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Қазақ ұлттық аграрлық университеті

# Х А Б А Р Л А Р Ы

## ИЗВЕСТИЯ

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## KETOSIS OF CATTLE IN THE FARM "BAYSERKE-AGRO»

**Abstract.** Results the pathomorphological studies of corpses 5 forcedly the killed cows belonging to farm of “Baysyerke-Agro” LLP of Almaty region. As a result of autopsy are established: protein-fat hepatosis and nephrosis, myocardiodystrophy and dilation of the heart ventricles, acute catarrhal abomasitis and enteritis, serous lymphadenitis, atony of the pancreas were established. Histologically, the parenchymatous organs detected vascular disorders, diffuse fatty infiltration, granular desprotegidos hepatocytes, kidney cells causes significant release and cardiomyocytes.

**Keyword:** cattle, ketosis, metabolic disorders, pathological morphology, fat infiltration.

**Introduction.** Improving animal feeding is the main source of increase livestock. Non-recovery of basic and biologically active substances in animals’ diet leads to metabolic disturbances (acidosis, ketosis, etc.), a decrease in natural immunity, diseases of the reproductive system, which negatively affects the economic efficiency of the industry. In recent years, literature review veterinary medicine in the country has provided sufficient and complete feeding of livestock, foodborne diseases, prevention of metabolic disorders, including vitamins A, D, E, iodine, selenium, etc.

In addition to government subsidies allocated to agriculture, it provides concessional loans. Farms throughout the country yield cattle, meat and dairy cattle from their own funds and state leasing from abroad. Among importing countries can be called Europe and America with strong economies. Livestock imported from these countries is adapted to climate, nutrition, and etc. Unfortunately, breeding herders have a large number of breeding cows due to the lack of scientifically based and complete feeding on farms, including various metabolic disorders and other diseases, including oedema. The disease is mainly observed in the first 1-2 months after calving, predominantly in high-producing cows, with the productivity level of 4,000 kg of milk during lactation, however, there are common cases when onset of the disease occurs in the interlactation period of cows [1, 2].

Disbolism at animals one of the burning issues in modern livestock production of many countries. With transfer of livestock production to industrial technology extent of distribution of a ketosis considerably increased [3, 4].

**Materials and methods.** Scientific work was carried out in 2016-2018 at Department of “Biological Safety” of the Kazakh National Agricultural University and in “Baysyerke-Agro” LLP private enterprise.

Necessary materials were received from collective farm of “Baysyerke-Agro” LLP in Talgar district of Almaty region, 4 cowsheds and 17 cows who died as a result of natural disasters. Their age changed. The disease was diagnosed by results of complex researches, called: clinical, pathological, anatomic, biochemical studies.

Clinical signs of cattle, its treatment, leaving and the epidemiological status of farms were collected by poll of the veterinarians who are engaged in livestock production and collected on clinical symptoms at

14 mentioned cows. For clinical tests the following general recommendations were used: viewing to iron, percussion and thermometry.

Pathological and pathosurgical researches were conducted.

To determine some biochemical parameters of blood, we have to conform to requirements of an aseptic and antiseptic arthroplasty, bloodsheds will not be given yet.

The biochemical inspection of cows noted by ketosis symptoms was carried out in laboratory laboratory of a farm, and the content of crude protein was determined by type of the RLU refractometer.

**Results.** Works were carried out in 2016-2018 on a farm of “Bayserke-Agro” located in the territory of Talgar district of Almaty region. On the basis of livestock production in collective farm of “Bayserke-Agro” treats black and Swiss seeds. To define disease degree, it was got according to 21 infested cows during 2 years old (table).

Occurrence of a disease on age among cows in “Bayserke-Agro” LLP

Quantity of infected animals 21			
#	Age	Infected animals	%
1	Up to 3 years	4	19,4
2	Up to 5 years	9	42,8
3	Up to 10 years	12	57,1

As it is shown in table 1, “Bayserke-Agro” LLP in livestock production has the highest share of cows in an age group till 10 years old, i.e. 57.1%, as a result of a disease. The reason of it is that large organisms of young animals are physiologically insufficient for reduction of formation of slate acids because of a lack of minerals therefore when in an organism the content of ketones increases, there is a lack of propionate and glucose that, in turn, reduces tricarboxylic reactions.

