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Healing with food: Treating gastrointestinal dysfunctions by diet prescription and supplementation

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Abstract

Statement of the Problem: Many people are suffering from digestive problems, ranging from dysphagia, bloating, constipation, gut flora and nutritional insufficiencies. We are also seeing more gluten intolerances in patients with chronic diseases. We will try to identify when to consider a gastro-intestinal specific dietary program to treat cases of GI dysfunction. Identify as well the Factors including age, genetics and diet that may influence micro-biome composition, and how they are related in digestion and absorption. Also we will identify factors that inhibit optimal health and function of digestive treat Recall pros and cons of conventional and unconventional diagnostic tools to assess malabsorption & maldigestion Learn when to prescribe specific food plan: (Low- FODMAP, specific carbohydrate, renew food plan, elimination, restorative, etc.…) And when and what to prescribe as botanicals and nutraceuticals to improve outcomes In patients with GI dysfunctions. References are adapted from Gibson PR, Barrett JS. Clinical Ramifications of malabsorption of Fructose and other short-chain carbohydrates. Nutrition issues in Gastroenterology. Beyer PL, Caviar EM McCallum RW. Fructose intake at current levels in the United States may cause gastrointestinal distress in normal adults. A major consideration in choosing a diet to feed an animal with gastrointestinal (GI) disease is the digestibility of the nutrients. Typical maintenance pet foods have protein and carbohydrate (CHO) digestibility's ranging from 70% to 85% on a dry matter (DM) basis.[1] Pet foods formulated for dietary therapy of GI disease have CHO and protein digestibility's ≥90% (DM).[1] Therapeutic diets for GI disease also contain low levels of fat (e.g., <15% DM in cats, and <10% to 15% DM in dogs), are lactose-free, and have reduced amounts of dietary fibre and other poorly digestible CHO. There are many different, highly digestible, therapeutic diets available. However, each formula is unique, and, thus, a different individual response can occur. Thus, if the animal does not respond to the diet as expected, choose another highly digestible diet with a completely different ingredient profile. The amount of a diet fed should be calculated based on the energy needs of the individual animal. Although there is disagreement among nutritionists on the best equation for determining the energy requirements of sick animals, at the very least, the resting (or basal) energy requirements should be met In general, the equation recommended most commonly for this purpose is 70 x (body weight in kg).

However, if you need to use a linear equation in a pinch, the equation 30 x (body weight in kg) + 70 will approximate the values for the aforementioned exponential equation, as long the animal weighs more than 2 kg and less than 45 kg. Once resting energy requirements are determined, increase the kcal requirement by multiplying that number by an illness factor of 1.25–1.50 for cats, or 1.5–2.0 for dogs to account for the animals increased energy needs. The next aspect to consider concerning the diet is meal size, frequency, and consistency. Generally, small meals (e.g., <1/3 stomach capacity) are fed several times per day (meals). The feline stomach has a smaller capacity (approximately 60 mL/kg) and is less distensible than the stomach of a dog (capacity near 80 to 90 mL/kg), which is designed for more storage. Feeding small meals more frequently reduces gastric distension, decreases gastric acid secretion, and may reduce nausea, vomiting, and gastroesophageal reflux. Furthermore, the larger the volume of food ingested, the less that can be effectively assimilated. In general, liquid diets empty faster from the stomach than canned foods, and canned foods empty faster than dry. Thus, if liquid diets are fed too fast or in large volumes, diarrhoea will occur. In veterinary medicine, liquid diets are primarily used in specialized circumstances (e.g., nasoesophageal or jejunostomy tube feeding) or with certain GI conditions, such as oesophageal stricture, selected cases of achalasia, or gastric outflow disturbances, to reduce regurgitation or vomiting. Although a variety of nutritional and no nutritional diseases affect the GI tract, the treatment of most GI diseases is enhanced by appropriate diet selection. Numerous therapeutic diets are available for the treatment of GI disease, including highly digestible diets, novel antigen or hypoallergenic diets, hydrolysed (protein) diets, and diets with added concentrations of dietary fibre. Each of these diets may be used for the treatment of various GI disturbances. However, recognizing and understanding the differences in the nutrient composition of these diets is necessary to select the most appropriate diet. Finally, in special circumstances, homemade diets may be required for the successful dietary treatment of severe GI disease, when the available commercial products are either unacceptable or ineffective. The effects of protein on the GI tract are subtle and often less clinically obvious than that of fat or CHO, but they are crucially important to disease treatment because the amino acid glutamine is the primary source of respiratory fuel for enterocytes. The presence of a protein meal in the GI tract increases lower oesophageal sphincter pressure, is a potent stimulus for secretion of GI hormones, including gastrin and pancreatic hormones, and increases gastric emptying and

intestinal transit Despite this, protein malassimilation is not a major stimulus for diarrhoea (i.e., dogs with protein-losing enteropathies (PLE) often have normal stools, unless they have concurrent fat or CHO malabsorption). However, intact protein reaching the distal small intestine and colon will increase bacterial ammonia production, alter bacterial numbers and species, and may contribute to colitis or colonic hypersensitivity. Furthermore, protein antigens in food are responsible for the development of most food hypersensitivity reactions in dogs and cats. Food allergies are caused by one or multiple food proteins, which make potent antigens when they are exposed to GI mucosa. Animals with food allergies may have an immediate hypersensitivity reaction to the protein, or may have a delayed (i.e., type IV) response, thus the signs may be quite variable. Nevertheless, a combination of intestinal and/or dermatologic signs, including vomiting, diarrhoea, weight loss, pruritus, hair loss, or otitis externa, often develop in animals with food sensitivity. In animals with GI diseases causing severe mucosal disruption (e.g., inflammatory bowel disease lymphoma), intact proteins may cross the mucosa-exposing the immune cells of the lamina proprietor to these antigens, and potentially predisposing to the development of hypersensitivity to that protein. For that reason, feeding a “sacrificial” diet during the initial stages of therapy of severe GI disease until the inflammation is controlled is sometimes recommended. Once the inflammatory disease is suppressed with steroid or other immune suppressive drugs, a new highly digestible or novel antigen diet is introduced and fed as long-term therapy. One alternative to the sacrificial diet is to feed a hydrolysed diet (egg, a highly digestible, low fat diet that contains no intact proteins, only peptides which in theory are not large enough to serve as antigens). However, there are no data available to support or refute this claim. Although feeding hydrolysed diets may not completely eliminate the possibility of immune stimulation, anecdotal evidence suggests that feeding these diets may be beneficial for some animals with severe small intestinal disease or food sensitivity.

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