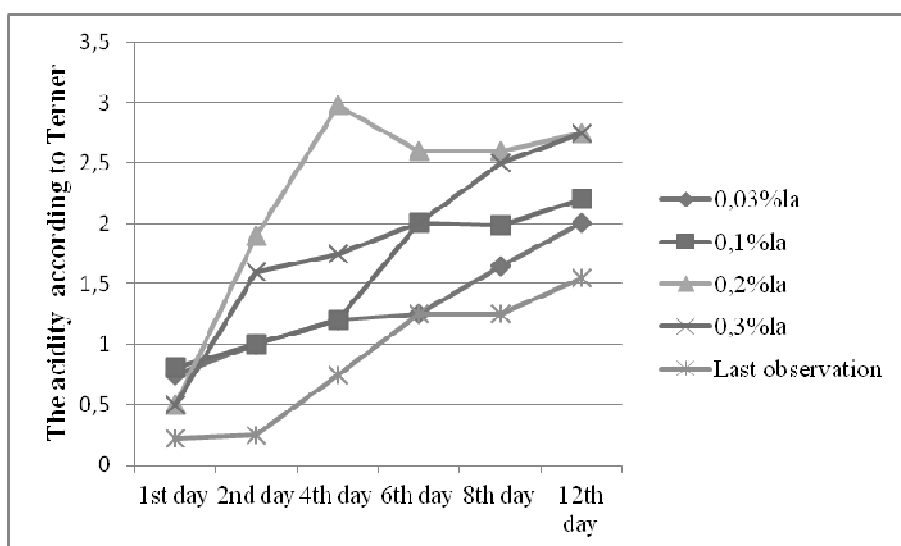


Figure 1. The change of the acidity of the drink with the addition of lemon acid

As the experiment showed, the amount of sugar in drink is less utilized in ferment medium, the acidity is lowered and gas will be isolated. One of the disadvantages of the drink made in laboratory is that carbonic acid gas will mostly be isolated and it is noticed from Figure 2.

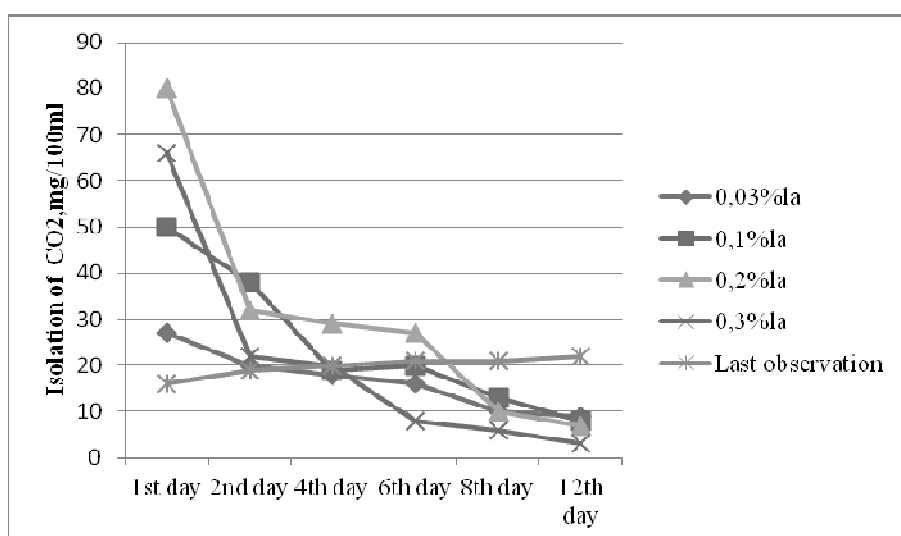


Figure 2. The dynamics of isolation of CO<sub>2</sub> with the addition of lemon acid

In the indicator of an experiment the isolation of spirit showed the lowest level before adding the lemon acid to the drink, after adding the 0,3 % lemon acid as a result of increasing of the amount of sugar the dynamics of isolation of spirit has been normal (Figure 3).

