



## Use of Flunex and Ceftonite drugs for inflammation of the uterus in cows

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### ABSTRACT

Currently, in connection with the active development of dairy farming in Russia, the main requirement is to increase the dairy productivity of cattle and improve the quality of primary products. Despite the successes achieved in studying the causes of the development and pathogenesis of endometritis, the development of prevention methods, the frequency of their manifestation, especially in highly productive dairy herds, has no tendency to decrease. We conducted an experiment to study the effectiveness of the Flunex biogenic preparation with the Ceftonite gynecological suppositories in a comparative aspect with other known preparations with acute catarrhal-purulent endometritis. When conducting the experiment, before determining the therapeutic efficacy of the above drugs, anamnestic data were collected, the general condition, fatness and physique of the animal were determined. When using the tissue preparation Flunex with the gynecological suppositories Ceftonite for therapeutic purposes, with acute catarrhal-purulent endometritis of cows, recovery is faster than when using natural colostrum in combination with ichthyol suppositories.



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### INTRODUCTION

Scientific and technological progress in agriculture, which brought great benefits to people, has led to the appearance of a number of problems, the solution of which is connected with the future of humanity on the planet. Among such problems the priority should be given to the problem of providing the population with environmentally friendly livestock products. In this regard, livestock and agriculture products have been and continue to be a significant international trade item, an important increasingly scarce resource. In the Russian Federation, current and long-term plans include accelerating pro-

duction growth in agriculture and related sectors of the agro-industrial complex (Khristoforovich *et al.*, 2016; Smolentsev *et al.*, 2018).

In this regard, the rise in livestock breeding is inconceivable without intensive reproduction of the herd, improved diagnosis, prevention and treatment of obstetric and gynecological diseases of female farm animals, which subsequently lead to infertility. Often, one of the etiological factors causing cow infertility is bacterial contamination of the uterus and various violations of their reproductive function that arise on these grounds (Semenov *et al.*, 2018). Microorganisms intensively show their pathogenic properties, especially when reducing the overall resistance of the body due to difficult births, trauma of the birth canal during obstetric care, operative separation of the delayed afterbirth, uterus subinvolution, violation or sharp changes of the feeding conditions, animals' keeping and exploitation (Anatolievna *et al.*, 2016; Ilyasovich *et al.*, 2016).

The problem of microbial contamination of the genital tract of cows is not well explored. This is due to the fact that in connection with the wide and not always rational use of various antimicrobial drugs, especially antibiotics, the balance in evolutionary ecological systems and microbial association is disturbed, which contributes to the emergence of bacterial strains resistant to antibacterial drugs that change the microbial landscape of animal genitalia and micro flora composition (Egorov *et al.*, 2018).

Moreover, drugs introduced into the uterine cavity, after 1–2 hours enter the milk, as a result of which during the entire course of treatment and after its completion (3–8 days) it can not be used as food by humans, as well as the dairy products made of it. All this necessitates the creation of new environmentally friendly highly effective drugs. In this direction, preparations based on the placenta and plant materials deserve positive attention (Matveeva *et al.*, 2015). The advantage of drugs based on raw materials of animal and plant origin is that they contain various active substances that have a complex action on the animal's body in comparison with many synthetic agents. Most of the above-mentioned drugs are also characterized by mild action and side effects absence, that can be explained by the commonality of the basic biochemical processes in plant and animal cells (Dmitriyevich *et al.*, 2016). In this regard, the use of placental-based biogenic preparations in conjunction with gynecological suppositories made on the basis of plant materials for the treatment of postpartum endometritis in cows is of great practical importance in the prevention of symptomatic animal infertility.

## MATERIALS AND METHODS

The work was carried out in the scientific advisory center of Mari State University, as well as on the farms of the Mari El Republic. Experimental work on the study of the efficacy of Flunex biogenic drug together with gynecological suppositories Ceftonite in a comparative aspect with other known drugs was carried out on 21 cow with acute catarrhal purulent endometritis. For this purpose, groups of animals were selected taking into account the goals and objectives of research on the basis of similarity and difference. Animals were kept in the same conditions, received the same diet, were treated equally. To obtain therapeutic efficacy, the tested Flunex preparation and Ceftonite gynecological suppositories were used according to the approved guidelines.

When conducting the experiment, before determining the therapeutic efficacy of the above drugs, anamnestic data were collected, the general condition, fatness and physique of the animal were determined. Clinical study: body temperature measurements, pulse counts, ruminations, and the number of respiratory movements in experimental cows were carried out before and in the end of the experiment. The condition of the reproductive system of the experimental cows was monitored regularly from the beginning of the treatment to their full recovery through external and internal studies. A rectal examination determined the shape, size and location of the uterus, the condition of its walls, sensitivity and rigidity degree. When examining the ovaries, their shape, size, presence of follicles, corpus luteum, as well as sensitivity, density, location and mobility were established.

The results of the therapeutic effectiveness of the complex treatment were judged based on the results of a general clinical gynecological study of the external and internal genitals of cows, manifestation time of sexual cycles, their usefulness, fertility after the first, repeated and subsequent insemination were taken into account, the days of infertility and the insemination index were calculated. The cows were inseminated on farms artificially with a deep-frozen sperm using the recto-cervical method. The timing for insemination of cows was carried out visually.

## RESULTS AND DISCUSSION

### Application of Flunex drugs together with Ceftonite gynecological suppositories

In acute catarrhal-purulent endometritis, mastitis in cows, immunodeficiency states of young animals, impaired reproductive function of the uterus, the pharmacological preparation Flunex (denatured,

emulsified placenta) developed by [Valiullin et al. \(2017\)](#) is a tissue biogenic stimulant consisting of human placenta in the form of cocoa color suspension.

