produced specifically for the patient are other functional, especially considering the variety of animal species and size differences. In addition to these, medical devices and instruments can also be produced. Recently, studies have been carried out on the use of 3d printing in pharmaceutical research and the drug manufacturing and dosage forms of active substances that are also used in human health and common animal health, but are not in a form suitable for dosage. Finally, three-dimensional bioprinters are used together with materials used in tissue engineering and stem cell technologies, making it possible to print living tissue such as skin, cartilage and bone tissue, and even organs, and this is possible to work on issues such as organ transplantation and tissue transplantation, which are discussed for ethical reasons in veterinary medicine.

Key Words: 3D printing, 3D models, Veterinary medicine, Veterinary education

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THE EFFECTIVENESS OF UBERDERMIN FOR DISEASES OF THE COWS UDDER

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Mastitis of lactating cows remains a more urgent problem in dairy cattle [3]. When developing methods and means of therapy for mastitic cows, it is important to take into account that the proposed means should be simple, non-traumatic and be in accordance with hygiene requirements, feasible under production conditions with simultaneous coverage of the entire dairy herd [2]. Iodine-containing compounds have pharmacological value, especially if iodine is in them in a biologically active form. Among the iodine-containing preparations that are currently used for the treatment of cows and heifers with mastitis are Lazin, Septogel and Polymeriodvismutsulfamid are known [1]. The interaction

of streptocide, iodine and bismuth salts in the medium of polymerizing substances by M. I. Polyantsev et al. polymeriodobismuthsulfamide (PIVS) was created.

Iodbismuthsulfamide, which is included in the composition of the drug, is enclosed in microcapsules made of a carrier polymer. Thanks to this structure, after application to intact skin, it easily overcomes tissue barriers and, reaching the pathological center, acts on it in a complex (antimicrobial, antiallergic, analgesic).

The transdermal remedy has advantages over the intracysternal one: the technique of carrying out procedures is simplified, the risk of injury to the nipple canal, and the inoculation of microorganisms from the outside are eliminated

The goal of our research was to create a new iodine-containing anti-mastitis preparation for skin (application) use, which would have high therapeutic efficacy and would not impair the organoleptic and biochemical characteristics of milk.

The science-based work program was carried out on the basis of the laboratory of the Department of Surgery, Obstetrics and Diseases of Small Animals of Odesa State Agrarian University, Experimental Agricultural Enterprise- Base "Dachne" of Bilyaiv District, Odesa Region.

The technological parameters of the new anti-mastitis drug uberdermin were worked out through research and development. In the future, the physico-chemical properties and stability during long-term storage were studied, the effect on the mammary gland and the organoleptic properties of milk were determined.

Laboratory studies included counting the number of somatic cells (according to Prescott-Bride), lysozyme activity (according to M. Mutovin), pH (pH - meter), the presence of free iodine (titrometric method), the content of lactose, total protein, chlorides.To study the application effect of uberdermin on the tissues of healthy mammary glands of cows, two groups were formed, each with the number of 6 cows.

Cows of 1 / experimental / group were treated with 25 ml of uberdermin diluted with physiological solution in a ratio of 1: 1 three times, with an interval of 24-26 hours, on the thoroughly washed skin of the right half of the udder.

We have completed the work on the creation of an iodine-containing drug for transdermal use, studied its physicochemical properties, long-term storage stability, local irritant effect, exfoliating ability, harmlessness for the cows, therapeutic effectiveness for mastitis (clinically and latent) in lactating and dry cows and some diseases of udder skin in It has been established that the active component of PIVS (iodbismuth sulfamide) is able not only to penetrate the skin, but also to reach the parenchyma of the udder cows (due to developed venous anastomoses under the skin of the udder).

The authors-developers of PIVS (N.I. Polyantsev, M.T. Tsupykov, 2001) explain this by the fact that PIVS is structured into microgranules (with the help of self-olding) into microgranules); on the other hand, its composition includes glycerin, possessing tropic properties in the presence of water, facilitates its passage through tissue barriers.

Although PIVS has been certified for a long time, its production for veterinary needs has not yet gone beyond the production of small batches by several veterinary laboratories, while other iodine-containing preparations (iodbismuthsulfamide emulsion, metromax intrauterine rods) have been put on a semi-industrial scale or industrial production, in particular, at the Kharkiv biofactory. The drug of the new generation - uberdermin is the result of the chemical interaction of polyiodbismuthsulfamide (PIVS) and dimexide, taken in a ratio of 10:1. It is a paste-like product of orange color, with a barely perceptible garlic smell, bitter and astringent taste. Dimexide has a unique ability to easily overcome tissue barriers, including intact skin, joint capsules, cartilaginous elements, tendon sheaths. To this should be added a high dispersing ability in relation to solid, difficult to dissolve and insoluble ingredients.

The study of the physical stability of uberdermin lasted 12 months; he did not reveal significant changes in the controlled parameters (color, smell, taste, consistency, homogeneity, specific gravity).

