



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Dipartimento di Scienze Mediche Veterinarie

**DOTTORATO IN
SCIENZE VETERINARIE**

**XXXVIII CICLO
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TITLE OF THE PROJECT:

Evaluation of clinical parameters of adult dogs affected by chronic enteropathy following the administration of a commercial diet based on hydrolyzed proteins and added (or not) with a probiotic strain.

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TIPOLOGIA POSIZIONE
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CURRICULUM
PRODUZIONI ANIMALI E SICUREZZA ALIMENTARE



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INTRODUCTION



CHRONIC ENTEROPATIES: WHAT WE KNOW



CE are pathologies characterized by a persistent inflammation of the intestine

The treatment is generally nutritional



*Hydrolyzed/novel proteins
MCT, fish, low fat...
Pre-/pro-/postbiotics*



*If not responsive to the food, drugs
may be used*



*Corticosteroids
Antibiotics*



COMMON GOAL: *Management of clinical signs and recovery of the nutritional and intestinal homeostasis*





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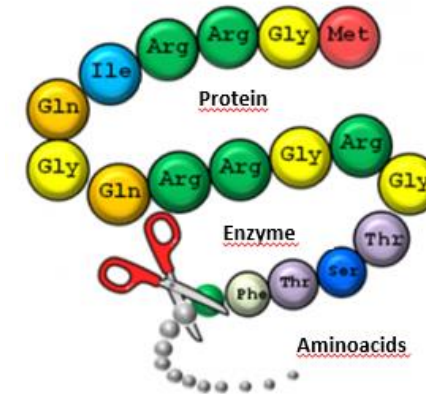
AIM OF THE STUDY



Evaluation of a hydrolysed diet (Alleva Care EnteroHypo) with and without the addition “in coating” of *Bacillus velezensis* DSM 15544 on dogs with Chronic Enteritis (CE)

WHAT IS HYDROLYSIS?

It's a process of pre-digestion able to breakdown proteins in small peptides and free aminoacids.



WHY USING HYDROLYZED PROTEINS?

Increase in digestibility and reduction of adverse food reaction -> able to bypass the immune system undetected.

WHAT A PROBIOTIC IS?

a live microbial feed supplement that improves the host's intestinal balance.



WHY ADDING IT IN “COATING”?

Coating it the last phase of kibble production, so any substance added here will not be submitted to thermic stress





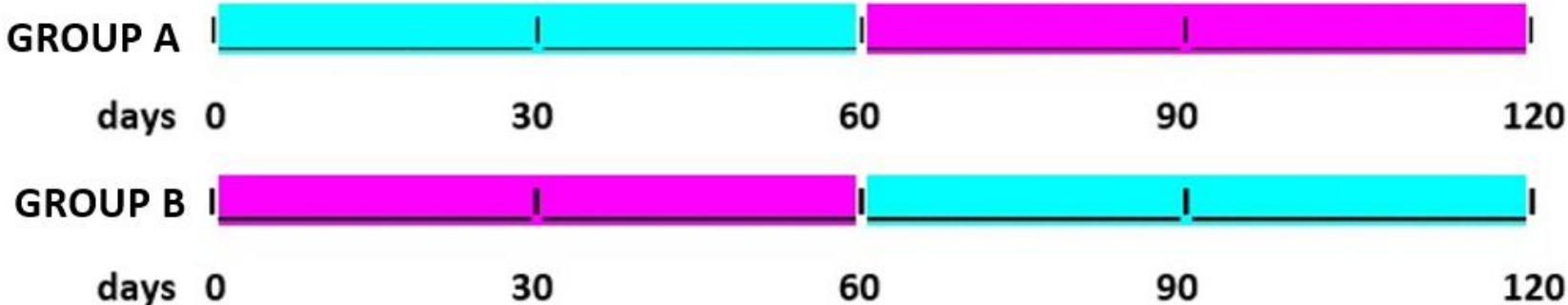
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MATERIALS AND METHODS


