

Feeding of birds was conducted with a full mixed fodder. Laying hens from the first research group in addition to the basic diet received selenium at a dose of 0.2 mg/kg of dry matter of mixed fodder. As a source of selenium, sodium selenite was used (TU-6-09-1315-76), with a conversion factor element in salt 2.2. Supplement was thoroughly mixed with mixed fodder. Mixed fodder was fed under the existing rules. Laying hens from the second experimental group were fed a full mixed fodder and were watered herbal Phytopank, Phytohol.

Analysis of the research indicates that including of sodium selenite in the diet of laying hens from the first experimental group eggs mass index at the end of the study increased by 1.9 % compared with the control group. In laying hens from the second experimental group an increase in egg weight was also observed compared with the control group by 2.3 %. A similar situation was observed in laying hens from the third research group. The difference was 2.5 % ($p < 0.001$). It should be noted that with the increase of egg mass the mass of its parts increases.

So, the average weight of egg yolk of laying hens from the first experimental group fed with sodium selenite increased by 2.8 %. In laying hens from the second experimental group given herbal dietary supplement an increase in the average weight of the yolk by 7.4 % ($p < 0.001$) was also observed. In the third experimental group, administered in the diet sodium selenite combined with herbal dietary supplement the average yolk mass increased by 7.0 % compared to the control group. Eggs quality directly depends on egg weight and the thickness of the shell and its mass.

As it was seen from the results eggshell mass index increased at the end of the experiment in laying hens from the first experimental group by 7.8 % ($p < 0.05$) compared with control. In laying hens from the second experimental group given herbal dietary supplement an increase in egg shell weight by 5.4 % at the end of the experiment was also observed. A similar trend of increasing egg shell weight by 6.2 % was observed in laying hens from the third experimental group fed with sodium selenite in combination with medicines.

In laying hens as from the second experimental group given herbal dietary supplement with basic diet and from the third experimental group fed with sodium selenite combined with herbal dietary supplement index indicator of eggs form was significantly higher compared with the control group, and was 77.0 % respectively. In laying hens from the first experimental group where diet was administered with sodium selenite significant differences from the control group on this indicator were not observed.

When studied the average weight of egg white and thickness of egg shell significant difference among the research and control groups of hens was not observed.

Analyzing the results we can conclude that during the experiment an increase in productivity in all research groups was observed compared to the control. Thus, in the first experimental group, which was administered in the diet sodium selenite, egg production increased by 9.5 % in laying hens from the second experimental group in the application of herbal dietary supplement an increase – 9.3 % in the third experimental group, in terms of the combined sodium selenite with herbal dietary supplement productivity increased by 9.9% compared with the control group at the end of the experiment.

The results of research proved that complex use of herbal dietary supplements Phytopank and Phytohol and sodium selenite for laying hens during active egg laying period has positive impact on the morphological characteristics of eggs, this is confirmed by increasing their mass to 2.5 % ($p < 0.001$) yolk to 7.4 % ($p < 0.001$) and egg shell to 7.8 % ($p < 0.001$). Egg production increased by 9.9 %. Also complex use in the diet of laying hens, sodium selenite and herbal dietary supplements Phytopank and Phytohol has significant impact at ant on slaughter weight.

Prospects for further research are explored in action of herbal dietary supplement and sodium selenite on protein metabolism during intensive productivity of laying hens.

Key words: egg production, carcass, heavy metals, laying hens, sodium selenite, Phytopank, Phytohol.

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DYNAMICS OF PROTEIN METABOLISM IN DRAFT DOGS UNDER INFLUENCE OF HERBAL FEED ADDITIVE «GASTROATSYD»

Наведено дані щодо впливу кормової фітодобавки «Гастроацид» на стан білкового обміну у службових собак. Встановлено підвищення вмісту загального білка на 11,49 %, в тому числі білкових фракцій; альбумінів – на 5,49 %, глобулінів – на 16,75 % та зниження сечовини на 58,01 % і азотсечовини на 9,24 %, креатиніну – на 35,96 %, а також активності ферментів АсАт та АлАТ відповідно на 4,26 і 13,66 %. Доведена ефективність застосування фітодобавки щодо профілактики шлунково-кишкових захворювань у службових собак.

Визначено позитивний вплив її на загальний стан, обмін речовин, в тому числі білковий обмін, функцію печінки та підшлункової залози тварин.

Ключові слова: кормова фітодобавка «Гастроацид», білковий обмін, профілактика, травна система, біохімічні показники, сироватка крові.

