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**INFLUENCE OF QUALITY OF WASHING OF TECHNOLOGICAL
LINE OF PRODUCTION OF MILK ON CONTAMINATION OF RAW
MATERIAL**

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**ВЛИЯНИЕ КАЧЕСТВА МЫТЬЯ ТЕХНОЛОГИЧЕСКОЙ ЛИНИИ
ПРОИЗВОДСТВА МОЛОКА НА ЗАГРЯЗНЕННОСТЬ МОЛОКА-СЫРЬЯ**

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**ВПЛИВ ЯКОСТІ МИТТЯ ТЕХНОЛОГІЧНОЇ ЛІНІЇ ВИРОБНИЦТВА
МОЛОКА НА ЗАБРУДНЕНІСТЬ МОЛОКА-СИРОВИНИ**

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Researching the raw milk that had been taken from under the cows, from milk pipe, hose and tank for milk cooling, we found that the sanitary treatment of all equipment affects the quality of milk-raw material all the way it from the udder of the cow to the tank. Indicators of the sanitary state of milking equipment in the first day after general cleaning and disinfection were normal. While on the seventh day they were unsatisfactory, which suggests that the washing equipment should be done more often and better, and it is necessary to replace worn hoses and milk pipes in time.

Key words: raw milk, udder, milk pipe, hose, tank, milking equipment, general cleaning, disinfection.

Исследуя сырое молоко, что было отобрано из-под коров, из молокопровода, шланга и емкости для охлаждения молока, мы обнаружили, что санитарная обработка оборудования влияет на качество молока-сырья на всем пути его от вымени коровы до ёмкости. Показатели санитарного

состояния доильного оборудования в первый день после генерального мытья и дезинфекции были в норме. Тогда как на седьмой день они были неудовлетворительными, что свидетельствует о том, что мытьё оборудования должно производиться чаще и лучше, и необходимо заменять изношенные шланги и молокопроводы во времени.

Ключевые слова: сырое молоко, вымя, молокопровод, шланг, ёмкость, доильное оборудование, генеральное мытьё, дезинфекция.

Досліджуючи сире молоко, що було відібрано з-під корів, з молокопроводу, шланга і ємності для охолодження молока, ми виявили, що санітарна обробка обладнання впливає на якість молока-сировини на всьому шляху його від вимені корови до ємності. Показники санітарного стану доїльного обладнання в перший день після генерального миття та дезінфекції були в нормі. Тоді як на сьомий день вони були незадовільними, що свідчить про те, що миття обладнання повинно проводитися частіше і краще, і необхідно замінювати зношені шланги і молокопроводи вчасно.

Ключові слова: сире молоко, вим'я, молокопровід, шланг, ємність, доїльне обладнання, генеральне миття, дезінфекція.

Statement of the problem. High quality milk is not the primary problem in Ukraine. However, no one considers necessary to pay attention not on animals and on service of the equipment for reception of milk. The quality and safety of raw milk depends on the number of microorganisms which get to it in the production process. It is known that both the number and species composition of microflora of raw milk affected by the state of health of dairy cows, the sanitary condition of the farm, milking equipment and milk ware [1, 2, 3]. Determination of the presence of microorganisms is used as an indicator to install the microbiological safety of raw materials and food products, because their presence indicates the level of compliance with sanitary requirements during production processes.

Indicator microbiological safety of raw milk in the EU is the observance by the manufacturer of compliance of microbiological criteria against Staphylococcus

aureus, *Listeria monocytogenes*, *Escherichia coli*, *Enterobacter sakazakii* and quantity of mesophilic aerobic and facultative anaerobic microorganisms (MAFAnM).

The purpose of research. The aim of our study was to investigate the level of contamination of raw milk mesophilic aerobic and facultative anaerobic microorganisms (MAFAnM), bacteria coliform and *Staphylococcus* depending on sanitary processing of the equipment.

