

# **DIAGNOSIS AND TREATMENT OF FOOD ALLERGY IN DOGS AND CATS**

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## **Prospective Clinical Evaluation of Food Allergic Dogs and Cats**

Previous recommendation of a 3 week elimination diet trial was empirical  
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  
Avoided any previously consumed foods  
Consisted of home cooked foods

### **Canine diets**

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

### **Feline diets**

Protein sources - rabbit, venison, lamb, duck, goose, ostrich, emu  
Carbohydrate source - green peas, rarely rice

### **Results – Canine** - 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

**Results – Feline** - Time elapsed before maximal clinical response

1-3 weeks - 4 cats

4-6 weeks - 7 cats

7 weeks - 1 cat, 9 weeks - 1 cat

**Results – Canine** - 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

**Results – Feline** - Time elapsed before return of initial clinical signs

15-30 minutes - 2 cats

24 hours - 2 cats

2-3 days - 4 cats

6-8 days - 4 cats

10 days - 1 cat

**Age At Onset of Clinical Signs - Canine**

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%)

**Age At Onset of Clinical Signs - Feline**

Range of 3 months to 11 years

<1 year old - 3 cats (23%)

1-2 years old - 3 cats (23%)

4 years old - 2 cats (15%)

6-11 years old - 5 cats (39%)

**Breeds Affected - Canine**

Soft-Coated Wheaten 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

**Breeds Affected - Feline**

Siamese, Domestic Shorthair, Domestic Longhair

**Clinical Signs - Canine**

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

**Clinical Signs - Feline**

Non-seasonal pruritus  
Most commonly affects the ear/pinnae, pre-aural region, neck, periorbital region and face  
Miliary type lesions most common (“Miliary dermatitis”)  
Eosinophilic plaques  
Feline symmetrical alopecia  
Severe excoriations can occur  
Angioedema, urticaria, conjunctivitis

**Response to Glucocorticoids**

Complete cessation of pruritus  
Dogs - 39% of cases  
Cats - 64% of cases  
Partial reduction in pruritus  
Dogs - 44% of cases  
Cats - 9% of cases  
No reduction in pruritus  
Dogs - 17% of cases  
Cats - 27% 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  
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  
Pruritus controlled for 2 months

Pruritus re-developed and dogs found to be reacting to lamb

### **Dogs Started On Elimination Diet Prior To 6 Months Of Pruritus**

1 case initially on lamb/rice based diet  
Placed on venison based diet after 2 months  
Pruritus controlled for 3 months  
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 yr.

Consider skin testing and in-vitro serum testing in puppies?

Rare in adults

False *negative* skin tests in adults

Delayed hypersensitivity reactions to foods:

More common in adults

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 HP<sub>19</sub> Canine – Hydrolyzed soy, rice, chicken fat, beet pulp,  
vegetable oil

Hypoallergenic HP<sub>23</sub> Feline – Hydrolyzed soy, rice, chicken fat, beet pulp, fish oil

### **Home-cooked Elimination Diet Trial**

Restricted diet fed for up to 90 days

Formulate based on known past exposure

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

Mix equal portions of protein and carbohydrate (50:50) to approximate the volume of the previous diet

1 cup of the cooked mixture per 10 pounds of body weight per day

Will need to increase the amount of carbohydrate 2-4 x for most dogs

Use carbohydrate and/or protein treat between meals

“Nothing else is to pass the dog’s or cat’s lips for the next 60 days”

Discontinue all:

Table scrapes

Dog and cat treats

Chewable heartworm preventative

Chewable vitamin supplements

Essential fatty acid diet supplements

### **Feline Diets**

Protein sources

Rabbit, lamb, venison, duck

Cook by boiling or broiling

Carbohydrate sources

Green peas

Often refuse rice or potatoes

Most often feed protein source alone

### **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 SS<sub>21</sub>)

Kangaroo and oat based dry diet (Eukanuba Response Formula KO for Dogs)



Fish and sweet potato based dry diets

Wellness Fish and Sweet Potato diet – whitefish, barley, rye flour, menhaden fish meal, canola oil

California Natural Herring & Sweet Potato diet – herring, barley, oatmeal, herring oil, sunflower oil

Natural Balance Sweet Potato and Fish diet – salmon, menhaden fish meal, canola 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

### **Treatment Diets - Feline**

Rabbit and rice based canned diets (Nature’s Recipe)

Venison, duck, or rabbit and green pea based dry or canned diets (d/d, Hill’s)

Lamb and barley based canned diet (Eukanuba Response Formula LB for Cats)

Venison, lamb, duck, or rabbit and green pea based canned and dry diets (Innovative Veterinary Diet – Royal Canin - Waltham)

### **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

Taurine for cats

### **EXclude DIET TRIALS**

#### **Introduction**

Diagnosis of Food Allergy in Dogs Increasingly More Difficult

Exposure to a wide variety of common and novel proteins and carbohydrates

Finding a novel food source an extreme challenge

### **Study Purpose**

“To evaluate the effectiveness of a *novel* carbohydrate and *hydrolyzed* protein diet in controlling pruritus in previously confirmed food allergic dogs”.

