The nitty-gritty of pet diets and client perceptions

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May 2014

What I hope to share today -

I. Pet Food Development (overview)
   - Unravel questions surrounding pet food manufacture, marketing, safety issues regarding pet ingredients.

II. Diet pointers:
   - Marketing Concepts…“Must knows” about food labels
   - Common concerns regarding commercial diets

III. Information-based diet recommendations
   - Choosing the “Right” diet for Fido
   - The GoodGuide insight

IV. Commonly asked questions – responses!

I. Pet Food Development (overview)
Growth commercial pet foods

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Dog &quot;cake&quot; or kibble</td>
<td>Canned horsemeat</td>
<td>Canned food 91% market</td>
<td>Specialized foods for K-9</td>
<td>Extruded foods</td>
</tr>
<tr>
<td>Dog meat in bags Gaines Dog Meal</td>
<td>1941-1946 WWII → dry diet focus</td>
<td>Semi-moist foods Gaines Burgers (GF) Tender Vittles (RP)</td>
<td>Life-stage &amp; health maintenance diets (SD)</td>
<td></td>
</tr>
</tbody>
</table>

Evolution of a pet diet product

- **Complexity** (Rx >>>> OTC)
- Idea grounded in science, often human medicine
  - Basic science (Rx) ideas generated/shared between researchers, clinicians, foodies, etc

- For example: JM diet was "born" from a (k-9) chondrocyte model to (initially) support human arthritis research.
  - Benefit humans and dogs

Team approach: Layered process

**Team**

- Biochemist
- Nutritionist
- Food scientist
- Food technology specialist
- Clinician
- Marketing experts
Layered process

Example: Gateway Process (Nestle Purina) to determine feasibility of diet idea.

Identify how diet will be advertised and sold

Marketing perspective—

- Is there a need, niche?
- Diet nutrient profile, diet form, diet packaging
- How many animals would the diet target?
- Trend or fad vs sustainable diet?
- Completely new idea or new spin on existing idea?

Gateway Process

Food Scientist-Technologist; basic nutritionist perspective—

- Can such a diet be formulated?
- Can such a diet be physically created?
- Dry, moist, liquid form
- Shelf-stability
- Safety
- Would such a diet pose any health concerns to pet?
  [long-term, short-term]

  Considerations of:
  - ketogenic,
  - anti-cancer,
  - Osteoarthritis diets

Team approach a Layered process

Prototype

Economically manufacture diet?
What else is involved?

Pre-market testing
- Levels of nutrient x, y, z
- Digestibility
- Palatability
- Product claim testing
- Clinical trials

Testing
- Prescription vs OTC brand-dependent
- Within a company, generally have separate divisions for a “Brand” of diet
- Testing level is a “Brand by Brand” or division-specific decision
- Likely (common) higher-end brands and Rx diets do more extensive testing as compared to lower end OTC diet brands.
  - Quality Control Procedures (not required, voluntary)
  - On-site Analytic testing
  - In-house lab

Testing
- Measure pet food features & benefits
- Palatability
- Preference & Acceptance

What influences food /diet preference? (pet/client)
- H2O content (p)
- Nutrient content; ingredient selection (p,c)
- Cooking effects/ food temp (p)
- Palatability enhancers (p)
- Digestibility (p)
- Stool quantity & quality (c)
- Feeding costs (c)
Product claim testing

- **AAFCO**
- **Clinical trials**
  - Non-affiliated locations (i.e. Veterinary Schools, private general or referral practices)

Time frame for the complete process

- **Revolutionary concept - 10 year avg!**
  - HA, DM, JM, Low Residue, SO, y/d (Rx diets)
- **Tweaking current diet – considerably shorter**
  - Adding nutrient, substance, or nutriceutical (probiotic, mobility enhancer (GCS), omega-3 fatty acids, fruits, extracts, prebiotics)

What goes into the diet?