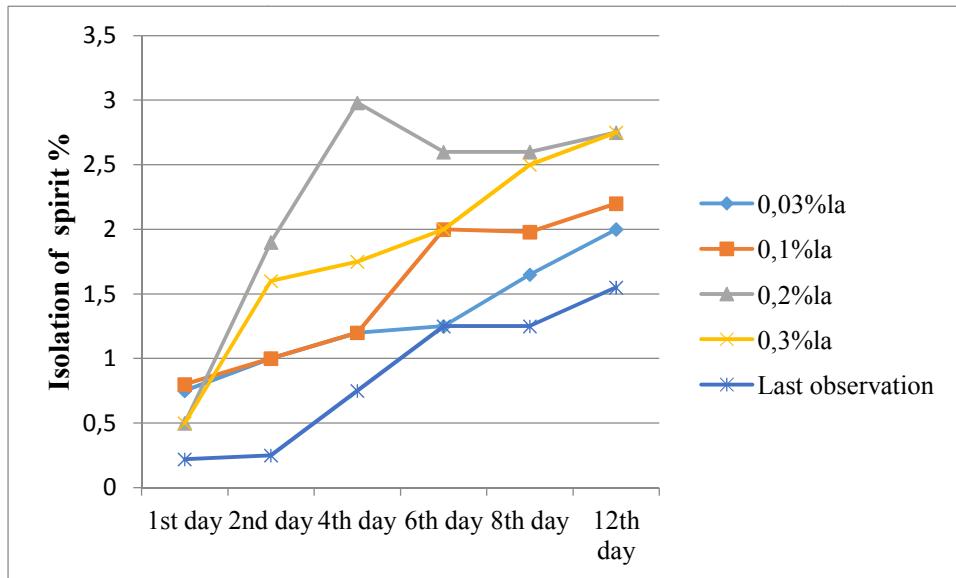


Figure 3. The dynamics of isolation of spirit of the drink with the addition of lemon acid

One of the reasons of the usage of sugar is shown from the usage of microorganisms of lemon acid, but there is a possibility to prove that it is taken from natural product. But the lemon acid is isolated to salts in milky medium, it is better spread in sour-milk bacteria and ferments, the quality of the product is increased, it gives positive taste and smell (Figure 4).

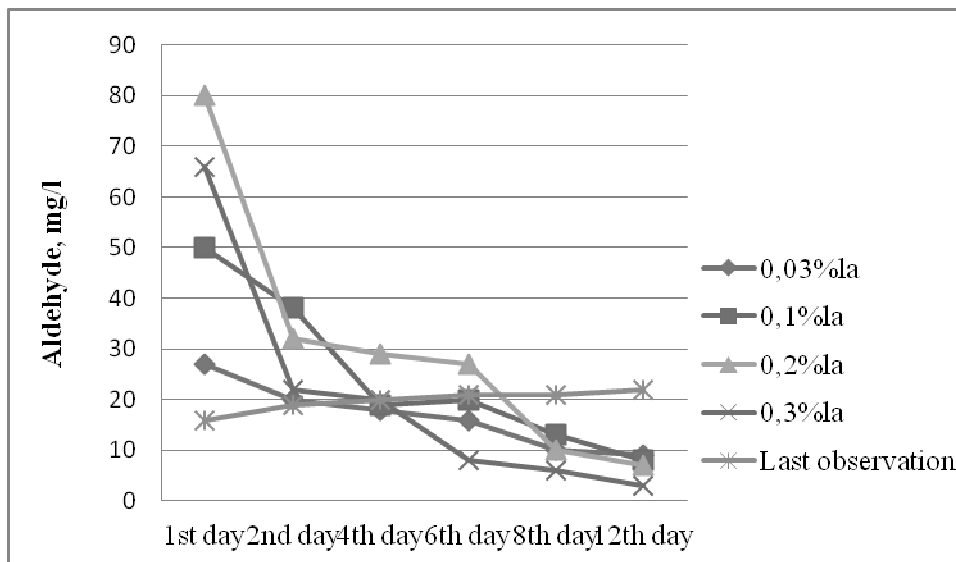


Figure 4. The dynamics of isolation of aldehyde of the drink with the addition of lemon acid

The buffered capacity is one of the basic physical-chemical factors in the sour-milk product, it has the feature of keeping pH level of the medium. Therefore in the process of the preparation and addition of lemon acid to the drink, defining the buffered capacity is put beforehand [4].

