SUMMARY

PhD IRIMIA CĂTĂLIN

Keys words: cow, endometritis, ozone, process of reproduction

The PhD thesis with the title : ***RESEARCH ON INFLAMMATORY DISORDERS OF THE GENITAL TRACT AND THEIR INFLUENCE ON THE PROCESS OF REPRODUCTION IN COW,*** reads methodological rules and contains two parts:

Part I, in which are described summarizing aspects of bibliographic research, contains a number of four chapters, named as follows: *Morphophysiology of genital apparatus in cow*; *Physiology of parturition in cow; Puerperal period in cow; Inflammatory diseases in cow.*

Part II consists in personal research and comprises eleven chapters named: *Purpose and importance of the proposed theme*, *Natural/ organizational and institutional setting where the research has been conducted*, *Research on frequency and diagnosis of uterine diseases in cow*, *Echografic aspects in uterine inflammatory diseases*, *Research on the bacteriology of uterine inflammatory diseases*, *Research on the eficiency of several therapeutical protocols in acute endometritis in cow*, *Research on the eficiency of several therapeutical protocols in chronical endometritis in cow*, *Research on the eficiency of several therapeutical protocols in chronic endometritis in cow*, *Research on correlations between uterine inflammatory processes and resuming sexual cyclicity*, *Research on the influence of uterine diseases upon reproductive indices in cow, Research on the economical implications of uterine inflammatory diseases in dairy cows.*

Research related to the thesis, were carried out in an operating farm for dairy cows in Vaslui County, research work was carried out for over more than 10 years.

In Chapter I, there are described, based on the scientific literature, the ***"Morphophysiology of genital apparatus in cow"*** , thus being presented anatomical particularities of the genital apparatus, regarding the gonads and the genital tract in large ruminants, also oogenesis and folliculogenesis aspects.

In Chapter II, the ***"Physiology of parturition in cow"*** is presented. The chapter deals with subjects known in the literature on: Factors triggering parturition (maternal and fetal); Prodromal signs of parturition; Mechanism and parturition stages. Parturition-birth-represents a complex of morphophysiological transformations which occur normally on term and which have as consequence the expulsion of the immunological and physiological „tolerated" product of

conception. Development of gestation under normal conditions is determined by several factors that interfere with each other, most important of them being related to the mother, foetus and functionability of the placenta.

In the third Chapter, it is described the puerperium period in cow. The data refers to the particularities of parturition in cows and also there are treated strict terms related to the immediately period which follows parturition. In this chapter, the following are detailed: postpartum uterine involution, removal of the foetal annexes, resumption of postpartum ovarian activity and the bacteriology of the puerperal uterus. Maternal changes that occur during the development phase of the conception product along with those occurred in parturition stage, require numerous postnatal changes. Physiological and morphological recovering processes status is conditioned by several factors: physical and health conditions of the female, how was the parturition carried out, parturition quality assistance, environmental conditions, parturition's hygiene and stress factors.

In Chapter IV, there are presented uterine inflammatory diseases in cow. These uterine inflammatory affections are presented under the aspect of their evolution (acute and chronic). Puerperium uterine inflammations relates to: postpartum catarrhal endometritis, puerperal purulent endometritis, necrotic metritis and gangrenous metritis. Numerous morphofunctional changes that occur postpartum from cellular level to organs and systems level are under the influence of different variation factors that in certain circumstances may have suppressive effects, negatively influencing body recover and delaying or blocking cyclic postpartum resumption of sexual function. Under the influence of these variation factors and under a high lability conditions of a postpartum body recovery process, the pathology of puerperium is diverse and complex and is directly related to the pathology of parturition and periparturial period.

Chapter V, entitled as ***"The purpose and the importance of the proposed theme"***, there are presented the main proposed objectives in order to conclude the researches: Monitoring the frequency of uterine diseases diagnosis in cow; Highlighting the ultrasonographic aspects in uterine inflammatory diseases in cow; Bacteriology of uterine inflammations, Therapy modalities in uterine inflammatory diseases; Correlations between uterine inflammatory processes and the resumption of sexual cyclicity; The influence of uterine disorders on cattle breeding indices and economic implications of uterine inflammatory diseases in dairy cows. Also, in this chapter there are related some methods and procedures used in research practice.

