Prospective Clinical Evaluation of Food Allergic Dogs and Cats

Previous recommendation of a three week elimination diet trial was empirical. The initial recommendation in this study was to feed a home-cooked restricted diet for 60 days. In several instances the results were equivocal after 60 days and the diet was fed an additional 30 days.

Data Collected

Time elapsed before maximal clinical response on diet; Time elapsed before return of initial clinical signs when fed previous diet; Age, breed, sex, clinical signs; Responsiveness to glucocorticoids; Concurrent disease conditions; Final treatment diets

Diets Fed

Formulated based on known past exposure while avoiding any previously consumed foods which consisted of home cooked foods.

Protein sources—lamb, venison, moose, elk, rabbit, duck, goose, goat, ostrich, emu, alligator, kangaroo, pinto beans.
Carbohydrate source—rice, potatoes, sweet potatoes (yams), rutabagas, oats, barley.

Results

Time elapsed before maximal clinical response:
1-3 weeks—13 dogs; 4-6 weeks—25 dogs; 7-8 weeks—10 dogs; 9-10 weeks—3 dogs

Time elapsed before return of initial clinical signs:
1-2 hours—9 dogs; 1-3 days—32 dogs; 7-9 days—3 dogs; 14 days—1 dog; 6 dogs never fed previous diet

Age At Onset of Clinical Signs

Range of 4 months to 11 years: <1 year old—17 dogs (33%); 1-3 years old—26 dogs (51%); 4-11 years old—8 dogs (16%)

Breeds Affected

Soft-Coated Wheaton Terrier, Dalmatian, Collie, West Highland White Terrier, Chinese Shar Pei, Lhasa Apso, Miniature Schnauzer, Cocker and Springer Spaniels, Labrador Retriever, Golden Retriever, German Shepherd, Bichon Frise

Clinical Signs

Non-seasonal pruritus: Most commonly affects the ears/pinnae, feet, inguinal region, axillary region, proximal foreleg, face, neck, perianal/perineal region

Chronic, recurrent otitis externa a common problem (Serous Otitis Media observed in 81/104 children from 1-9 years of age related to food allergy in 1 study). May develop secondary staphylococcal pyoderma or Malassezia dermatitis.

Possible history of seizures (Food Allergy and seizures in humans: seafoods and soybeans – increased dopamine in CNS). Concurrent diarrhea rare, may have more frequent or softer feces.

Only Clinical Sign on Presentation

Chronic recurrent pyoderma; Seborrheic dermatitis

Response to Glucocorticoids

Complete cessation of pruritus: 39% of cases; Partial reduction in pruritus: 44% of cases; No reduction in pruritus: 17% of cases

Concurrent Primary Pruritic Skin Diseases

Flea Allergy Dermatitis; Atopic Dermatitis; Flea Allergy and Atopic Dermatitis; Flea Collar Hypersensitivity
Diagnosis
Treat suspected food allergy cases symptomatically for first 6-12 months before recommending an elimination diet trial.

Rationale for Initial Symptomatic Therapy for 6-12 Months
51 food allergic dogs followed for 3 years: Only 3 dogs re-developed pruritus, 2 dogs became flea allergic, 1 dog became atopic. None of the dogs became pruritic due to the new hypoallergenic treatment diet and all dogs had been eating the initial sensitizing diet for 6-12 months or longer.

Dogs Started on Elimination Diet Prior to 6-12 Months of Pruritus
2 cases initially on beef/soy based diets: Placed on lamb based diets after 3 months with the pruritus controlled for 2 months, then the pruritus re-developed and dogs found to be reacting to lamb.

1 case initially on lamb/rice based diet: Placed on venison based diet after 2 months with the pruritus controlled for 3 months, then the pruritus re-developed and dog found to be reacting to venison.

Theory of an Immunologic Window
Patient is genetically programmed to become sensitized to commonly exposed antigens in the diet after a certain age. At this age, sensitization begins over a 6-12 month time period. After this time period of programming, the sensitizing immunologic window closes.

Immunology of Food Allergy
IgE mediated food allergy: Common in children—peaks at 1 year, therefore to consider skin testing and in-vitro serum testing in puppies. IgE mediated food allergy rare in adults with false negative skin tests in adults.
Delayed hypersensitivity reactions to foods: More common in adults and therefore need to consider patch testing with foods.

