

**Food Allergies: Diagnostic and therapeutic updates**

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GBVA

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**1 Food allergy itch is INTENSE**

Olivry and Mueller *BMC Veterinary Research* (2019) 15:140  
https://doi.org/10.1186/s12917-019-1889-2

BMC Veterinary Research

RESEARCH ARTICLE Open Access

Critically appraised topic on adverse food reactions of companion animals (7): signalment and cutaneous manifestations of dogs and cats with adverse food reactions

Thierry Olivry<sup>1\*</sup> and Ralf S. Mueller<sup>2</sup>

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**Veterinary Dermatology**  
Claude Favrot et al *Vet Derm* 2010;21:23-31  
DOI: 10.1111/v.1365-3164.2009.00758.x

**A prospective study on the clinical features of chronic canine atopic dermatitis and its diagnosis**

- Food (FIAD) in dogs
  - < 1 year: 46.5%
  - > 6 years: 8.7%
  - Non-seasonal: 89.5%
  - More gastrointestinal disturbances (P < 0.001)
  - Pruritus was less responsive glucocorticoids (P < 0.001)
  - Itching typically INTENSE
- Environmental Allergies
  - 6mos-6yrs
  - 75% between 1-3 yrs
  - Seasonality is common
  - NO GI disturbances
  - 80-100% responsive to steroids
  - Itching is milder than FIAD

**NB: NOT ALL FOOD ALLERGIES ITCH**  
Type I, III, IV hypersensitivity, Intolerance

Favrot et al *Vet Derm* 2010 n=1096 dogs; 34 vet derms (EU, NA, SA, Japan)

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**Food Allergy vs Atopy - Distribution patterns**

Food Allergy Atopy

intranet.tdmu.edu.ua

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**+If worsening in areas of CAFR (dogs)...**

CAF (Canada) AF (America) FR (France)

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**+Feline Allergies**  
Flea vs Food vs Atopy - Distribution patterns

- Flea HD
  - Signs affecting rump or tail, flank or dorsum
- Nonflea HD (Food Allergies)
  - Lesions on head or face
  - Particularly with food HD
- Nonflea and nonfood HD (Atopy)
  - Wide spread distribution
  - Abdomen and extremities
- Food and Atopy
  - Sometimes clinically indistinguishable
  - Thorough workup - eliminate differential diagnoses

Hohi S, Linke M, Marignac G et al. *Vet Derm* 2011; 22(5): 406-413.

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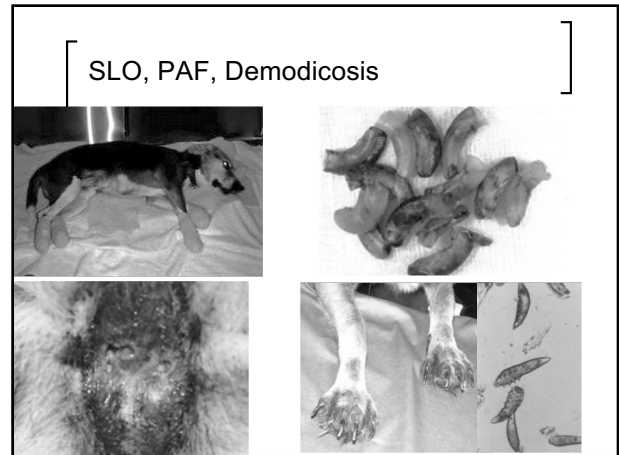
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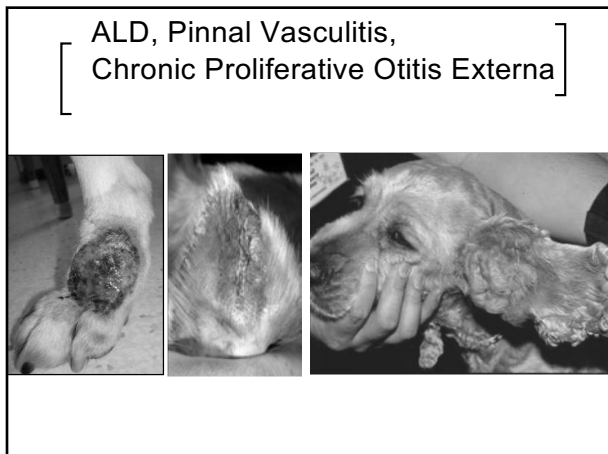
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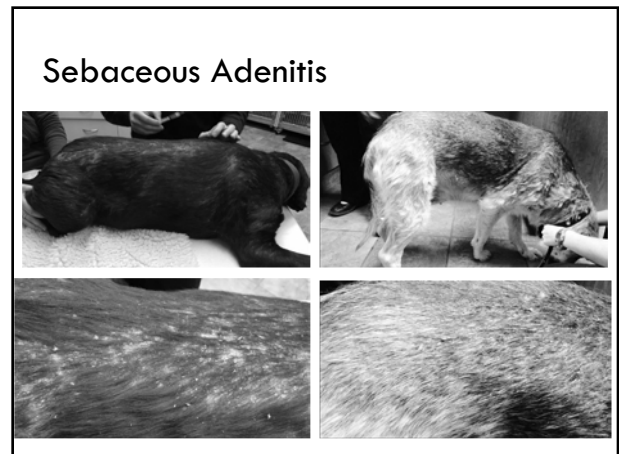
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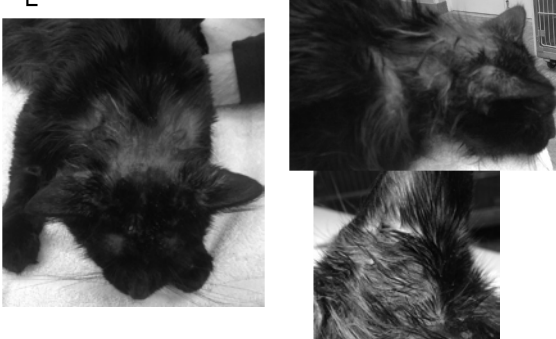


