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## **INFLAMMATION OF MILK IRONS METHODS OF COMPARATIVE EQUALIZATION OF DETECTION**

### **Abstract**

Presently an mastitis of cows is actual in West Kazakhstan area. The were conducted the laboratory research studies on the milk sample that took from diary cows caused subclinical and purulent catarrhal mastitis in order to diagnose, as well as data on the effect of mastitis on the chemical composition, organoleptic properties of milk are given in the article.

***Keywords:** Inflammation of the mammary gland, Cattle, Diagnostic test, Methods of treatment, subclinical mastitis.*

Mastitis is a serious problem causing enormous economic losses in dairy industry throughout the world. Many of the intramammary infections (IMI) originate during the dry or non lactating period and result in clinical or subclinical mastitis during early lactation. Subclinically infected udder quarters can develop clinical mastitis and the rate of new infections can be high. Cows with subclinical mastitis maintain a reservoir of infection within the dairy herd and increase the potential exposure of uninfected cows to contagious pathogens. The identification of the microorganisms responsible for subclinical mastitis in cattle is significant, in order to establish specific and efficient management of dairy flocks to avoid the development of clinical mastitis. [1]

Mastitis is the main disease in dairy cattle breeding, because of this pathology, the main percentage of cows are being culled out of the herd, since animals, even after curing, do not restore their full milk productivity. Usually about 20-50% of the animals from the total number of culls are cows with clinically pronounced signs of mastitis, partial or complete atrophy of individual lobes or mammary gland as a whole. [2].

Milk derived from cows, patients with a clinically expressed or latent form of mastitis, can not be used as a food, especially in preschool or school establishments. In such milk, significant physical and chemical changes occur, it loses its taste qualities, contains a very large number of different forms of leukocytes and various microflora, especially streptococci and staphylococci. This microflora can cause people after eating milk various disorders of the digestive and respiratory organs.

Therefore, the problem of treatment and prevention of breast diseases is currently relevant for veterinarians and scientists. The main goal of therapeutic care for animals in mastitis is to eliminate inflammation in udder tissues and restore milk production. The treatment is started in time: the earlier it is started, the more favorable the outcome of the disease.

Since there are no universal methods and means of therapy for this disease in veterinary practice, most experts believe that a positive effect in the treatment of cows suffering from mastitis can be obtained only if the treatment is carried out in a comprehensive manner taking into account the shape and timing of the course of the inflammatory process, the cause that caused it, the biological characteristics of the pathogen, its sensitivity to the antimicrobial agents used, and the general condition of the animal's body. Over the years, a large number of treatments and medicines have been used. But a universal treatment regimen has not yet been developed, which would shorten treatment time and costs. [3]

Changes in teat tissue around the teat orifice may increase the likelihood of bacterial penetration of the udder and predispose the cow to subclinical mastitis [4].

Cow factors including teat-end shape, teat position, teat length, milk yield, stage of lactation, and parity are associated with the degree of teat-end callosity. TEC is influenced by milking machine conditions and milking management. Histological study of teat tissue shows good correlation with TEC scores [5].

Cows are of great importance to people due to the meat, milk and other useful items they produce. Mastitis is a common disease in dairy herds in many countries.

A dairy producer may decide it is more economical to cull a mastitic cow than to treat her, if her expected future net revenue is less than that from a replacement heifer. Various papers have discussed the economic impact of bovine mastitis. Bovine mastitis caused by bacterial infection of the mammary gland of dairy cows is often associated with loss of milk production due to a reduction in milk composition and quality which in turn, leads to negative economic impact on dairy industry. Milk of cows with mastitis is not suitable for human consumption. The main purpose of medical care for animals with mastitis is the elimination of the inflammatory process in the tissues of the udder and milk production recovery. To begin timely treatment: the sooner it is started, the more favorable the outcome.

Dairy cattle breeding is one of the leading sectors of agricultural production, aimed at meeting the needs of people in the foods of animal origin. In the pathology of cattle in Russia and other countries have a significant proportion of mastitis, constraining the pace of increase in milk production. The observed tendency of further spread of the disease in herds of cows dictates the need for a more vigorous implementation of the system of targeted preventive measures, the use of effective methods of treatment [6].

