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Treatment and Prevention of Mastitis in High-Yielding Cows

Abstract

The article deals with the study of the prevalence of acute mastitis among cows in the farms of the Republic of Azerbaijan and the improvement of the effectiveness of treatment measures based on complex therapy with pathogenetic, symptomatic and etiological effects in the treatment of this disease. The therapeutic efficacy of Roxacin-M 0.1% solution in the treatment of subclinical mastitis in dairy cows was 93% and the effectiveness of Roxacin-M and Masticort Phyto preparations in combination with other mastitis treatments was investigated and applied.

The direct causes of mastitis are mechanical damage to mammary gland tissues and their infection. As a result of improving the functional properties of the mammary gland (milking rate, resistance of the mammary gland to diseases), it is possible to use milking equipment efficiently and reduce the time spent on milking. The incidence of mastitis depends on both productivity indicators and technological factors. Thus, when the productivity of animals is low, the percentage of cows with mastitis also decreases.

Keywords: *cow, mastitis, mammary gland, subclinical, therapy, inflammation*

Introduction

There are a fairly large number of factors affecting the development of mastitis (inflammation of the mammary gland) in animals. Today, veterinarians and specialists working in this field are working on the issues raised in order to identify the causes leading to the development of mastitis.

Research conducted over several years has shown that mastitis in animals occurs mainly for two reasons: endogenous and exogenous. It is also necessary to note the following factors for the development of this disease: complicated course of the birth process, gynecological diseases, violation of sanitary and hygienic rules established in animals during childbirth, improper composition of the feed ration, mechanical shocks during milking, pathogenic microflora.

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The main purpose and objectives of the study:

To determine the prevalence of acute mastitis among cows; to analyze the clinical forms and features of the course of mastitis; to evaluate existing treatment methods and comparatively study their effectiveness; to develop a complex therapy regimen consisting of pathogenetic, symptomatic and etiologically effective drugs; to determine the therapeutic efficacy and duration of action of the developed treatment regimen; to substantiate the application of the proposed treatment measures in farms.

The etiology of the disease is often associated with the introduction of infection against the background of a weakened immune system (Danmallam, & Pimenov, 2017; Golubev, Pavlov, & Sukhova, 2001). Infection of the mammary gland parenchyma occurs mainly as a result of the entry of pathogenic bacteria through the teat canal.

Research

In the works of Bozhenov E.S. and Sviridenko G.M., it is noted that about 90 types of "conditionally pathogenic" microorganisms that are the causative agents of mastitis are relevant. These microorganisms can enter the mammary gland galactogenically (through the milk duct), as well as lymphogenously and hematogenously, especially during wounds, when inflammatory processes develop in other organs and tissues (endometritis, gastroenteritis) (Kartashova, Kirgizova, & Isaykina, 2004; Klimov, & Slobodyanik, 2012).

According to different authors (Ahmadov, Isgandarov, 2010; Ajuwape, Roberts, Solarin, & Adetosoye, 2005), staphylococci are the most etiologically important of these bacteria, followed by streptococci and Escherichia coli, the role of other microorganisms is secondary.

Unlike other organs, the mammary gland does not only serve the body, but often even hinders it. It removes from the body the most valuable elements that enter the blood for other organs and tissues and their components, often weakening them and can lead to the death of the organism as a result of exhaustion; the mammary gland prevents the animal from moving. Like the genitals, the mammary gland should always be considered as an organ of the species, it functions only in natural conditions during the period of suckling the cub; it evolves in connection with birth and involutes when the cub no longer needs its mother's milk.

The mammary gland is of interest to zootechnicians and veterinarians as an organ that produces an indispensable food product (colostrum) for newborns and provides the food industry with an important raw material - milk. According to various authors, staphylococci are detected in 25-50% of cases of mastitis in Tanzania, Bangladesh, Ethiopia, Pakistan and India (Alawa, Ngele, & Ogwu, 2000; Golubev, Pavlov, & Sukhova, 2001).