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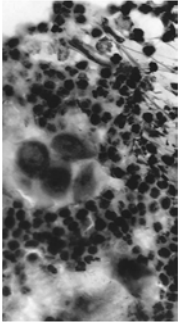
[ Pemphigus in young patients ]



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[ Feeny – 1yr old M DLH ]

- Historical clues
  - Onset of “crusting otitis”
  - Started at 10 mos of age
  - Spread to head, neck, forelimbs
  - PRURITIC
- Dermatohistopathology
  - Pemphigus foliaceus
  - AND allergic dermatitis



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**2 NON-CUTANEOUS SIGNS**

Mueller and Olivry BMC Veterinary Research (2018) 14:341  
https://doi.org/10.1186/s12917-018-1656-0 BMC Veterinary Research

RESEARCH ARTICLE Open Access


Critically appraised topic on adverse food reactions of companion animals (6): prevalence of noncutaneous manifestations of adverse food reactions in dogs and cats

Ralf S. Mueller<sup>1\*</sup> and Thierry Olivry<sup>2</sup>

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[ Gastrointestinal signs... ]

- Concurrent with cutaneous signs
- Increased frequency of BMs/day
- Eructations, halitosis
- Borborygmus, Flatulence
- Tenesmus
- Anal gland impaction & scooting
- Pica and/or Coprophagia
- Changes in the stool consistency, volume, frequency
- Eosinophilic esophagitis (“heartburn”, reflux)
- Eosinophilic or Lymphocytic-plasmacytic colitis, Chronic Idiopathic Enteropathy (CIE aka IBD)



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[ Other signs ]

- Respiratory
  - Conjunctivitis, Scleritis, Sinusitis
  - Rhinitis/Sneezing
  - Asthma/Cough
- Neurologic/Behavioral
  - Malaise and seizures
  - ADD, aggression, “F” in dog school



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**3 NO laboratory tests for CAFR**

Mueller and Olivry BMC Veterinary Research (2017) 13:275  
DOI 10.1186/s12917-017-1142-0 BMC Veterinary Research

RESEARCH ARTICLE Open Access

Critically appraised topic on adverse food reactions of companion animals (4): can we diagnose adverse food reactions in dogs and cats with in vivo or in vitro tests?

