УДК 619:612.017.1:616-006.446:636.22/.28

Research article

Open access

DOI: 10.32634/0869-8155-2023-375-10-30-33

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Received by the editorial office:
12.05.2023

Accepted in revised:
15.09.2023

Accepted for publication:
29.09.2023

# An alternative remedy for the treatment of mastit in cows

## ABSTRACT

**Relevance.** Mastitis in farm animals is widespread and ubiquitous and causes great economic damage to dairy cattle. The drugs used do not always give the desired results. The search of new highly effective methods and means of therapy for all forms of mastitis in cows is a top priority of scientific and practical veterinary workers.

**Methods.** The therapeutic effect of the cream was carried out in the SPK «Red Partizan» of the Khunzakh region, on 90 dairy cows of the red steppe breed, on different stages of lactation, with inflammation of the skin of the nipples of the udder. Cows after milking were lubricated with inflamed nipples 2 times a day. In the experimental group 50 heads, inflamed nipples were smeared with a developed cream. In the second (control) group — 40 heads, the means used in this farm was used.

**Results.** Studies have established that 98.0% recovered in the experimental group. The course of treatment was 3–4 days. It should be noted that in animals after 2–3 procedures of applying of the cream on the inflamed nipples, the skin became softer, dryness disappeared. On cracks and abrasions tissue, regeneration began and complete healing occurred on the 3–6th day. The animals tolerated the milking process more calmly. In the control group, 75.0% of cows were cured. Duration of treatment — 5–8 days.

***Key words:*** cows, udder teat skin inflammation, cracks, treatment, milking cream, mastitis

***For citation:*** Aliyev A.Yu., Karpuschenko K.A. An alternative remedy for the treatment of mastit in cows. *Agrarian science.* 2023; 375(10): 36–33. https://doi.org/10.32634/0869-8155-2023-375-10-30-33



**Научная статья**

Открытый доступ

DOI: 10.32634/0869-8155-2023-375-10-30-33

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Поступила в редакцию:
12.05.2023

Одобрена после рецензирования:
15.09.2023

Принята к публикации:
29.09.2023

# Альтернативное средство для лечения мастита у коров

## РЕЗЮМЕ

**Актуальность.** Мастит у сельскохозяйственных животных широко и повсеместно распространен и наносит молочному скотоводству большой экономический ущерб. Применяемые лекарственные препараты не всегда дают желаемые результаты. Изыскание новых высокоэффективных методов и средств терапии всех форм мастита у коров представляет собой первоочередную задачу научных и практических ветеринарных работников.

**Методы.** Изучение лечебного действия крема проводили в СПК «Красный партизан» Хунзахского района на 90 молочных коровах красной степной породы на разных стадиях лактации, имеющих воспаление кожи сосков вымени. Коровам после завершения доения смазывали воспаленные соски два раза в день. В опытной группе 50 голов, воспаленные соски смазывали разработанным кремом. Во второй (контрольной) группе — 40 голов, использовали средство, применяемое в данном хозяйстве.

**Результаты.** Исследованиями установлено, что в опытной группе выздоровели 98%. Курс лечения составил 3–4 дня. Необходимо отметить, что у животных уже после 2–3 процедур нанесения крема на воспаленные соски кожа становилась более мягкой, исчезала сухость. На трещинах и ссадинах начиналась регенерация тканей, полное заживление происходило на 3–6-й день. Животные более спокойно переносили процесс доения. В контрольной группе излечены 75% коров. Длительность лечения — 5–8 дней.

***Ключевые слова:*** коровы, воспаление кожи сосков вымени, трещины, лечение, крем для доения, мастит

***Для цитирования:*** Алиев А.Ю., Карпущенко К.А. Альтернативное средство для лечения мастита у коров. *Аграрная наука.* 2023; 375(10): 30–33 (In English). https://doi.org/10.32634/0869-8155-2023-375-10-30-33

**Введение/Introduction**

In the conditions of industrial animal husbandry, the productivity of the industry, including the quality of the resulting meat, milk and wool, are significant indicators of its effectiveness. The quality of milk depends, mainly, on the condition of the mammary gland. One of the main diseases are mastitis, which, under conditions of intensification, cause significant damage to dairy cattle breeding [1–4].