In experiments on laboratory animals (rabbits, white mice), uberdermin diluted with water 1:2 caused weak and short-term hyperemia of the conjunctiva. Cutaneous applications of uberdermin did not reveal an irritating effect of the drug on the parenchyma of the mammary gland of cows. This is confirmed by such highly sensitive tests as counting the number of somatic cells in milk, lysozyme titer.

When studying the skin resorptive capacity of uberdermin, one of the tests was a visual control of the speed of its discoloration after application; it ended after 1 h 27 m.

Control over the translocation of active components of uberdermin into the glandular tissue of the udder of lactating cows was based on changes in the concentration of molecular iodine in milk after applying the drug to the skin surface of udder. As it turned out, already 8 hours after its application in a therapeutic dose, the concentration of iodine in milk samples increased almost twice, and this level was maintained for the next 12 hours.

The next step was to study the bacteriostatic and bactericidal activity of uberdermin, using passport strains of microbes - the main causative agents of mastitis. Uberdermin showed fairly high antibacterial activity against all tested strains, but the advantages over PIVS are not obvious.

When comparing the therapeutic effectiveness of uberdermin and PIVS for catarrhal and purulent-catarrhal mastitis in cows that are in the pre-dry period, some advantage of uberdermin can be traced, both in terms of the percentage of recovery and in the frequency of use of the drug.

Treatment with uberdermin dry cows with the same diagnoses ensured 100% recovery, and only 2-3 applications of the drug were needed for the course of treatment; it is 2 times less compared to the pre-launch period.

We explain such contrasting differences by the fact that, with a functioning udder, it is difficult to create and continuously maintain sufficiently high

concentrations of active components (iodine, bismuth, sulfamide, etc.) in the pathological center.

Research studies on the use of uberdermin for diseases of udders that occur frequently (frostbite of the apices, bruises and wounds, cracks in the udder skin) indicate the prospect of deeper and thorough research in this direction.

Being a highly effective and absolutely safe chemotherapeutic drug for veterinary use, uberdermin could be widely used in surgical practice, and the simplest method of application. A high therapeutic effect from the use of uberdermin was achieved for closed and open mechanical injuries of udders.

In the case of closed injuries, with tissue crushing, before the end of the first two days of the therapeutic course, a significant decrease in the pain response to palpation, disappearance of nipple skin hyperemia, reduction or disappearance of tissue swelling was observed. It took an average of 5-6 days to completely eliminate the pathological process.

During the treatment with uberdermin of infected wounds (with a predominant localization in the area of the apex), drying of the wound surface and suppression of the development of the purulent process were observed in the first two days of the therapeutic course; in the next two days, the growth of healthy granulations on the surface, and the growth of the epidermal layer were noted. Wound healing was completed after 7-8 days, without the formation of a scar.

Conclusions

The composition and technological regulations for the production of the anti-mastitis drug - uberdermin have been developed. It is a chemical interaction of polymeriodbismuthsulfamide and dimexide.

The use of uberdermin for catarrhal and catarrhal-purulent mastitis of lactating cows ensures recovery of 99 % of animals and treatment of 92,8% of udder quartes The effectiveness of therapy for clinically mastitis of cows before and during the dry period is 89.5% and 100.0%, respectively.

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PSEUDOCYESIS BITCH: MODERN DIAGNOSTIC AND TREATMENT

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Relevance. Pseudocyesis (PSC), pseudopregnancy, false pregnancy or nervous lactation is a physiological syndrome characterized by signs similar to those observed during the post-partum period [1, 2]. The intensity of these signs is extremely variable among bitches. Being an atavism, PSC could have had some functional importance during evolution when non-bred female wolves had to nurse other females' litters. PSC is now a frequent finding in domestic dogs and although its exact prevalence is not known, it is estimated that it is as high as 50 %. Although it is generally admitted that prolactin (PRL) plays a central role in the genesis of PSC, its exact aetiophysiology is not completely understood. A recent publication describes the concept that PSC may be influenced by nutritional practices [3, 4] and immunity [5].

The *purpose* of this article is to review the most relevant features of the physiology, clinical signs, diagnosis, treatment and prevention of PSC in the domestic bitch. Endocrine features of the canine oestrous cycle. In comparison with other domestic and laboratory species, the female dog has several reproductive features that are unique.

Materials and methods. Clinical and experimental studies were conducted on clinically healthy bitches (control group, n = 12) and on sick (experimental group, n = 12) animals with pseudocyesis. For the treatment of bitches, the drug carbogoline was used, which was used cabergoline (Galastop; VetemCentralvet s.p.a, Milan, Italy), dose 5 mkg/kg per day for 4-6 days.

Results and discussion. Pseudocyesis occurred at the end of diestrus and was characterized by mammary hyperplasia, lactation and behavioral changes. Some bitches act as if they have given birth, "nurturing" inanimate objects and refusing food. The possibility of a true pregnancy was ruled out with the help of anamnesis, abdominal palpation, X-ray and ultrasound of the abdominal cavity.