- **Nutrients**
  - CHO, **Protein**, Fat, Vitamins, Minerals, Water
    - Calories ➔ CHO, Protein, Fat
    - Minerals as organic or inorganic
    - CHO includes fiber
- **Additives** (for texture & preservation)
- **Supplements**
  - Pre- & pro-biotics, n-3 FA, GCS, AOX
- **Other ingredients**
  - “goodies” such as dried fruits, vegetables, etc
Carbohydrates

**Nutritional Characteristics**

- **Primary energy source**
- **Secondary protein, fat, fiber, mineral, vitamin source**
- Grains vary in actual nutrient concentrations (protein, minerals, fiber)
- Variations in fiber levels accounts for varying DM digestibility of whole grains (rice>corn>barley>oats)

Nutrient composition/availability differences, highlight grain choice for diet purpose.

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Carbohydrates

**Process characteristics**

- **Principal function** CHO to provide structural integrity to kibble
- Starch "cements" kibble together to pv crumbling
  - 40% or> soluble CHO in kibble needed for extrusion process
- Obesity mgt diets w/ <40%, but ↑fiber
- Starch “gelatinizes” which gives mix structure to allow even distribution of components

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Fiber

**Provide crude fiber levels 18-80%**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Crude fiber (%, AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat bran</td>
<td>13-16</td>
</tr>
<tr>
<td>Beet pulp</td>
<td>17-20</td>
</tr>
<tr>
<td>Soymill run</td>
<td>32-36</td>
</tr>
<tr>
<td>Peanut hulls</td>
<td>52-58</td>
</tr>
<tr>
<td>Cellulose</td>
<td>72-78</td>
</tr>
</tbody>
</table>

SACN, 2010
**Fiber – Nutritional characteristics**

- Pectin
- Guar gum
- Soy mill run
- Bran
- Beet pulp, citrus pulp
- Soybean hulls
- Peanut hulls
- Cellulose

- Energy source for colonocyte health
- Improve stool consistency; not alter total digestibility
- Add bulk; hold water; modulates GI motility
- Improve stool quality
- Satiety
- Dilute calories
- Reduce flatulence

**Proteins**

**Dry protein ingredients**

**Nutritional characteristics**

- >20% protein
- Protein:Ash ratio good indicator:
  - Ingrid. efficy provide protein
  - Ingrid. DM digestibility
  - ↑ ash content, ↓ diet digestibility
  - Critical in diet formulation (Cat)
  - Dog (omnivore), utilize plant & animal proteins

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>% protein, AF</th>
<th>protein:ash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poultry by-product meal</td>
<td>65-75</td>
<td>6:1</td>
</tr>
<tr>
<td>Meat &amp; bone meal</td>
<td>50-55</td>
<td>2:1</td>
</tr>
<tr>
<td>Chicken, lamb, fish meals</td>
<td>48-67</td>
<td>4, 2.5, 3:1</td>
</tr>
<tr>
<td>SBM</td>
<td>46-50</td>
<td>10:1</td>
</tr>
<tr>
<td>Corn, rice gluten meals</td>
<td>40-64</td>
<td>25, 20:1</td>
</tr>
<tr>
<td>Dried egg product</td>
<td>43-48</td>
<td>8:1</td>
</tr>
</tbody>
</table>

**Wet protein ingredients**

**Nutritional characteristics**

- Wet = Fresh or frozen meats and meat by-products
- 60% > moisture

**Process characteristics**

- Provide structure to kibble
- Meat tissue in moist foods helps w/ structure (firmness)
- TVP from wheat/soy flour + sulfur for structure

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>% protein, AF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver (pork, beef, turkey, sheep)</td>
<td>17-22</td>
</tr>
<tr>
<td>Meat by-products</td>
<td>15-20</td>
</tr>
<tr>
<td>Beef (carcass)</td>
<td>18-22</td>
</tr>
<tr>
<td>Chicken (whole, backs, necks)</td>
<td>10-12</td>
</tr>
<tr>
<td>Fish (fresh water, ocean)</td>
<td>12-15</td>
</tr>
</tbody>
</table>

