

## **Diet Dilemmas: When, why, and how to recommend a therapeutic diet for your patients**

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Despite increased interest in nutrition from pet owners, multiple surveys have reported that client compliance with dietary recommendations, especially for veterinary-exclusive diets (we'll call them therapeutic diets from here on out) is, to put it kindly, not always optimal. One of the causes of poor compliance with dietary recommendations may be inadequate communication between the veterinarian and the pet owner about the importance of diet modification to the diagnosis or treatment of the pet and the rationale for the recommendation of specific diets. Some veterinarians may reach for therapeutic diets without a good understanding of the theory or evidence behind these diets or may not feel comfortable discussing this information with clients while some pet owners may be inclined to dismiss all recommendations for therapeutic diets due to perceptions that the veterinarian is in cahoots with the pet food manufacturer or because of concern for the quality of foods produced by "Big Pet Food".

For some medical conditions, therapeutic diets may not necessarily provide tangible benefit to the pet, while in other diseases they may be critical to diagnosis or disease management. Communicating this information effectively to pet owners may improve client trust as well as compliance.

Diseases/conditions where therapeutic diets should be considered to be the first choice and standard of care include IRIS stage 3 or 4 kidney disease, severe hyperlipidemia, hepatic encephalopathy, copper-associated hepatopathy, some types of urolithiasis, and for diagnosis of potential food allergies. Diseases that often do equally well on carefully chosen over-the-counter foods include diabetes, heart disease, many cases of liver disease and mild fat intolerance.

### **Addressing common resistance to the use of veterinary therapeutic diets**

The internet and various lay publications for dog owners are often full of misinformation regarding the purpose, efficacy, quality control, and ingredients used in therapeutic diets. Many therapeutic diets utilize grains and by-products, which are both untrendy in today's pet food market. A discussion of the current concerns regarding exotic and grain-free diets and dilated cardiomyopathy may help convince some clients to feed grains. Pointing out that by-products are typically things like organ meats and other perfectly healthy parts of the animal that people *in the US* don't like to eat but that are commonly eaten in Europe and elsewhere can also help to allay fears. For certain diseases, these ingredients may be intentionally used due to their nutrient levels – for instance, chicken by-product meal is typically richer in nutrients per calorie than chicken meal, which may make it a better option for a low calorie diet such as for weight loss. White rice and brewer's rice are low in protein, phosphorus, potassium, and sodium, making them great options for renal diets.

The author typically emphasizes to clients that she would never recommend a diet that she wouldn't feed to her own pet and that wasn't high quality. Clients can be advised that inclusion of these ingredients can be taken as a sign that the company is more interested in putting their money into the science and quality control rather than on fancy ingredients that appeal to the pet owner but have little or no benefit for the pet.

Many pet owners have concerns that therapeutic diets are more expensive than OTC diets, which may be true if they are feeding brands purchased at the grocery or big box store. For owners purchasing higher end brands from pet supply stores or pet "boutiques", there may not be a dramatic difference in cost. It should be emphasized that an ideal diet for a pet with health concerns can save plenty of money in the long-run, such as if a cystotomy for uroliths is prevented or delayed. You can calculate the cost of feeding a therapeutic diet vs their current diet using this calculator:

<https://vetnutrition.tufts.edu/2019/06/pet-food-cost-calculator/>

You may also consider scripting pet foods to online retailers, especially if you don't carry a specific diet in stock. While this reduces [the often small] profit on selling diets in-house, it can improve compliance, reinforcing to the client that your goal is their pet's health, not profit, and allows access to diets from manufacturers that your practice may not otherwise carry, which can be a huge benefit as each company has diets that are their "stars" and it's not always possible to carry all of them.

### **Home-cooked diets**

For medical conditions where a therapeutic diet is indicated, but existing diets are not acceptable to the client or the pet, a Board Certified Veterinary Nutritionist™ may be able to formulate a comparable home-cooked diet recipe. This strategy

can work well for gastrointestinal disease, kidney disease (especially in dogs), fat intolerance, copper-associated hepatopathy, and hepatic encephalopathy but is typically not ideal for struvite urolith dissolution or prevention or calcium oxalate urolith prevention or weight loss. Beware of diet recipes published online or in books – they rarely meet basic nutritional needs and may not appropriately address health concerns.