**According to the purpose, the following tasks are set:**

1. In economic conditions by means of various diagnostic tests to check cows for an udder inflammation.
2. Identify the biochemical and immunological status of blood of the cows infected with an udder inflammation.
3. In production conditions by means of other methods in a comparative aspect to reveal efficiency of a medical preparation at the infected groups of cows and also to make the offer on an evidence-based method of treatment of an inflammation of an udder.
4. Prepare technical, normative documents to implement
5. To study the prevalence of clinical mastitis cows on a farm of cattle in the LLP "Adiet".
6. To develop and put into production a new effective treatment for cows with clinical forms of mastitis.
7. To determine the cost-effectiveness of the new drug. The experimental part of the work carried out in 2017-2018, in the LLP "Adiet" Zelenovsky district of West Kazakhstan region.

To solve the first problem, we studied the distribution of obstetrical pathology in cows. For this purpose, daily observations were made of the livestock of the cattle farm. To detect symptoms of mastitis of cows, a clinical study was conducted, which included the following methods: collection of anamnesis; determination of temperature; pulse and respiratory rate. General research on systems and special (examination of the breast, palpation, trial sdoynanie followed by an organoleptic evaluation of the secreted secret).

During the collection of the anamnesis, the physiological state of the female was taken into account (pregnancy, dead period, delivery time, postpartum period and after it, sexual cycle stage), milk yield, milking method, time of illness, who and how helped, which drugs were used for treatment earlier.

When examining the breast, attention was paid to its shape, the symmetry of the lobes and nipples, the color and integrity of the skin, the condition of the superficial blood and lymphatic vessels.

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**Results and Discussion.** With superficial palpation, the local temperature was compared at the symmetrical portions of the udder. With deep - the presence of soreness, foci of consolidation or softening, the condition of supra-lymph nodes: size, consistency, mobility, soreness. The nipples were examined by rolling between the fingers to detect morphological changes in their wall, the permeability of the canal. Trial sdoynanie conducted with a cam method using a milky control plate (PMC). The secret was researched by external signs: by color, smell, consistency and uniformity.

Milk from each quarter of the udder is positively reactive, check the settling test. With a positive sample, the cow is considered a sick mastitis. At the end of the milking, 10-15 ml of milk is taken from the each test tube and placed for 16-18 hours in a cold place (in a refrigerator, at a temperature of +4 to 100 ° C) so that the milk does not get poured. The reaction is read on the second day at the light source. Explore: the color of milk, the presence of sediment, the thickness and nature of the cream layer. Milk from a healthy cow is white or slightly bluish, sediment does not form. Milk from the sick cow is watery, the consistency of the cream is changed (viscous, mucous, flaky). The main feature is the presence of sediment with a height of 1 mm or more. A layer of cream thicker than 1.5 cm – no mastitis, a layer of less than 5 mm - there is mastitis.

To diagnose mastitis in the parenchymal milk of each affected lobe, a 5% solution of mastidine in distilled water is used. When mastitis is detected in an average sample of milk, 10% mastidine solution is used from four quarters of udders, milk is tested in milks, 1 ml of mastidine is added to 1 ml of milk from the beak machine and the contents of the well are thoroughly mixed with a wooden or glass rod.