- 13 dogs (of different breeds) with CE which never ate hydrolyzed diet
- Same diagnostic iter for all: coprologic exam, abdominal echography, CBC, biochemistry, pholates/B12, urines, cortisol + BCS, CIBDAI, FS, CCECAI – except for 2 dogs (1 no coprologic / 1 no urines)
- B12 integrated in 8/13 dogs (4 PO + 4 SC)
- Good palatability of the diet
- All dogs reacted well to the therapy, for 5/13 dogs identical clinical response



EXPERIMENTAL DESIGN



Legenda:

 = C (control diet)

 = D (test diet)

Data from the two groups were collected at T0, after 30 days (T1), after 60 days (T2, contemporary to the switch of the diet), after 90 (T3) and after 120 days (T4) of follow-up.



Composition: hydrolyzed fish (herring) (34%), rice, potato starch, coconut oil (source of medium-chain fatty acids) (6%), fish oil (herring), sunflower oil (source of linoleic acid), chicory root (source of inulin and F.O.S.) (1%), psyllium (1%), calcium carbonate, potassium carbonate, selected inactivated yeast complex (*Saccharomyces cerevisiae*, *Cyberlindnera jadinii*, source of M.O.S. and β -glucans) (0,5%), xylo-oligosaccharides (X.O.S.) (0,3%), sodium chloride, Yucca juice. Highly digestible ingredient sources: hydrolyzed fish (herring), rice, potato starch, coconut oil, fish oil (herring), sunflower oil. Protein source: hydrolyzed fish (herring). Carbohydrate sources: rice, potato starch.

Additives per kg – Nutritional additives: 3a672a Vitamin A 24.000 IU; 3a671 Vitamin D3 1.320 IU; 3a700 Vitamin E 720mg; 3a820 Vitamin B1 9,60mg; Vitamin B2 60mg; 3a831 Vitamin B6 60mg; Vitamin B12 0,12mg; 3a315 Niacinamide 168mg; 3a880 Biotin 9,60mg; 3a316 Folic acid 2,40mg; 3a841 Calcium D-pantothenate 60mg; 3a300 Vitamin C 180mg; 3a160(a) Beta-carotene 60mg; 3a890 Choline chloride 2.500mg; 3b6.10 Zinc (zinc chelate of hydroxy analogue of methionine) 120mg; 3b5.10 Manganese (manganese chelate of hydroxy analogue of methionine) 30mg; 3b106 Iron (Iron (II) chelate of amino acids hydrate) 120mg; 3b4.10 Copper (copper chelate of hydroxy analogue of methionine) 12mg; 3b8.12 Selenium (Selenomethionine produced by *Saccharomyces cerevisiae* CNCM I-3399) 0,50mg; 3c310 DL-methionine 3.000mg; 3a370 Taurine 1.000mg; 3a910 L-Carnitine 500mg. Gut flora stabilizer: 4b1820 *Bacillus velezensis* DSM 15544 100mg. Antioxidant: 1b306(i) tocopherol extract from vegetable oil 150mg.

Analytical constituents: Moisture 9,00%; Crude protein 26,00%; Crude fat 12,00%; Crude fibre 1,50%; Crude ash 8,00%; Calcium 1,20%; Phosphorus 0,80%; Sodium 0,50%; Potassium 0,80%; Magnesium 0,10%; Chloride 0,60%; Copper 0,001%; Omega-6 1,50%; Omega-3 1,00%; DHA 0,0%; EPA 0,20%. Linoleic Acid 1,50%
Metabolizable Energy (CEN): 3.762 kcal/kg; 15,8 MJ/kg, of which 26% from protein and 27% from fat. Protein of animal origin: 92%.





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RESULTS

Follow up!

In 8 dogs, adverse signs were observed:

- 7 dogs performed better with Control (C) than with Diet (D):
 - 3 dogs adversely reacted switching from C to D;
 - 4 dogs improved switching from D to C.