In the CIS countries, pathogenic staphylococci are found in 20-40% of cases of mammary gland inflammation in small ruminants (Kartashova, Kirgizova, & Isaykina, 2004). As mentioned, mastitis is an inflammation of the mammary gland parenchyma, characterized by physicochemical and bacteriological changes in milk, as well as the development of pathologies in the gland (Klimov, & Slobodyanik, 2012; Ahmadov, & Isgandarov, 2010). This disease can have both infectious and non-infectious etiology, but bacterial and other pathogens have a major impact on the pathogenesis and progression of the disease. These include various bacteria (Ajuwape, Roberts, Solarin, & Adetosoye, 2005), viruses, mycoplasmas, and yeast fungi. Due to mastitis in cattle, milk production suffers great economic losses in many countries of the world, including the United States, Pakistan and other places.

Mastitis is one of the main problems of dairy cattle breeding. One of the main reasons for the occurrence of mastitis in cows is the genetic predisposition and the fact that animals show various forms of resistance depending on their sex, intraspecific and lineage. This is confirmed by morphological and interior indicators (Gomboyev, 2005).

According to studies, due to shortcomings in the selection of dairy cattle and their transfer to machine milking, more than 10% of cows are eliminated during selection due to atrophy of one or two mammary glands, taking into account the shape of the mammary gland and the size of the udder.

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Against the background of intensive development of dairy farming and the constant increase in milk yield, deficiencies in feeding, violation of housing conditions and improper milking technology are considered important problems. As a result, changes occur in the general physiological state of the animal's body and in the mammary gland (Klimov, 2009).

According to veterinary statistics, up to 75% of mastitis cases observed with clinical signs occur during lactation. The prevalence of mastitis is due to the year-round confinement of animals. The highest incidence of acute mastitis was observed in January-March, which is associated with the lack of valuable feed and active movement. The percentage of mastitis cases was lowest during the grazing period (May-September). According to the observations, in 69% of cases, one lobe of the mammary gland is involved in the inflammatory process, and in rare cases (29%) - two or more lobes. At the same time, in more cases (61.4%) it was observed that the anterior lobes of the mammary gland of cows were damaged (Kolenchukova, n.d.).

According to the data in the outpatient journal, mastitis occurred on average 26% in the postpartum period, 37% in the later stages of lactation, and 37% during the cessation of milking and the transition to the dry period.

The main causes of mastitis are as follows: Lack of selection and breeding work on the shape of the mammary gland and the structure of the teats, which in many cases leads to violations of the technology of milking by machine; Incomplete and irrational organization of protein-carbohydrate-mineral feeding, especially at the initial stage of milking, which leads to the development of ketosis and acidosis in animals (Nasibov, & Verdiyeva, 2023).

The development of methods for studying and evaluating the morphological and functional properties of the mammary gland is of great practical importance.

Our analysis of the composition of the microflora in the secretion of the mammary gland showed that the following microbial cultures are mainly found during subclinical mastitis: staphylococci, streptococci, E. coli, proteus, blue-green bacilli (Pseudomonas aeruginosa), Bacillus and fungi.

Experiments were conducted to determine the therapeutic efficacy of the drug Roxacin-M.

Table 1. Therapeutic efficacy of Roxacin-M in cows with mastitis.

Experimental groups	Preparations	Dose (ml)	Number of sick animals	Recovered animals (after 3 days)	Recovered animals (after 5 days)
First experiment	Roxacin-M Fluxirol	10 intercisternal) every 12 hours 22 (intravenously) for 3 days	6	3	6
Second experiment	Roxacin-M Recefur PS-200	15 (intercisternal) every 12 hours 17 (subcutaneous) Once	6	4	6
Control group	Masticort - Phyto Resefur PS-200	10 intercisternal) Every 12 hours 17 (subcutaneous) Once	6	4	6

According to the available data, on the third day of treatment, the number of recovered animals in the second experimental and control groups was 4, while in the first experimental group this figure was 3. On the fifth day of treatment, complete recovery was observed in all three groups (Nasibov, Ahmadov, & Verdiyeva, 2014).

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Conclusion

Cows throughout the lactation period are subjected to diagnostic measures every month, taking into account the relevant requirements, in order to determine the increase in the number of somatic cells in the mammary gland secretion, and various indirect methods are still used to determine their number.

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