Ralf S. Mueller<sup>1\*</sup> and Thierry Olivry<sup>2</sup>

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*Vet Dermatol* 2014; 26: 447-470 DOI: 10.1111/vde.12133

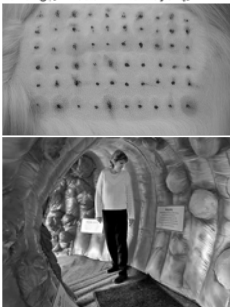
### Food-specific serum IgE and IgG reactivity in dogs with and without skin disease: lack of correlation between laboratories

Jonathan I. Hardy\*, Anke Hendricks\*, Anette Loeffler\*, Yu-Mei Chang†, Kristien L. Verheyen‡, Oliver A. Garden§ and Ross Bond\*

Issues: Threshold, testing raw ingredients, cross-reactive carbohydrate determinants, non-immunologic food-induced reactions

- IDT Kunkle & Horner 1992; Ishida et al 2004
- Gastroscopic testing Gullford et al 2001
- Colon testing (COLAP)? Allenspach et al 2006
- Lymphocyte Blastogenesis Ishida et al 2004
- Flow Cytometry Fujimura et al 2010
- Immunoblotting with commercial diets Maina et al 2017
- NutriScan Salivary Testing Coyner (VIN reposted 2016)
- Immune IQ fur testing Coyner & Schick 2016

**INVEST \$\$\$ IN THE DIET TRIAL INSTEAD**




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### Lack of Reliability of Hair or Saliva Testing for Food and Atopy

- Assessment of diagnostic tests for food allergy
  - Mueller, R.S., Olivry, T. Critically appraised topic on adverse food reactions of companion animals (4): can we diagnose adverse food reactions in dogs and cats with in vivo or in vitro tests? *BMC Vet Res* 13, 275 (2017). <https://doi.org/10.1186/s12917-017-1142-0>
- Hair and Salivary antigen testing for FOOD allergies
  - Coyner, K. and Schick, A. (2019), Hair and saliva test fails to identify allergies in dogs. *J Small Anim Pract*, 60: 121-125. <https://doi.org/10.1111/jsap.12952>
- Salivary and Hair testing for ENVIRONMENTAL allergies (Atopy)
  - Bernstein, J.A., Tater, K., Bicalho, R.C. and Rishniw, M. (2019), Hair and saliva analysis fails to accurately identify atopic dogs or differentiate real and fake samples. *Vet Dermatol*, 30: 105-e28. <https://doi.org/10.1111/vde.12274>
- Salivary Antigen Testing for Foods
  - Lam, A. T. H., Johnson, L. N., & Heinze, C. R. (2019). Assessment of the clinical accuracy of serum and saliva assays for identification of adverse food reaction in dogs without clinical signs of disease. *Journal of the American Veterinary Medical Association*, 255(7), 812-816. Retrieved Oct 17, 2022, from <https://ornjournals.avsma.org/view/journals/javma/255/7/javma.255.7.812.xml>
  - Udraitė Vovk I, Watson A, Dodds WJ, Klinger CJ, Classen J, Mueller RS. Testing for food-specific antibodies in saliva and blood of food allergic and healthy dogs. *Vet J*. 2019 Mar;245:1-6. doi: 10.1016/j.tvjl.2018.12.014. Epub 2018 Dec 12. Erratum in: *Vet J*. 2019 Jul;249:89. PMID: 30819419.

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### NutriScan Salivary Antigen Test



- NutriScan is novel and patented and is not testing for food allergies, but rather tests for food sensitivities (IgA, IgM and intolerance)???
- \$298 USD for dogs/cats; \$380 USD horses
- Kim Coyner (Reposted on VIN 2016)
- 45 dogs (normal, food allergic, atopic dogs)
- Negative controls (tap & distilled water, dry unused rope and 2 human saliva sent in a blinded fashion)
- ALL reactive to beef, corn, milk, wheat with IgA & IgM results

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### ImmuneIQ fur testing for Food Sensitivity

#### Inaccuracy of hair and saliva test for allergies in dogs

K. COYNER<sup>1</sup>, A. SCHICK<sup>2</sup>


<sup>1</sup> Dermatology Clinic for Animals, Olympia, WA USA  
<sup>2</sup> Dermatology for Animals, Scottsdale, AZ USA

**Introduction and Objective**  
Several in-vitro assays for food and/or environmental allergens in companion animals, but offer no indication of their test accuracy for allergic in companion animals.

**Statistics**  
Statistical analysis was performed to determine if the response distribution differed significantly between dogs using the Prunen-chicken coefficient, as well as to determine test-retest reliability by calculating Cohen's kappa for each allergen.