Of these 7 dogs:

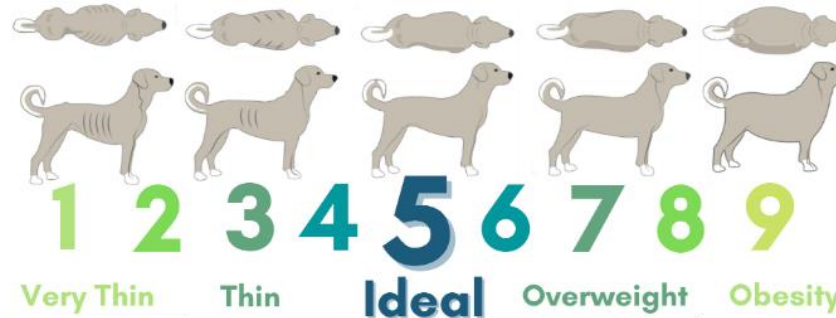
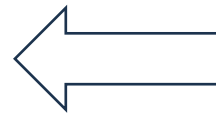
- 3 had ocular signs (epiphora, hyperemia, black spots in periocular region);
 - 3 had GI signs (diarrhea, borborigms, flatulence, one with altered appetite plus a difficult weight increase – expected for the nature of the pathology);
 - 1 had a combination of both, with additional itching of the paws.
- 1 dog improved switching from C to D, reducing faecal mucus and flatulence.



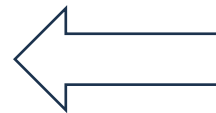
Clinical index from T0 to T4 (120 days) expressed as median + min / max:

- Weight: **13,6 kg** (1,7; 37,5) -> **16,2 kg** (1,845; 34,9): a desired reduction of weight was measured in 3 dogs;

- BCS: **4** (3; 7) -> **4** (3; 6);

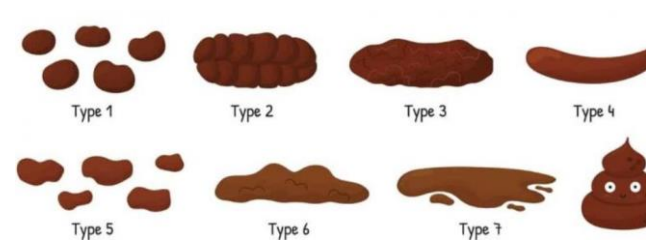


- CIBDAI: **4** (2; 7) -> **1** (0; 4);



1. Attitude/activity	Scored 0-3		
2. Appetite	0 = normal		
3. Vomiting	1 = mild change		
4. Stool consistency	2 = moderate change		
5. Stool frequency	3 = severe change		
6. Weight loss			
Summation of six variables			
Total composite the CIBDAI score			
0-3	4-5	6-8	9 or higher
Clinically insignificant disease	Mild IBD	Moderate IBD	Severe IBD

- FS: **4** (2; 6) -> **2** (2; 5).





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DISCUSSION AND CONCLUSIONS

DISCUSSION

The trial had a **positive outcome**: all dogs reduced GI signs and improved the FS (from 4 to 2) and the CIBDAI (from 4 to 1).

This rate of success is on the **higher range** of the literature (60 - 88%).

The **positive** results on the BCS despite the pathology (causing impairment of the digestion ability) is a sign of **recovery** of intestinal health, **digestibility** of the ingredients and **palatability**.

The general **worsening** of signs with D may be due to **adverse reaction** towards the **probiotic** strain or toward traces of the **culture medium**.



CONCLUSIONS

Hydrolyzed diets **can be used** for controlling chronic enteropathies.

The inclusion of **soluble fibers** may help to stabilize the intestine.

Analysis of the **microbiota** is needed to evaluate the effect of the supplementation of **probiotics** in favoring certain bacterial population and metabolites production.



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THANKS FOR THE ATTENTION



HAPPY TO REPLY TO ANY QUESTION.