SACN, 2010
Fat

- Typically used fat types:
  - Animal (pork fat, beef tallow, poultry fat)
  - Vegetable oil (soy, sunflower, corn)
- Vary in quality grade (peroxide values, free fatty acid levels) → rancidity
- Higher quality fat ↑ palatability by ↓ oxidative potential

Nutritional characteristics

- 2.25 > calories CHO or protein

Process characteristics

- Low melting pt (mixed into or sprayed outside kibble)
- Help “lubricate” during extrusion process

Additives

- AOX preservatives – shelf life, oxidant damage protection
- Antimicrobial preservatives – especially for moist foods
- Coloring agents – to enhance consumer appeal
  - Natural (carotenoids)
  - Synthetic (FeOx, azo dyes)
- Color enhancers/preservatives (nitrites, bisulfites)
- Humectants – prevent water loss post-processing

Additives

- Emulsifying agents: stabilizers/thickeners
  - Gums, glycerin, modified starch prevent separation; create gravy, sauce, jelly in moist foods
- Miscellaneous additives
  - Polyphosphates: improve texture; retain natural moisture; reduce oxidation; improve color development
  - Yucca schidigera extracts; saponins: reduce fecal odor (trap free NH₃)
Additives

**Palatability Enhancers**
- Dogs like fats, sweet (i.e. sugars, whey), meats, digests (animal tissues chemically or enzymatically altered to release lysine & dipeptide combos that ↑ palatability)
- Cats like meat ingredients, inorganic acids (phosphoric); aa (cysteine, glycine); feline digests
- Formulation with up to 25% fat, improves palatability

**Take home message**
- Pet diet manufacture can be a long, arduous process. Complex, expensive, involves a “village”.
- Many levels “testing” occurs in process, as well, as in routine production of finished product.
- Understanding rhyme and reason for ingredient inclusions/exclusions helps dispel hype and clarify truth of pet food marketing/manufacture.

**II. Diet pointers:**
- Marketing Concepts…
  - “Must knows” about food labels
- Common concerns regarding commercial diets
Pet food **marketing concepts**

- Identify how product will be advertised and sold.
- Helpful to understand basic concepts. Most clients know little about pet's actual nutritional needs; influenced/susceptible to advertising claims.
- The **LABEL** is home to much of this influential information

*What is the label telling me?*

- Purpose statement
- Ingredient list
- Brand / Product name
- Guaranteed Analysis
- Nutritional Adequacy Statement
- Quantity statement
- Feeding directions
- Manufacturer contact information

*Purpose statement*

**Product Purpose** is a basic marketing concept

- Specific-purpose
- All-purpose
- Low price
- "People" food
- Flavors and varieties
- Presence/absence of ingredient
- "More is better"
- Natural or holistic or organic
Specific-purpose foods

- Provide a specialized nutrient profile for particular feeding application.
  - Educated to understand points of difference bwt all vs specific-purpose products.
  - Sold from "value-added" environments (vet clinic)
- Just because marketed/named as fulfilling specific purpose…no guarantee!

A. Life-stage (growth, adult (M), senior/geriatric)
B. Special needs groups (lg breed pups, obese, ow, oral care, high activity, hairball control, Rx)

All-purpose foods

- Premise that one product satisfies all nutritional needs all the time.
- Provide adequate nutrients to support most demanding life-stages (i.e. growth, lactation)
- Require little explanation
- Suited for sale in grocery-type stores
- All-purpose foods over feed adult and geriatric pets

LOW Price

- Important criterion for many pet caregivers
- How determine best value ($$) food?
  a) unit price (cost per weight)… poor estimate of value
  b) measure feeding costs (cost per calorie or per day).. Best value estimate
“People” food & flavors/varieties

- Pet caregivers think their pets like/need same food as them.
- Belief that human foods superior to pet foods
  1. Relative in that nutrient reqts people = pets
  2. Most pet foods better balanced to meet nutritional needs dog/cat vs people food.
  3. Many people have poor nutritional habits that can be detrimental to pet
     (complex starches, hi fat, salt, gravies, burgers, etc)

- Fulfill pet caregivers assumption pet needs variety.
  - In natural state, wild canid/felid diet is pretty monotonous!