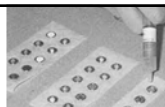
**Results**  
The distribution of Immune IQ™ test results among allergic dog, non-allergic dog and fake fur samples were not distinguishable from those expected from random chance, after correcting for multiple comparisons. Test-retest reliability was poor to slight (Table 1).

**Conclusions**  
The Immune IQ™ test results could not differentiate between an allergic dog, a non-allergic dog and fake animal fur, and should not be recommended as an alternative to hypodermic skin tests or intradermal or serologic allergy testing in companion animals.



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### Patch testing vs Serologic



- N=25 elimination diet + challenged + patch + IgE, IgG
- N=11 clinically normal + patch + IgE, IgG

N=25 AFR N = 11 Control	Sensitivity	Specificity	Predictive +	Predictive -
Patch	96.7%	89%	63%	99%
IgE	6.7%	91.4%	15.4%	80.7%
IgG	26.7%	88.3%	34.8%	83.7%

Patch testing and allergen-specific serum IgE and IgG antibodies in the diagnosis of canine adverse food reactions.  
Bethlehem S, et al. *Vet Imm Immunopathology* 2012;145(3-4):582-589


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### Evaluation of patch testing with proteins, carbohydrates and commercial foods for diagnosis of canine adverse food reactions

C. JOHANSEN\*, C. MARIANI† AND R.S. MUELLER\* 2013 ESVV, 197

- N=25 dogs
  - raw and cooked meat (n=16)
  - salmon and carbohydrates (n=11)
  - commercial foods (n=4)
  - patches/dog = 17-30
- Food Challenge

	Sensitivity	Specificity
Overall	78%	82%
Meats/salmon	100%	69%
Carbohydrates	70%	83%
Commercial diets	22%	100%



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**Extracts + components**

**PAX** pet allergy explorer

**Environmental**

Summary on detectable sensitizations

GROUP ALLERGEN	SENSITIZED	PERCENTAGE
Grass pollen	48	48.00%
Tree pollen	48	48.00%
Mold	48	48.00%
Wheat pollen	48	48.00%
Beet pollen	48	48.00%
Pea pollen	48	48.00%
Tomato pollen	48	48.00%
Quinoa pollen	48	48.00%
Flaxseed pollen	48	48.00%
Coconut pollen	48	48.00%
Brewer's rice pollen	48	48.00%
Millet pollen	48	48.00%
Fava bean pollen	48	48.00%
Fava pollen	48	48.00%
Coconut oil pollen	48	48.00%
Natural flavors pollen	48	48.00%
Dried plain beet pulp pollen	48	48.00%
Pea fiber pollen	48	48.00%
Tomato pomace pollen	48	48.00%
Dicalcium phosphate pollen	48	48.00%
Pumpkin pollen	48	48.00%
Calcium carbonate pollen	48	48.00%
Salt pollen	48	48.00%
Marine microalgae pollen	48	48.00%
Potassium chloride pollen	48	48.00%

**PAX and testing for Food Allergies**  
Measures circulating IgE (Type I Hypersensitivity)  
Evaluates crude and component extract

Future lymphocyte proliferation testing  
Type IV cell-mediated immune response  
80% sensitivity; 100% specificity  
Test for both in future

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## 4 The "4-week" Dietary Trial

Olivry et al. BMC Veterinary Research (2015) 11:225  
DOI 10.1186/s12917-015-0541-3

BMC Veterinary Research

RESEARCH ARTICLE Open Access

### Critically appraised topic on adverse food reactions of companion animals (1): duration of elimination diets

Thierry Olivry<sup>1\*</sup>, Ralf S. Mueller<sup>2</sup> and Pascal Prélaud<sup>3</sup>

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## The "4-week" Dietary Trial

- Increase owner acceptance

**GOAL**

- At least 50% reduction of clinical signs in 4-weeks
  - If NOT → Change the diet
  - If positive response noted → owner is more willing to continue for total of 8-12 weeks
- 100% restriction REQUIRED

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## Plant Based

1. Quinoa
2. Brewer's rice
3. Millet
4. Fava bean
5. Coconut oil
6. Natural flavoring
7. Tomato pomace
8. Dicalcium phosphate
9. Pumpkin
10. Calcium carbonate
11. Salt
12. Marine microalgae

1. Oat groats
2. Brewer's rice
3. Potato protein
4. Coconut oil
5. Natural flavors
6. Dried plain beet pulp
7. Pea fiber
8. Tomato pomace
9. Flaxseed
10. Monocalcium phosphate
11. Calcium carbonate
12. Potassium chloride