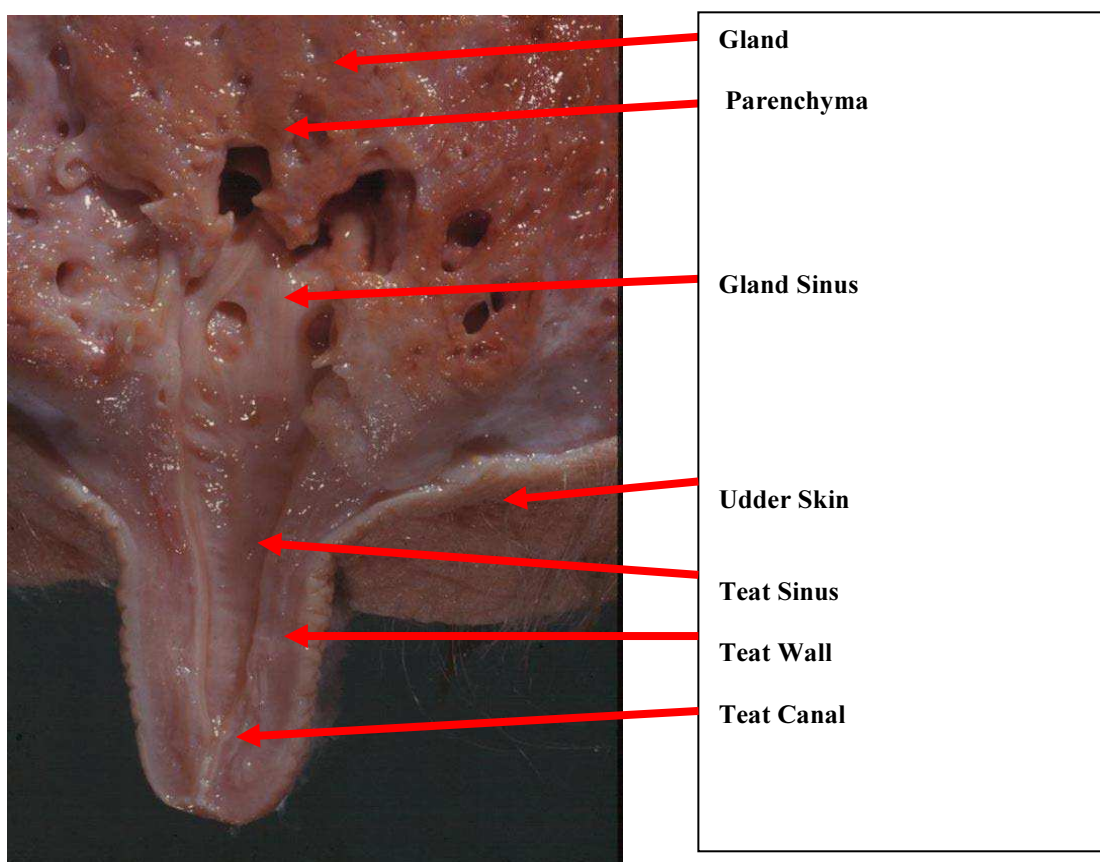


Figure 1 – Anatomy udder

After 15-20 seconds, they begin to read the result of the reaction. With a positive mastitis reaction, a jelly-like clot forms on the plate, its consistence is denoted by crosses. One cross (+) is a very weak clot, with All preparations with milk stretch behind the wand in the form of strands (indicating a slight irritation of the udder's parenchyma), two crosses (++) - a weak clot (strong irritation of the parenchyma), three crosses (+++) of jelly has a consistency of raw egg white hen protein it is difficult to throw out the stick from the recess of the plate (the presence of inflammation of the udder), four crosses (++++) - jelly has a very large clot that is easily ejected from the recess of the plate (presence of inflammation of the parenchyma). To examine the milk for mastitis, 1 ml of a daily sample of milk from the corresponding cow is poured into the nests of plates MKP-1 and 1 ml of a 10% solution of mastidine is added by the beak machine. For the mastidine reaction, it is desirable not

to preserve the milk. To identify the reaction of milk with mastidin, it is not necessary to use samples from three or two control milking, which must be done when determining the fat and protein content. It is enough to take 2-3 ml of milk from the last milking of each cow in special containers immediately before sending milk samples to the laboratory and ensure its delivery within 3-4 hours from the moment of taking in a refrigerated form.

The results of this work are reflected in Table 1. So, if we make an analysis on Table 1, the detection of inflammation in cows bromothymol and Whiteside is the most sensitive. With this test it was revealed 35 infected cows, which is 20%. And with Sample of settling 60 heads (11), Bromtimol 60 heads (12), 5% solution of a dimastin 60 heads (11), Whiteside reaction 60 heads (12), with the help were revealed. According to the control of sedimentation samples, 11 cows were found. This total composition of the heads is 18,3%, according to the bromothymol reaction from 60 cows, 20% of patients with mastitis, 18,3% of dimastin, 20% of the reaction were tested. To study the selected samples, the reaction was sensitive were bromothymol and Whiteside.

Table 1 – Laboratory tests of milk samples of cows

Laboratory research	Results of the study								Explored Cows	diseases of cattle	
	positive				negative						
	Udder parts								n	бас	%
	AO	ApO	CA	CAP	AO	ApO	CO	CAP			
Sample of settling	1	3	3	4	60	59	59	58	60	11	18,3
Bromtimol	2	3	4	3	59	59	59	59	60	12	20
5% solution of mastidine	1	4	4	2	60	24	24	24	60	11	18,3
Whiteside reaction	2	3	3	4	24	24	24	25	60	12	20
Comment	1. AO –front right udder 2. ApO –back right side of the udder 3. CA –left part front udder 4. CAP – The left part of the posterior udder										

Table 2. Final multivariable association (odds ratios – OR, lower confidence limits – LCL, upper confidence limits – UCL; *P*-values) between current subclinical mastitis status and farm-as well as cow-level parameters in a study involving 60 cows held on 15 dairy farms with organic production (OP) located in the LLP "Adiet" Zelenovsky district of West Razakhstan region. Current measurements were done at a median of 31 days postpartum. Logistic regression model with adjustment for farm-level clustering of cows; all continuously measured variables were categorized based on quartiles. FW/BW (x) = variable initially selected by the forward and backward stepping approach (*P* < 0.05), respectively.