Ingredients

- Diet ingredients are listed in order of concentration in the product.
- Appreciation of:
  - protein (animal vs plant), CHO, fat, mineral sources;
  - fiber type (soluble vs insoluble);
  - concentration of “goodies” (i.e. tomato pomice, blueberries, chicory root, apple, probiotics, omega-3 fatty acids, etc) based on where listed.

Ingredients ... provide the needed nutrients

- **Highlighted** ingredients provide unique benefits.
- Products marketed on ingredient appeal, generally provide many other +/- ingredients.
- Actual **nutrient profile** should be focus
- **Absence of ingredient**...
  - Perceived that ingredient poses problem or danger to pet (i.e. NO corn, no –fillers, grain-free)
- **Presence of ingredient**...
  - Perceived as beneficial
  - Perceived as 'enriched' in that ingredient (+/-)
- **“More is better”** (i.e. high protein)
Newman's Own Organic Dog Food

INGREDIENTS:

6 grain sources                     51 total ingredients!

What is the label telling me?  Ingredient list

Meat:
- clean flesh derived from slaughtered mammals
- limited to skeletal striate muscle or tongue, diaphragm, heart, esophagus muscle
- may have some accompanying /overlying fat, skin, sinew, nerve, blood vessels

Meat meal:
- rendered mammal tissue (not blood, hair, hoof, hide, manure, stomach or rumen contents)
- calcium level not to exceed phosphorus level by 2.2 x
- limits on crude protein as pepsin indigestible
Meat-by-products:

- non-rendered, clean parts (not meat) derived from slaughtered mammals
- can include lungs, spleen, kidneys, brain, liver, blood, bone, fatty tissue, stomachs/intestines (minus contents)
- can NOT include hair, horns, teeth, hoof

Natural - Holistic - Organic

- **Suggested** guidelines for the manufacturers of pet foods to follow when referring to term *Natural* (2001, Pet Food Committee, AAFCO)
- **Natural** = a feed or ingredient derived solely from plant, animal, mined source; either in unprocessed state or having been subjected to physical processing; heat; rendering; purification extraction; hydrolysis, enzymolysis or fermentation.

- **Holistic** is defined as being concerned with the WHOLE, not just the parts...how does that describe pet food?

Organic Foods Production Act

OPFA) for humans not pets but...

Although OPFA does not apply to pet food, if a pet food company wants to use the USDA Organic seal on their label, then they must abide by the USDA standards applied as “100% organic”, “organic”, or “made with organic ingredients”.

USDA Organic Seal
100% Organic: Product must contain only organically produced ingredients and processing aids (excluding water and salt).

Organic: At least 95% of the product must be organically produced (excluding water and salt). The rest of the product must either be non-agricultural or not available organically.

Produced with Organic Ingredients: At least 70% of the product must be organically produced, but the product cannot use the USDA organic seal.

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What’s marketed as Organic?