When studying specific features of relative clinical features of a cation among cows, cattle-farmers of country economy “Bayserke-Agro” LLP were observed recently by the following changes at milk cows: abdominal tenderness, abnormal changes, diarrhea hypotension, decrease in efficiency, the Black - refusal of meal, change of excitement on fatigue, decrease in fertility and efficiency, frequent decrease in body temperature, an atony, I am a constipation, diarrhea, liver border increase, reduction of a diuresis, growth and reproductive frustration, postnatal complications, frequency mastitis, the last wall and are absorbed a tail vertebrae delete. Results and the analysis of a research showed that we carried out clinical tests for the nursing cows. The general methods were applied to clinical tests.

Results of clinical test of cows were the following: when cows weak, their pupils change, the surrounding objects and cells attached to each other are visible lying, wool and wool indistinct, coloring and time of wool). Between horns and wool around a brush and a brush we found out that the milk plants reduced the milk yield, dropped mesial fabric and fell from its normal size. We learned from the words of veterinarians that cows did not receive timely noise after the birth when heart, heart sounds weak, low, accurate and when the bone tissue is injured is heard, force a move of cattle, front legs brilliant decreases, joint pains were not observed, extremities were noted, edges of walls decayed, final scales were reduced, absorbed 3/1, the last tail department of a backbone is absorbed, including relaxations of coxofemoral parts the wool tousled, the animal does not move to rise from the photo (1b).

Thus, the main clinical signs of a disease, irrespective of age and a floor of cattle, were same: loss of skin fabric, the complicated breath, a loss of appetite, absorption of face walls and a tail and absorption of vertebrae. Features: abortion and noise at cows, loss of milk at cows and an osteodystrophy at adults (more than 5 year old).

Result of a biochemical research of ketones of blood in blood by means of the RLU refractometer. We conducted a biochemical research to define composition of ketones in blood. In our research we generally received 15-20 ml of blood for biochemical researches of a cerebral palsy of 21 cows with clinical symptoms. In the analysis of results of biochemical researches the content of calcium and crude protein in a blood-groove significantly did not differ from normal, the content of glucose and alkali considerably decreased, and donors of ketones increased several times. For example, in our case cancer of ketone makes from 1 to 6 mg of % in a normality, in our research we showed 21-63 mg of %.



Photo 1 – Natural loss of wool (a), disorder of moving (b)

Because of a pathomorphologic trend of deep internals at flash pathogenetic - the histologic research of internals showed the following results, generally on a farm within two years, 21 catheters for the head, 5 of which were a cataract, and, therefore, pathomorphologic researches, 5 cows on the basis of the obtained data.

3 of 5 dead cows had an acute disease, and at 2 - chronic therefore it is important to describe acute and chronic type of pathomorphologic changes which are directly connected with the course of a disease.

At cows who are observed at the most acute forms of diseases: process of a mutilation, identification of internals of a liver, emergence of fat on all internals (figure 1). Dystrophy of a myocardium, liver, kidney dandruff, the orange-red, fatty tissue always left on a knife without fat (figure 2). The size of kidneys enlarged, and particles of bark and dirt are scattered. The bast layer is filled with blood of orange tone and matter. The expanded myocardial dystrophy in a right ventricle is the main fatty rest which bleeds in heart under an epicardium, inflammation of a myocardium, myogenetic space of a stomach (figure 3).



Figure 1 – Complete degreasing fat of internal organs



Figure 2 – Enlarged liver



Figure 3 – Fatty dystrophy

Acute catarrhal gastroenteritis. In intestines, especially in the stomach, dry and dense fodder weight is full. The expressed hypostasis and hemorrhagic inflammation in glaciers and separate small and large intestines. Lymph nodes in a cell wet, wet, are increased (figure 4).