In Chapter VI entitled as ***"The natural environment / organizational and institutional framework in which the researches took place"***, there are described research and environmental conditions along with their biological material which has been used. The researches were conducted in a cattle farm, in Vaslui County, which is mainly aimed milk production farm and belongs to the S.C. Agrocomplex S.R.L trust. The cows, which belong to "Holstein-Friesian", a specialized breed in milk production, are imported from Netherland. The total average milk production is about 9200 litres per day. The closed circuit of the exploitation *system*, with the compliance of technologies and sanitary veterinary norms has contributed for maintaining the health status of the entire herd of cattle, which has been free of infectious and contagious diseases like LEB, TBC, BB, but because of successive animal imports was not possible to keep the herd free of BVD, MD, PI3.

The seventh Chapter is entitled ***"Research regarding the frequency and diagnosis of uterine diseases in cattle"***. In this chapter two parts are fully described: research regarding frequency of uterine diseases in cattle and diagnosis of uterine diseases. Within the general morbidity, a mean incidence of diseases localized to the genital system in cattle was 54,26%. Monthly related, between March and April there are recorded some increased mean values of fetal annexes retention incidence (21,2% and 15,0%), and low mean values in June (5,4%) and September (5,4%). Related to lactation, there is a maximum frequency in the fifth lactation (11,7%) and a minimum frequency in the first lactation (5,8%). The incidence of genital inflammations (endometritis) recorded an average of 38,53%. Of this total, 6,16% were diagnosed during oestrus (induced or spontaneous). Post-puerperal and chronic endometritis registered lower frequencies, thus chronic catarrhal endometritis (ECC) was diagnosed in 7,14% of cases, and chronic purulent endometritis (EPC) in 9,52%. The highest frequency was registered in catarrhal puerperal endometritis (EPC) with a value of 44,64% and purulent puerperal endometritis (EPP) had a frequency of 38,69%. Diagnosis in catarrhal puerperal endometritis, it's easy so establish in the first 10 days postpartum, because of the pyrexia and by the lack of contractile reaction of the uterus in palpation (hypotonic and hypokinetic). By trans-rectal exploration and the characteristics of uterine leakage, can be obtained additional informations regarding the presence of some uterine collections that can be eliminated during the vaginal examination. This had a sero-mucous aspect, yellowish-brown colour and sometimes with fibrin deposits. The diagnosis of purulent puerperal endometritis was identified based on

local and general symptoms and by the moment of appearance this type of inflammation (3-6 days after parturition). The local symptoms are characterized by prolonged lochia discharge, which appears like mucosal, reddish secretions, or yellowish creamy with cellular debris and smelly secretions.

Chapter VIII entitled ***"Echographic aspects of uterine inflammatory diseases in cattle"*** describes defining aspects of endometritis in cattle. Ultrasound examination of cows affected by purulent endometritis with a large amount of pus, revealed an enlarged volume of the uterus and an irregularly thickened wall with a hipoechogen aspect. Intrauterine collections were observed in large amount and there were made of liquids (anechoic) with particles in suspension ("suspended spots"). Ultrasound examination of cows affected by endometritis revealed an enlarged volume of the uterus and the uterine wall with a hipoechogen aspect, mainly because thickening of the endometrium.

Chapter IX is entitled ***"Research regarding bacteriology of the uterus inflammations"***. In this chapter are identified the main bacterial species that occur in cows with endometritis and testing their sensibility to antibiotics. 31 samples represented by genital discharge from cows with endometritis were examined. From these, 8 bacterial strains were isolated and identified and also a Candida species levuriform agent. 75,6% of the bacterial strains were classified as Gram positive and 24,4% were classified as Gram negative. 51,5% of the 36 cases examined had single infections, 41,7% presented mixed infections and 6,8% were classified as associated infections. From about a 16,6 percent of total involved cows, pathogenic bacterias haven't been isolated during the fourth week after parturition. The antibiograms results from the cows with acute endometritis, revealed a highest sensitivity to Flumequine and Enrofloxacine, a moderate sensitivity to Ampicilin and to Erythromycin showed antibioresistance. After carrying out the antibiograms, it was revealed that cows with chronic endometritis have a high sensitivity to Cephalosporins, Ampicilin and Penicilin, moderate sensitivity to Streptomycin and Metronidazol and antibioresistance to Gentamicin, Enrofloxacin and Oxytetracycline.