## **Notes on specific diseases**

### Cardiac disease

Evidence/Rationale to support use

- Reduced arrhythmias with diet supplemented with DHA and EPA in one dog study
- Many human studies addressing sodium

Important nutrients/properties

- Protein – want moderate to high to support lean body mass, avoid low protein unless comorbidity necessitates it
- DHA + EPA – 180 mg EPA + 120 mg DHA per 10lb body weight shown to have anti-inflammatory and anti-arrhythmic benefits in dogs
- Sodium – avoid high sodium – 0.5-1.0 g/1000 kcal = appropriate for most pets with heart disease

Notes

- Low sodium OTC diets and treats and fish oil supplements are reasonable suggestions for most patients

### Diabetes

Evidence/Rationale to support use

- A few studies suggest benefit of specific therapeutic low carbohydrate diets versus other diet options in cats
- Dog studies suggest diet composition is less important
- Fiber may help blunt glucose spikes in both species, but potentially more useful in dogs
- Many diabetic cats are obese and may have very low energy requirements once controlled which can make it hard to meet their nutrient needs without diets formulated for weight loss

Important nutrients/properties

- Protein – enough to help maintain lean body mass, no metabolic downside for high protein in otherwise healthy diabetics
- Carbohydrates – complex better than simple, amount is likely more important in cats than dogs, but ideal carbohydrate amount and type is unknown for either species
- Fat – diabetic pets, especially dogs, are predisposed to hyperlipidemia so lower fat diets may be better
- Calories – should be high for underweight animals and low for overweight animals
- Fiber – may be helpful for glucose control, dogs > cats

Alternatives

- Lots of OTC options – therapeutic diets can be used, especially for particularly difficult to manage cases, but many animals can be well-managed using OTC diets
- Home-cooked diets are not ideal options due to less consistency than commercial diets; less ideal for weight loss

### Food allergies

- Studies have shown benefits of limited antigen and hydrolyzed diets for dogs with skin disease and confirmed food allergies
- Hydrolyzed proteins are only available in therapeutic diets
- OTC “limited antigen” diets often have numerous potential antigens and have been shown in several studies to be frequently contaminated with other proteins

Important nutrients/properties

- Hydrolyzed proteins – hydrolyzing proteins reduces allergenicity greatly and the smaller the peptides, potentially the lower the risk
- Novel ingredients – if not hydrolyzed, both protein and carbohydrate diets should be novel to the pet
- Should be manufactured on a “clean” line in factory to avoid contamination with other ingredients

#### Alternatives

- No appropriate OTC alternatives for a food trial – hydrolyzed are not available OTC and risk of contamination of novel limited protein OTC diets is quite high
- Home-cooked novel protein diets can be used
- May be able to transition to OTC diets once food allergies confirmed and allergens identified or if food allergies are ruled out

#### Note

- Salivary and blood allergy tests should not be used to choose diets as they are unreliable
- Consider stressing temporary nature of therapeutic diet – “we are doing this as a diagnostic test” to help get owners on board
- Stress quality control of therapeutic diets versus likelihood of contamination of OTC diet and poor likelihood that OTC can confirm or rule out an allergy

#### Gastrointestinal issues (acute or chronic vomiting, diarrhea, flatulence)

##### Evidence/Rationale to support use

- Studies show that hydrolyzed diets can be effective for dogs with GI signs from food allergies
- Digestibility and total dietary fiber data is rarely available for OTC diets
- Studies looking at effect of some of these diets on microbiome
- Better control of quality and ingredients than many OTC diets, especially for limited ingredient diets

##### Important nutrients/properties

- Fat – lower fat diets may reduce vomiting, address potential for pancreatitis while higher fat diets may allow for higher caloric intake in animals with GI compromise
- Digestibility/Fiber – high quality ingredients and studies to assess digestibility, high digestibility or “low residue” = more digested so less becomes stool, fiber types appropriate to slow transit time (diarrhea) and support microbiome, thorough quantification of types and amounts of fiber
- Ingredients – affects digestibility, can be important in the case of limited ingredient or hydrolyzed diets to diagnose food allergy or intolerance
- “Functional foods” – many contain ingredients like colostrum, prebiotic fibers, natural anti-inflammatory compounds, etc

