



EVALUATION OF DIETARY SUPPLEMENTATION WITH COCONUT OIL IN DOGS SUFFERING OF CHRONIC ENTEROPATHY

INTRODUCTION

Medium Chain Triglycerides (MCT) are fatty acids that, once ingested, are rapidly available as energetic source. This is possible thanks to their intestinal absorption mechanism which does not include the lymphatic transport but diffusion through the portal blood circulation up to the liver [1, 2]. Protein-losing enteropathy (PLE) is a form of chronic enteropathy (CE) of dog in which there is dilatation of intestinal lymphatic that result in extravasation of protein-rich lymph and in decreased absorption due to the damage at the intestinal mucosa [3, 4]. It has been demonstrated that in these subjects a low fat diet or ultra-low fat diet is part of the therapy, probably for a decreased lymphatic pressure [5]. Thanks to their absorption through blood circulation, MCT could represent an energy share for dogs with chronic enteropathy and in particular PLE. Coconut oil is having a growing interest especially in human nutrition for its nutritional values and several beneficial properties on health, for example weight control, antioxidant, anti-inflammatory and many others [6, 7]. Its content of MCT is high (about 60%), therefore coconut oil was chosen for our study [8].

FRE: food responsive enteropathy
ARE: antibiotic responsive enteropathy
IRE: immunosuppressant responsive enteropathy
NRE: non responsive enteropathy
PLE: protein losing enteropathy



PURPOSES OF THE STUDY

1. evaluate palatability of coconut oil in healthy dogs and dogs with CE, at a dose corresponding to 8-10% of the maintenance energy requirement;
2. evaluate the MCT after the oral integration of coconut oil in stool of healthy and CE dogs by quantification with gas liquid chromatography (GLC) [9];
3. evaluate possible modification of lipid serum values before, during and after treatment with coconut oil in healthy and CE dogs.

MATERIALS AND METHODS

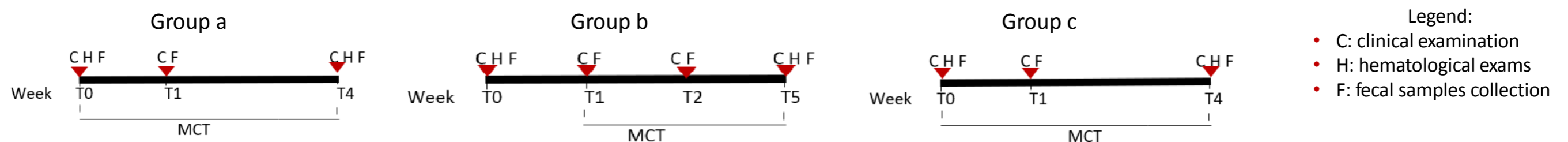
This prospective study provides three groups of dogs who will be subjected to dietary regimens supplemented to coconut oil at a dose corresponding to 8-10% of the maintenance energy requirement:

- a) 10 healthy owned dogs that fed with a commercial food and a supplementation of MCT by adding coconut oil to the diet for four weeks;
- b) 10 CE owned dogs that fed with a balanced homemade diet based on horses and potatoes with added coconut oil for four weeks. Dogs of this group, in addition to the diet, receive an adequate medical therapy based on their type of CE (FRE, ARE, IRE);
- c) 10 PLE dogs owned dogs that fed with an homemade diet based on cod and potatoes with added coconut oil for four weeks. Dogs receive adequate medical therapy in addition to diet when necessary.

Dogs of every group, at inclusion time must be subjected to clinical examination, complete blood chemistry test (inclusive of cholesterol, triglycerides, folate, cobalamin, C-reactive protein, total protein and albumin), urine test with creatinine to protein ratio, parasitological examination of feces.

Samples of feces for the GLC analysis have different collection times based on the group they belong to. All the three groups have a collection point before and at the end of the supplementation of MCT. The second collection time is after 2 weeks of administration of coconut oil. Dogs with ARE or IRE in the group B have a further time of sample collection after the introduction of medical therapy (ex. Tylosin or immunosuppressants). Samples of feces for the GLC must be frozen from the owners as soon as possible after the emission.

WORK SCHEME



BIBLIOGRAPHY

- [1] Mu H and Høy CE. "Effects of different medium-chain fatty acids on intestinal absorption of structured triacylglycerols." *Lipids* 35.1 (2000): 83-89.
- [2] Zentek J, Buchheit-Renko S, Ferrara F, Vahjen W, Van Kessel AG and Pieper R. "Nutritional and physiological role of medium-chain triglycerides and medium-chain fatty acids in piglets." *Animal Health Research Reviews* 12.1 (2011): 83-93.
- [3] Peterson PB and Willard MD. "Protein-losing enteropathies." *Veterinary Clinics: Small Animal Practice* 33.5 (2003): 1061-1082.
- [4] Dandrieux JRS. "Inflammatory bowel disease versus chronic enteropathy in dogs: are they one and the same?." *Journal of Small Animal Practice* 57.11 (2016): 589-599.
- [5] Okanishi H, Yoshioka R, Kagawa Y and Watari T. "The clinical efficacy of dietary fat restriction in treatment of dogs with intestinal lymphangiectasia." *Journal of veterinary internal medicine* 28.3 (2014): 809-817.
- [6] Intahphuak S, Khonsung P and Panthong A. «Anti-inflammatory, analgesic, and antipyretic activities of virgin coconut oil». *Pharmaceutical biology* 48.2 (2010): 151-157.
- [7] DebMandal M and Mandal S. "Coconut (*Cocos nucifera* L.: *Arecaceae*): in health promotion and disease prevention." *Asian Pacific Journal of Tropical Medicine* 4.3 (2011): 241-247.
- [8] Bhatnagar AS, Prasanth Kumar PK, Hemavathy J and Gopala Krishna AG. "Fatty acid composition, oxidative stability, and radical scavenging activity of vegetable oil blends with coconut oil." *Journal of the American Oil Chemists' Society* 86.10 (2009): 991-999.
- [9] Primec M, Mičetić-Turk D and Langerholc T. «Analysis of short-chain fatty acids in human feces: a scoping review». *Analytical biochemistry* 526 (2017): 9-21.