

UDC 636.7:087.7.636:612.34

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## THE EFFICIENCY OF FEED PHYTOADDITIVES FITOPANK FOR EXOCRINE PANCREATIC INSUFFICIENCY IN DOGS

У статті показано, що екзокринна недостатність у собак проявляється зниженням  $\alpha$ -амілази на 27 %, загального білка на 23,6 %, та наявністю в калі жиру і крохмалю. Застосування фітодобавки Фітопанк (містить в своєму складі манган, ферум, купрум, кобальт, натрій та калій, а також ефірні олії, жирні олії, та ін. біологічно активні речовини) сприяло покращенню функціонального стану підшлункової залози, про що свідчить відсутність в калових масах ліпідів, крохмалю, підвищення до фізіологічних величин  $\alpha$ -амілази в 1,5 рази, загального білка на 37,5 %, альбумінів на 30,2 %. Крім того, під впливом рослинного препарату покращується еритроцитопоез, на що вказують підвищення кількості гемоглобіну та еритроцитів на 17,08 і 30,2 % відповідно.

**Ключові слова:** кормова фітодобавка Фітопанк, Royal Canin "Gastro Intestinal Low Fat", біохімічні показники крові, підшлункова залоза, собаки.

**Statement of the problem, analysis of recent researches and publications.** The pancreas is a mixed gland secretions that provides the digestion of feed with one hand and regulation of all types of metabolism by the incretion of hormones. The reported prevalence of diseases can reach up to 10 % [1], among which pancreatitis occupies a leading place [2]. According to the literature, the disease is affecting dogs older than 7 years, as well as castrated males. Often acute pancreatitis is a consequence of other diseases, surgical interventions or the application of chemotherapeutic agents [3, 11,12].

Treatment and prevention of pancreatic diseases requires a comprehensive approach [2, 4, 5]. In recent times there is evidence of high efficiency of the use of herbal medicines in the treatment and prevention of pathologies of the pancreas [6, 7]. Given this, the study of efficiency of application of preparations of plant origin is relevant.

The **aim** of this work was to establish changes of biochemical parameters in dogs with the use of food additives "Fitopank" pathology of the pancreas.

**Materials and methods.** The experimental part of the work was carried out on the basis of the private veterinary office "the CAT and Co" PE Plahotin called Dnepropetrovsk. As experimental animals used dogs of various breeds and sexes, addressed to the veterinary office with a pathology gastrointestinal tract, in particular the pancreas. The physiological condition of the animals was determined on the basis of clinical examination and hematological data of the research. Only 20 were selected dogs 6-12 months of age, which is conditional, at the time of receipt of a veterinary office, were divided into two groups – control and experimental. This takes into account age (6-12 months), breed (Yorkshire Terrier, drathaar, mixed), gender, and abnormalities of biochemical indicators of blood, namely decrease in the level of  $\alpha$ -amylase (exocrine pancreatic insufficiency), the General condition of the animal.

During the tests, the dogs of both groups were housed under identical conditions: each dog, within 14 days, was in a separate cage with an individual feeder and drinker, which was free access. Animals in the control group received dry food Royal Canin "Gastro Intestinal Low Fat", and the dogs of the experimental group additionally vidouville food additive of plant origin "Fitopank". The drug is applied orally 30-40 minutes after feeding and dosage: animals up to 10 kg – 0,5 ml, 10-20 kg 1 ml 20 kg or more – 20-30 ml. in 2 ml. of boiled chilled water to t - S.

"Fitopank" is the composition of the alcoholic tinctures of the seven individual medicinal plants are combined in appropriate ratio (rhubarb root ogorodnova, swamp iris, elecampane, sage, etc.). It has anti-inflammatory, antispasmodic, choleric, analgesic effect, normalizes gastric secretion, motor function of the gastrointestinal tract and pancreas, improves digestion, improves performance, enhances the immune reactivity of the organism, and also has sedative and anti-hypertensive effects (patent of Ukraine (11) 47289 And from 17.06.2002 years).

