

ANNOTATION

**dissertation work of Gabdullin Dosmukan Ermukhanovich on the theme
“Prevalence of endometritis in cows in the farms of West Kazakhstan Region
and the development of effective treatment protocols” submitted for the
degree of Doctor of Philosophy (PhD) in specialty
6D120100 - “Veterinary Medicine”**

Relevance of the research topic. Endometritis in cows is one of the leading diseases in dairy cattle breeding, which affects the reproductive state of the herd and causes damage to the farm, therefore affecting the economic and food sectors of the country of the Republic of Kazakhstan. This problem requires serious attention from the point of view of veterinary science and agricultural practice. Problems in livestock reproduction and high fruit losses are serious challenges for agriculture. In addition, the costs of veterinary treatment and the additional resources required for disease management can significantly increase farmers' costs.

To achieve the best reproduction of cattle, contributing to the maximum litter and milk profitability can only be achieved by the normal functioning of the reproductive system of animals. Violation of the reproductive function of cattle at this time creates one of the first problems of further growth of animal productivity and, in general, the profitability of dairy farming. In recent years, the number of unseminated cows in cattle farms has increased.

Causes of infertility in cows are associated with multiple differences of diseases of genital organs, one of the most common is inflammation of the endometrium. It should be emphasized that by the nature of the course of endometritis, it appears catarrhal and purulent-catarrhal endometritis. At late treatment of pathology, it acquires a more complicated form, which requires labor-intensive and costly treatment, leading to prolongation of the service period in cows and their culling. In this regard, the study of new, more effective methods of therapy for sick animals with purulent-catarrhal endometritis is carried out. Despite the achieved successes in studying the causes of development and pathogenesis of endometritis, the development of methods of preventing the frequency of their manifestation, especially in highly productive dairy herds, does not tend to decrease. On the contrary, due to the organization of large specialized dairy farms, and the high concentration of animals in limited areas, there is a steady tendency to increase the pathology of labor and postpartum period in cows. Treatment of purulent-catarrhal endometritis in cattle should meet the following requirements: minimum period of milk culling, rapid and maximum distribution of fast-acting substances, and wide spectrum of antibacterial activity. The increase in fertility and prevention of infertility of uterine stock is of particular relevance, which should be solved comprehensively.

Purpose of dissertation research. Monitoring of the spread of endometritis in cows in the conditions of farms in the West Kazakhstan region and development of effective treatment protocols.

Research objectives.

1. To monitor the prevalence of endometritis and the etiology of obstetric and gynecologic pathologies in farms in Western Kazakhstan.
2. To conduct research on the prediction of endometritis by controlling uterine stiffness in cows in the third stage of labor and after it.
3. To analyze hematological and biochemical blood parameters of cows with postpartum endometritis and during the period of treatment.
4. To determine the microbiocenosis of the uterus of cows with postpartum endometritis and to study the sensitivity of isolated pathogenic microbes to antibiotics.
5. To carry out a comparative evaluation of the effectiveness of the developed protocols of treatment of cows and to determine their economic efficiency.

Research methods. Research work was carried out based on LLP “Agrofirma ‘AKAS’ of Terekta district, farm ”Shkanov N.E.” Baiterek district, MBS “Zhaiyk” of Akzhaik district of West Kazakhstan region, and farm “Anisan” of Aktobe district of Aktobe region.

To find out the extent of diseases of reproductive organs, the obstetric-gynecological examination was conducted with the help of a veterinary ultrasound scanner, the DRAMINSKI 4Vet Slim. The diagnosis of diseases of the reproductive organs of cows was made based on clinical and laboratory tests.

Early diagnosis of diseases of reproductive organs during labor and the postpartum period studied the strength and duration of uterine contractions, in the third stage of labor and after their completion. When studying the contractile function of the uterine musculature after fetal delivery, we used a device that determines uterine contractions (POMS No. 483 rationalization proposal, dated “03.12.2015.”).

For differential diagnosis of diseases of the reproductive organs of cows, we used express tests to determine the pH-environment of uterine secretion. Determination of the pH of uterine exudate isolated from the uterus was carried out using universal indicator paper (pH 0–12, Lachner, Czech Republic).

Hematological blood parameters were performed using a veterinary analyzer, Abacus Vet 5.5200 (Diatron, Austria), and serum biochemical parameters were performed using a ChemWell apparatus (Awareness Technology, USA). Microbiological studies to determine the microbiocenosis and their sensitivity to antibiotics were carried out by disk-diffusion method.

Species affiliation of microorganisms was determined using the recommendations of Bergi (1980), N.N. Mikhailova (1983), and V.M. Kartashova et al. (1988). Identification was carried out according to generally accepted methods, taking into account the morphological, cultural, and biochemical properties of microorganisms (Sidorov M. A. 1982).

To determine the effective treatment of the developed protocol in cows, the comparative efficacy of three treatment protocols was carried out. The cows of LLP “Agrofirma AKAS,” KH “Anisan,” and “Shkanov N.E.” of blackbreed at the age of 3-6 years with lactation of 5000-6000 thousand per year were taken as objects for the study.

The main provisions of the dissertation.