V.P. Goncharov, V.A. Karpov, I.L. Yakimchuk (1987) and others note the diversity of etiological factors and the heterogeneity of pathological changes in the tissues of the udder, which indicates that the prevention and treatment of mastitis must be carried out taking into account the care, maintenance and sanitary and hygienic measures in farms. The etiology of mastitis in cows has infectious (it occurs due to the fact that various pathogenic bacteria penetrate into the udder) and non-infectious nature (they include udder skin diseases, violation of housing and feeding conditions, non-compliance with machine milking technology, intoxication of the animal's body, leading to a decrease in local and general immunity, etc.). These factors can lead to premature culling of cows and breeding heifers [5–7].

Therapeutic measures in mastitis with the use of drugs do not always lead to the desired results and the expected effect. In this regard, the search of effective means and methods of treating of various manifestations of mastitis in cows is an urgent task [8].

The etiological factors of the non-infectious manifestation of mastitis include a violation of the integrity of the mammary gland tissues, through which microbes freely penetrate into damaged tissues, develop in them, acquiring pathogenic properties, being a predisposing factor to drying, chapping, loss of elasticity, and the appearance of cracks.

Penetrating through the cracks, microbes through the lymphatic vessels enter the breast tissue and contribute to the occurrence of mastitis [9].

Often, irritation first appears, which can be considered the initial stage of mastitis, and subsequently can be layered on the infectious process. This once again proves that the basis of measures to combat mastitis should be the prevention and treatment of udder irritations that occur as a result of violations of the rules of feeding, keeping and exploiting of animals.

Currently, veterinary practice has an arsenal of tools to combat udder skin diseases, but not all of them are sufficiently effective. Therefore, the search of highly effective means is an urgent task.

Many authors note a positive effect when applied on the skin of the udder after milking means that have a beneficial effect on the skin of the nipples and udder with mastitis[1, 2] [10–12].

It is impossible to eliminate the problem with the help of ointments or creams alone, but they can be an excellent addition to the treatment prescribed by the doctor. These drugs are used as anti-inflammatory, anesthetic and warming drugs, which helps to restore the skin in its deep layers with mastitis and bruises in the udder of a cow. In combination with other medicines, they can be used as an adjuvant for mastopathy and endometritis. The high efficiency of this product is due to its constituent components.

Taking into account the above, the staff of the laboratory of the study of diseases of agricultural animals of non-contagious etiology of the Caspian zonal NIVI — branch of the Federal State Budget Scientific Institution «FANC RD» — developed a Cream for milking[3].

*Purpose of the study.* To study the allergenic, sensitizing, regenerating and healing properties of the developed Milking Cream as an alternative treatment of mastitis in cows.

**Материалы и методы исследований / Materials and methods**

Allergenic, sensitizing, regenerating and healing properties of the preparations werestudied according to the Guidelines[4].

The study of allergenic (sensitizing) properties of Milking Cream was carried out on 8 clinically healthy rabbits, weighing 2–3 kg, 4 of which were experimental and 4 — control. The studies were carried out by the method of epicutaneous applications. For this purpose, in the rabbits on the back, in a 5 × 5 cm area, were cut off the hairline and a cream was applied 2 times a day. Rabbits of the control group were treated with fir ointment intended for the treatment of hand skin diseases in humans. The processing of rabbits of both groups was carried out during 15 days in a row, with a systematic monitoring of their health.

The regenerating and healing properties of the cream were studied on 10 white rats, weighing 170–210 g (5 experimental, 5 control). The hair was removed from the animals in a 5 × 5 cm area, and a wound area was created with superficial incisions of the scalpel, on which a culture of *St. aureus* 209 P, in a concentration of 1 billion ml in 1 cm, in an amount of 0.5 cm. The entire surface of the wound was wetted last. After 1–2 days, a pronounced inflammatory lesion on the skin appeared.

Animals of the experimental group were treated with the developed ointment in a thin layer on the focus of inflammation, 2 times a day, until healing. In the control, fir ointment was used.

The material for the study was Milking Cream, which includes: veterinary vaseline, anhydrous lanolin, biologically active additives, emulsifier and electrified water. As a bactericidalcomponent, the cream includes 15% decoction of green walnut leaves and electrified water, as biosafe biologically active and antibacterial additives and stimulants of regeneration processes — black cumin oil, chamomile oil, rosehip oil, as an emulsifier — Olivem 1000, prolongator — bentonite (dry powder), preservative — citric acid.

Emulsifier Olivem 1000 is a substance of natural origin, prevents irritation, gives energy and nourishment to the skin, is hypoallergenic, softens the aggressive effect of surfactants.

The therapeutic effect of the Milking Cream was studied from March 15 to June 15, 2021 in the Krasny Partizan farm, Khunzakh district, Dagestan, on 90 dairy cows of the red steppe breed with cracks, abrasions, scratches, wounds, erosion, dermatitis of the udder teats, divided into 2 groups: experimental — 50, control — 40 heads.