Elimination Diet Trial: Minimum 12 Weeks in Duration

Protein Hydrolysate Formulated Diets
Reducing the Molecular Weight (Daltons) of a specific protein in the diet
- DVM Pharmaceuticals – Exclude—Hydrolyzed casein and chicken liver, oat groats, pinto beans
- Purina CNM Diet—HA-Formula—Hydrolyzed soy, corn starch, canola/coconut oil
  - Purina Gentle Snackers—Hydrolyzed soy, corn starch, canola/coconut oil, oat fiber
- Hill’s Prescription Diets
  - Canine z/d Ultra—Hydrolyzed chicken and chicken liver, corn starch, soybean oil
  - Canine and Feline z/d Low Allergen—Hydrolyzed chicken and chicken liver, potato (canine), rice (feline), soybean oil
  - Canine and Feline Hypoallergenic Treats—Hydrolyzed chicken and chicken liver, corn starch (dogs), rice (feline) soybean oil
- Royal Canin Veterinary Diet (Waltham)
  - Hypoallergenic HP19 Canine – Hydrolyzed soy, rice, chicken fat, beet pulp, vegetable oil
  - Hypoallergenic HP23 Feline – Hydrolyzed soy, rice, chicken fat, beet pulp, fish oil

Home-Cooked Elimination Diet Trial
Restricted diet fed for up to 90 days that is formulated based on known past exposure and to avoid any previously consumed foods.

Canine Diets
Protein sources: lamb, venison, rabbit, duck, goose, goat, ostrich, emu, alligator, kangaroo, elk, moose
- Cook by boiling, baking or broiling.

Carbohydrate sources: rice, potatoes, rutabagas – boiled, No instant or minute forms; Sweet potatoes—baked
- Add nothing to the cooking water and mix equal portions of protein and carbohydrate (50:50) to approximate the volume of the previous diet using 1 cup of the cooked mixture per 10 pounds of body weight per day. You
will need to increase the amount of carbohydrate 2-4 x for most dogs. Use carbohydrate and/or protein treat between meals and “Nothing else is to pass the dog’s or cat’s lips for the next 90 days.”

Discontinue all: table scrapes; dog treats; chewable heartworm preventative; chewable vitamin supplements; essential fatty acid diet supplements

Observation
“Complications of feeding a hydrolyzed diet over an 8-12 week time period mimic the problems encountered using home-cooked elimination diets” with potential problems with palatability, weight loss, diarrhea, and soft stool.

Clostridial Overgrowth
Treatment of Diarrhea/Soft Feces: Submit fecal sample ASAP for direct exam using a Diff-Quik stain—Clostridial overgrowth. Change to a home-cooked bland diet, usually chicken and rice or potatoes with plain cultured yogurt added to diet, Pepto-Bismol tablets—adult dosage, and Metronidazole (Flagyl)—10 mg/kg BID x 7 days.

Treatment Diets—Canine
- Lamb, venison or vegetable and rice based dry diets (Nature’s Recipe)
- Rabbit and rice based canned diet (Nature’s Recipe)
- Duck, venison, or salmon and potato based dry or canned diets; lamb and rice based canned diet, egg and rice based dry diet (d/d, Hill’s)
- Venison, duck, rabbit, or whitefish and potato based canned and dry diets (Innovative Veterinary Diets – Royal Canin—Waltham)
- Vegetable and potato/oat/rice based dry diet (IVD Select Care Vegetarian Formula)
- Vegetable and rice/oatmeal/barley/potato based dry diet (Natural Balance Vegetarian Formula)
- Fish and potato based dry diet (Eukanuba Response Formula FP for Dogs)
- Salmon, trout and rice dry diet (Purina CNM Diet: LA-Formula); Menhaden fish meal and rice dry diet (Royal Canin—Skin Support SS21)
- Kangaroo and oat based dry diet (Eukanuba Response Formula KO for Dogs)
- Fish and sweet potato based dry diets
  - California Natural Herring & Sweet Potato diet – whitefish, barley, rye flour, menhaden fish meal, canola oil
  - Natural Balance Sweet Potato and Fish diet – herring, barley, oatmeal, herring oil, sunflower oil
  - Flint River Ranch “Fish and Chips” Trout and Sweet Potato diet – trout, millet, herring meal, oatmeal, canola oil
- Duck and sweet potato based dry diet – Fromm Duck and Sweet Potato Formula – barley, rice, oatmeal, egg, millet, tomato pomace, canola oil, cheese, carrots, broccoli, cauliflower, apples, green beans, cranberries, blueberries, chicory root, alfalfa sprouts, garlic, parsley
- Venison based dog treats – Nature’s Recipe Healthy Skin Venison Dog Treat – soy flour, molasses, garlic powder; Shaffer Venison Farms – Venison Dog Treats – 100% smoked venison
- Sweet potato based dog treats – Sam’s Yams Sweet Potato dog Chewz – 100% dried sweet potatoes/yams