Presence of a paddock, feeding routine and plasma 3,5,3-triiodothyronine concentrations were found as additional factors that were recognized in the step-wise selection model, but they are not shown because OR for subclinical mastitis were not significant (*P* > 0.05) SI × RH = Simmental × Red Holstein; SI = pure Simmental; HO = (pure) red and black Holstein; other = Montbeliard, Jersey and Brown cattle for the use of mineral feed supplements, for irregular milking intervals (< 12 or > 12 h/day), and for milk urea concentrations of 210.1–270.0 mg/l. On the other hand, decreased OR for SM were recorded for cows held in barns on beddings other than rubber mats or concrete, for farms with water rinsing temperatures of milking systems between 54.75 and 60°C, for milk lactose > 50.5 g/l, and for blood albumin levels of ≥ 38.5 g/l. Several additional factors showed trend associations with the SM status. In CP, eight variables were entered in the forward stepping approach, while 12 variables were retained in the backward elimination process.

Table 2 – Final multivariable association

Risk factor	Group	Selection process and final model results					P
		FW	BW	OR	LCL	UCL	
Cow breed	SI × RH			-			
	SI	X	X	1.034	0.496	2.157	0.928
	HO	X	X	1.744	0.911	3.339	0.093
	other	x	x	3.307	1.571	6.959	0.002
Number of heifers and cows on farm	< 20			-			
	20–22		x	1.415	0.687	2.915	0.346
	23–27			1.445	0.732	2.853	0.289
	> 27			2.243	1.121	4.487	0.002
Cows held on bedding other than rubber mat or concrete	No			-			
	yes	x	x	0.380	0.192	0.753	0.006
Use of mineral feed supplements	No			-			
	yes	x		2.173	1.179	4.007	0.013
Rinsing water temperature of milking system (°C)	<54.75			-			
	54.75–60.0		X	0.485	0.269	0.874	0.016
	60.01–70.0		X	0.857	0.421	1,745	0,671
	> 70		x	0,715	0,356	1,435	0,345
Milking interval (h)	12/12			-			
	11/13		x	1,715	1,110	2,650	0,015
Milk lactose (g/l)	< 48.2			-			
	48,2		X	0,161	0,456	1,270	0,297
	49,3		X	0,789	0,433	1,440	0,440
	> 50.5		x	0,392	0,203	0,757	0,005
Milk urea (mg/l)	< 160			-			
	160–210		X	0,960	0,559	1,647	0,882
	210.1–270		X	1,768	0,941	3,324	0,007
	> 270		x	0,718	3,324	1,471	0,365
Plasma albumin (g/l)	< 38.5			-			
	38,5		X	0,492	0,272	0,892	0,020
	40,01		X	0,560	0,303	1,037	0,065
	> 41.5		x	0,233	1,037	0,889	0,021

The second part of the experiment was divided into three groups of milking cows in the control group-healthy cows, patients with latent mastitis group 1, and 2 groups obtained from cows with clinical mastitis. During the study, there were 10 cows in each group and their feeding and maintenance were the same. Buying models from cows milk mix well the whole mass obtained, the average diameter of 9ml from aluminum tubular jars selected samples of milk, that is milk, organoleptic indicators, acidity, microbial contamination, the number of somatic cells revealed in a week was investigated.

The revealed subclinical and purulent-catarrhal mastitis effect on the productivity of dairy cows. This indicator depends on the type of disease. For example, the latent form of the disease produced cow's milk productivity was 2.98%, and in the clinical form of the disease – 6.21%, a decrease was revealed. In the disease of mastitis, the chemical composition of cow's milk changes. Density of milk due to increased detectability of mastitis disease level, reaching the total percentage of fat, the acidity of all the cows examined at 2-3 ° C, that is, metabolic disorders decreased, mastitis and decline due to a decrease in the total proportion of SOMO. Density of milk of cows of different groups of patients in the control group for milk mastitis 2 0.36 ° A (0.00999 patients have a decrease in the quality of cow's milk milk mastitis (in Table 2): the number of somatic cells has increased, for example, in breast milk of healthy cows 121 , 8 thousand / cm<sup>3</sup>, 487.95 thousand this indicator latent form of the disease. / Cm<sup>3</sup>, then this figure in the form of clinic - 1379.5 thousand / was cm<sup>3</sup> (P <0.999).



