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MASTITIS AND ITS COMPARATIVE TREATMENT METHODS

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МАСТИТ И СРАВНИТЕЛЬНЫЕ МЕТОДЫ ЕГО ЛЕЧЕНИЯ

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Abstract. Modern scientific data confirm that mastitis is a major problem in dairy farming in all countries of the world, and its subclinical form, unlike the clinical manifestation, is the most common. In addition, literature data allow us to conclude that mastitis is a polyetiological disease. On the one hand, its occurrence is caused by infectious agents (bacteria, mycoplasmas, fungi), and on the other hand, by the influence of environmental factors that reduce the resistance of the animal organism. The predisposing and accompanying factors for the development of this disease have a great influence. The first includes the body's resistance and the immune status of the animal, the second includes non-compliance with zootechnical, preventive and therapeutic measures, non-compliance with udder hygiene before and after milking, lack of control over the serviceability of milking. Inadequate disinfection of machines, as well as milking systems. Since mastitis remains one of the most common diseases of dairy herds in the world, it can be assumed that the required zootechnical, preventive and therapeutic measures are not fully observed in farms engaged in the breeding of dairy cattle. By strengthening control over the implementation of a number of measures, it is possible to reduce the number of cases of clinical and subclinical mastitis in cows. Specific prevention is the most effective method of combating mastitis, but the formation of stable and dense immunity can be achieved only by strict adherence to a certain list of zoohygienic and technological requirements.

Аннотация. Современные научные данные подтверждают, что мастит является важнейшей проблемой в молочном животноводстве всех стран мира, а его субклиническая форма, в отличие от клинического проявления, является наиболее распространенной. Кроме того, литературные данные позволяют сделать вывод о том, что мастит является полиэтиологическим заболеванием. С одной стороны, его возникновение обусловлено инфекционными агентами (бактериями, микоплазмами, грибами), а с другой стороны, влиянием факторов внешней среды, снижающих резистентность организма животных.

Большое влияние оказывают предрасполагающие и сопутствующие факторы развития этого заболевания. К первым относятся резистентность организма и иммунный статус животного, ко вторым – несоблюдение зоотехнических, профилактических и лечебных мероприятий, несоблюдение гигиены вымени до и после доения, отсутствие контроля за исправностью доения. Недостаточная дезинфекция станков, а также доильных установок. Поскольку мастит остается одним из самых распространенных заболеваний молочных стад в мире, можно предположить, что в хозяйствах, занимающихся разведением молочного скота, не в полной мере соблюдаются требуемые зоотехнические, профилактические и лечебные мероприятия. Усилив контроль за выполнением ряда мероприятий, можно снизить количество случаев клинического и субклинического мастита у коров. Наиболее эффективным методом борьбы с маститом является специфическая профилактика, однако формирование стойкого и плотного иммунитета может быть достигнуто только при строгом соблюдении определенного перечня зоогигиенических и технологических требований.

Keywords: cow, mammary gland, mastitis, inflammation, morphofunctional changes.

Ключевые слова: корова, молочная железа, мастит, воспаление, морфофункциональные изменения.

Mastitis is an inflammation of the mammary glands. The disease is characterized by damage to part or all of the mammary gland. This most often occurs during the calving or lactation period, since during this period the cows' body's defense system is weakened and they become more susceptible to negative factors, that is, they are more susceptible to various types of diseases [1].

The issues of mammary gland pathology are given such great attention by scientists, practitioners and manufacturers of veterinary drugs that it seems that it is simply impossible to say anything important and meaningful. However, the problem of mastitis does not go away, and its relevance is only increasing. What is the reason? We know everything, we can do everything, but we can do nothing or practically nothing. Some farms produce milk of European quality, and mastitis is under control. And at the same time, a huge amount of commercial milk goes to dairies of the I degree, that is, the number of somatic cells in milk varies from 500 thousand to 1 million per milliliter [3, 4].

Regarding the treatment of mastitis, successful treatment is directly dependent on the general condition of the cow and the timing of the start of treatment. The sooner the disease is detected and the sooner measures are taken, the higher the chance of success.

Mastitis can cause changes in the milk, udder and death of the cow. Mastitis can be treated with a combination of systemic antibiotics. For mild forms of mastitis, intrauterine drugs are usually best, while in more severe cases, systemic treatment is better. A rapid response procedure should be developed that is known to the farm staff responsible for treating mastitis with antibiotics. Recognizing the signs of mastitis and monitoring for early signs of infection is important for the health of the cow as well as the herd [2, 5, 6].

Materials and methods of the study

In 2024-2025, data on the occurrence and spread of mastitis among cows on farms were systematically collected and observed.

To conduct the experiment, we used dairy cows aged 2 to 5 years with an average weight of 450-550 kg, diagnosed with clinical and subclinical mastitis. Based on the principle of analogues,

taking into account the diagnosis, 3 groups of animals were created — one control and 2 experimental groups, each with 3 animals.

First of all, we examined the animals. The suprapubic lymph nodes were swollen, hard, painful, and some were red. It was very difficult to approach the animal. The animal was very anxious during the examination because it was painful.