Setting of the problem. To create necessary conditions for the dog existence where health and ability to work would be saved, first of all it is necessary to know what environmental factors are favorable for the dog and which are harmful. Environmental conditions have significant impact on the dogs. An important role belongs to gas composition of the air (oxygen content, nitrogen, carbon dioxide and water vapor), physical properties (humidity, temperature, atmospheric pressure, air velocity, precipitation), the presence in the air of impurities (dust) [2, 7].

Group keeping is a good practice in special schools, kennels for draft and hunting dogs and in hospitals (vivarium). The area for the kennel placement is selected on the place which is protected from the wind slopes, forest clearings, forest edges, away from sources of industrial and road noise.

During the construction of the kennel it should be taken into account the number of dogs, the breed, their function, the place for studying and training, walking. The distances among buildings, residential and industrial premises are determined under the provisions of veterinary and fire control, and care for the protection from smoke pollution, waste production of various industrial enterprises, street noise. Around the kennel to protect against dust, wind and solar radiation it is preferably to plant dense sprawling trees in the southern areas and high dense shrub in the north. The trees protect the area from the sun in summer heat, create cool, shrub protects from the wind and does not prevent the sunlight. The size of the plot depends on the number of animals. To prevent the territory from stray dogs kennel area should be fenced with the fence not less than 2 m high [4].

Proteins are the basic and most important structural parts of living organisms. It is known that protein metabolism coordinates, regulates and integrates most of the chemical reactions in the body. Most of the plasma protein is synthesized in the liver - albumin, α_1 , α_2 - and of β -globulins, fibrinogen, some coagulation factors, one of β - and γ -globulins - in cells of the immune system.

Metabolic disorders including protein caused by various factors: a) the shortage in feeding, keeping and operation of dogs, including draft dogs leads to disorders of protein metabolism caused by various factors; b) insufficient of protein feeding; c) excessive protein feeding, especially on the background of a lack of supply of other components, including sugar; d) violation of protein digestion in the stomach, intestine and absorption of amino acids; e) violation of protein synthesis in the body and allocation of the end products of metabolism – ammonia, urea, creatinine, uric acid; e) metabolic violation of proteins between the liver and the blood; g) increased need for protein during pregnancy, lactation, stress factors and various diseases; f) loss of proteins in various diseases; c) metabolic violation of amino acids in organs and tissues.

The first system that responds to the metabolism violation of proteins is the digestive tract. Gastrointestinal diseases are common in dogs. Therefore, an efficient and reliable prevention of these diseases by observance of hygiene requirements, keeping and feeding conditions of dogs, including service dogs will contribute to the improvement of metabolism including protein. Thus, at present time, this problem is important and relevant.

Analysis of recent research and publications. The soil effects on the organism of the dog. The most favorable soils for the animals are sandy and sandy loam soils that pass air and water and become dry quickly after rain, the least favorable – clay and especially silty soils, which keep moisture and cold for a long time. That is why it is undesirable to place kennels and cages on such soils.

In areas with long and harsh winter in dogs that are kept outside in booths or enclosures, before the onset of cold weather longer and thicker wool with thick undercoat grows. In a hot dry climate wool in dogs of the same breed is shorter, less dense and undercoat in most cases is absent [1, 2].

In cold and wet weather heat transfer in dogs is enhanced. If under such conditions the dog is kept too long outdoors without movement, it can catch a cold or may be frostbitten. Conversely, during the intense heat they may get sunstroke, and in hot weather without air movement and especially for its high humidity – heat strokes. Dog's resistance to many diseases depends on where it is kept. As shown long-term observations, dogs of the same breed under the same conditions of feeding live longer if kept in backyards, not in apartments. Draft dogs, especially German Shepherds, are quite resistant to adverse environmental conditions, quickly adapt to climate change. But it should be noted that abrupt changes in living conditions, climate, even for these dogs are not desirable. Therefore, we must as far as possible to protect the animals from extreme heat, cold and other adverse climatic factors.

Among the diseases of the digestive system the most common are functional and morphological disorders of the stomach and small intestine mostly of catarrhal character (gastroenteritis) [1].

According to foreign veterinary literature, gastroenteritis (called «small intestinal disease») are classified primarily as acute inflammation of the gastrointestinal polyetiologial – intestinal tract, manifested digestive disorders, immune response and intoxication. Animal death as a result of digestive diseases is on the second place after deaths from cardio - vascular pathologies. Many authors paid attention to the etiology, pathogenesis, diagnosis and treatment of diseases of the gastrointestinal tract in dogs, but prevention and prophylaxes are studied not enough. So it is important to search for new efficient and cost-effective preventive means for the prevention of pathology of the gastrointestinal tract [4].

