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ESTIMATION OF INFLUENCE THE SHORT-TIME FEEDING OF THE PROTEIN HYDROLYSATE ON MORPHOLOGY AND CHOSEN BIOCHEMICAL PARAMETERS IN TWO YOUNG GERMAN SHEPHERD DOGS

Abstrakt. *Protein hydrolysates become more popular in human and animals nutrition. The article presents the six-weeks lasting experiment conducted on two young German Shepherd Dog which were fed protein hydrolysates. Morphology and chosen biochemical parameters and body weigh were monitored during that experiment.*

Key words: *protein hydrolysates, dogs, nutrition*

Introduction

Protein hydrolysates are produced by heating purifying protein in acids or proteolytic enzymes presence. Each of hydrolysates are the mixture of various peptides of various length- chains and free amino-acids. Hydrolysates are usually used in human industry for food production and also in animals nutrition, especially in feeding of ill animals. Hydrolysis improve the digestibility and absorption of protein from gastrointestinal tract and improve the usage of food protein by organism. Steinhardt et all shown that giving the protein hydrolysates to the patients with pancreas insufficiency eliminate the necessity of giving high-protein diets. It is known that di- and tri-peptides are absorbed better from alimentary tract than non-hydrolysed protein. In human patients that obtained hydrolysed casein the amino-acid content was higher than in patients that were fed non-hydrolysed casein. In human nutrition protein hydrolysates are used in patients with digestion and absorption disorders, allergies, pancreatitis, ect. Protein hydrolysates are used as the main element of the mixture for force feeding. And they are also used in sportsmen to improve the protein usage and increase the amino-acids level in blood serum.

In animals feeding protein hydrolysates are used as a source of protein in hypo-allergenic diets. They are also used in diet - therapy of gastrointestinal disorders coming with chronic vomiting and diarrhoea and in animals with hypoalbuminaemia. That hydrolysate was used in one cat with hypoalbuminaemia, increase the level of albumin and improve the life quality of that animal. Hydrolysates may be used in dogs with pancreas insufficiency because of theirs simply structure and high digestibility. Nowadays in pancreas insufficiency we recommend high digestibility diets with reduced amount of fat and moderate level of protein. And because German Shepherd Dog are predisposed to gastrointestinal disorders, pancreas insufficiency we chose two young German Shepherd Dogs for our short-time experiment.

The aim of the experiment

The aim of the experiment was the estimation of influence of the protein hydrolysates on morphology and chosen biochemical parameters of growing German Shepherd Dogs that are in the risk group of gastrointestinal tract diseases and pancreas insufficiency.

Material and methods

Two young healthy German Shepherd Dog was taken into short-time experiment. For six weeks, two six-months old dogs were fed by standard commercial dry food for young dogs supplemented by protein hydrolysate – Vetfood BB & Recovery Balance and every week blood samples were taken. Additionally body weighs were weakly monitored. Morphological (WBC, RBC, HGB, HCT, PLT, LYM, MON, GRA) and chosen parameters of biochemical analysis (protein, albumin, creatinine) was done. Activity of liver enzymes (ALAT and ASPAT) in blood serum were measured twice: on the first and end - day of experiment. Analysis was done on apparatus: Kone Lab Prime i30.

Standard commercial food for young dogs contains: 30% of protein, 18% of fat, 8% of ash, 2% of fibre, 377kcal ME/100g of food. Vetfood BB & Recovery Balance for dogs contains: 50% of protein, 37% of fat, 11% of ash, 1% of fibre. The amino-acids content in 1 kg of powder is: arginine: 10g, glutamine: 10g, glycine: 10g, leucine: 10g, iso-leucine: 5g, valine: 5g, creatine: 10g, taurine: 10g. The full content of Vetfood BB & Recovery for dogs was shown in tab.1. Dogs were given 40g of Vetfood BB & Recovery Balance every day for six weeks. Every week the body weight and blood sample were taken for analysis.

Results and discussion

Dogs obtained daily 168 and 180g of protein from standard commercial pet-food, respectively and additionally: 24,8g of protein from hydrolysate: Vetfood BB & Recovery Balance. All the result of blood and body weight analysis were given in tables below (tab. No: 2, 3, 4). All morphological and chosen biochemical results were within reference range.

There were no significant difference in morphological parameters and chosen biochemical dates: protein, albumin and creatinine level in serum and ALAT and ASPAT activity during Vetfood BB & Recovery Balance feeding. Probably it comes out of proper amino-acid balance in those two young dogs. But it requires further and more details examinations.

Amino-acids are absorbed from alimentary tract. The part of them are used directly for regeneration of mucosal membrane of intestines and most of them are coming to the liver. Liver is the main organ that take part in synthesis of endogenous amino-acids (glycine, serine, alanine, ect). Also the degeneration process of amino-acids that are in excess in blood are took place in liver. So the liver is the main organ that regulates protein metabolism. Kidneys are the second important organs that protect against loss of free amino-acids from organism. They are tickered in renal glomeruli and turned back into the circulation. So the level of free amino-acids are very low in urine. And it increases when exceed the renal threshold which is various for various amino-acids. Proteins are not accumulated in organism, but the muscles

could be a transient reservoir of amino-acids. In young animals the protein is mainly used for lean body mass building.