To assess the impact of additives on the physiological state and biochemical blood parameters in dogs were collected blood at the beginning and immediately after the end of the research period. Blood was collected from saphenous vein of the forearm in the morning on an empty stomach. The number of erythrocytes and leukocytes was determined in a chamber with a grid Goryaeva, hemoglobin – hemiglobincyanide method. In the serum was determined the content of total protein

bureauin the method, albumin – the reaction with bromcresol green, total bilirubin – Harshika-Cleghorn-Grof, as well as the activity of  $\alpha$ -amylase – Caravan, ASAT and Alat – kinetic method [8]. Additionally, we performed the calculation of the concentration of globulins.

The obtained data were statistically processed using software package MS Excel with calculation of student's criterion. Changes were considered significant at  $p < 0.05$ .

**The results of the research.** As a result of the morphological blood examination (table. 1) between animals of experimental and control group significant changes were not detected, except for minor leucocytopenia, all indicators were in the lower limits of physiological norm.

Table 1 – **The morphological parameters of blood of dogs before the application of the feed additive "Fitopank",  $M \pm m$ ,  $n=10$**

Parameters	Groups of animals		Norm
	control	experimental	
Hemoglobin, g/l	131,0 $\pm$ 2,05	133,5 $\pm$ 1,46	120–180
Hematocrit, %	35,0 $\pm$ 0,32	35,0 $\pm$ 0,32	34–48
Erythrocytes, 10 <sup>12</sup> /l	4,5 $\pm$ 0,09	4,45 $\pm$ 0,09	4–7
ESR, mm/h	6,4 $\pm$ 0,29	2,1 $\pm$ 0,22**	до 13
Leukocytes, 10 <sup>9</sup> /l	7,5 $\pm$ 0,14	7,95 $\pm$ 0,12	8,5–10,5

Notes: \*\* -  $p < 0,01$  relative to control

According to the table shows that after the introduction in the diet of animals feed phytoadditives Fitopank and veterinary diets Royal Canin morphological blood indices improved, indicating the effectiveness of this type of study design (table. 2). The performance of the experimental group of animals increased from 17 to 35 %, namely, the hemoglobin 17,08 %, the number of red blood cells on 34,83 %, leukocyte count of 19,5 %, hematocrit of 23,5 %, but they ranged within physiological norm. All this points to the improvement in the general condition of the animals, the normalization of hemopoiesis in dogs. Also when comparing control and experimental groups observed a similar change: in the experimental group unlike the control the hemoglobin rose by 9,3 %, hematocrit 8 %, the number of red blood cells by 11,1 %. The number of leukocytes in the control group declined from baseline values of 41 %, which may indicate the development of leukopenia and severe the disease. In the experimental group animals, which also asked produbanco Fitopank, the number of leukocytes were within the physiological norm, that is greater compared to the control in 2 times. This indicates restoring homeostasis and increasing resistance.

Table 2 – **The morphological parameters of blood of dogs after application of the feed additive "Fitopank",  $M \pm m$ ,  $n=10$**

Parameters	Groups of animals		Norm
	control	experimental	
Hemoglobin, g/l	143,0 $\pm$ 1,5	156,3 $\pm$ 3,89**	120–180
Hematocrit, %	40,0 $\pm$ 0,89	43,2 $\pm$ 0,71*	34–48
Erythrocytes, 10 <sup>12</sup> /l	5,4 $\pm$ 0,12	6,0 $\pm$ 0,11*	4–7
ESR, mm/h	5,0 $\pm$ 0,22	2,1 $\pm$ 0,22**	до 13
Leukocytes, 10 <sup>9</sup> /l	4,4 $\pm$ 0,10	9,5 $\pm$ 0,19***	8,5–10,5

Notes: \* -  $p < 0,05$ ; \*\* -  $p < 0,01$ ; \*\*\* -  $p < 0,001$  relative to control

In the study of feces had traces of fat and starch, which also indicates the violation of the functional state of the pancreas.