Paying attention to the table given below, addition of lemon acid in the beginning of an experiment will ferment the drink 100 °T, the acidity will be increased gradually and on the fourteenth day it reaches 140 °T. And while observing the acidity is 80 °T, on the fourteenth day it reaches 180 °T. According to this, pH level is lowered. In an observation experiment, the buffered capacity is 0,61 on the first day, and the drink with the

addition of lemon is 2,45. The quickest non-ferment of the drink is noticed from the initial buffered capacity of the product. Relying on made experiments, addition of the lemon acid to the drink increases the buffet, lowers the acidity, it is shown from the table given below that the conservation period can be longer without destroying the qualities of ferments in its structure (table is given below).

The change of buffered quality of drinks that the 0,3 % lemon acid has been added and the influence of them on gathering the acid.

Table

## Experiment results

	Types of experiments	The age of the drink (daily)	Acidity, °T	pH	Buffered capacity, B
1	Ferment with the addition of lemon acid	1	100	4,00	2,45
		3	108	3,74	2,45
		5	120	3,64	2,45
		7	125	3,51	2,45
		10	130	3,42	2,73
		14	140	3,40	3,06
2	Ferment with non-addition of lemon acid (observation)	1	80	5,05	0,61
		3	120	3,50	2,00
		5	130	3,50	2,13
		7	135	3,35	2,17
		10	150	3,25	2,45
		14	180	3,21	2,65

## Conclusion

1. As another suitable factor for the lemon acid in the process of made experiments can be its buffered capacity. But the chemical indicators of the medium, that is to say, that the concentration of hydrogen ion (pH), indicators of oxide-non-oxide potentials, buffered capacity (B) are significantly important in the development of microorganisms.

2. With the addition of lemon acid to the structure of the produced drink from the strain of ferment *Torulopsis S<sub>k</sub>*, sour-milk bacteria such as *Str.Lactis*, *Lb.Bulgaricum* their quality feature is not destroyed and conservation period of the temperature between 18–20 °C can be longer up to two weeks.

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### Сүт қышқылды сусын дайындауда бактериялардың биохимиялық қасиеттерін жоғарылатудың кейбір жолдары

Мақалада қазіргі өндірісте қолданылып жүрген кейбір сүтқышқылды бактериялардың биохимиялық құрылымына әсер ете отырып, негізгі құндылығын жоймай, жаңа өнім алудың кейбір зерттеулері қарастырылған. Соның ішінде ерекше *Str. lactis*, *Lb. Bulgaricum* мен ашытқы түріндегі *Torulopsis Sk* штамдарынан құрылған сусынның биохимиясы көрсетілген. Сусынға лимон қышқылын қосқан кездегі биохимиялық факторлары және диагностикалық көрсеткіштерінің жоғарылауы байқалады. Сүтқышқылды бактериялардың ерекше қасиеттері дәлелденген. Сонымен қатар адам ағзасына әсер ететін оң және теріс бағыттар биохимиялық көрсеткіштермен берілген. Зертханалық жағдайда хош иіс бөлгіш бактериялардың орнына лимон қосып, витаминдік құрылымын жақсартуға болатыны айтылған.

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### **Некоторые пути повышения биохимических свойств бактерий, используемых для изготовления кисломолочных напитков**

В статье представлены результаты исследования широко используемых в производстве кисломолочных напитков бактерий *Str. lactis*, *Lb. Bulgaricum* и дрожжей вида *Torulopsis Sk.*, их биохимический состав и влияние на организм человека. Показано, что при добавлении лимонной кислоты некоторые биохимические особенности кисломолочных бактерий изменяются и улучшаются их диагностические показатели. Кроме того, в статье выделены положительные и отрицательные стороны влияния на организм человека данных биохимических показателей. В лабораторных условиях, отмечено авторами, для повышения состава витаминов вместо ароматообразующих бактерий в кисломолочный напиток кумыс был добавлен лимон.

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