**Cost:**

- Quinoa vs. Oat Groats & Rice – **98% per lb**
- Fava Protein vs. Potato Protein – **85% per lb**
- Tom Pom vs. Beet Pulp/Pea Fiber – **115% per lb**
- Marine Microalgae vs. no supplemental source

**Quality:**

- Quinoa has more minerals, fiber and protein vs. oat groats
- Novel Vegetable Protein
- Tomato pomace vs. Beet Pulp and Pea Fiber (potential allergens)
- Marine Microalgae for Omega 3 supplementation

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## Nature's Hug - Dried Yeast-based Vegan Diet

<https://natureshugpetfood.com/>

VEGAN Diet - based on yeast/levure as protein source  
FELINE and CANINE - all stages  
Only kibble/dry format available  
OTC - Global Pet Foods, Pattes et Griffes

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## Rayne Insect-Based Diet

**ECODERM-BSFL™ WITH QUINOA (Dry)**

**INGREDIENTS (DRY):**  
Dried black soldier fly larvae, quinoa, oats, millet, fava bean, fava protein, coconut oil, natural flavor, flaxseed, blueberry fiber, dried pumpkin, dicalcium phosphate, calcium carbonate, marine microalgae oil, salt, threonine, fructooligosaccharide, DL-methionine, choline chloride, minerals (zinc proteinate, iron sulfate, zinc sulfate, iron proteinate, copper proteinate, copper sulfate, manganese proteinate, manganese sulfate, sodium selenite, cobalt proteinate, calcium iodate, potassium iodide), taurine, vitamins (vitamin E supplement, niacin, vitamin B12 supplement, vitamin A acetate, thiamin mononitrate, pyridoxine hydrochloride, riboflavin, d-calcium pantothenate, vitamin D3 supplement, biotin, folic acid), L-carnitine, tryptophan, mixed tocopherols, rosemary extract.

**NUTRITIONAL DETAILS (Calculated \*\*) & AMOUNT/CUP:**

**Dry (1.8 kg)**  
ME: 3,494 kcal/kg as is;  
3,871 kcal/kg dry weight  
Approximate g/cup: 72  
kcal/cup: 252

**Percentage of Metabolizable Energy from:**  
Protein: 23.0%  
Fat: 35.7%  
Carbohydrates: 41.3%

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### Tim Horton's Drive Thru Withdrawals for 4 weeks easier than 8-12 weeks



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### 5 Verbalize the treat list

Mueller et al. BMC Veterinary Research (2016) 12:9  
DOI 10.1186/s12917-016-0633-8

BMC Veterinary Research

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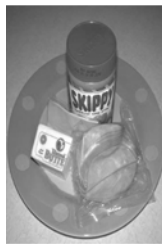
Critically appraised topic on adverse food reactions of companion animals (2): common food allergen sources in dogs and cats

Ralf S. Mueller<sup>1</sup>, Thierry Olivry<sup>2\*</sup> and Pascal Prélaud<sup>3</sup>

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### What owners don't perceive as treats – Verbalize a Treat List - **THE NO NO list**

- BEEF, DAIRY, LAMB, CHICKEN, WHEAT, CORN, [+ FISH - cats]
- Drive-thru treats (Timbits...)
- Treats, bones and rawhide chew toys
- Neighbour/service person
- Popcorn, tuna juice
- End-o-cereal/ice cream bowl
- Pilling vehicles; Flavoured toothpaste
- Supplements, Alternative meds
- Chewable medications, gelatin capsules
- Probiotics e.g., Fortiflora - **animal digest**



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### Keep Treats Behind Reception Desk



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### Oral Allergy Syndrome

Birch (Bet v 1)	Apple, carrot, cherry, pear, peach, plum, prune, nectarine, apricot, kiwi fruit, honey, potato, soy, tomato, spinach, celery, parsnips, green pepper, lentils, peas, beans, peanut, parsley, anise, dill, fennel, caraway, coriander, cumin, wheat, buckwheat, hazelnut, walnut, almond
Mugwort Sage (Art v 1)	Celery, carrot, spices, melon, watermelon, apple, chamomile, hazelnut, anise, fennel, coriander, cumin.
Grass (Phl p 1-6)	Potato, melon, tomato, watermelon, orange, cherry, peanut, kiwi
Ragweed (Amb a 1)	Watermelon, cantaloupe, honeydew, chamomile, honey, banana, sunflower seeds, zucchini, cucumber
Latex (Hev b 5)	Avocado, potato, banana, tomato, chestnut, kiwi fruit, herbs, carrot
Peanuts (Ara h 1)	Legumes, grass, wheat, corn
Plantain (Pla 1 1)	Melon