As a result of the conducted researches (tab. 3) that in early studies, the formation of the experimental groups, no statistically significant difference between biochemical parameters in animals was not observed. Early studies have noted a reduction in  $\alpha$ -amylase in the blood by 27 %, which gave us the opportunity to form groups of animals with exocrine insufficiency of the pancreas and increased activity of AsAT and AlAT, respectively, 32 % and 7,8 %, which indicate inflammatory and dystrophic processes in the liver. Also, found a decrease in total blood protein 23,6 %, albumin decreased by 13,12 % and globulins on 26,05 %, but the level of  $\gamma$ -globulin fraction was higher than the physiological minimal norm, and  $\alpha$ -globulin on the contrary, below. Our findings show that in animals there was a decrease in the activity of  $\alpha$ -amylase with simultaneous insignificant increase in activity of aminotransferases in

comparison with normal values [9]. Probably, this is due to depressed synthesis of pancreatic enzymes, as well as a minor manifestation of the syndrome of cytolysis of hepatocytes [10].

Table 3 – Biochemical blood indices of dogs in the beginning of the study, M±m, n=10

Parameters	Groups of animals		Norm
	control	experimental	
Total protein, g/l	45,9±0,39	44,5±0,46	55–75
Albumins, g/l	22,1±0,30	21,5±0,41	25–38
Globulins, g/l	23,8±0,25	23,0±0,62	30–37
α-globulins, %	4,6±0,31	4,4±0,36	10–18
β-globulins, %	4,0±0,28	3,8±0,33	6–12
γ-globulins, %	25,0±0,16	24,8±0,23	15–20
α-amylase, g/h*1	55,5±4,76	62,9±2,46	80–160
Bilirubin total, mmol/l	1,16±0,06	1,32±0,10	1–7
AsAT, U/l	62,0±1,92	66,1±1,83	10–50
AlAT, U/l	59,3±0,73	59,3±0,62	10–55

According to the table. 4 and table. 3, it is seen that the action of the additive increases blood proteins, bilirubin, activity of α-amylase, as well as a decrease in the activity of AlAT and AsAT compared with the indicators before the use of phytoadditives. The level of total blood proteins increased by 37,5 %, while albumin's fraction increased by 30,2 %, and globulin's 44,4 % and stabilized against the α-, β - and γ-globulins. Among the indicators of enzyme activity is noteworthy, increased levels of α-amylase by 73,3 %, AsAT by 53,1 %, AlAT – 50,5 %. It should be noted that the above figures have to be within the physiological norm. The recovery processes of fermentation and protein synthesis of the liver confirms the positive effect of the feed phytoadditives "Fitopank" for exocrine insufficiency of the pancreas and liver. This is due to the fact that the composition of phytoadditives include a significant number of biologically active substances that positively and holistically impact on the animal organism, as a whole system, namely the macro- and microelements, vitamins and essential oils. Trace elements: zinc, manganese, iron, copper, cobalt and others. For example, zinc plays an important role in the synthesis of protein and nucleic acids, stimulation of alkaline phosphatase activity and the insular apparatus of the pancreas. Biochemical role of zinc is connected with the action of enzymes for which it is a necessary component or activator, stabilizer of the structure of DNA, RNA and ribosomes. Manganese is actively involved in redox processes in tissue respiration, affects the growth, reproduction, hematopoiesis, the function of the endocrine organs. It has a lipotropic effect, improves utilization of fat, prevents fatty degeneration of the liver. Manganese interacts with folic acid and cyanocobalamin and plays an important role in erythropoiesis and the formation of hemoglobin, as evidenced by the increase in hemoglobin in the experimental group of animals. Macronutrients: potassium and sodium participate in the maintenance of acid-base balance, regulation of intra-cellular osmotic pressure, in the processes of phosphorylation. Sodium along with potassium ions supports normal function of the myocardium, along with magnesium are involved in reactions neuro-muscular stimulation.

In the control group of animals treated only dry food is Royal Canin "Gastro Intestinal Low Fat" increased activity of α-amylase, but it was still below the physiological norm. All other biochemical indicators of blood were in acceptable limits. So, diet production Royal Canin "Gastro Intestinal Low Fat" is effective in restoring functional status of both the pancreas and liver: the activity of indicator liver enzymes AlAT and AsAT decreased in comparison with baseline values in dogs of both groups.