1. Results of monitoring studies on the prevalence of obstetric-gynecological pathologies and in particular endometritis in farms of Western Kazakhstan;
2. Possibility of forecasting endometritis by controlling uterine stiffness in cows in the third stage of labor and after it;
3. Results of hematologic and biochemical blood tests of cows with purulent-catarrhal endometritis and during the period of treatment;
4. Determination of species composition of uterine microflora of cows with postpartum endometritis and determination of their sensitivity to antibiotics;
5. Comparative evaluation of the effectiveness of the developed protocols of treatment of cows with purulent-catarrhal endometritis.

Description of the main results of the study. According to the results of monitoring the high morbidity of cows with obstetric-gynecological diseases in farms of the West-Kazakhstan region, namely: in LLP Agrofirma "AKAS" - 44.8%, farm "Shkanov N.E." - 42.3% and farm "Anisan" - 39.8%. - 42.3% and farm "Anisan" - 39.8%. At the same time, the greatest prevalence of purulent-catarrhal endometritis, which in LLP Agrofirma "AKAS" amounted to - 70.8%, farm "Shkanov N.E." - 63.3% and farm "Anisan" - 39%. - 63.3% and farm "Anisan" - 58.6%.

The main and predisposing causes of purulent-catarrhal endometritis in cows in the mentioned farms were revealed. The predisposing causes of the mentioned pathology were weak fodder base, unbalanced diet in nutritive and mineral composition, hypodynamia of animals in the postpartum period, atony and hypotonia of uterus, and the main causes were retention of afterbirth, pathogenic microflora penetrated uterus genitally during labor and delivery works.

With the help of the POMS device in the third stage of labor and after it, it was possible to conduct early diagnosis of uterine pathology in cows, which provided timely application of therapeutic and preventive measures and prediction of endometritis manifestation.

The treatment protocol developed by us allowed us to improve the biochemical and hematological blood parameters of cows with purulent catarrhal endometritis.

The species composition of uterine microflora of cows with purulent-catarrhal endometritis in all studied farms was determined. Microorganisms of coccus form were identified, mainly staphylococci within the range of 66,7-73,6%, these microorganisms, in most cases, were detected in cows of Agrofirma "Akas" LLP. The sensitivity of detected microflora from the uterus to different antimicrobial agents was determined. High sensitivity was revealed to antibiotics Cefimag and Nitox 200.

For the treatment of cows with purulent-catarrhal endometritis, the most effective in therapeutic and economic terms developed by us therapy protocol (№2), where we used complex means of etiologic, pathogenetic, and symptomatic therapy.

Justification of novelty and importance of the obtained results. For the first time in the Western region of the Republic of Kazakhstan, dairy farms studied

the spread of obstetric-gynecological pathologies, etiology of their manifestations, and prediction of endometritis by controlling uterine stiffness in cows in the third stage of labor and after it. The data of hematological and biochemical blood parameters of cows with postpartum endometritis during the period of treatment were studied, and the microflora of the uterus of cows with postpartum endometritis and their sensitivity to antibiotics were determined.

Based on the above-mentioned studies, treatment protocols for endometritis were developed, and their effectiveness was comparatively evaluated.

The protocol of treatment of cows with purulent-catarrhal endometritis developed by us was introduced in farms of WKR, where complex means of etiotropic, pathogenetic, and symptomatic therapy were used.

In veterinary practice, a proposed treatment protocol was proposed and developed, allowing us to achieve positive results in the treatment of purulent-catarrhal endometritis in cows and reducing the time of treatment.

The results of the research work are included in the curriculum of universities and higher colleges in the disciplines “Veterinary obstetrics, gynecology, gynecological diseases” and “Biotechnology of reproduction.”

The materials published on the results of the research work have been proposed for use by scientists in their studies.

In addition, the developed treatment protocol was recommended for use in peasant farms in the West Kazakhstan region.

Correspondence to the directions of science development or state programs. Dissertation research was carried out in the framework of scientific projects in the period from 2018 to 2023 in NJSC “West Kazakhstan Agrarian-Technical University named after Zhangir Khan” within the framework of scientific and technical program: “Improving the efficiency of breeding methods in cattle breeding” under the project: ‘Development of effective methods of selection in the branch of dairy cattle breeding’ under the measure: ‘Improving the reproductive capacity of dairy cows in the western region’ state registration number 0118RK01277, BR06249373 and ‘Development of technologies of maintenance, feeding, breeding and reproduction in dairy cattle breeding based on the use of adapted resource-energy-saving and digital technologies for different natural-climatic zones of Kazakhstan’ BR10764965.

Description of the doctoral student's contribution to the preparation of each publication. The doctoral student independently conducted experimental research, data collection, data analysis, and interpretation, and participated in writing articles.

In total, 12 scientific articles were published on the topic of the dissertation, including 2 in peer-reviewed scientific journals included in the Scopus database, 4 in journals submitted by the Committee for Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan, and 6 in the materials of international scientific conferences.

Scope and structure of the dissertation. The dissertation consists of an introduction, choice of research direction, materials and methods of research, results of own research, conclusions, and suggestions for production, and a list of

used literature, including 147 sources, exactly 27 in foreign languages. The dissertation is outlined on 118 pages of typewritten text and contains 8 tables, 21 figures, 6 appendices.