FEATURES OF METABOLIC DISTURBANCE IN ENDEMIC GOITRE IN COWS

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Аннотация:
В статье приведены распространение, этиология, специфические эндокринологические и метаболические аспекты Эндемического зоба у коров в условиях фермерских хозяйств Самаркандской, Кашкадарьинской и Бухарской областей Узбекистана.

Abstract:
In the article there is adduced the information distribution, etiology, specific endocrinological and metabolic aspects of Endemic goiter of cows farms of Samarkand, Kashkadarya and Bukhara regions of the Republic.

Ключевые слова: Эндемический зоб, метаболизма, тироид, гипотиреоз, гипертиреоз, Т4, Т3.

Key words: Endemic goiter, metabolism, thyroid, hypothyroidism, hyperthyroidism, T4, T3.

Relevance of the topic. One of the most significant obstacles to the implementation of the tasks to deepen the agrarian reform specified in the "Action Strategy for the Five Directions of Development of the Republic of Uzbekistan for 2017-2021", as well as in Resolutions No. 4841 "On additional measures to deepen economic reforms in animal husbandry" dated March 16, 2017 and ПҚ-4576 "On additional measures of state support for the livestock industry" dated January 29, 2020, prepared personally by the President of Uzbekistan, in the Laws of the Republic of Uzbekistan No. ZRU-97 "On the prevention of iodine deficiency diseases" dated May 3, 2007 and No. ZRU-397 "On Veterinary Medicine" dated December 29, 2015 (Collected Legislation of the Republic of Uzbekistan, 2007, No. 17-18, Art. 175; 2015, No. 23, Art.) and Decree of the President of the Republic of Uzbekistan No. PF- 5696 "On measures to radically improve the system of public administration in the field of veterinary medicine and animal husbandry" dated March 28, 2019, are diseases of imported breeding stock.

It is known that endemic goiter (Struma endemica) is a disease that develops due to iodine deficiency and is accompanied by specific morphological and functional changes in the thyroid gland [1,3,5].

The results of studies conducted by us over the past 10-15 years have shown that endemic goiter and associated metabolic disorders are relatively widespread among imported cattle and their offspring [2,7].

As a result of thyroid dysfunction and its metabolic consequences in cows in a relatively short period of time, there is a decrease in live weight by 20-30%, milk yield by 25-50%, as well as a deterioration in fertility and product quality. As a result, farms suffer an average of 1.5-2.5 million soums per year per cow. Therefore, studies aimed at increasing the productivity and reproductive performance of cows by preventing endemic goiter and associated metabolic disorders are relevant [4,6,8].

The purpose of the study is to develop evidence-based measures for early diagnosis, effective therapy and group prevention of endemic goiter and associated metabolic disorders in breeding dairy cows.

Research objectives:

- to determine the spread and economic damage of endemic goiter and associated metabolic disorders in breeding cows;
- identify the main alimentary and endemic causes;
- to establish clinical-physiological, hemomorpho-biochemical, hepatological and immunological changes characteristic of endemic goiter and associated metabolic disorders in breeding cows;
- to develop methods for early diagnosis of endemic goiter and associated metabolic disorders in breeding cows;
- through alternative experimental studies to develop effective means and methods for the treatment of endemic goiter and associated metabolic disorders in breeding cows;
- through alternative experimental studies to develop effective means and methods of group prevention of endemic goiter and associated metabolic disorders in breeding cows;
- develop recommendations for early diagnosis, effective treatment and group prevention of endemic goiter and related metabolic disorders in breeding cows and implement them in production.

Material and methods of research. The studies were carried out in 2015-2020 in cows and heifers of the black-and-white breed of the educational and experimental farm of the Samarkand Institute of Veterinary Medicine (Akdarya district of the Samarkand region), in cows and heifers of the local and Simmental breeds of the Fazo and Omadli Zarnigor farms of the Chirakchi district , black-and-white breed MCHZH "Karpat-ola chashmasi" of the Yakkabag district of the Kashkadarya region, in cows and heifers of the local breed of the farm "Zoir Abbos Azizjon" of the Kogon district of the Bukhara region.

Healthy and sick with endemic goiter, cows and heifers in the context of breed, age, seasons of the year, lactation periods and types of diet, were subjected to clinical-physiological, hemo-morpho-biochemical, thyroid-immunological, and samples of the goiter of forcedly dead cows were subjected to organoleptic and specific morphometric studies.

Analysis of the research results. The results of the studies show that in all regions of the country where studies were carried out, endemic goiter in breeding cattle manifests itself in three types: latent goiter, hypothyroidism, hyperthyroidism. In addition to the symptoms of the general metabolic syndrome (problems with milk production and fertility), sick animals are characterized by a peculiar body structure (ovality or flatness), the presence of hairless (forested) or hairless areas on the skin, the formation of "false mushrooms" and "false eyebrows", in on average, 30–50% of cows and heifers palpated morphological changes (increase or decrease) in the thyroid gland.

The results of the study of blood samples for indicators reflecting the state of the functions of the thyroid gland were characterized by strict thyroid specificity. So the average level of thyroxine (T4) in the blood of healthy cows was 3.6±0.15-5.36±0.21 μg%, triiodothyronine (T3) in blood serum - 1.25±0.10-1.50± 0.13 ng/ml. As the disease progressed, significant changes in these parameters were observed, in particular, an increase in serum T3 (on average, up to 2.45 ± 0.22-2.9 ± 0.25 ng / ml) and a decrease in the amount of T4 in the blood (up to 3.4 ±0.33-4.1±0.36 μg%). In the chronic course of the process, these changes were further deepened.

General endemo-metabolic disorders (GEMS). Studies have shown that in about 30-60% of cows of experimental farms, along with specific thyroid changes, deep metabolic disorders were established, the dominant type of which was a violation of protein-carbohydrate-lipid metabolism, which was characterized by a decrease in hemoglobin (up to 66-84 g/l) and the number of red blood cells (up to 4.4-4.9 million / μl) in the blood, as well as total protein (due to albumin), glucose and reserve alkalinity in the blood serum.

With EMN, as a result of endemia, especially after the third and fourth calving, dystrophic changes in the liver develop, which are characterized by an increase and soreness of the organ on palpation. Violated biliary, albumin-synthesizing, urea-synthesizing, lipid-synthesizing, enzyme-synthesizing and bilirubin-conjugating functions of the liver. Such disorders are especially evident in highly productive cows, in conditions of hay-concentrate and straw-concentrate types of diet compared to silage-concentrate.

The results of the analysis of the nutritional value of diets show that in all farms the share of high-quality roughage in them was no more than 12-15%. The degree of provision of diets for sugar was no more than 40-50%, for carotene - 50-60%, phosphorus - 70-75%, for digestible protein - 75-80%, for iodine - 45-55%, for calcium - 130- 150%. The calcium-phosphorus ratio was 2-2.5, the sugar-protein ratio was 0.45-0.55.

Conclusions

1. In the conditions of farms of the Republic of Uzbekistan, the environment of breeding dairy cows, the infection with endemic goiter is on average 30-60%, the main etiological factors of which are the lack of high-quality roughage in the diet, the tyrodic endemism of the regions,

as well as its low availability for sugar, carotene, phosphorus, digestible protein and iodine, as well as low sugar-protein (0.45-0.55) and high calcium-phosphorus (2.2-3.0) ratios in it.

3. When assessing the state of the thyroid gland in breeding dairy cows, along with specific thyroid changes, it is advisable to take into account general metabolic disorders and the functional state of the liver.

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