#### Alternatives

- Home-cooked highly digestible, low fat, and/or limited antigen
- Trial and error with commercial OTC diets if food allergy is not suspected – likely will not be able to obtain digestibility or total dietary fiber data

#### Notes

- May only be temporary – once problem is under control, may be able to transition to OTC option

#### Kidney disease

##### Evidence/Rationale to support use

- Therapeutic renal diets shown to double lifespan in dogs and cats compared with maintenance diets
- Diets must contain at least 1.0 g/1000 kcal (dog) and 1.25 g/1000 kcal (cat) of phosphorus to be sold OTC (average ~3.0 g/1000 kcal), Therapeutic renal diets range from ~ 0.45-1.25 g/1000 kcal phosphorus (i.e. there are no OTC substitutes that aren't too high in phosphorus for most animals with kidney disease)

- Most OTC dog diets have more protein (often as much as 2-3x) than is considered appropriate for stage 3-4 disease. Cat diets more variable as are recommendations for the amount of protein for cats with kidney disease

#### Important nutrients/properties

- Phosphorus – follow IRIS Treatment recommendations by stage, adjust diet to keep within phosphorus recommendations (extrapolate stage 2 recs to stage 1). Typically this means <2-2.5 g/1000 kcal for stage 1-2, and <1 g/1000 kcal for stage 2+ to 4
- Protein – avoid high protein in all stages, reduce protein below maintenance levels for stage 3&4, earlier if proteinuric
- Potassium – dogs often hyperkalemic, especially if treated with ACE-I, cats hypo – may be able to adjust with diet
- Sodium – avoid diets > 1 g/1000 kcal to reduce the risk of systemic or renal hypertension

#### Alternatives

- Home-cooked diets for dogs, but cats unlikely to eat them if not already accustomed to eating human foods and higher fat or carb diet
- For stages 1-2, there may be OTC options with lower phosphorus

### Liver Disease

#### Evidence/Rationale to support use

- Therapeutic liver diets are lowest copper diets available – they contain about half the minimum amount of copper allowed to be in OTC diets
- Data show that therapeutic liver diet can be used to reduce copper stores in the liver alone, and in combination with penicillamine chelation therapy
- Data show that plant proteins and dairy are better options for hepatic encephalopathy and that plant proteins, dairy, and egg are lower in purines than meat or organ proteins.
- No specific rationale for using low copper or low protein diets in dogs or cats that do not have copper-associated liver disease or hepatic encephalopathy

#### Important nutrients/properties

- Protein type and amount – only relevant for pets at risk for hepatic encephalopathy or urate stones. For these pets, feed as much high quality egg, dairy, or plant-based protein as is tolerated. No indication for modification of protein amounts or types unless protein intolerance is documented or expected due to severity of liver dysfunction
- Copper – low copper diets are only of benefit if the liver copper levels are excessive
- Antioxidants – vitamin E and C are often recommended and seem like a good idea, but no data to support appropriate doses

#### Notes:

- Only available for dogs!
- Most dogs with copper-associated liver disease do not need low protein diets – consider home-cooked or low-copper protein supplementation on top of a liver diet
- Most dogs with hepatic encephalopathy do not need low copper diets – consider copper supplementation up to minimum recommendations
- Increases in liver enzymes without evidence of significant liver dysfunction or copper accumulation is not an indication for low protein or low copper diet

### Obesity

#### Evidence/Rationale to support use

- Studies have demonstrated the potential for nutrient inadequacy with caloric restriction of maintenance diets

- Maintenance diets are formulated to provide adequate essential nutrients only when fed at recommended feeding amounts, so feeding less than recommended amounts for ideal body weight can result in nutrient levels below recommendations
- Some data to support better satiety with therapeutic diets versus maintenance-type diets
- Data support healthy weight loss of 1-2% per week with therapeutic diets