<table>
<thead>
<tr>
<th>Natura Pet Products® Karma™</th>
<th>95% organic ingredients USDA Certified Organic AAFCO Formulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pet Guard Organic LIFEPATH™</td>
<td>USDA Certified organic for all life stages AAFCO Formulated</td>
</tr>
<tr>
<td>Newman’s Own® Organics Premium Pet Foods™</td>
<td>70% organic, Grain Free AAFCO?</td>
</tr>
<tr>
<td>Evangers Dog &amp; Cat Food Company (canned diets)</td>
<td>Since 1936 100% USDA Organic</td>
</tr>
</tbody>
</table>
Product name
Amusing, easy to remember, authoritative, help reinforce food’s application

<table>
<thead>
<tr>
<th>New</th>
<th>Within past 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>in sauce</td>
<td>&gt; 78% water</td>
</tr>
<tr>
<td>with beef (chicken, lamb, etc)</td>
<td>≥ 3% of total product</td>
</tr>
<tr>
<td>Beef (etc) food</td>
<td>&gt; 70% of total product</td>
</tr>
<tr>
<td>Beef (etc) dinner (platter, entrée, formula)</td>
<td>≥ 10% of total product</td>
</tr>
<tr>
<td>Beef (etc) flavor</td>
<td>&lt; 3% of total product</td>
</tr>
</tbody>
</table>

What is the label telling me?

- Purpose statement
- Ingredient list
- Brand / Product name
- **Guaranteed Analysis**
- **Nutritional Adequacy Statement**
- Quantity statement
- Feeding directions
- Manufacturer contact information

**Guaranteed Analysis**
US pet food manufacturer requires:
- Crude protein, minimum
- Crude fat, minimum (max if calorie-restricted)
- Crude fiber, maximum
- Moisture, maximum
- Kcals/unit
- Others only if highlighted on label
- Disclaimer for substances not AAFCO listed
- Can utilize GA to compare across diets
% protein As Fed basis = 21%

Moisture content in diet = 12%, therefore DM content = 100% - 12% = 88%

\[ \frac{21}{88} \times 100 = 28.9\% \text{ protein, DM basis} \]

**Nutrition Adequacy Statement**

- Since 1984 US regulations require all pet food labels contain statement & validation of nutritional adequacy.
- AAFCO (2007) regs allow 3 methods to substantiate claims for “complete and balanced” or “100% nutritious”, etc based on life-stage.
  1. Formulation
  2. Feeding trial protocol
  3. Family

**Nutrition Adequacy Claim**

- Animal feeding tests using AAFCO procedures substantiate that King Kong Kitty Cuisine provides complete and balanced nutrition for all stages of a cat’s life.
- Perky Pet Chicken Kibble is formulated to meet the nutritional levels established by the AAFCO Dog Food Nutrient Profiles for maintenance of adult dogs.
- Giddyup Ranch Stew is 100% complete and balanced and is formulated to meet PFAC nutrient guidelines for the adult dog.
Recurring concerns
(public and/or veterinarian)

- Ingredients (i.e. corn, grains, by-products, fillers, human-grade ingredients, source of ingredients, value of ingredient, safety, preservatives, additives)
- Foreign (imported) ingredients (safety)
- Transparency, Assurance
- Company size (motives, non-personal), public records
- Carbon footprint of company (parent or pet food company)

Corn is a bad guy

- Corn is a filler
- Corn is poorly digested
- Corn causes allergies

**Filler = an ingredient that serves NO nutritional purpose.**
- Corn: nutritional grain providing a balance of nutrients not found in many other grains.
- Source of: complex CHO; significant [linoleic acid]; EAA; fiber
- Digestibility of any grain is linked (in part) to form in diet (i.e. flour, meal, whole grain)
- Allergic aspect of corn not substantiated.
  - Survey Vet derms: review 15 studies (278 dogs with skin lesions +/- adverse rens to specific foods/ingredients
    - Beef, dairy, wheat (69%); lamb, chicken, soy (25%); corn not on radar!

Fat & protein concentration of grains

Phos & Mg concentrations of grains
Wheat gluten is bad

- Wheat gluten is unsafe/undesirable ingredient in pet food diets

Gluten = tough, viscid nitrogenous substance remaining when the flour of wheat (or other grain) is washed to remove the starch.

