Impact Factor: 9.9 ISSN-L: 2544-980X

Diagnosis and Symptom Complexes of Ovarian Hypofunction in Productive Cows

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Annotation: This article presents the results of the study of the features of the diagnosis and course of ovarian hypofunction in cows. Ovarian hypofunction in cows begins 3 months after calving and is accompanied by the observation of whitish vaginal mucosa, persistent corpus luteum in the ovaries, absence of ovulation, and anophrodisia. During ovarian hypofunction, a decrease in the amount of hemoglobin, total protein, glucose, in the blood.

Keywords: Productive cows, ovaries, follicles, masion, ovarian cyst, ovulation, oogenesis, corpus luteum, persistent corpus luteum, anophrodisia, estradiol, sexual cycle.

Introduction

Obstetric and gynecological diseases of productive cows, in particular ovarian diseases, are widespread in farms, leading to the development of infertility in them. The main reasons for the occurrence of such ovarian diseases can be considered as the failure to feed cows on a nutritious diet or as a complication of severe pathological births. Today, research aimed at developing modern methods for diagnosing ovarian diseases in cows and obtaining a cure is relevant.

The lack of active nutrition, sunlight, high-quality and nutritious feed for cattle, the lack of consideration of the physiological state, age and productivity of animals in feeding them, as well as the frequent occurrence of ovarian hypofunction in cows, prolonged infertility of sick cows, costs for treatment and a decrease in reproductive characteristics, cause great economic damage to farms due to their unsuitability for use on the farm. During ovarian hypofunction of a cow, metabolic disorders in the body do not fully restore its previous productivity and reproductive ability, and cows have an extended service period and become infertile. As a result, product quality and the efficiency of using nutrients in the diet decrease. Therefore, it is of great importance to develop and implement measures for the early detection, treatment and prevention of ovarian hypofunction, which is one of the main causes of infertility in cows.

In livestock farms, up to 38% of cows have a long period of anovulatory periods, which is caused, among other things, by a negative energy balance. When energy is deficient, the secretion of gonadotropins in the body decreases. This, in turn, negatively affects the ability of follicles to produce estradiol. The hormone estradiol is necessary for the maturation of follicles and ovulation. As a result, the first ovulation and, at the same time, the period of heat (flow) are significantly prolonged [1,3].

Alimentary infertility in cows is caused by improper feeding of the animal. Improper feeding of animals, insufficient feeding (starvation), excessive feeding (obesity), or a lack of important components in the diet that affect the functioning of the reproductive system (proteins, carbohydrates, vitamins, minerals, etc.) can lead to infertility [2].

Ovarian hypofunction is a disease characterized by impaired development and maturation of follicles, ovulation and formation of the corpus luteum. This pathology can manifest itself in the form of

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persistence of the follicle (long-term preservation) and delayed ovulation, insufficiently active functioning of the corpus luteum or complete suppression of the activity of the gonads and prolonged loss of sexual desire (anaphrodisia) [1,4].

The causes of ovarian hypofunction can be a decrease in the synthesis and secretion of gonadotropic hormones by the pituitary gland or a decrease in the reactivity of the ovaries to gonadotropic hormones. The latter is usually observed when the synthesis of corticosteroid hormones is increased under the influence of severe stress, as well as with a deficiency of thyroid hormones in the body [2].

Imbalance of energy and protein substances in the diet of high-yielding cows can lead to the development of a number of serious diseases in animals, a decrease in productivity, and a decrease in the level of reproduction due to ovarian dysfunction [3].

Ovarian hypofunction in cows is often characterized by functional disorders of their ovaries, as well as an increase in the service life, significant economic losses and the deterioration of the animals in a state of unfitness, as well as a decrease in the period of their use on the farm [4].

Prolonged hypodynamia (i.e., inactivity) in cows leads to the development of hemodynamic disorders (blood circulation disorders) in the ovaries and birth canal and disrupts the normal oxygen supply of these organs. As a result, atresia (withering) increases not only in primordial (primary), but also in tertiary follicles, and pronounced destructive (destructive) changes occur in them. This leads to ovarian hypofunction [5].

Zinc deficiency in the diet causes growth retardation in animals, pathological changes in the skin and skin cover, and blood formed elements, and deterioration of reproductive characteristics [2,5,6].

