

Dietary management of clinical Disorders in dogs

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Nutritional stress is a common consequence of surgery, trauma, cancer and other debilitating conditions. The nutritional needs of critically ill or diseased dogs, as well as the effects of nutrient deprivation in hypermetabolic patients, can differ dramatically from those of healthy animals. Effective nutritional support helps to improve the prognosis for survival in animals with serious trauma. But at present nutritional management often receives less consideration than the medical or surgical components of therapy.

During simple starvation or fasting, metabolic changes in response to inadequate food intake in healthy animals include decreased blood glucose, reduced insulin secretion, and a lower metabolic rate, which reduces nutrient requirements and encourages survival. In contrast, hypermetabolism and catabolism characterize the stress response in critically ill patients. Energy expenditure may increase significantly during the first few days post-insult. The animal therefore, needs high levels of nutrients to maintain body mass, repair tissue, and counteract hypermetabolism.

Starvation, even for a shorter duration of 2 or 3 days, in a hypermetabolic state results in

- Immuno compromise
- Negative nitrogen balance
- Acid-base disturbances
- Increased risk of sepsis
- Impaired immune, renal, Cardiovascular and gastro intestinal function
- Loss of liver protein / Loss of skeletal muscle mass.

Under such conditions the patient may become increasingly susceptible to shock, less tolerant of stress and less likely to respond favorably to drug therapy.

A common response to trauma and illness is increased protein turn over, resulting in increased demand for amino acids which may exceed dietary supply or from muscle

stores. If this need for additional proteins is not adequately taken care of, it may result in acute protein malnutrition with an ultimate end result of complete and multiple organ failure.

Nutritional support is a very important part of patient management plan and no medical or surgical condition is benefited from starvation. The fasting dogs can lose 1 to 3 % of body weight per day. Nutritional support in surgical cases are required to promote positive nitrogen balance, wound healing, wound strength, repairs muscle proteins and to replace and rebuild red blood cells and antibodies. For example, the synthesis of globulin and albumin, during 24 hours after lower resection in a dog have increased from 5.3 to 12 units and 1.4 to 5 g respectively due to adequate feeding.

Inadequate nutritional support may result in poor wound healing, increased risk of infection, increased morbidity and mortality and exacerbation of negative nutrient balance. The ultimate end result being muscle catabolism, negative nitrogen balance, metabolic imbalances and decreased plasma protein synthesis.

Fiber

Fiber is a complex carbohydrate that is resistant to intestinal enzymes. Although fiber is important nutritionally, it is not a nutrient and therefore has no established dietary requirement.

Fiber does serve important functions, however. These include:

- providing short-chain fatty acids (via fermentation) as energy sources for a healthy intestinal mucosa
- helping to prevent constipation and improve gut motility
- influencing nutrient absorption and adsorption
- delaying gastric emptying
- altering food transit in the gastrointestinal (GI) tract

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A good fiber source should be moderately fermentable to provide the short-chain fatty acids for a healthy gut. It should also contain a nonfermentable component to provide bulk. Soluble fibers tend to be fermentable while insoluble fibers usually are not. Cellulose is not fermentable and promotes increased stool volume and decreased digestibility.

Rice bran is a high-quality fiber source for dogs. It provides both a fermentable and nonfermentable component to allow for a healthy gut, formation of small, firm stools, and excellent nutrient digestion.

Nutritional Support For Cancer Patient

Malnutrition is a common outcome of cancer and its treatment. Recent studies suggest, alteration in nutrient utilization in a cancer patient as compared to healthy dogs. Animals with cancer show dramatic alterations in proteins, fat, and carbohydrate metabolism. These alterations are collectively known as cancer cachexia - a complex syndrome characterized by progressive weight loss even with adequate nutritional intake. Tissue wastage, myopathy, accelerated lipolysis and loss of fat storage, lethargy and anorexia are common outcomes of cancer cachexia. An important observation is a net energy gain by the tumor and a net energy loss by the host, as metabolism shifts from energy producing glycolytic pathways to energy requiring gluconeogenic pathways. Tumor cells preferentially use carbohydrate for energy and cancer patients use lipids more efficiently than carbohydrate. All this indicates that high-fat, low carbohydrate diets can be beneficial to animals with cancer.