Home Cooked Treatment Diets
Protein source: lamb, venison, rabbit, chicken, turkey, beef, duck, ostrich
Carbohydrate source: rice, potato, sweet potatoes, or rutabagas
Essential fatty acid dietary supplement: Derm Caps, EFA-Caps
Dicalcium phosphate: non-flavored, additive free multiple vitamin and mineral supplement

Foods Associated with Exacerbation of Clinical Signs
Any food items being prepared in the kitchen: meats, cheeses, cooking oils, margarine, breads, odors from various cooked foods. Peoples favorite snack foods: popcorn, pretzels, peanuts, cookies (Oreo), potato chips, corn chips, doughnuts, pizza, french fries. “The Hoover Hound”!!

New Dilemma
Many patients with a possible food allergy that have already eaten and been exposed to “everything but the kitchen sink.” Possible cross contamination of commercial diets during processing. Potential for patients reacting to various ingredients used in the processing of commercial diets.
**Treatment of Food Allergy in Humans**

Breast feeding exclusively for > 6 months results in decreased food allergy, atopic dermatitis, allergic rhinitis. Oral cromolyn sodium (Gastrocrom)—Increased G.I. permeability in food allergic patients.

Enzyme potentiated desensitization: Beta-glucuronidase + food Ag intradermally; Enzyme treated foods – rice.

**Gut Sterilization Treatment Protocols**

*Clostridium sp.*, *Helicobacter sp.*: Decreases bowel inflammation and thereby decreases GI absorption of dietary allergens.

“Triple Therapy Regimen” – *Canine*: Metronidazole—15 mg/kg BID x 28 days; Amoxicillin—20 mg/kg TID x 28 days; Bismuth subsalicylate (Procter)—1 ml/kg QID x 28 days.

**Food Allergy Potpourri**

Food challenge can be dose dependent—Negative at small doses, positive after a large meal. Children with egg allergy can react to mother’s breast milk after eating eggs. Cat with penicillin allergy can react to cow’s milk containing penicillin.

**Unique Food-Related Reactions**

Onion powder in baby food—Heinz body anemia in cats

Allergenic food additives—Tartrazine (azo dyes), Na benzoate (preservative), MSG (flavor), Na bisulfate (antioxidant).

Cutaneous vasculitis—potatoes, green beans, peas, eggs

Lupoid onychodystrophy, paronychia; Reactive cutaneous histiocytosis; Sterile granuloma/pyogranulomas; Footpad hyperkeratosis with eosinophils; Nasodigital hyperkeratosis; Pinal vasculitis, urticarial vasculitis; Sebaceous Adenitis; Obsessive/compulsive disorders—Separation anxiety, Kleenex shredders, Lick granulomas; Lethargy, depression, aggressive behavior.

Food allergy to fish: Exacerbated by inhalation of fish odors/fumes; Food allergens in house dust—Egg, milk, sugars.

**Cross-Reactions with Foods**

Pork-cat syndrome—IgE reactions to pork meat and cat dander.

Bird-egg syndrome—Bird feather allergy (asthma), followed by food allergy to eggs.

IgE mediated oral allergy syndrome—Cross reactivity between pollens (birch, grass, mugwort) and foods (fruits, vegetables, nuts).