Material and methods of research. Research conducted in raw milk, which was taken during the week directly from under the cows, from milk pipe, hose and tank for milk cooling. On the farm after each milking unit is used circulating washing. But despite this, maintenance of equipment is weekly instead of once a month, dismantling and rinsing it manually.

Indication of microorganisms was carried out in accordance with existing national methods [4, 6, 7]. Just were studied 140 samples.

Before carrying out microbiological analyses were performed tenfold cultivation of selected samples tested in the buffer-infusion water [7]. The total number of microorganisms established by planting 1 cm³ pre-cooked research material under agar to determine the quantity of mesophilic aerobic and facultative anaerobic microorganisms (MAFAnM), and the number of coliform bacteria (CGB) - glucose-gall-agar with neutral red. After incubation of cultures at a temperature 30±2 and 37±2 °C in accordance within 72 and 36 hours were counting the number of colonies grown and determined the number of colony-forming units in a unit volume of the material studied (CFU/cm³). Method of determining the number of *staphylococcus* is in cultured milk or dilutions on the surface of dense matter, cultivation of microorganisms, counting of typical colonies with subsequent confirmation plasma coagulation.

The results of the research. Starting from the udder of cows to the tank, passing several points of the technological line organisms are distributed on objects, as evidenced by the graphics content MAFAnM in Fig. 1.

The number of MAFAnM in the milk hose is the highest compared with other objects lines as of the 1st day of practice, and on the 7th day that can testify to the

accumulation of microorganisms in the hose through the lack of possibilities of hand washing. This indicator exceeds the indicator in milk, which was taken away from under cows in 66,67 times in the beginning of the research period and 95 times the end of the experiment.