The daily requirement of cows for zinc is 60-70 mg per 1 kg of dry matter of feed. Zinc ensures the normal course of reproductive functions in animals [6].

Methodology.

Research materials and methods. In order to diagnose ovarian diseases in cows, 10 Holstein dairy cows (3 months old) kept at the “Jura” farm in the Pastdargam district of the Samarkand region were examined by obstetric and gynecological examination for 60 days. The composition and nutritional content of the cows’ diet were analyzed. Laboratory and clinical examinations were performed on blood samples taken from the cows. As a result of clinical examinations, the level of obesity of the cows, their response to external influences, the color of the vaginal mucosa, the number of pulses and respirations per minute, and the number of ruminations per 2 minutes were determined.

The blood samples taken from the cows were analyzed for hemoglobin, total protein, glucose, total calcium, inorganic phosphorus, iron, zinc, and carotene.

Blood biochemical tests were performed using the Rayto Chemray 330 automatic hemanalizer.

The FARMSCAN 150 ultrasound examination (UTT) device was used to determine the sterility of the cows. The condition of the uterine mucosa and ovaries was also determined. For the examination, the sensor electrode of the device was held over both horns of the uterus through the cow's rectum, and signs such as the condition of the uterus, the amount of uterine fluid, the presence of the fetus, and its condition were detected on the screen through acoustic signals and displayed on the screen.

The obtained quantitative indicators were processed on a Pentium PC using the statistical program package "Complex" and "Biostat", to assess the reliability of the obtained results, the Student and Fisher criteria were used.

Result and discussion.

The obtained results and their analysis. The diet of cows on the farm was characterized by the fact that it was mainly of the silage-concentrate type, and a deficiency of 0.5 food units was found compared to the feeding standards. The digestible protein in the diet was 1294.8 grams, and its supply was 129.48 percent.

One food unit of the diet accounted for 136.2 g of digestible protein. In addition to the high content of digestible protein in cottonseed meal and cottonseed meal, which constitute the main part of the diet of cows, the concentration of gossypol alkaloid, which is considered toxic to animals, in these foods can reach 0.020-0.046% per 1 kg of dry matter. Therefore, long-term feeding of cottonseed meal and cottonseed meal to animals leads to their poisoning and a decrease in the activity of the reproductive organs.

It was found that the amount of sugar in the diet of cows was 352.02 grams less than the norm, that is, the satisfaction of the body's needs for easily digestible carbohydrates was 60.88 percent. The sugar-protein ratio was 0.42 instead of the norm of 0.8-1.2. A decrease in the sugar-protein ratio in the diet leads to impaired digestion of food in the rumen, changes in the rumen fluid environment, and disturbances in the ratio of volatile fatty acids, as well as the development of acidosis in the body (Ya.T. Khmelkov, 2006).

The amount of carotene in the cows' diet was 263.6 mg., its supply was 58.6 percent, the amount of fiber was 4455 grams instead of the norm of 3380 g, and the supply of the cows' body with it was 131.8 percent.

The cows' diet on the farm was characterized by an excess of calcium by 36.3 grams and a deficiency of phosphorus by 1.3 grams compared to the feeding standards. The cows' calcium supply was 153.3% and phosphorus supply was 97.2 percent. The ratio of phosphorus to calcium was found to be 0.44.

Analyzing the feeding of dairy cows, it was concluded that the type, composition and nutritional value of the diets do not fully satisfy the needs of the cows' body in nutrients and biologically active substances. Protein and energy imbalance of diets, low sugar-protein and phosphorus-calcium ratios are the main etiological factors in the occurrence of ovarian hypofunction in cows.

The literature also emphasizes the occurrence of alimentary infertility due to incomplete satisfaction of the needs of the cow's body for nutrients and a lack of microelements [6].

Out of 10 cows examined rectally on the farm, 8 heads were found to have persistent corpus luteum. This persistent corpus luteum appeared due to the failure of the luteum to be absorbed. We believe that the reason for this is the lack of nutrients and biologically active substances in the cows' body.

Uterine subinvolution was found in 4 heads of the examined cows. Endometritis and ovarian inflammation are observed in cows due to uterine subinvolution. As a result, it causes ovarian hypofunction. Ovarian hypofunction causes hormonal disorders, which in turn leads to disruption of the sexual cycle in cows.