[1] Patent RF 2245133, A61 K9/06, 31/14/ Antiseptic ointment for the udder / publ.2005.01.27/ A.G. Milyanovsky, A.M. Toktaeva.
[2] Patent RF 2189237, A61 K33/00 Means for the prevention of mastitis in lactating cows — cream «Garant» / publ. 2002.09.02 // N.I. Polyantsev, O.F. Shakirov.
[3] Patent RF 2787381 / Cream for milking / publ. 01/09/2023, bul. No. 1 / A.Yu. Aliev, A.M. Bittirov, K.A. Karpuschenko, S.Sh. Abdulmagomedov; applicant and patent holder FGBNU «FANC RD».
[4] Guidelines on toxicological assessment of chemicals and pharmacological preparations used in veterinary medicine (approved by MS MHP RB No. 10-1-5 / 198 of March 16, 2007).

Cows were lubricated with inflamed nipples 2 times a day. In the experimental group, the nipples were lubricated with a developed cream. In the control group, the agent used in this household (Vaseline) was used.

**Результаты и обсуждение / Results and discussion**

When determining of the allergenic and sensitizing properties of the developed cream, it was found that during the entire period of its application and 15 days after the end, the skin of both experimental and control rabbits did not observe the appearance of swelling, hyperemia, soreness and other signs of an inflammatory reaction. With intradermal administration of 0.1 $cm^3$ of sterile saline, it was found that it was absorbed within 60 minutes in both experimental and control animals. The data obtained indicated the absence of allergenic and sensitizing properties in the resulting cream.

The study of the regenerating and healing properties of the obtained cream showed that after its application on 3–4 days, the experimentally induced inflammatory process on the skin of white rats decreased, tissue swelling decreased, the wound surface was cleaned and active growth of granulation tissue began. On the 7–8th days, healing occurred. In the control group, the process of regeneration and healing of the inflammatory focus occurred 2–3 days later.

It was established that the use of Milking Cream during the observation period did not have a negative effect on the skin of the udder teats.

Restorative and regenerating properties of the developed cream appeared on the 3–4th days.

The therapeutic properties of the cream were tested on 90 cows, which were divided into 2 groups: experimental — 50, control — 40 heads, in which pathology of the skin of the udder teats (cracks, abrasions, scratches, wounds, erosion, dermatitis) was observed before the start of the experiment.

The results of the conducted studies are presented in table 1.

*Table 1.* **Data of the therapeutic efficacy of the Cream for milking in «Red Partizan» Khunzakhsky district**

| Groups | Number of living | Days of treatment | Recovered | | Remaining patients | |
|---|---|---|---|---|---|---|
| | | | head. | % | head. | % |
| Experimental | 50 | 3–4 | 49 | 98.0 | 1 | 2,0 |
| Control | 40 | 5–8 | 30 | 75.0 | 10 | 25,0 |

From table 1 it follows that the effectiveness of treatment in the experimental group of cows was 98.0%, with a course of treatment — 3–4 days.

It should be noted that the process of restoration and regeneration of the skin of the udder teats lasted 3–6 days.

In the control group, the effectiveness of treatment is 75.0%, with a course of treatment of 5–8 days. Further observations of the animals for 10 days did not reveal any deviations in the condition of the teats and udders.

As a result of the research, a pronounced ability of the Milking Cream to activate the processes of healing and regeneration of the skin epithelium was established, in the absence of allergenic and sensitizing properties.

**Выводы/Conclusion**

Studies have shown the high efficiency of Milking Cream for the treatment of udder teat skin pathologies (cracks, abrasions, scratches, wounds, erosions, dermatitis) in cows and the possibility of using it as an alternative remedy. The effectiveness of treatment in the experimental group — 98%, with a course of treatment — 3–4 days. It should be noted that the process of restoration and regeneration of the skin of the udder teats lasted 3–6 days.

In the control group, the effectiveness is 75%, with a course of treatment of 5–8 days. Further observations for the animals during 10 days did not reveal any deviations in the condition of the teats and udders.

Все авторы несут ответственность за работу и представленные данные.
Все авторы внесли равный вклад в работу.
Авторы в равной степени принимали участие в написании рукописи и несут равную ответственность за плагиат.
Авторы объявили об отсутствии конфликта интересов.

All authors bear responsibility for the work and presented data.
All authors made an equal contribution to the work.
The authors were equally involved in writing the manuscript and bear the equal responsibility for plagiarism.
The authors declare no conflict of interest.

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