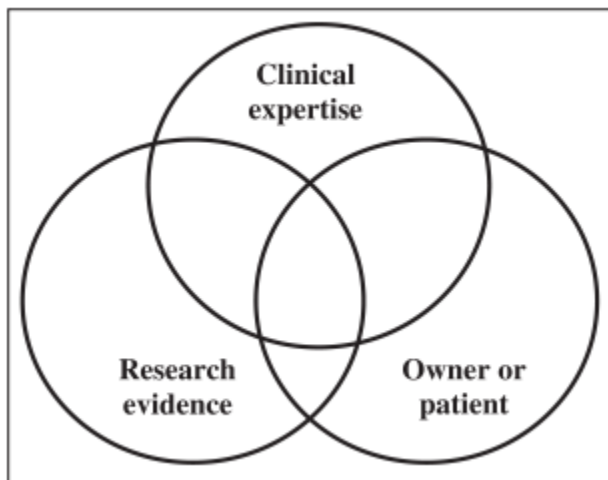


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So Many Choices of Therapeutic Diets:
Navigating *how* to decide and *what* to prescribe.

Julie Churchill, DVM, PhD, DACVN
vetnut@umn.edu or churc002@umn.edu

Evidence Based Medicine (EBM)

The concept of EBM represents a major but largely untested advance when making clinical decisions to determine patient care. The conceptual model for this suggests that the best clinical decisions are made when high quality evidence from controlled studies, clinical expertise and patient/client preferences overlap:



High quality research refers to clinically relevant research from patient centered clinical trials. Clinical expertise refers to the use of clinical skills to identify each patient's unique health condition, reach a diagnosis and consider the risks and benefits of potential intervention. A quality of evidence grading scale has been developed:

Quality of Evidence	
Grade	Description
I	Evidence from one or more properly designed randomized controlled clinical studies performed in clinical patients of the target species
II	Evidence from properly designed randomized controlled studies performed using animals of the target species with spontaneous disease in a lab setting or research colony of animals
III	Evidence from appropriately controlled study without randomization, appropriate cohort or case control design using acceptable models of disease or simulations in target species; dramatic result from uncontrolled study or case series
IV	Evidence from studies conducted in other species, report of expert committee, descriptive study, case report, or pathophysiologic justification or opinion of expert based on clinical experience

Although there is a paucity of grade I evidence in much of veterinary medicine, the focus of nutritional research is to evaluate effectiveness of treatment including veterinary therapeutic diets. In the absence of evidence, patients must eat.



Using the circle of nutrition to make a nutrition recommendation, a pet-specific process

In addition to assessing the patient (species, lifestage health or disease) the diet must be assessed to assure that it first and foremost meets the needs of the patient and is appropriate for managing disease. The owner and environment must be taken into consideration and to complete the process, monitor the pet's response to make sure it achieves the expected results. If not, reassess and begin the process again. There are many options for therapeutic diets and it can be difficult deciding which, if any product to use.

Comparing Therapeutic Veterinary Diets-Using information from a product guide

(adapted and used with permission from CA Buffington and <http://vet.osu.edu/vmc/nutrition-support-service>)

Look for tables containing some nutrient parameters of the therapeutic veterinary foods. The diets are classified as veterinary foods because they are to be used only under veterinary supervision. Commercially available foods also may be appropriate for some of the conditions listed (as described where appropriate in the tables). The tables are based on the most commonly recognized nutrient modifications for a particular disease. This format was chosen because veterinarians commonly make the diagnosis, decide on necessary nutrient modifications, then choose the most appropriate diet for their particular patient. Some foods are used for more conditions than are mentioned in the tables.