During the examinations, it was found that 3 cows, which were 5 months old after calving, came into heat. This figure is 15% of 20 cows. The rest did not come into heat at all (anophrodisia). The lengthening of the service period in cows indicates a decrease in ovarian function in them.

During clinical examinations, the body temperature of dairy cows was 38.9 ^{o}C (normal - 37.5 - 39.0 ^{o}C), the number of breaths per minute was 28.9 times (normal - 12-25 times), and the number of heartbeats per minute was higher than the norm, that is, an average of 86.5 times per minute (normal - 60-80 times per minute).

The average number of contractions of the foregut sections in 2 minutes was 2.8 times (the norm is 3-5 times in 2 minutes). The observation of hypotonia in dairy cows can be explained by the fact that cows are kept in one place all year round and fed with a one-sided silage-concentrate type of feed, as well as a decrease in the activity of the rumen microflora due to the lack of vitamins and minerals in the diet. Almost all cows have signs of pale vaginal mucosa, changes in appetite, and metabolic disorders, which lead to disruption of the sexual cycle, heat and untimely ovulation. It was found that the number of erythrocytes in the blood of dairy cows decreased by 0.69 million/µl on average compared to the initial values at the 5th month of lactation.

By the end of the tests, the hemoglobin content in the blood of cows decreased on average from 98.5±4.5 g/l to 88.6±2.6 g/l (normal 99-129 g/l). The total protein content in the blood serum of the

examined cows also decreased throughout the lactation period, and by the 5th month of lactation it was an average of 70.4±2.08 g/l (normal 72-86 g/l). At the beginning of the dispensary examinations, the average blood glucose level in cows was 2.34±0.08 mmol/l (the norm is 2.22-2.33 mmol/l), but by the 5th month of lactation it decreased to an average of 2.18±0.05 mmol/l.

The decrease in the blood glucose level in productive cows during lactation indicates that their energy needs in the diet are not fully met. It is also noted in scientific sources that such a change causes atresia of the follicles maturing in the ovaries.

The level of carotene in the blood serum, like other indicators, also showed a decreasing trend, and at the end of the examination it was found that it decreased from an average of 0.342±0.04 mg% to 0.292±0.08 mg%.

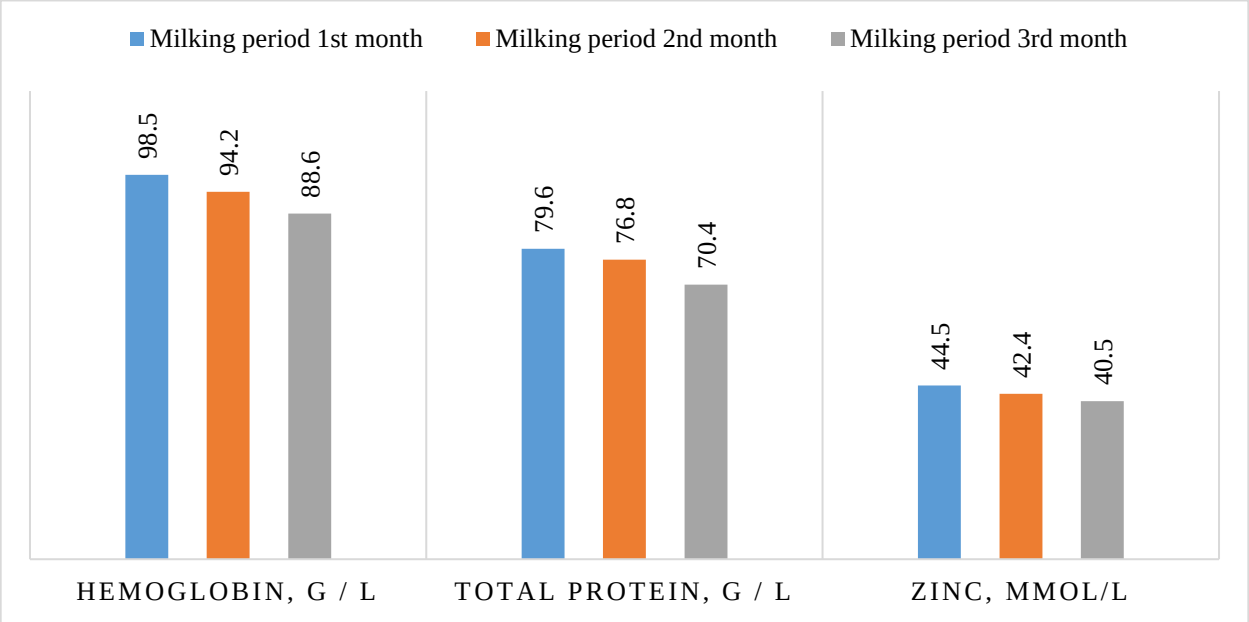

Figure 1. Biochemical indicators of cows' blood M±m. (n=10.)