The conclusion of that experiment is: in those two young and healthy German Shepherd Dogs there is a very good functioning mechanisms of homoeostasis and the protein is mainly used for growth (lean body mass building), so significant differences in morphological and chosen biochemical parameters may not be observed. But that theme requires more specific and precise research.

Tables

Tab 1. Content of given protein hydrolysate, named: Vetfood BB & Recovery Balance

No	Nutrient	Content of nutrient (g) in 1000g of BB & Recovery Balance
1	arginine	10
2	glutamine	10
3	glycine	10
4	leucine	10
5	isoleucine	5
6	valine	5
7	creatine	10
8	taurine	10
9	L-carnitine	10
10	D-rybose	10
11	lecithin	10
12	MCT	10
13	Chicken fat	235
14	HMB	10
15	beta-alanine	10
16	beta-glucan	1
17	Alfa-liponic acid	3.8
18	Hypoallergenic chicken protein hydrolysate	550
19	glucosamine	10
20	chondroitin	5
21	Hyaluronic acid	0.5
22	Vitamin Complex	
23	Mineral Complex	
24	EnzymeShot	

Tab. 2. Morphological parameters in two German Shepherd Dogs (“a” - dog no 1; “b” - dog no 2)

Date of blood checkup	Id of animal and no of blood checkup	WBCN (10 ⁹ /l)	RBC (10 ¹² /l)	HGB mmol/l	HCT (l/l)	PLT (10 ⁷ /l)	LYM (%)	MON (%)	GRA (%)
20/05/10	1a	10.3	6.46	8.6	0.42	298	22	5.8	72.2
27/05/10	2a	9.4	6.64	9.1	0.43	373	23.3	6.7	70
03/06/10	3a	10.8	6.67	9.2	0.43	319	24.2	5.1	70.7
10/06/10	4a	11.1	6.23	8.5	0.4	304	17.6	4.3	78.1
17/06/10	5a	11.3	6.18	8	0.4	293	17.2	4.7	78.1
24/06/10	6a	9.4	5.79	7.8	0.37	330	20.7	5.1	74.2
20/05/10	1b	13.6	6.27	8.4	0.41	269	28.9	6.5	64.6
27/05/10	2b	12.4	6.07	8.3	0.39	356	24.3	5.7	70
03/06/10	3b	14.2	6.3	8.7	0.41	308	24.7	5	70.3
10/06/10	4b	12.8	6.13	8.4	0.4	247	21.8	4.9	73.3
17/06/10	5b	16.4	6.45	8.4	0.42	297	15	4.3	80.4
24/06/10	6b	12.9	5.87	7.7	0.38	260	16.9	4.5	78.6

Tab. 3. Chosen biochemical parameters in two German Shepherd Dogs (“a” - dog no 1; “b” - dog no 2)

Date of blood checkup	Id of animal and no of blood checkup	ALAT (U/l)	ASPAT (U/l)	Protein (g/l)	Albumin (g/l)	Creatinine (μmol/l)
20/05/10	1a	46	24	51	28	71
27/05/10	2a	-	-	50	28	59
03/06/10	3a	-	-	45	29	63
10/06/10	4a	-	-	50	28	62
17/06/10	5a	-	-	45	26	59
24/06/10	6a	47	25	47	27	60
20/05/10	1b	46	25	53	29	69
27/05/10	2b	-	-	51	29	65
03/06/10	3b	-	-	48	28	64
10/06/10	4b	-	-	50	28	67
17/06/10	5b	-	-	50	27	63
24/06/10	6b	46	26	50	27	65

Tab.4. Weekly measured body weight of German Shepherd Dogs ("a" - dog no 1; "b" - dog no 2)

Lp.	Date	Body weight of dog „a” (kg)	Body weight of dog „b” (kg)
1	20/05/10	20.8	21.6
2	27/05/10	21.1	22.1
3	03/06/10	20.3	22.4
4	10/06/10	21.2	22.7
5	17/06/10	21.2	24.3
6	24/06/10	23.2	24.3

References:

- 1.Folador J.F. et al.: Fish meals, fish components and fish protein hydrolysates as potential ingredients in pet foods. *J. Am. Sci.* 2006,84, 2752-2765
- 2.Guilford W.G. et al.: Food sensitivity in cats with chronic idiopathic gastrointestinal problems. *J Vt. Inter. Med.* 2001,15 (1), 7-13
- 3.Jank M.: Hydrolizaty białka w żywieniu małych zwierząt. *Magazyn wet.* 2010,160(19), 974-976
- 4.Kungl K. et al.: Niepożądane reakcje na niektóre składniki pokarmowe, występujące w żywieniu dla psów i kotów. *Medycyna Wet.* 2007,63 (1), 37-40
- 5.Ludow C.L. et al.: Hydrolyzed protein: what, when and why. *The North American Veterinary Conference*, 8-12.01,2005., Orlando, USA
- 6.Steinhardt H.J et al.: Nitrogen absorption in pancreatectomized patient : protein versus protein hydrolysate as substrate. *J. Lab. Clin. Med.* 1989,113 (2), 167-24

Summary

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The article presents the six-weeks lasting experiment conducted on two young German Shepherd Dog which were fed protein hydrolysates. Morphological and chosen biochemical parameters were estimated weekly, but no significant changes were observed during the protein hydrolysate feeding.

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