By-products are bad

- By-products are of lesser "quality" than meat
- Meal (chicken, meat, etc) is superior to like by-product meal
  - Meat by-product: non-rendered, clean parts (not meat) derived from slaughtered mammals. Can include lungs, spleen, kidneys, brain, liver, blood, bone, fatty tissue, stomachs/intestines (minus contents). Can NOT include hair, horns, teeth, hoof
  - Poultry by-product meal: ground, rendered, clean parts of carcass of slaughtered poultry (i.e. necks, feet, undeveloped eggs, intestines, exclusive of feathers). Limitations on calcium level.

Do by-products have lower nutrient value?

<table>
<thead>
<tr>
<th>Ingredient</th>
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<tbody>
<tr>
<td>Poultry by-product meal</td>
<td>65-70</td>
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<td>Beef (carcass)</td>
<td>18-22</td>
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</tbody>
</table>
“Human Grade” is good

- Pet foods made with “human grade” ingredients are superior for pets.
- Human grade implies foods you would feed your family
- Use of descriptors (human grade, or human quality) for pet foods is **NOT allowed** (AAFCO 2007)

Assurance that product formulation promotes/matches/addresses what it is stated for on label?

- **Nutritional Adequacy Statement/Claim**
  - OTC diets
    - Statement/Claim required (AAFCO), variable wording
    - Feeding guidelines required
  - Rx diets
    - Pass AAFCO feeding trials or state “for intermittent or supplemental feeding only”
    - Exempt from feeding directions

More on **Recurring Concerns**

**Company size...Considerations**

- How big is the company? ($$, knowledge resources, success history, stay-ability / stability)
  - In-house R&D group +/-?
  - In-house dog/cat colonies +/-?
  - Parent company (nutrition resource rich +/-)?
  - Who included in company “team of experts”?
  - Who did the actual feeding trials for diet (if performed)?
- Cost involved (idea to shelf product)?
**BIG or SMALL?**

**BIG - Pros/Cons**
- Corporate backing
- $$, people resources to support multiple diet ideas simultaneously over many years
- Buying power vs standard of quality control (own production plant)
- Targeted by media
- Bad guy
- Perception of ‘greedy”, mass production approach, impersonal

**SMALL - Pros/Cons**
- Support “family”, “small business”, “underdog” concept
- Locally produced, local ingredients (quality control?)
- Target special niche better??
- $$, people resources limited
- Lower level product testing
- Increased expense of diet to client

**Carbon footprint of company**

(parent or pet food) ...

Do you know what CFP is?
Should you care?

The **Good Guide**  ([www.goodguide.com](http://www.goodguide.com))

<table>
<thead>
<tr>
<th></th>
<th>0-10 Health</th>
<th>0-10 Environment</th>
<th>0-10 Society</th>
<th>Average of 3 scores</th>
</tr>
</thead>
</table>

Data on environmental and social performance are generally unavailable for specific pet food products, so Good Guide relies on company-level environmental and social scores to characterize the performance of a product on this dimension.
Take Home Message

- Pet food marketing involves numerous concepts, basic understanding can help you better guide clients on diet choices.
- **LABEL** information is ‘bountiful’; most useful is Nutritional Adequacy Statement and the 30 Guaranteed Analysis.
- Understand terminology in pet food marketing /packaging to dispel unwarranted client concerns.
- Discourage internet 'pet food expert' following, most perpetuate untruths.

III. Information-based diet recommendations

- *Choosing the “Right” diet for Fido*
- The **GoodGuide** insight

Choosing the “right” diet for Fido

**Consider:**

- Creating “short-list’ of key factors
  - What’s most important to you as a veterinarian / pet caregiver?
- Identifying 1 > companies you are comfortable with
  - Trusted nutrient value, product safety, quality control, reliable service, ethical, relationship)
- Utilizing a reputable, un-biased source of diet rating /ranking
  - i.e. GoodGuide
Choosing the “right” diet for Fido

Suggested focus areas …

- Life-stage appropriate
- Nutritionally complete and balanced
- Economics
- Access
- Form/ Appearance