Chapter X entitled ***"Research regarding efficiency of different therapeutic protocols in acute endometritis in cows."*** This study presents the values of breeding indicators obtained after application of regimen which aimed to prevent and control the acute endometritis in dairy cows. There were ozone treatments applied to intrauterine area, the results being compared with the standard antibiotics treatments which were intrauterine or general administered, also, the

economic efficiency of these treatments was monitored. The therapeutic ways used in control of acute endometritis had an effectiveness which varied between 69,23 % (the group E3) and 92,86 % (the group E1). The best results regarding the clinical healing were recorded to the experimental group E1 (92,86%) and the pregnancy occurred after the first 3 artificial insemination (85,71%). The results for the experimental group E2 (80% cured and pregnant cows after the first 3 artificial insemination) have shown new perspective and therapy options for the acute endometritis using the ozone in many ways. The use of antibiotics (the group E3) to treat these endometritis produce economic losses due the waiting time until milk harness. Due to the results from the cows healed by using the ozone we recommend further researches for the use of this product.

Chapter XI *"Researches regarding the efficiency of different therapeutic protocols in chronic endometritis in cows"*. During this study there were constituted 4 experimental cow batches with chronicle endometritis, in order to apply four therapeutically options. Regarding the results of the chronicle the initial effect were to rebound the chronicle endometritis solution with antibiotics) with 78,7 days. The efficiency of therapy, regarding the average number of administrations, at LE1 was materialized into a medium 1,2 treatments/ female until the healing, at LE2 1,8 and at LE3 2,9. For the E3 group which was cured with ozonized serum and marigold extract, encouraging results have been obtained like the results from LE1 and LE2.

The chapter XII is named ***"Researches regarding correlations between uterine inflammatory processes and resumption of the sexual cyclic"***. The manifestation of estrum postpartum on dairy cows is a resumption sign of ovarian activity after birth. This process is in close relationship with the morphofunctional restoration of hypothalamic pituitary unit and in positive correlation with the utero ovarian unit. For cows with catarrhal puerperal endometritis, the average occurrence interval of oestrus postpartum was 27,53 days after the treatment, and the average index for insemination was 2,65. For the cows with puerperal endometritis, the interval was 38,77 days and the index was 3,25. In chronic purulent endometritis the average occurrence of oestrus postpartum was 56,25 days and the average for the index of insemination 3,25.

Chapter XIII is entitled ***"Researches related to influence of uterine disorders indices in cows breeding".*** There have been watched the following reproductive fecundity parameters: the average between the parturition and the first insemination, the length of service-period, the claving interval, the insemination index and the conception rate. The average interval between

the parturition - first insemination for the cows with cured endometritis was for about 68,12 days, and for the control group was 70,76 days, 2,64 in addition for E1 group. The average service period recorded at females with E1 endometritis was 94,3 days, and for the control group 112,14, with an addition of 17,84 more. The medium for calving interval at the E1 group was for about 38 days, and for the control group 397 days, with 10 days more. The average number for performed insemination in order to obtain a gestation was 2,21 artificial insemination for E1 group and for the control group 3,21. Conception rate in the control group was 42,3%, and cows which had been endometritis treated, had a conception rate of 26,7%, with 15,6 less than females from the control group. This major difference is due to the morphological changes that the endometrium suffered during the inflammations evolution. All the indices from the E2 group (cows with uncured endometritis) has higher values, comparing with the cows from the control group and the ones from the E1 group.

Chapter XIV is entitled ***"Research regarding economic implications of uterine inflammatory diseases in dairy cows"***. To establish the economic efficiency, there were calculated breeding indices of the studied cows following some formulas used in speciality literature as: losses due some unproductive expenditure (feeding, maintenance and caring of sick animals); losses by failure numbers of calves; losses by milk production failure and expenditure related to treatment of sick cows. The lowest cost/treated animal, was for cows from the experimental group E2, 20 lei/treated cow. It must be specified that these females were treated with ozonized physiological serum with addition of calendula extract. Results from the experimental group E2 were good in terms of pregnancy rate (73,3%), of the service period (85,8 days) and the number of artificial inseminations performed for a gestation (2,1 A.I.), all these results correlating with a lower cost of treatment/ cow (20 lei). The best breeding indices from the experimental group were recorded in group E1, but with a cost/ treatment/ cow, of 98 lei which is quite high. By calculating the total economic losses for a cow with endometritis (acute or chronicle) these are about 1310,74 lei/ animal. The economic losses caused by failure of milk production in cows with endometritis, are estimated at 700 lei, during the infertility of the female. It must be specified that milk deficit/infertility day was calculated for milk production of healthy cows and not to planned or optimal milk production.