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The Effect of Nutritional Supplements Used to Stimulate Reproductive Activity in High-Yielding Cows on Fermentation Processes in The Digestive Organs

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Abstract:

The article describes the effect of the nutritional supplement "VILOFOSS", used to stimulate the reproductive activity of Holstein cows, on the fermentation processes occurring in the digestive organs. The study evaluates how the supplement influences physiological condition, digestive microflora activity, and reproductive parameters in high-producing dairy cows during the postpartum period.

Keywords : Holstein breed, reproduction, dispensary examination, pregnancy, gene pool, stimulation, VILOFOSS, ration, maize silage, wheat straw, alfalfa hay, placenta retention, uterine subinvolution, ovarian hypofunction, corpus luteum, endometritis

Introduction

Relevance of the Topic

In recent years, significant attention has been paid to the development of cattle breeding based on scientific achievements and advanced technologies. In particular, efforts have been directed toward improving breeding programs, strengthening feed resources, and modernizing production and processing technologies in livestock farming. Highly productive cattle breeds such as Holstein, Simmental, and Swiss, which possess economically valuable traits and differ significantly from local breeds, have been imported into various regions of the country to improve the genetic potential of dairy herds [1-2].

Alongside these developments, modern specialized livestock farms have been established in many regions. Despite these positive changes, reproductive disorders and diseases of the reproductive organs among highly productive cows remain a major problem in livestock farms. Such reproductive dysfunctions often lead to infertility, decreased productivity, reduced calf output, and shorter productive lifespan of high-yielding animals. As a result, farms suffer significant economic losses due to decreased milk production and inefficient use of genetically valuable animals [3].

Methodology

The scientific research was conducted at the “Barxayot Muhammad Rajab” livestock farm located in Karakul district of Bukhara region. Obstetric and gynecological dispensary examinations were performed on 120 head of cattle. During the examinations, cows were categorized according to their reproductive status: pregnant cows by months of gestation, recently inseminated cows, cows that had recently calved, and infertile cows. Based on these categories, treatment and management measures were applied separately to each group.

Among the examined animals, 50 cows were diagnosed with various gynecological disorders, including:

1. 19 cows with endometritis
2. 13 cows with retained placenta
3. 5 cows with ovarian hypofunction
4. 13 cows with uterine subinvolution

These animals received appropriate treatment and monitoring.

At the same farm, research was conducted within the framework of the scientific project “Improvement of Methods for Stimulating Reproductive Activity in Holstein Cows”. As an additional component of this research, a study was carried out to determine the effect of the nutritional supplement “VILOFOSS” on fermentation processes in the digestive organs.

For the experiment, 40 Holstein cows that had calved 15–20 days earlier were selected. After obstetric and gynecological examinations, the animals were divided into two groups:

1. Experimental group – 20 cows
2. Control group – 20 cows

The cows in the experimental group received 100 g of the VILOFOSS nutritional supplement per head per day, mixed with their feed ration. The control group cows were fed according to the farm's standard ration

without the addition of the supplement.

Results and Discussion

The control group, consisting of 20 cows, was fed according to the standard farm ration without any nutritional supplement. During the observation period, several physiological parameters were monitored and recorded for both groups, including:

body temperature
heart rate and pulse
rumen motility
respiration rate
condition of skin and coat
condition of hooves and limbs [4-5].

The control group cows were fed with the farm's standard ration consisting of maize silage, wheat straw, cotton hulls, cottonseed meal, compound feed, table salt, alfalfa hay, and other feeds [6].

Among the 20 cows in the control group, 13 cows developed gynecological disorders, and the onset of estrus was delayed for 45–50 days, which clearly demonstrated reproductive dysfunction under standard feeding conditions.

In contrast, the experimental group, which received 100 g of the VILOFOSS supplement per cow, showed improved reproductive indicators. In this group, 9 cows experienced uterine subinvolution lasting 25–30 days, after which estrus occurred and fertilization took place. The service period in the experimental group averaged 60–65 days [7].

These results indicate that the nutritional supplement positively influenced the physiological condition of the animals, supporting the normalization of reproductive functions and improving the general metabolic and digestive processes in the organism.

Physiological Role of VILOFOSS Components

The vitamins and minerals contained in the VILOFOSS supplement exert several important physiological effects in the animal organism.

Calcium (Ca) primarily functions as a structural material in the body. Approximately 97–99% of calcium in the animal organism is found in bone tissue. It ensures the excitability of nervous and muscular tissues, reduces vascular permeability, enhances the phagocytic function of leukocytes, and increases the body's immune defense mechanisms.

Magnesium (Mg) is present in healthy organisms in the form of magnesium phosphate within bone tissue. It participates in the formation of protein complexes involving actin and myosin, which are responsible for muscle contraction [8-9].

Copper (Cu) is an essential trace element that forms part of protein compounds and enzymes. It acts as an activator of enzymatic reactions in the organism and accumulates in the liver and spleen. Copper is involved in blood circulation, hemoglobin synthesis, and hematopoiesis. It also plays a role in wool pigmentation, osteogenesis, and reproductive functions [10-11].

Copper also improves the activity of microflora in the rumen (forestomachs), contributes to normal pigmentation and keratinization of skin tissues, enhances enzymatic activity, improves carbohydrate metabolism, and accelerates glucose oxidation [12].

Manganese (Mn) influences reproductive organ functions and growth processes in animals. It improves oxidation processes in the body, enhances oxygen supply, stimulates glycogen synthesis, and accelerates fat metabolism. It also contributes positively to bone development and reproductive organ function [13].

Phosphorus (P) is largely present in the organism in the form of calcium–phosphorus compounds in bones, connective tissues, and blood. Phosphorus deficiency can lead to conditions such as osteodystrophy, uterine subinvolution, hypofunction of the parathyroid gland, kidney damage, decreased muscle tone, and the birth of weak calves. Phosphate salts are components of all

cells and intercellular fluids and play a crucial role in the metabolism of proteins, lipids, carbohydrates, and vitamins [14.

Vitamin E (tocopherol) is not synthesized in the body and must be supplied through feed or fat-based preparations. As a powerful antioxidant, vitamin E protects fats from oxidation and prevents the destruction of vitamins A and D as well as carotene. It promotes the accumulation of these vitamins in body tissues and improves their absorption. Vitamin E is absorbed through the intestinal wall and stored in adipose tissue [15].

Deficiency of vitamin E in feed leads to hypovitaminosis E, which in cows and sheep results in impaired reproductive functions, disruption of gamete maturation, embryonic mortality, and infertility even after repeated insemination attempts.

Conclusion

Based on the results of the experiment, it can be concluded that adding 100 g of the "VILOFOSS" nutritional supplement per cow to the feed ration of postpartum dairy cows has a positive effect on their physiological and reproductive condition. The use of this supplement contributes to an easier calving process and plays an important role in the prevention of postpartum reproductive disorders, including retained placenta, uterine subinvolution, ovarian hypofunction, persistent corpus luteum, endometritis, and other related diseases.

The study also demonstrated that the inclusion of VILOFOSS in the diet improves metabolic processes and digestive fermentation activity, which supports the normalization of reproductive functions in high-yielding cows. As a result, cows receiving the supplement return to estrus in a timely manner and achieve successful fertilization within two months after calving, which is considered an optimal service period in dairy production.

Therefore, the practical application of the VILOFOSS feed supplement in dairy farms can be recommended as an effective method for improving reproductive efficiency, reducing postpartum complications, and increasing overall herd productivity.

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