Dystrophic changes in a liver and kidneys at chronic diseases were more expressed (more than figures 6, 7) mesenchymal cells. In heart, along with defeat dystrophy, the dysphagy was noted (figure 5). Walls of blood vessels were mucous fibrinedidales, with necroses character. Tubular bones, a forehead, lumbar department of a backbone, soft tissues, friable fabrics, soft tissues in some parts of a bone are developed in rather soft, mixed bone joints (especially in a backbone). Lymph nodes of a breast are not enlarged, a light gray bean seal dense, borders of layers are not clear.



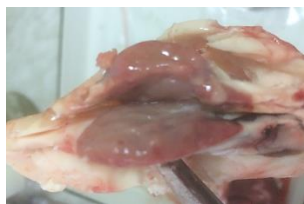


Figure 4 –  
Enlarged lymph nodes



Figure 5 – Accumulation  
of fat and haemorrhages  
in an epicard



Figure 6 –  
Fatty dystrophy in liver



Figure 7 – Fatty and  
granular dystrophy in kidneys

The urolithiasis is slightly filled with urine, the mucous membrane is light gray. The uterus is abundant, the wall of the uterus is dense, the mucous membrane is light gray. Vagina without any changes. Eggs are not enlarged, the sizes of yellow bodies are up to 2,5 cm. Lumbar, hip and hip, lymph nodes are enlarged, dense, with a water surface, light gray color.

The roots of the brain are a little filled with blood, not very moist, in the brain plate contains a large amount of clear fluid. The back is unchanged. Bone fat is very moist, light red color of thoracic, ribbed and spine.

Stomach in green color, there are minor. Intestinal tract and the mucous membranes are the steel-colored. The ovary in small amount of liquid food, and a cream crust light and gray. The duodenum is partially filled with fluid in small amounts. The mucous membrane is shiny, gray-red. Mesenteric lymph nodes are not enlarged. When cutting the surface is wet, light gray, some areas are hollow. There are gray spots. In the round intestine, small intestine and colon contains a small amount of substance yellowish-brown, light gray with purple spots with mucosa. The large intestine, the cecum and rectum are gray-brown, filled with a semi-liquid substance. The mucous membrane is light gray, unchanged.

Microscopic changes. Changes in a ketosis always were in a liver. Hepatocytes are affected by fat, carbohydrates and granular dystrophy. Inflammation of mitochondrions and granular tanks of an endoplasmic lattice extended, and the number of cytoplasmatic tanks with a flat lattice increases, and they become bubble (figure 8).

At the same time fatty infiltration of a liver is connected with carbon dioxide and cerebral dystrophy. In this regard there is mitochondrial hypostasis, granular endoplasmic (EPT) substrate extends, and granular ENK increases. The renal failure of a liver was caused by a degenerative degeneration with symptoms of fatty dystrophy.

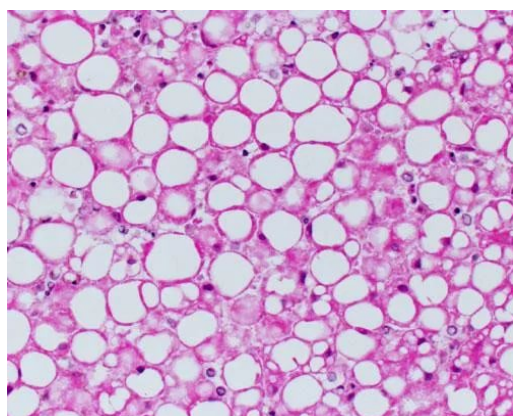


Figure 8 – Infiltrative Fatty dystrophy in liver.  
Hematoxylin - Eozin stain, x 100