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### 6 Cross-Reaction, Cross-Contamination

Olivry and Mueller BMC Veterinary Research (2016) 14:24  
DOI 10.1186/s12917-016-1346-y

BMC Veterinary Research

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Critically appraised topic on adverse food reactions of companion animals (5): discrepancies between ingredients and labeling in commercial pet foods

Thierry Olivry<sup>1\*</sup> and Ralf S. Mueller<sup>2</sup>

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**ELISA Testing for Soy Antigens in Dry Dog Foods Used in Dietary Elimination Trials**  
Journal of the American Animal Hospital Association 50(6) 2014  
Christine Willis-Mahn, DVM, DACVIM, Rebecca Remillard, PhD, DVM, DACVN, Kathy Tater, DVM, DACVD  
**3/4 OTC 'no soy' diets - all positive (2 diets >25 ppm)**  
Blue Buffalo Basics salmon/potato, Taste of the Wild Prairie bison/venison, Canidae salmon


**ELISA testing for common food antigens in four dry dog foods used in dietary elimination trials\***  
Journal of Animal Physiology and Animal Nutrition 95 (2011) 90–97  
D. M. Raditic, R. L. Remillard and K. C. Tater  
**Beef and soy in Venison OTC diets**

**Identification of undeclared sources of animal origin in canine dry foods used in dietary elimination trials**  
Journal of Animal Physiology and Animal Nutrition 97 (2013) 52–58  
R. Ricci<sup>1</sup>, A. Granato<sup>2</sup>, M. Vascellari<sup>2</sup>, M. Boscarato<sup>2</sup>, C. Palagiano<sup>1</sup>, L. Andrighetto<sup>1,2</sup>, M. Diez<sup>3</sup> and F. Mutinelli<sup>2</sup>  
**2/12 pet foods did PCR and microscopy match ingredients listed**  
**10/12 – microscopic bone fragments from mammalian, avian and fish that were not on their ingredient lists**

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**Use Veterinary Diets for Trial**

- Quality control and assurance
  - Spotless facilities
  - Mycotoxin testing via ELISA
  - Oxidation test for fats
  - Near infrared Spectroscopy
    - “fingerprinting” ingredients before and after
    - >30 different tests
    - Ingredients not offloaded testing results
    - Checks nutritional specifications
- Recommendation
  - Use **VETERINARY** diets for trial period
  - Consider challenging with OTC



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CROSS-REACTIONS	COMMON PROTEIN
Management of Food Allergens Jacqueline Coutts, John Wiley & Sons, 2009	
Poultry X flight fowl (things with wings)	<b>alpha-livetin</b>
Venison X Beef X Lamb (ruminants)	<b>S alb, Bov IgG</b>
Shellfish & crustacea	<b>Tropomyosins</b>
Wheat, barley, rye	<b>Gluten/gliadins</b>
Fish	<b>β-parvalbumin</b>
Wheat, rice, corn, barley	<b>α-amylase inhibitors</b>
Corn, wheat, barley, spelt	<b>Lipid transfer proteins</b>
Oats do <b>NOT</b> contain gluten; +/- cross-contact @ harvest J Li, et al. <i>Gluten-Free Diet Guide for People with Celiac Disease</i> , CSU extension May 2010	

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**7 Hydrolyzed diets not all equal**

**Veterinary Dermatology**

*Vet Dermatol* 2016; 27: 289–e70 DOI: 10.1111/vde.12302

**A randomized, double-blinded crossover trial testing the benefit of two hydrolysed poultry-based commercial diets for dogs with spontaneous pruritic chicken allergy**

Petra Bizikova\*\*† and Thierry Olivry\*\*†

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**Veterinary Dermatology**

*Vet Dermatol* 2016; 27: 289–e70 DOI: 10.1111/vde.12302

**A randomized, double-blinded crossover trial testing the benefit of two hydrolysed poultry-based commercial diets for dogs with spontaneous pruritic chicken allergy**