Diet vs Hip Dysplasia

Hip dysplasia, a developmental abnormality of the coxofemoral joint in dogs, although has a genetic basis, there are indications that its development is influenced by excess food consumption, weight gain or both. Recent studies suggest that diets with lower dietary anion gap ($K^+ + Na^+ - Cl^-$ in milliequivalents

per 100 g of blood). It is possible either to delay or mitigate the characteristic clinical and radiographic signs of hip dysplasia in growing dogs through dietary modification.

Obesity

Obesity is the most common form of malnutrition faced by small animal practitioners today. And the number one cause of obesity is client overfeeding.

Many weight-loss diets contain high, often excessively high, levels of fiber as the recommended method of losing weight. The human weight loss model, on the other hand, offers a healthier and more effective route: decreased fat, decreased calories, and increased exercise.

Causes of Obesity

There are two types of obesity: Primary and secondary. Secondary obesity requires treatment of the underlying cause. Primary obesity may be genetic, metabolic, hormonal, or behavioral in origin, or related to reproductive status, age and gender. A genetic predisposition to obesity can be demonstrated by the variations in propensity of different breeds to accumulate excess body fat.

The major contributing factor to obesity is excessive caloric intake in relation to the animal's nutritional requirements.

Obesity Management-Nutritional

Caloric Distribution represents the per cent of calories from each nutrient group. By replacing some fats with carbohydrates instead of fiber, dogs and cats can maintain a higher level of nutrition with lower caloric intake. Carbohydrates contain only half the calories of fat, which allows dogs and cats to consume fewer calories without compromising consumption of the right quantity amount of protein and other nutrients for healthy muscle tone and overall health. And with the optimal ratio of omega-6 to omega-3 fatty acids, the diet will maintain superior skin and coat quality.

Many pet foods attempt to dilute their 'light' diets with high levels of fiber to reduce

caloric density. Increased fiber levels cause decreased digestibility, which can deprive the animal of vital nutrients such as proteins, vitamins, and minerals and can affect overall well-being. Increased stool volume, poor skin and coat quality, and too often, poor client compliance may result.

When losing weight, it is appropriate for the pet's well being to have the best animal protein sources available. This ensures that the pet is provided essential amino acids and helps to maintain the pet's lean muscle mass.

Of course, the best method of obesity management is prevention. But when an obese animal is presented, you want to treat it with a regimen of the best nutrition that still allows healthy weight loss.

When recommending an obesity management plan, keep in mind the foods that provide high quality meat proteins and animal fats for healthy skin and coat, and optimal fiber levels from high quality sources for firm, small stools. They provide nutrition that helps keep your patient healthy and your client compliant.

Dietary Protein and the Kidney

Recent research on dietary protein and the kidney has shown that

- dietary protein does not cause renal failure
- dietary protein does not appear to be involved in the progression of chronic renal failure
- inappropriate restriction of dietary protein may actually have an adverse effect on the normal or compromised kidney
- The goals of dietary handling of the renal patient are to
- Maintain a neutral or positive nitrogen balance
- Maintain the glomerular filtration rate (GFR)
- Control the BUN (i.e., avoid azotemia)

Therefore, with these goals in mind, the timing and degree of protein restriction are individually determined and dependent upon existing renal function. Renal patients should be monitored regularly and dietary protein intake adjusted to match kidney function based on BUN and serum creatinine. It is not appropriate to arbitrarily decrease protein to a set quantity. Keep the protein intake normal until it must be decreased. This beneficial effect is not seen until the BUN exceeds 60 mg/dl.

Regardless of the status of your patients, high quality proteins are necessary for proper amino acid nutrition and to maintain a neutral or positive nitrogen balance. Inappropriate restriction of dietary protein may actually have an adverse effect on the healthy or compromised kidney. In times of renal failure, careful monitoring can help establish the best intake of protein to fulfill the dog's nutritional needs.

Small Intestinal Bacterial Growth

The key points on managing small intestinal bacterial overgrowth are:

- Small intestinal bacterial overgrowth (SIBO) in dogs is more common than many clinicians realize.
- In a study conducted in U.S.A., SIBO was documented in 41 of 80 dogs (51 %) representing 23 breeds.
- Clinical signs can include severe diarrhoea, steatorrhea, and weight loss. Diagnosis is challenging, however, because a practical and definitive detection method does not exist.
- A highly digestible, low-fat diet can be an effective adjunct in the management of SIBO
- Supplementing the diet with fructooligosaccharides (FOS) may positively modify intestinal bacterial populations, thereby alleviating SIBO.

Goals Of Nutritional Support

The nutritional management program for sick should aim in providing best nutrition. It is

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