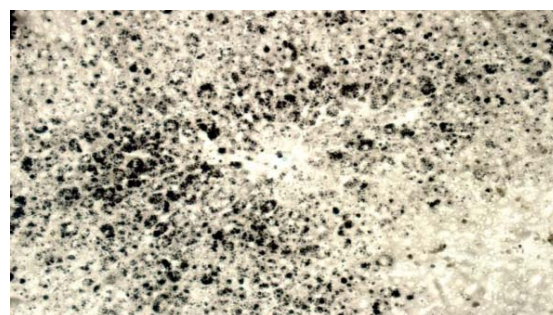


Figure 9 –  
Fatty dystrophy in liver. Black Sudan stain, x 100

In process of growth of phagocytal activity of cells of Kupfer of a sinusoid, apparently, are replaced with macrophages and lymphocytes in the place of hepatocytes which were affected by dead (figure 9).



Renal vertical hoses tend to settle fat drops. Neurons of a nervous system of heart are exposed to a chromatolysis, neuronofag, and fibers are thickened and cut. Mesh dystrophy of protein is characteristic of cardiomyocytes and fibers of skeletal muscles. Acute fatty infiltration in kidneys is directly connected with brain dystrophy. In a chronic case - a glomerular and epithelial coronary necrosis. In heart - the intestinal impassability, an intra arterial nervous system is formed by neurophages. Purkin's Fiber - the majority of fibers, fatty spots, at a myocardium - a degeneration, fatty and cerebral dystrophy, a muscular atrophy. Tubular and lymph nodes - a hyperplasia of a mesenchyma and eosinophils.

**Conclusion.** The research conducted on the basis of "Baysерке-Agro" LLP the farm of dairy cows and some biochemical changes in blood changes in clinical signs, amounts of glucose in normal conditions, the total amount of ketones increased by 6-7 times, and pathological researches of cattle of a ketosis gloss dystrophy of a liver, catarrhal abomasitis and enteritis, serous lymphadenitis, atony, deformation of hoofs, osteomalyation, metabolic disorders – which indicate ketoses in animals.

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#### «БАЙСЕРКЕ-АГРО» ШАРУАШЫЛЫҒЫНДАҒЫ ІРІ ҚАРА МАЛ КЕТОЗЫ

**Аннотация.** Мақалада Алматы облысына қарасты "Байсерке-Агро" шаруа қожалығына тиесілі лажысыздан сойылған 5 сиыр өлекесінің патоморфологиялық зерттеу нәтижелері келтірілген. Зерттеу нәтижесінде: белокты-майлы гепатоз және нефроз, миокардтың дистрофиясы, жүрек қарыншасының дилатациясы, жедел катаральды абомазит және энтерит, серозды лимфаденит, қарыншалардың атониясы анықталды. Гистологиялық зерттеулер нәтижесінде паренхималық мүшелерде қан айналымының бұзылуы, Паренхиматозды мүшелерде гистологиялық тұрғыдан тамыр бұзылыстары, диффузды майлану инфильтрациясы, гепатоциттердің, нефроциттердің, кардиомиоциттердің түйіршікті диспротеинозы анықталды.

**Түйін сөздер:** ірі қара мал, кетоз, зат алмасуының бұзылуы, патологиялық морфология, майлану инфильтрация.

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#### КЕТОЗ КРУПНОГО РОГАТОГО СКОТА В ХОЗЯЙСТВЕ «БАЙСЕРКЕ-АГРО»

**Аннотация.** В статье приводятся результаты патоморфологических исследований трупов 5 вынужденно убитых коров, принадлежавших хозяйству «Байсерке-Агро» Алматинской области. В результате аутопсии установлены: белково-жировая гепатоз и нефроз, миокардиодистрофия и дилатация желудочков сердца, острый катаральный абомазит и энтерит, серозный лимфаденит, атония преджелудков. Гистологически в паренхиматозных органах обнаружены сосудистые расстройства, диффузная жировая инфильтрация, зернистый диспротеиноз гепатоцитов, нефроцитов, кардиомиоцитов.

**Ключевые слова:** крупный рогатый скот, кетоз, нарушение обмена веществ, патологическая морфология, жировая инфильтрация.

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