The conductometric method is carried out by measuring the electrical conductivity of milk.

The presence of an inflammatory process, mastitis, increases the content of chloride ions in milk, and as a result, leads to an increase in electrical conductivity. This method is carried out on Draminsky mastitis detectors. Their advantage is the ability to detect subclinical mastitis. The method serves as an indicator of an increase in the number of somatic cells in milk. We determined somatic cells in milk using the Draminsky device, which is located in the obstetrics laboratory of ASAU.

The diagnosis was made based on the results of daily diagnostics of milk during morning and evening milking using the Kenotest test, clinical signs and hematological studies.

Results of the examinations

The effectiveness of the treatment of mastitis was assessed using the same criteria throughout the experiment. The final control of the condition of the udder using the express test was carried out three weeks after the clinical recovery of the animals. Blood sampling from each group of animals was taken before taking the drugs, 24 hours after their use, and also on the day of recovery after 96 hours.

Table 1

RESULTS OF RECOVERY OF COWS DURING COMPLEX THERAPY WITH CEFTONIT AND FLUNEX

<i>Group</i>	<i>Flunex dose, ml/kg in live weight</i>	<i>Recovery dynamics, hours</i>	<i>Negative test for mastitis*, days</i>	<i>Duration of clinical recovery, days</i>
Subclinical mastitis				
control	-	-	3	3
1 experience	2/45 over 24 s**		2	2 - 3
2 experience	1/45 over 24 s		2	2 - 3
Clinical mastitis				
control	-	12	4-5	4-5
1 experience	2/ over 24 s**	1-2	3	3,5
2 experience	1/45 over 24 s	2-3	3	3,5

* the number of somatic cells per cm³ is from 0 to 170,000

** according to the instructions

Since there are no local changes in the udder in subclinical mastitis, the effectiveness of complex treatment was assessed using an express test — the number of somatic cells in 1 cm³ of milk. As can be seen from Table 1, this indicator showed the fastest recovery dynamics with the three-time use of the Flunex drug with Ceftonit after 24 hours at a dose of 2 ml/45 kg. This allowed to obtain usable milk and healthy animals one day before treatment with antibiotics. Positive dynamics with complex therapy of purulent-catarrhal mastitis with antibiotics is observed on average 10 hours before the start of treatment compared to therapy with a single antibiotic (Table 1). At the same time, the hardening, swelling and pain of the udder decrease, the number of somatic

cells in milk tends to recover 1-2 days faster than with monotherapy. When using complex therapy, the recovery period of animals is also reduced by 0.5-1.5 days. Compared with the traditional use of the Flunex drug in the control group, the doses prescribed in the 2nd and 3rd experimental groups allow to achieve similar therapeutic effects, but at the same time reduce the cost of therapy (Table 2).

Table 2

SOME AVERAGE HOMEOSTATIC INDICATORS

Indicators	Physiological norm	Post-treatment period	Groups		
			1	2	3
Leukocytes, 10 ⁹ /l	4,0-12,0	background	47+-12	27+-7	43+-11
		96	17+-5	10+-2	11+-2
Lymphocytes, %	50,0-62,5	background	82+-4	80+-4	85+-4
		96	86+-7	57+-8	65+-3
Monocytes, Eosonophils, %	0,0-32,0	background	9+-2	10+-2	8+-3
		96	20+-4	24+-4	18+-2
Granulocytes, %	15,0-54,2	background	9+-2	9+-3	7+-2
		96	14+-3	19+-4	17+-1

Other indicators of blood and serum do not change, only small fluctuations are observed compared to the initial indicators within the physiological norm. It should be noted that throughout the experiment, an increase in the number of granulocytes (50-142.9%), monocytes and eosinophils (122.2-140%) was observed in the blood of experimental animals in all groups. This is probably the result of exposure to a small sensitizing factor in the body, which is not related to the disease and the therapy being carried out.

Table 3

BIOCHEMICAL BLOOD PARAMETERS OF COWS WITH CLINICAL AND SUBCLINICAL MASTitis (n=45)

Indicator	Groups			
	control	1 experiment	2 experiment	background
Total protein, g/l	76,9±3,12	77,3±2,97	76,2±2,11	80,56±1,89
Albumins, g/l	44,1±2,83	43,8±2,79	43,6±2,06	45,8±1,19
Globulins, g/l	32,8±1,97	33,5±1,37	32,6±1,58	34,76±1,47
Glucose, mmol/l	2,23±0,02	2,24±0,02	2,31±0,01	2,47±0,21
Total calcium, mmol/l	2,36±0,22	2,34±0,16	2,37±0,12	2,56±0,17
Inorganic phosphorus, mmol/l	1,54±0,18	1,58±0,19	1,59±0,09	1,65±0,13

As can be seen from Table 3, the level of total protein in the blood serum of animals from the experimental and control groups was slightly lower than the background values and was 76.9±3.12 g/l, 77.3±2.97 and 76.2±2.11 g/l in the control, first and second experimental groups, respectively. Meanwhile, there was a statistically significant difference in this indicator between the control and experimental groups.

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