### **Patient Selection**

History of persistent, non-seasonal pruritus

Dogs initially exposed to numerous common and novel proteins and carbohydrates

Occurred prior to initiation of the home-cooked elimination diet trial

### **Initial home-cooked diets fed (19 dogs):**

Venison and white potatoes (8 dogs)

Venison and sweet potatoes (4 dogs)

Duck and sweet potatoes (3 dogs)

Duck and white potatoes (1 dog)

Lamb and sweet potatoes (1 dog)

Rabbit and sweet potatoes (1 dog)

Pinto beans and white potatoes (1 dog)

Initially fed the home-cooked diet for up to 8 weeks

Then re-fed the previous diet for up 14 days until pruritus recurred

Again fed the initial home-cooked diet until pruritus resolved

### **Patient Selection – 19 dogs**

All dogs on treatment diets for >6 months prior to entering study:

IVD - Venison/potato (8 dogs)

IVD - Duck/potato (4 dogs)

IVD - Lamb/potato (1 dog)

IVD - Rabbit/potato (1 dog)

Balanced home-cooked diets (5 dogs)

### **Study Design**

Dogs initially examined and found to be free of any clinical signs or history of pruritus

All dogs fed the novel carbohydrate (pinto beans, oats) and hydrolyzed protein (casein =

99.7% < 1100 Daltons, chicken liver = 99.8% < 1400 Daltons) diet (EXclude<sup>R</sup>) for 30 days

### **Owner to monitor each of the following:**

Palatability

Gastrointestinal signs

Weight

Dermatologic signs and pruritus

## **RESULTS**

All dogs re-examined in 30 days:

### **Palatability**

Readily consumed (18 dogs); Refused diet after 9 days (1 dog)

### **Gastrointestinal signs**

Diarrhea/soft feces (7 dogs)

**Weight** - diet fed at a rate of 1/2 cup per 20# body weight

Weight loss (11 dogs)

Corrected by increased volume of food for each feeding except 1 dog

Weight gain (0 dogs)

Maintained weight (8 dogs)

### **Dermatologic Signs and Pruritus**

Pruritus well controlled (18 dogs)

Re-developed pruritus (1 dog)

Occurred within 7 days of feeding

Original treatment diet - Balanced home-cooked pinto beans and potatoes

## **Conclusions**

EXclude<sup>R</sup> adequate for controlling pruritus in a sizable number of known food allergic dogs

May be a suitable substitute for a home-cooked elimination diet

Problems encountered are similar to those when feeding a home-cooked elimination diet

## **Treatment of Diarrhea/Soft Feces**

Submit fecal sample ASAP for direct exam

Diff-Quik stain - Clostridial overgrowth

Change to a home-cooked bland diet - Usually chicken and rice or potatoes

Plain cultured yogurt added to diet

Pepto-Bismol tablets - adult dosage

Metronidazole (Flagyl) - 10 mg/kg BID x 7 days

## **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  
Prescription and non-prescription hypoallergenic diets  
Patients reacting to various ingredients used in the processing of commercial diets

### **Treatment of Food Allergy**

Breast feeding exclusively for > 6 mos  
Decreased food allergy, atopic dermatitis, allergic rhinitis  
Oral cromolyn sodium (Gastrocrom)  
Increased G.I. permeability  
    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 (anti-oxidant)  
Cutaneous vasculitis - Potatoes, green beans, peas, eggs  
Lupoid onychodystrophy, paronychia  
Reactive cutaneous histiocytosis  
Sterile granuloma/pyogranuloma  
Footpad hyperkeratosis with eosinophils  
Nasodigital hyperkeratosis  
Pinnal vasculitis, urticarial vasculitis  
Sebaceous adenitis  
Obsessive/compulsive disorders - Separation anxiety, Kleenex shredders, Lick granulomas  
Lethargy, depression, aggressive behavior

### **Unique Reactions to Foods**

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)

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