There is a need to explore non-traditional feed ingredients that affect the gastrointestinal tract. It is also necessary to pay attention to natural herbal complexes, which are more effective than synthetic additives and are cheaper.

Herbal preparations have low toxicity and promote high therapeutic and prophylactic effect. Their use in practice due to the presence in their structure, in addition to food, biologically active substances, after entering the body, even in small quantities, cause specific physiological effects [4, 8].

Earlier a group of scientists from the Institute of Gastroenterology and Dnepropetrovsk State Agrarian and Economic University, led by Professor P.P Antonenko, developed, tested and implemented in practice herbal preparations, justified their use for the prevention and treatment of diseases, including gastrointestinal, in farm animals and dogs. Among these tools there is a feed additive "Gastroatsyd", which includes alcohol tinctures of certain herbs, such as: water mint, Belladonna, St. John's wort grass, licorice root, white acacia bark, ahearn root, coriander, pine cones and fennel fruit.

This feed additive has anti-inflammatory, antispasmodic, antibacterial, cholagogic, analgesic effect, normalizes gastric secretion, motor function of the gastrointestinal tract and improves food digestion. So, determining the effectiveness of the feed additive "Gastroatsyd" is important for the prevention of gastrointestinal diseases particularly in dogs.

The objective of the research – to determine the effect of herbal feed additive "Gastroatsyd" on indicators of protein metabolism in the blood of dogs for prevention diseases of the gastrointestinal tract.

Materials and methods of the research. The study was conducted on the base of the kennel of special police "Berkut" and a veterinary center of pet and exotic animals "Biomyr" in Dnipro city.

Experimental animals were dogs of draft breeds (German Shepherd), aged 5–6 years. Two experimental groups (on a pair-analogues) in the amount of 5 animals each were formed. The control and experimental groups of animals were located in the same conditions of feeding and keeping.

Dogs from the experimental group after 60 minutes after feeding were watered "Gastroatsyd" according to the scheme: 0.25 ml. diluted drug in 20 ml. of boiled water cooled to 37 C two times a day for 30 days. To assess the impact of supplements on the physiological condition of the dogs the blood was taken at the beginning and immediately after the experimental period. Blood was taken from the subcutaneous vein of the forearm fasting in the morning. Serum samples were tested for total protein content by biuret test, albumin and globulin by nonphelometric test, urea content – by a method of Marsh, creatinine – by the method of Popper, AST and ALT activity – by kinetic method.

The data were calculated statistically using the application package MS Excel. Changes considered reliable at $p < 0.05$.

The main results of the research. According to the data from the Table 1 blood biochemical parameters of dogs before using feed additives were at the upper limit of the physiological norm, and creatinine and ALT activity even larger 27.8 mmol / l and 11.8 U / L. respectively.

The data from the Table 1 indicate that total protein and protein fractions, albumin and globulins increase in dogs after using herbal additive. Thus, raising the total protein was at 11.49 % ($p < 0.05$). Absolute albuminosis was accompanied by increased content of globulin fraction, at 16.75 % ($p < 0.05$), and albumin factions to 5.49 % ($p < 0.05$). However, the protein ratio decreased by 9.09 % and was within normal limits. These data indicate improved protein metabolism as herbal feed additive "Gastroatsyd" contains additional sources for protein synthesis and stimulates the immune system of animals by significantly increased globulin fraction, in our opinion, due to gamma globulin.

Table 1 – The evolution of protein metabolism in dogs blood using herbal feed additive «Gastroatsyd» (M ± m, n = 5)

Indicator	Before using	After using
Total protein, g / l	74±1,04	82,5±2,21*
Albumins, g / l	34,6±0,67	36,5±1,91
Globulins, g / l	39,4±1,01	46±2,05*
Protein coefficient	0,88±0,08	0,8±0,10
Urea, mmol / L	8,36±2,11	3,5±0,55*
Urea nitrogen, mg%	15,94±1,85	6,7±1,06*
Creatinine mmol / l	163,2±18,63	104,5±9,09*
AST, U / l	41±5,14	42,75±7,38
ALT, U / l	38,8±7,31	33,5±1,14
Index de Ritis U	1±0,26	1,42±0,26

Note: * – p<0.05 in respect to the initial data.

Products of final metabolism (urea, creatinine, urea nitrogen) have significant importance in the investigating of protein metabolism. Creatinine in clinically healthy animals is completely filtered by nephron glomerular apparatus and is not reabsorbed in the tubules. That is why the determination of creatinine is used to study kidney filtration function. The concentration of urea depends on the intensity of synthesis and excretion. Therefore, it is important to determine the diagnostic test as the liver, where it is synthesized, and the kidneys, through which it is eliminated.