Petra Bizikova\*\*† and Thierry Olivry\*\*†

RDDB crossover trial with 10 known chicken allergic dogs and negative to corn Diets fed 14 days separated by a 14 day wash-out period. Owners rated Pruritus daily with a Visual Analog Scale (PVAS). The challenge was ended if a flare in pruritus occurred (i.e. PVAS ≥5/10)

Results – Pruritus increased significantly after Hill's Z/D (P < 0.001) not after RC Anallergenic Maximal PVAS score Hill's Z/D (4.7) compared to RC Anallergenic (2.5) (P = 0.01) Four dogs fed Hill's Z/D (40%) were withdrawn due to flare

**Conclusions – AVOID Z/D or Hill's HYPO Treats in chicken allergic dogs – BUT what about “Natural Flavours in Royal Canin HP??”**

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**What about...**



**Patch testing with feather hydrolysate, corn starch and a commercial diet containing corn starch and feather hydrolysate in chicken and corn-allergic dogs**


Johansen et al, *Vet Derm* 2012;23(suppl. 1):62

- N=5 chicken; 3 of 5 BOTH chicken AND corn
- 48h post-clipping, occlude 48h, remove 48h, read
- Raw/cooked chicken, corn/corn starch and Anallergenic diet, petrolatum jelly
- **5/5 chicken & 3/3 corn – 100%**
- **1/5 positive for Anallergenic on patch/challenge**
  - +/- granule-bound starch synthase-1 (GBSS1) from Zea mays (corn)

**Although Anallergenic MWt makes it highly unlikely to trigger an allergic reaction, we still don't have an effective diet for every case.**

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### Feline Anallergenic



- Extensively hydrolyzed
- DNA testing of diet
- Prebiotics and zeolite to reduce V/D
- Skin barrier blend
- S/O® Index
- Granule-bound starch synthase-1 (GBSS1) from Zea mays (corn)
  - DNA and protein analyses support the clinical reliability of Anallergenic, an extensively hydrolysed diet. LESPONNE ID, et al, 2017 ECVJ/ESVD Proceedings; page 244

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### SO SHOULD WE HOMECOOK??




[www.hilarysblend.com](http://www.hilarysblend.com)

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### Cooking and processing reduce IgE sensitization to foods in dogs


RICHARD C, et al. 2017 ECVJ/ESVD Proceedings; page 248

- Cooking reduced IgE sensitization
- Meat from 45 to 19%
- Fish from 81 to 40%
- Milk → cheese/yoghurt from 65 to 31 and 13%
- Wheat → bread/pasta from 100 to 58 and 83%
- Kibbles (37%) versus wet-foods (13%)
- **Conclusion:** Although IgE sensitization does not equate clinical allergy, our results suggest that feeding raw food might be more allergenic and should be avoided.

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### Dilated Cardiomyopathy and Grain-Free Diets

The Journal of Nutrition xxx (xxxx) xxx



journal homepage: [www.journals.elsevier.com/the-journal-of-nutrition](http://www.journals.elsevier.com/the-journal-of-nutrition)

**Nutrition and Disease**

**The Pulse of It: Dietary Inclusion of Up to 45% Whole Pulse Ingredients with Chicken Meal and Pea Starch in a Complete and Balanced Diet Does Not Affect Cardiac Function, Fasted Sulfur Amino Acid Status, or Other Gross Measures of Health in Adult Dogs**

Pawanpreet Singh<sup>1</sup>, Sydney Banton<sup>1</sup>, Shari Raheb<sup>2</sup>, James R. Templeman<sup>1</sup>, Jennifer Saunders-Blades<sup>3</sup>, Darcia Kostjuk<sup>4</sup>, Janelle Kelly<sup>5</sup>, Christopher PF. Marinangeli<sup>6</sup>, Adronice Verbrugge<sup>7</sup>, Shoshana Verton-Shaw<sup>8</sup>, Anna K. Shoveller<sup>1</sup>

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The Journal of Nutrition xxx (xxxx) xxx



journal homepage: [www.journals.elsevier.com/the-journal-of-nutrition](http://www.journals.elsevier.com/the-journal-of-nutrition)

**Nutrition and Disease**

**The Pulse of It: Dietary Inclusion of Up to 45% Whole Pulse Ingredients with Chicken Meal and Pea Starch in a Complete and Balanced Diet Does Not Affect Cardiac Function, Fasted Sulfur Amino Acid Status, or Other Gross Measures of Health in Adult Dogs**