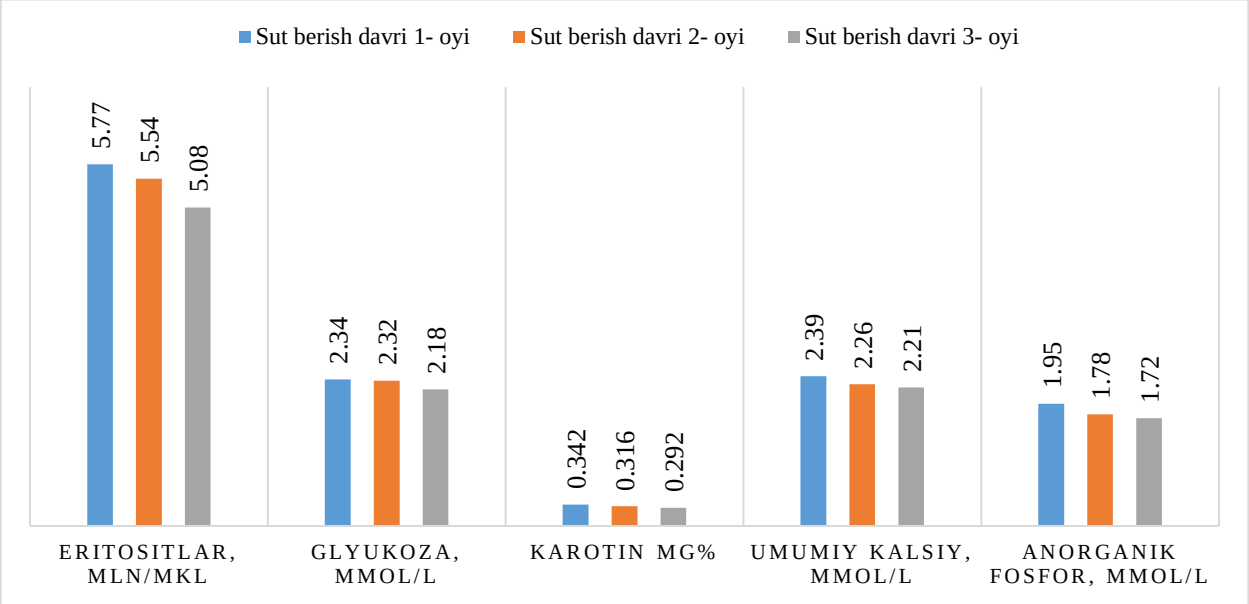

Fig. 2. Biochemical parameters of cows' blood M±m. (n=10.)

The total calcium content in the blood serum of cows at the beginning of the study was on average 2.39±0.02 mmol/l (normal 2.5-3.13 mmol/l), and by the end of the study it was found that it decreased to an average of 2.21±0.06 mmol/l. The amount of inorganic phosphorus was correspondingly reduced from an average of 1.95±0.05 mmol/l to 1.72±0.08 mmol/l (normal - 1.45-1.94).

The amount of zinc in the blood of cows at the beginning of the study was on average 44.5±1.2 μmol/l, and at the end it was on average 40.5±1.8 μmol/l (normal - 46.1-61.1 μmol/l). The decrease in the amount of zinc in the blood of dairy cows during lactation negatively affects the reproductive system, that is, the follicular activity of the ovaries.

Conclusion. In the case of ovarian hypofunction in productive cows, symptoms such as blanching of the vaginal mucosa, changes in appetite, disruption of the sexual cycle, uterine subinvolution, burning and untimely ovulation were observed, as well as symptom complexes accompanied by a dynamic decrease in the amount of hemoglobin, glucose, total protein, carotene and zinc.

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