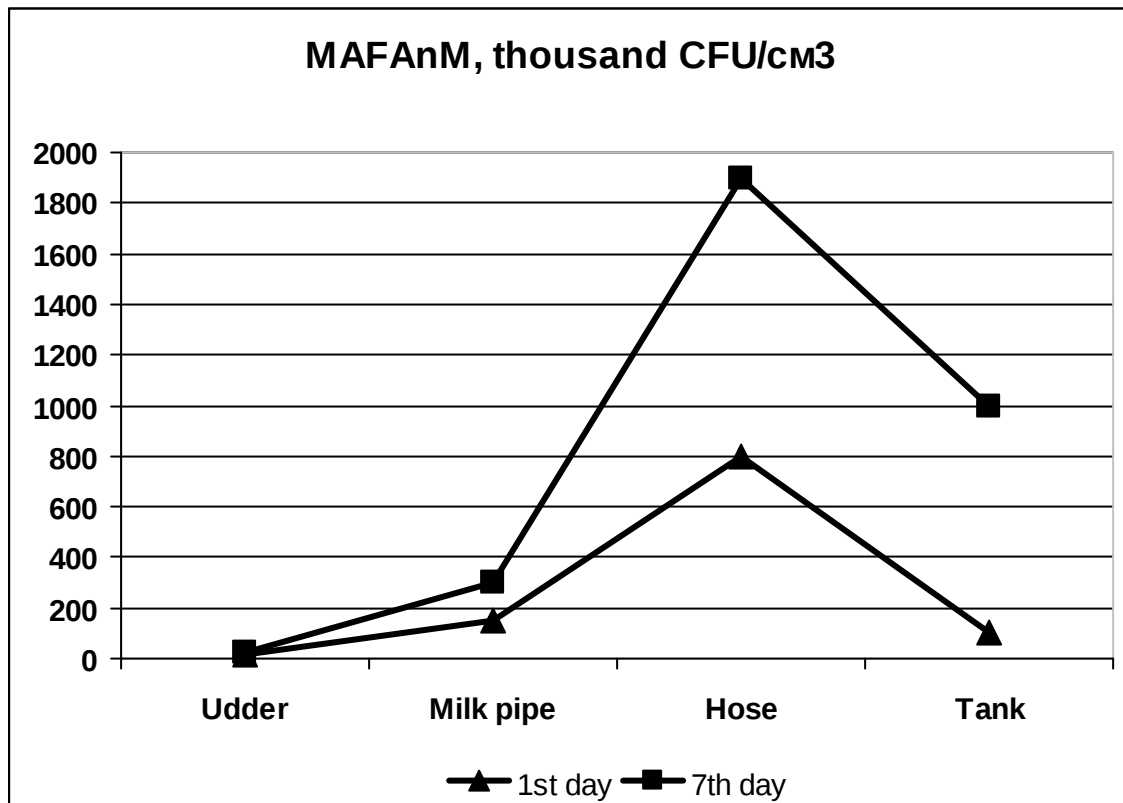


Fig. 1. The number of MAFAnM on various objects of the technological line

In milk and milk pipe, this index was higher in the milk from the udder 12.5 and 15 times, respectively, on the 1st and 7th days of experience. The number of MAFAnM in the tank-cooler exceeds even indicator in milk pipe, not to mention the milk from under cows. Obviously, this is because of the hose microorganisms reaching the tank with milk even more polluting it. In the tank number MAFAnM exceeded the data in the milk from the udder 8.3 times in 1 day experience and 50 times at the end of the experience.

Scientifically proven, that the titer CGB freshly drawn milk $>1,0$ is an indication of proper sanitation receiving it, which microbe number of milk does not exceed 60 thousand bacteria [6]. E-coli in milk from under the udder of a cow on the 7th day experience is 10^{-2} cm^3 , which testifies to the detection of coliform bacteria in milk.

The presence of coliform bacteria is also in milk and milk pipe, hose, and a tank at the beginning of the experience, and in the last day. We can conclude that on the 1st day experience after general washing equipment coliform bacteria still have in stock. Accordingly, on the 7th day of the experience of the amount of data bacteria does not decrease, but on the contrary they are distributed. Also we can observe dependence of increasing the number of CGB at various points of the technological line starting from the udder of the cow to the tank.

According to standard GOST 9225 in 1 g of milk presence of *Staphylococcus aureus* is not allowed.

In 1st day experience of *Staphylococcus aureus* in milk was not detected, while 7th day experience there was a growth of fungus on a Petri dish (table 1).

Table 1

Presence of *Staphylococcus aureus* in 1 g of milk, selected from different points of the technological line (n=5)

Objects	The days of experience	
	1 st day	7 th day
Udder	-	+
Milk pipe	-	+
Hose	+	+
Tank	+	+

In milk from each of the milk pipe on the 1st day of the experience of *Staphylococcus aureus* was not found, then a week in the end of the experiment was awarded its presence on a Petri dish. Again poor-quality processing equipment with detergents during the week is confirmed.

In milk from each of the hose, on the 1st and 7th days of experience conclusion was equally unsatisfactory. Similar conclusions can be drawn about the milk tank, which during the week was detected *Staphylococcus aureus* that is unacceptable.

Conclusions and perspectives of further research. Thus, several conclusions can be drawn based on the data.

The day maintenance of the equipment sanitary condition of the milk of cows under answered the standard requirements for raw milk, but during the week with daily sanitary processing of the milking of dairy equipment, milk gradually was contaminated.

On the first day milk from the hose and the tank a bit quite polluted state. This gives reason to conclude low-quality cleaning and maintenance of equipment. So, despite the fact that maintenance and sanitary processing of the equipment was conducted in accordance with the instructions, the level of contamination of raw milk MAFAnM is relatively high, which gives grounds to note milking machines and other parts of milking equipment, maintenance and sanitary condition.

On the basis of the data obtained in the course of the research shows that safety and quality of raw materials on this sector is a significant problem, it is therefore useful to further our work directed to the study of such objects of this dairy farm, as the udder of cows, milking machines, equalizing tank. Also in the further work it is planned to investigate the influence of detergents and disinfectants on the composition and safety of produced milk.

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