Choosing the “right” diet for Fido

**Life-stage appropriate**

What numbers should be acceptable for healthy pet

1. **Association of American Feed Control Officials (AAFCO)** publishes minimum recommended nutrient levels for pet foods based on life-stage (adult & growth/reproduction).
   - % dry matter basis (convert label GA values from as fed –>DM)
   - Calorie density basis (product reference guides)

**Where to find AAFCO recommendations?**

- Web-site (AAFCO Dog/Cat Nutrient Profiles)
- Purchase or free download of AAFCO manual

Choosing the “right” diet for Fido

**Life –stage appropriate**

What numbers should be acceptable for healthy pet

2. **Small Animal Nutrition text books**

3. **Product Reference Guides** (from trusted company)
Choosing the “right” diet for Fido

Nutritionally complete and balanced

- Nutritional Adequacy Statement

- and other claims of interest

Choosing the “right” diet for Fido

Economics

- Nutrient value provided vs cost of materials to make/package diet

- Nutrient value provided vs ingredients in diet
  - The “goodies” cost $. Is it worth it?

- Point of sale (why not buy local?)

- Choose diet within your (clients) budget

Choosing the “right” diet for Fido

Guaranteed Analysis

- Crude Protein (Min.) 8.00%
- Crude Fat (Min.) 4.00%
- Crude Fiber (Max.) 1.4%
- Moisture (Max.) 82.00%
- Calorie Content 887 kcal/kg (calculated)

Ingredients:
- Chicken, Chicken Broth, Chicken Liver, Fresh Sweet Potato, Bacon, Pumpkin, Dried Egg, Dried Peas, Natural Flavor, Spinach Flakes, Dried Potatoes, Calcium Carbonate, Sodium Phosphate, Carrageenan, Carrot Ole, Salt, Choline Chloride, Yucca shidigera Extract, Leithin, Zinc Amino Acid Complex, Mixed Tocophers, Iron Amino Acid Complex, Vitamin E Supplement, Manganese Amino Acid Complex, Vitamin B12 Supplement, Vitamin A Acetate, Copper Amino Acid Complex, d-calcium Pantothenate, Vitamin D3 Supplement, Niacin, Riboflavin Supplement, Biotin, Ethylenediamine Dihydriodide, Pyridoxine Hydrochloride, Folacin, Thiamine Mononitrate, Sodium Selenite

Autumn Leaf's Overs is formulated to meet the nutritional levels established by the AAFCO Dog Food nutrient profiles for all life stages.
Choosing the “right” diet for Fido

Guaranteed Analysis

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Min.</th>
<th>Max.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein</td>
<td>10.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude Fat</td>
<td>7.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude Fiber</td>
<td>1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture</td>
<td>76.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calorie Content</td>
<td>1,248 kcal/kg (calculated)</td>
<td>A 13 oz. can provides 461 kcal of metabolizable energy, calculated value.</td>
<td></td>
</tr>
</tbody>
</table>

Ingredients:
Chicken, water sufficient for processing, liver, meat by-products, brewers rice, potassium chloride, guar gum, salt, tricalcium phosphate, carrageenan, added color, zinc sulfate, choline chloride,calcium phosphate, Vitamin E supplement, ferrous sulfate, copper sulfate, thiamine mononitrate, manganese sulfate, Vitamin A supplement, niacin, calcium pantothenate, Vitamin B-12 supplement, riboflavin supplement, pyridoxine hydrochloride, potassium iodide, Vitamin D-3 supplement, folic acid, sodium selenite, bootin.

Pro Plan® Puppy Chicken & Rice Entrée is formulated to meet the nutritional levels established by the Association of American Feed Control Officials (AAFCO) Puppy Food Nutrient Profiles for maintenance of puppies.