However, tissue biostimulgins have neither bactericidal nor bacteriostatic properties, their therapeutic effect depends on the tonic action on the organism of the animal.

In this regard, for local exposure against pathogenic microflora agents in acute catarrhal and purulent endometritis in cows there were used intrauterine gynecological suppositories Ceftonite, developed and patented by us (patent №2198652 dated 20.02.2003, priority of invention dated 07.02.2001), which have antimicrobial and anti-inflammatory effects.

The table shows that after the introduction of the above drugs in the treatment of cows with acute catarrhal-purulent endometritis, the recovery was faster than in case of using natural colostrum in combination with ichthyol suppositories.

A complete restoration of the sick uterus contractile ability was observed in most of cows after 8–9 days, with the exception of some cases when uterine rigidity was restored only on the 15–17th day from the start of treatment. This is apparently due to the fact that acute catarrhal-purulent endometritis of those cows was complicated by inflammation of the mammary gland.

With the restoration of a sick uterus contractile ability, positive changes also affected its walls. On the 5–6th day after complex treatment, most cows experienced gradual decreasing of the uterus walls swelling; on the 8–9th day in many sick animals the uterus was located in the pubic fusion, its size was approaching to standard values.

In the vagina and external genitalia, hyperemia of the mucous membranes, swelling of the labia and soreness disappeared. Complete restoration of the reproductive organs was observed in 17 (80.9%) cows.

In 4 cows the uterine contractility has not been restored. Clinical recovery occurred after 15–17 days.

Amongst 21 cows with catarrhal-purulent endometritis treated using Flunex preparations and Ceftonite gynecological suppositories, 17 came in oestrus and were successfully inseminated, which is 80.9%: including those after first insemination – 4 (19.05%), after the second insemination – 8 (38.09%), after the third and subsequent inseminations – 5 (23.8%). Four cows, or 19.05%, after repeated insemination remained barren.

Infertility days in the group averaged  $72.0 \pm 4.6$  days, with insemination index of  $1.9 \pm 0.46$ .

### **The use of natural colostrum in combination with ichthyol suppositories**

It is known that natural colostrum in the form of injections is used to accelerate uterine involution to stimulate sexual function in cows in the early post-natal period, as well as in cases of retained placenta and subinvolution of the uterus, which proceeds in the initial stage as serous inflammation of the endometrium and mammary gland inflammation.

The ichthyol-based drugs are used in veterinary practice for local exposure against infectious agents for endometritis in cows. Thus, [Popov et al. \(2018\)](#) successfully used ichthyol suppositories in the treatment of endometritis. They are low toxic, having moderately irritating properties, contribute to the activation of secretory and contractile activity of the uterus, improve blood circulation and thereby enhance regenerative processes in the focus of inflammation.

There were 18 cows with acute catarrhal-purulent endometritis involved in the experiment. For therapy, a second portion of colostrum was taken from healthy cows and injected subcutaneously into the region of the middle third of the neck at a dose of 30 ml 5–6 times with a 48-hour interval; ichthyol suppositories were used intrauterine according to the approved instruction.

Table 1 shows that the results of treating cows with colostrum and intrauterine administration of ichthyol suppositories turned out to be less effective when comparing with using the Flunex preparation with the Ceftonite gynecological suppositories.

On application of this method of treating the cows with acute catarrhal-purulent endometritis, the treatment required a longer use of drugs (12–14 days), especially for those animals having a difficult birth with injuries of the birth canal.

However, as in case with treatment using Flunex in combination with the Ceftonite gynecological suppositories, an improvement in the course of the inflammatory process was noted in most cases: Metrorrhea changed from liquid dirty brown to stiffer and lighter ones, an unpleasant odors of purulence has disappeared. However, the full recovery of sick animals was going more slowly and not in all cases. The effectiveness of this treatment method was lower in comparison with using the Flunex preparation together with Ceftonite suppositories.

The Table shows that amongst 18 cows treated, 12 (66.67%) were successfully inseminated, including

**Table 1: Efficacy and Fertilization of Cows in the Treatment of Acute Catarrhal-Purulent Endometritis**

No. p/p	Indicators	Flunex + Ceftonite		Colostrum + ichthyol suppositories n=18	
		goals	%	goals	%
0%					
1.	Recovered	17	80.9	12	66.67
2.	Fertilization rate, total	17	80.9	12	66.67
	- after first oestrus	4	19.05	2	11.11
	- after second oestrus	8	38.09	6	33.33
	- after third and subsequent oestrus	5	23.8	4	22.22
3.	Remained barren	4	19.05	6	33.33
4.	Infertility days, n	72.0±4.6		83.4±6.88	
5.	Insemination index	1.9±0.46		2.1±0.56	

2 cows (11.11%) after the first insemination, 6 after the second (33.33%) one, and after the third and subsequent inseminations – 4 (22.22%). The other 6 cows (33.33%) remained barren. The number of infertility days in the group averaged  $83.4 \pm 6.89$  days, with insemination index of  $2.1 \pm 0.56$ .

## CONCLUSION

Thus, the best therapeutic effect was obtained when using the Flunex preparation in combination with the Ceftonite gynecological suppositories, having antimicrobial effect against bacteria and fungi secreted from the genitals of cows with catarrhal-purulent endometritis. In this case, the contractile ability of the animal uterus had been restored faster. Positive changes were observed for uterus walls condition, hyperemia of the mucous membranes, swelling of the labia and soreness disappeared in the vagina and external genitals. All this contributed to the improvement of metabolic processes. In addition, the use of the Flunex biogenic preparation in combination with gynecological suppositories based on plant materials provides environmentally friendly milk and dairy products.

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## Conflict of Interest

None.

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