However, comparing the performance of experimental and control group animals (table. 4) may argue for full recovery of the pancreas, liver and the whole gastrointestinal tract in dogs which used feed fotobanka "Fitopank".

Table 4 – Biochemical parameters of blood of dogs after application of the feed additive "Fitopank", M±m, n=10

Parameters	Groups of animals		Norm
	control	experimental	
Total protein, g/l	56,4±0,35***	61,2±1,52***°	55–75
Albumins, g/l	24,8±0,56*	28,0±1,17***°	25–38
Globulins, g/l	31,6±0,63**	33,2±0,78**	30–37
α-globulins, %	10,6±0,38**	11,3±0,65***	10–18
β-globulins, %	7,5±0,54*	8,1±0,81**	6–12

$\gamma$ -globulins, %	18,5±0,43**	17,7±0,28**	15–20
$\alpha$ -amylase, g/h*1	72,6±2,82*	109,0±5,55*** <sup>°°°</sup>	80–160
Bilirubin total, mmol/l	1,4±0,07	3,0±0,29*** <sup>°°</sup>	1–7
AsAT, U/l	29,5±3,55**	35,1±3,37***	10–50
AlAT, U/l	33,3±4,47**	30,0±3,76***	10–55

Notes: \*-p<0,05; \*\* - p< 0,01; \*\*\* - p<0,001 comparatively the beginning of the test according to the same group (control or experimental); °-p<0,05; °° - p<0,01; °°°- p<0,001 relative to control.

**Conclusions.** The use of food additives of plant origin "Fitopank" against the background of a diet low in fat content in dogs is an effective therapeutic and prophylactic agent in the process of normalizing the function of the pancreas and liver, as evidenced by the high activity of  $\alpha$ -amylase, albumin and total protein in serum.

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**Эффективность кормовой фитодобавки Фитопанк при экзокринной недостаточности поджелудочной железы у собак**

**К.Э. Приварников**

В статье показано, что экзокринная недостаточность у собак проявляется снижением  $\alpha$ -амилазы на 27 %, общего белка на 23,6 %, и наличием в кале жира и крахмала. Применение фитодобавки Фитопанк (которая содержит цинк, марганец, феррум, купрум, кобальт, натрий и калий, а также эфирные масла, жирные масла, и др. биологически активные вещества) способствовало улучшению функционального состояния поджелудочной железы, о чем свидетельствует отсутствие в каловых массах липидов, крахмала, повышение до физиологических величин  $\alpha$ -амилазы в 1,5 раза, общего белка на 37,5 %, альбуминов на 30,2 %. Кроме того, улучшается эритроцитопоз (повышается количество гемоглобина на 17,08 %, эритроцитов на 34,83 %).

**Ключевые слова:** кормовая фитодобавка Фитопанк, Royal Canin “Gastro Intestinal Low Fat”, биохимические показатели крови, поджелудочная железа, собаки.

**The efficiency of feed phytoadditives Fitopank for exocrine pancreatic insufficiency in dogs**

**K. Privarnikov**

In article it is shown that exocrine insufficiency in dogs manifested by reduced  $\alpha$ -amylase by 27 %, total protein 23.6 %, and the presence in stool of fat and starch. After use of phytoadditives Fitopank (which contains zinc, manganese, iron, copper, cobalt, sodium and potassium, as well as essential oils, fatty oils, etc. biologically active substances) contributed to the improvement of the functional state of the pancreas, as evidenced by the absence of fecal lipids, starch, increased to physiological values of  $\alpha$ -amylase 1.5 times, total protein 37.5 %, albumin by 30.2 %. In addition, the improved of the development of red blood cells (increases the amount of hemoglobin on 17.08 %, red blood cells in 34.83 %).

**Key words:** feed phytoadditives Fitopank, Royal Canin “Gastro Intestinal Low Fat”, biochemical indicators of blood, pancreas, dogs.

*Надійшла 19.10.2015 р.*