Table 3 – The quality of sanitation of cow's milk, which hurted like a kind of inflammation of the lymph glands

Indicators	Control group	1 - group	2 - group
Livestock	10	9	5
Organoleptic indicators	C Light yellow, with a characteristic pleasant smell and taste, evenly liquid, consistency	Beige, characteristic smell, taste	there is creamy dark yellow mucus
Acidity, ° T	16,40 ± 0,03	16,13 ± 0,03	15,73 ± 0,10
Density, ° A	1,031±0,03	1,031±0,03	1,024±0,05
Total oil,%	3,6 ± 0,02	3,83 ± 0,01	3,85 ± 0,03
Total lactose,%	4,45 ± 0,01	4,44 ± 0,01	4,43 ± 0,01
Number of somatic cells, thousand / cm <sup>3</sup>	121,8 ± 3,32	487,95 ± 14,31	1379,5 ± 32,68
КМАФАнМ, thousand / cm <sup>3</sup>	121,01 ± 7,11	1180,34 ± 59,95	3825,06 ± 89,16
Contamination of Microbes, class	631,6±0,04	Up to 500 of us 4 million.	Up to 4-20 million
Transmission capacity of electric milk, 1 / Ohm * cm <sup>3</sup>	4,34 ± 0,01	4,59 ± 0,02	6,14 ± 0,11
Milk grades	of superior quality	the first	is not subject to

In case of hidden mastitis, the acidity of milk is 0.27 ° T, and in the form of a clinical form, 0.67 ° T. decrease (P <0.999). In the composition of somatic cells of milk increased in connection with the increase in transmissibility. Up to 4.59 and 4.34 (latent mastitis) and 6.14 1 / ohm \* cm<sup>3</sup> (purulent-catarrhal mastitis). This is a sign of yshyrachanina's disease. The deterioration in the physical properties of milk in cows 1 and 2 groups, leading to a decrease in quality and sanitation quality of milk. In the composition of cow's milk of the 1st grade, it can be attributed to its latent mastitis disease only in terms of the number of bacteria. The clinical form of the disease, as well as the acidity of cow's milk, somatic cells and bacteria, does not correspond to the standard size, can not be accepted for the production of such milk.

**Conclusions.** The aim of our work in the economy of subclinical, purulent-catarrhal mastitis of spreading, revealing the factors causing inflammation in the udder, cows and disease prevention results of the analysis show that, in order to ensure effective work, the presence of clear clinical signs was found out of the investigated 30 goblets, 5 clinical signs of purulent-catarrhal mastitis, 9 (secretive mastitis) are more common than identified.

In case of expediency of economic expenses, having provided the following ways of prevention summing up the results of research works, clinical and laboratory research works in order to organize timely prevention. Disease of mastitis, milk with the disease reduces productivity, deteriorates the quality of protein, whey of milk, the quality of milk, safety performance and sanitation decreases. Milk production in milk production farms and therefore requires comprehensive measures aimed at safety. When carrying out work on the farm, it is possible to prevent, there is the opportunity to undergo the following lactation phase of diagnosing mastitis disease costs for prevention. They are: milk received from cows on the farm, a reduction in the consumption of lactation, milk from cows, mastitis patients, recycling, reduction in the number and reduction in sales, costs for calves treatment. Effective results can be obtained through timely diagnosis. "Cleanliness is the guarantee of health" as they say, cleanliness where there is a disease of livestock is reduced, the quality of the products is increased.

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#### ТҮЙІН

Қазіргі таңда Батыс Қазақстан облысында сиырлар маститі өзекті мәселе болып табылады. Мақалада сауын сиырларындағы субклиникалық және ірінді-катаралды желінсауды балауды нақтылау үшін шаруашылықтардағы сауын сиырлар мен алынған сүт сынамалары клиникалық және зертханалық жағдайда зерттелінді. Шаруашылықтарда жиі кездесетін желінсау ауруының сиырлардың сүт өнімділігі мен өндірілетін сүттің химиялық құрамы, органолептикалық қасиеттеріне тигізетін әсері анықталды.

#### РЕЗЮМЕ

В настоящее время в ЗКО мастит коров является актуальной проблемой. В статье приведены данные клинических и лабораторных исследований проб молока лактирующих коров хозяйства для более точной диагностики субклинического и гнойно-катарального мастита, а также приведены данные влияния мастита на химический состав, органолептические свойства молока.