Reduction the level of urea in the serum on the 30th day of using phyto additive was at 58.01 % (p<0.05), urea nitrogen to 9.24 mg% and creatinine level at 35.96 % (p<0.05).

All these points show improvement of liver and kidney function. In clinical practice, aminotransferase activity is used to diagnose diseases of liver, myocardium and skeletal muscles. ALT activity of dogs is an indicator for the diagnosis of liver diseases. After using feed additive ALT activity decreased by 13.66 % and AST increased by 4.26 % and these figures remained within the physiological norm.

All these changes show a positive effect of herbal feed additive "Gastroatsyd" on protein metabolism, which in turn points to the high efficiency of prophylactic use for diseases of the stomach, intestines, pancreas and liver in dogs. Herbal additives have a considerable number of biologically active substances that affect positively and comprehensively on animals as a whole system, namely macro and – micro elements, vitamins and essential oils. Trace elements: zinc, manganese, iron, copper, cobalt and others. For example, zinc plays an important role in the synthesis of proteins and nucleic acids, stimulation of alkaline phosphatase and insular apparatus of the pancreas. Biochemical role of zinc is associated with the action of enzymes to which it is a necessary component, or activator, stabilizer structure of DNA, RNA and ribosomes. Manganese, is actively involved in oxidation processes in the tissue respiration, affects the growth, reproduction, blood, endocrine function. It results in lipotropic action and utilization of fats increases, it also prevents fatty liver. Manganese interacts with folic acid and cyanocobalamin and plays an important role in the formation of hemoglobin as evidenced by increasing hemoglobin in the experimental group of animals. Macronutrients: potassium and sodium are involved in maintaining acid-base balance regulation of intra-cellular osmotic pressure in the phosphorylation process. Sodium along with potassium ions maintains normal function of the myocardium, and with magnesium is involved in the reactions of the neuromuscular stimulation.

Conclusions. Conducted research as for prophylaxes diseases of gastrointestinal tract and renal system in dogs using herbal feed additive "Gastroatsyd" showed positive effect on animals, dynamics of protein metabolism, function of the digestive system, liver, pancreas and renal system, and metabolic processes in dogs. Using herbal feed additive "Gastroatsyd" resulted in increasing of general protein to 11.5 % (albumin fractions to 5.5 % and globulin fractions to 16.75 %), decreasing of urea to 58.01 %, nitrogen of urea to 9.74 %, creatinine to 35.96 %, ALT activity to 13.66 %. These parameters prove improvement of the function of liver and kidneys of the dogs.

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Динамика белкового обмена у служебных собак при влиянии фитодобавки «Гастроацид»

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Приведены данные о влиянии кормовой фитодобавки «Гастроацид» на состояние белкового обмена у служебных собак. Установлено повышение содержания общего белка на 11,49 %, в том числе белковых фракций; альбуминов – на 5,49 %, глобулинов – на 16,75 % и снижение мочевины на 58,01 % и азотмочевины на 9,24 %, креатинина – на 35,96 %, а также активности ферментов АсАТ и АлАТ соответственно на 4,26 и 13,66 %. Доказана эффективность применения фитодобавки по профилактике желудочно-кишечных заболеваний у служебных собак.

Определено положительное влияние ее на общее состояние, обмен веществ, в том числе белковый обмен, функцию печени и поджелудочной железы животных.

Ключевые слова: кормовая фитодобавка «Гастроацид», белковый обмен, профилактика, пищеварительная система, биохимические показатели, сыворотка крови.

The dynamics of protein metabolism in draft dogs under the influence of herbal feed additive "Gastroatsyd"

O. Kachalova

The article presents data on the effect of herbal feed additive "Gastroatsyd" on the state of protein metabolism in the draft dogs. Increase of total protein to 11.49 %, including protein fractions; albumin to 5.49 % globulins to 16.75 % and reduced urea to 58.01 % and urea nitrogen to 9.24 %, and 35.96 % creatinine, as well as the activity of enzymes AST and ALT, respectively to 4.26 % and 13.66 %. The efficiency of the use of herbal feed additive for the prevention of gastrointestinal diseases in draft dogs was described.

It was determined its positive effect on the overall condition, metabolism, including protein metabolism, liver function and animal pancreas.

Key words: herbal feed additive "Gastroatsyd", protein metabolism, prevention, digestive system, biochemical parameters, blood serum.

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