Choosing the “right” diet for Fido

Form/Appearance

3 mo, F, Border collie, BW 8.2 kg, DER = 1018 kcal/d

<table>
<thead>
<tr>
<th>Protein (g/day)</th>
<th>Fat (g/day)</th>
<th>CHO (g/day)</th>
<th>Fiber (g/day)</th>
<th>Water (g/day)</th>
<th>$/g diet</th>
<th>$/g protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, stew-like</td>
<td>91.7</td>
<td>46</td>
<td>24</td>
<td>16.1</td>
<td>940</td>
<td>$2.42</td>
</tr>
<tr>
<td>B, ground</td>
<td>81.5</td>
<td>57</td>
<td>24.5</td>
<td>12.3</td>
<td>619</td>
<td>$1.55</td>
</tr>
<tr>
<td>AAFCO, growth</td>
<td>64</td>
<td>23</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>(min)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SACN text</td>
<td>69.2</td>
<td>58</td>
<td>96.7</td>
<td>3.0</td>
<td>n/a</td>
<td>-</td>
</tr>
</tbody>
</table>

Nutrient value for pet is the key focus

The Good Guide

<table>
<thead>
<tr>
<th>Health</th>
<th>Environment</th>
<th>Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>0-10</td>
<td>0-10</td>
</tr>
</tbody>
</table>

Average of 3 scores
The **Good Guide**

**GoodGuide's Health ratings for pet food products are based on** four attributes:

1. The nutritional adequacy of the food, as demonstrated by feeding trials or formulation testing,
2. Caloric content disclosure,
3. Life stage specificity, and
4. An assessment of product ingredients

**Ingredients (Least important)**

- **Most ‘desirable in high quantities’ ingredients:** categorized as source many nutrients, should generally be present in high quantities in the food. Threshold for ‘high quantity’ was assigned to the first 5 ingredients listed in the ingredient statement.
- **Desirable:** include nutrients, sources of soluble fiber important for health, but not needed in high quantities such as vitamins (i.e. listed within the first five ingredients).
- **Less desirable:** those with low nutrient bioavailability, provide non-nutritional content to the food (e.g. artificial colors or stabilizers), are undefined by AAFCO, or are potentially harmful. (i.e. many fruits, vegetables, other “healthy” ingredients due to no AAFCO definition for the ingredient. Scores for foods containing potentially harmful ingredients (i.e. garlic) capped at maximum of 2 for this criterion.
- **Extraneous:** do not impact scoring (i.e. water, broth, non-essential nutrients, and manufactured flavoring agents)

“The **Good Guide**

“GoodGuide’s Science Team worked closely with Diplomate(s) of the American College of Veterinary Nutrition to ensure that our ratings criteria were science-based, and feedback from these experts consistently indicated that reliance on pet food ingredient categorization alone would be a poor indicator of a product’s overall health impact for a pet.”

Data on environmental and social performance are generally unavailable for specific pet food products, so GoodGuide relies on company-level environmental and social scores to characterize the performance of a product on this dimension.
Take Home

- Key considerations when choosing a diet:
  - Life-stage appropriate
  - Nutritional complete and balanced
  - Economics
  - Access
- Develop personal Assessment Criteria or other
- Utilize un-biased resources to evaluate diets, understand marketing highlights, and nutrient value for the pet.
  - Veterinary nutritionists, ACVN or AAVN web-sites, CE

IV. Commonly asked questions!
Snap shot of Nutrition Service questions

- Dog-Wolf – Carnivore quandary
- What is appropriate diet for cats
- Breed specific diets
- Raw diets
- Food allergies and OTC diets
- Probiotics
- Choosing diet for multiple health concerns
  - Urolithiasis (Ca Oxalate) plus
- Diet for elevated liver enzymes
- How long to keep NPO with pancreatitis
- Cancer diets

NCSU-CVM Veterinary Clinical Nutrition Service
Contact Info:
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NCSUVetNutrition@gmail.com

Contact us with nutrition-related inquires
Schedule 'Lunch & Learn' sessions at your clinic (CE credit)