The data in the tables can be used to compare the nutrient content of different diets and, to compare nutrient content of a diet with the nutrient needs of a patient:

To compare diets:

- a. **of similar moisture content and energy density, one can use the amount of nutrient per unit as fed** - AAFCO regulations require that minimum percentages of protein and fat, and maximums for moisture and fiber, be reported on all pet foods.
- b. **of differing moisture content (e.g., dry vs. canned) and similar energy density, one can use the amount of nutrient per unit dry matter**. For example, a dry diet

containing 20% protein and 9% water (=91% dry matter) on an as fed basis contains $20/91 * 100 = 22\%$ protein on a dry matter basis, whereas a canned diet containing 5% protein and 77% water (=23% dry matter) on an as fed basis contains $5/23 * 100 = 22\%$ protein on a dry matter basis.

- c. **of differing energy density (e.g., high vs. low fat), one can use the amount of nutrient per 100 kcal** - For example, a diet containing 25% protein and 7% fat on a dry matter basis contains 8 grams of protein per 100 kcal, whereas a diet containing 25% protein and 21% fat on a dry matter basis contains only 5 grams of protein per 100 kcal. The therapeutic (prescription) diets report information this way.

To compare nutrient content of a diet with the nutrient needs of a patient, use the amount per unit body weight per day - because many veterinary foods contain restricted amounts of some nutrients, one must compare the number of grams of nutrient in the amount of food consumed with the needs of the animal to ensure that deficiencies are avoided. This is of practical concern for protein and sodium. For example, the minimum protein intake to sustain protein reserves in dogs is approximately 2.55 gms protein /kg body weight (BW) or ~ 1 gm protein/pound BW per day. If a dog with advanced renal failure consumes 20 kcal per pound body weight per day, the diet would need to contain at least 5 grams per 100 kcal to provide enough protein to meet the dog's needs. If the dog consumed 30 kcal per pound body weight per day, only 3.3 grams protein per 100 kcal diet would be necessary.

Because diet therapy for a number of diseases consists of restriction of nutrient intake, and because many patients with nutrient-sensitive diseases are older and don't eat much, the risk of nutrient deficiencies must be considered. This is particularly true when the therapy is anticipated to continue for months or years. For these reasons, estimates of daily minimum intakes of some essential nutrients (amount per pound body weight) for adult, average-sized pets are presented below:

Nutrient	Dog	Cat
Energy	10 kcal	
Water	10 ml	
Protein	1 gm (2.55gm/kg BW)	2 gm (~ 5 gm/kg BW)
Sodium	10 mg	
Phosphorus	20 mg	

Veterinary foods often are sold as containing "high" or "low" levels of some nutrients. Currently, no generally accepted definition of these terms exists. My own definitions, many extrapolated from humans, follow:

Definition of "high" and "low" nutrient densities

Nutrient	Dog	Cat
Low calorie	< 3 kcal/gm dry matter	< 3 kcal/gm dry matter
High calorie	>4.5 kcal/gm dry matter	>4.5 kcal/gm dry matter
Low protein	<5 gm/100 kcal	<7 gm/100 kcal
High protein	>8 gm/100 kcal	>10 gm/100 kcal
Low fat	<2.5 gm/100 kcal	<3 gm/100 kcal
High fat	>5 gm/100 kcal	>5 gm/100 kcal
Low fiber	<0.25 gm/100 kcal	<0.25 gm/100 kcal
High fiber	>1.5 gm/100 kcal	>1.5 gm/100 kcal
Low sodium	<100 mg/100 kcal	<100 mg/100 kcal

General feeding suggestions: Remember, It is may be better for a patient to eat some of the "wrong" diet than none of the "right" diet!

1. Introduce diet gradually, *once the patient's condition is improving*, to avoid creating a learned aversion, which is the association of an adverse stimulus with a novel diet. If one intends to feed a particular diet long-term, it should be introduced when the patient is feeling better so it is associated with feelings of improving health.
2. Amount- use the "Energy needs of sedentary dogs and cats" graph for initial guidelines, or offer ~20 kcal per pound body weight per day to cats and most dogs (~10 kcal/pound if > ~100 pounds), *adjusting intake as necessary to maintain a moderate body condition*.
3. Follow instructions in the section entitled "treating inappetence" when patient food intake falls below the above intake estimates.

The remainder of this discussion will use cases of commonly used veterinary therapeutic diets to evaluate evidence in the context of patients.

References

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