#### Important nutrients/properties

- High nutrient to calorie ratio – allows for calorie restriction without nutrient restriction
- Low calorie density – allows for larger volume with less calories
- Protein – need higher protein to compensate for lower calorie intake and to help preserve lean body mass
- Fiber – added fiber may improve satiety and dilute out calories

#### Alternatives

- Small number of OTC diets formulated for active weight loss – e.g. Science Diet Perfect Weight, Royal Canin Feline Ultra Light, Natural Balance Fat Dog
- Lower calorie OTC (< 300 kcal/cup dogs, < 350 kcal/cup cats) if overfeeding was more of a problem than low energy needs (i.e. if total calories being fed much higher than expected needs and so reduction is still within manufacturer's recommendations), may also be an option if only slightly overweight as less caloric restriction may be needed
  - Note protein – many low calorie OTC diets are quite low in protein
- Home-cooked diet not a good option due to logistics of frequent reformulation/amount adjustment during weight loss period

#### Notes:

- If ideal weight loss diet cannot be fed, reduce rate of weight loss to no more than 0.5% per week to minimize the degree of caloric restriction
- Can emphasize that goal is to get pet to ideal weight, may be able to use a maintenance diet at that point if energy needs aren't too low – so could be only temporary to accomplish goal of weight loss

### Pancreatitis/fat intolerance/hyperlipidemia

#### Evidence/Rationale to support use

- Presence of fat in duodenum stimulates cholecystokinin, which in turn stimulates zymogen secretion. Theoretically, if zymogens are being activated within pancreas, this could worsen pancreatitis
- Dietary triglyceride is a big component of the total triglyceride in the blood of hyperlipidemic dogs
- Lowest fat therapeutic diets are about 20% lower in fat than lowest available OTC diets, 50% the fat of average OTC dry, and 15-30% the fat of OTC canned
- Omega-3 fatty acids shown to decrease blood lipids in humans and other animals, but not dogs (no data)

#### Important nutrients/properties

- Fat – for acute pancreatitis, author looks for < 2.0 g/1000 kcal, for other conditions, based on clinical signs, lab values (triglycerides) and previous dietary fat
- Fish oil – shown to decrease lipids in people, rodents, birds, ideal dose in dogs is unknown, may have anti-inflammatory effect for pancreatitis, but also increases overall dietary fat if added as a supplement
- Fiber – may have some benefits for hyperlipidemia

#### Alternatives

- Depending on severity of condition, low fat OTC diets (< 3.0 g/1000 kcal fat) – consider diets marketed as low fat or low calorie
- Home-cooked diet options

## Uroliths

### Evidence/Rationale to support use

- Studies show ability to dissolve struvite, RSS (relative super saturation) values appropriate for stone prevention for calcium oxalate
- Basically impossible to mimic all properties of these diets in OTC diet

### Important nutrients/properties

- Struvite – moderate protein, phosphorus, magnesium, **urine acidifying < 6.2, high moisture** or designed to increase water consumption (high sodium), important for dissolution in dogs and cats, prevention in cats
- Calcium oxalate – moderate calcium, low oxalate, moderate phosphorus, +/- alkalinizing urine, high moisture or designed to increase water consumption (high sodium)
- Urate – low purine (low in meat proteins, substitute dairy, egg, soy) but not necessarily low protein, urine alkalinizing, high moisture or designed to increase water consumption (high sodium)
- Cystine – low but adequate methionine +cysteine, urine alkalinizing, high moisture or designed to increase water consumption (high sodium) – this is VERY hard to find for cats

### Alternatives

- Struvite – acidifying canned OTC? Moisture and pH alone may be enough
- Calcium oxalate – not recommended, but high moisture, moderate calcium and oxalate OTC or home-cooked could be tried, especially for dogs
- Urate – home-cooked for dogs, vegetarian commercial diets
- Cystine – home-cooked for dogs, vegetarian commercial diets

### Note:

- As struvite in dogs is nearly always associated with UTI, prevention diets are rarely needed. In cases of chronic UTI, they can be tried, but may not prevent recurrence