Pawanpreet Singh<sup>1</sup>, Sydney Banton<sup>1</sup>, Shari Raheb<sup>2</sup>, James R. Templeman<sup>1</sup>, Jennifer Saunders-Blades<sup>3</sup>, Darcia Kostjuk<sup>4</sup>, Janelle Kelly<sup>5</sup>, Christopher PF. Marinangeli<sup>6</sup>, Adronice Verbrugge<sup>7</sup>, Shoshana Verton-Shaw<sup>8</sup>, Anna K. Shoveller<sup>1</sup>

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**N=28** privately-owned Siberian Huskies sled dogs (9F; 4F; 9M; 6M), mean age of 5.3  
4 diets w/ 0%, 15%, 30%, 45% pulse ingredient for 20 weeks  
Effect of PULSES [green & yellow peas, pinto beans, chickpeas, and lentils] on:

- 1) Echocardiographic measurements
  - NSD (P > 0.05)
- 2) Cardiac biomarkers N-terminal pro-B-type natriuretic peptide and cardiac troponin I (cTnI)
  - NSD (P > 0.05) and values remained below safe upper limits
- 3) Plasma sulfur amino acid (SAA) concentrations - low levels may limit taurine synthesis
  - Similar among all four groups
- 4) Effects on body composition and CBC/biochemistry
  - Similar among all four groups

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**Conclusions:** Increasing the inclusion of pulses up to 45% with the removal of grains does not impact cardiac function concurrent with dilated cardiomyopathy, body composition, or SAA status and is safe for healthy adult dogs to consume when fed for 20 wks.

**Limitations:** Healthy fit breed without predisposition to DCM; Short duration of feeding

**BUT... Kaplan et al (2018):** improvement in Golden Retrievers when switched onto a pulse-devoid and grain-inclusive diet with Taurine supplementation.

**Freeman et al. (2022):** switched dogs with DCM on a legume/potato inclusive diet onto a grain-inclusive intervention diet and found an improvement in echocardiograph in 9 months  
**THE DEBATE GOES ON !!**

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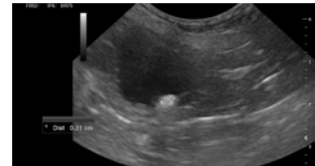
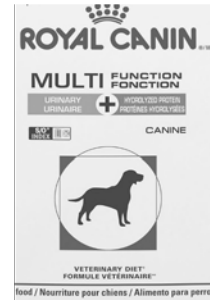
### What do I use and when?

\*Favrot C. New options for allergen identification in allergic patients. 2017  
ESVD/ECVD Proceedings; pp194-195

- Home-prepared
  - Depends on owners
  - Raw vs lightly seared vs cooked
  - Raw is more allergenic than cooked(\*)
- Commercial
  - **Cutaneous adverse food reaction**
    - Novel protein limited ingredient diet
    - Pork, kangaroo, rabbit, alligator, vegetarian, insect
    - Canned is less allergenic than kibble (\*)
  - **Atopic dermatitis**
    - Epidermal barrier repair (EFAs, PINCH)
    - RC Skin Support, DermComplete
- Partially/Extensively Hydrolyzed diet
  - **Inflammatory bowel +/- CAFR +/- Crystalluria**

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### Benny – food allergy + urolith



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### Rayne Crocodilia – Canine & Feline

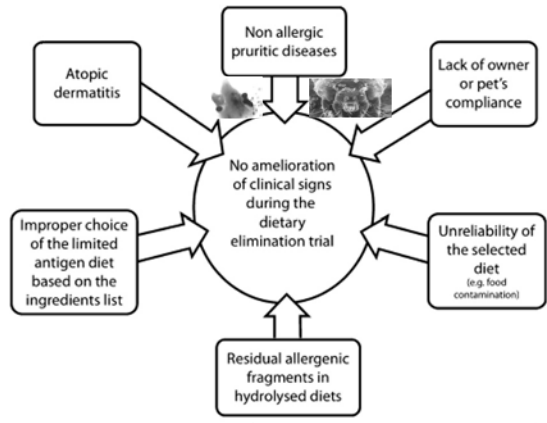


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9 “It should only get better; It should NOT get worse.”



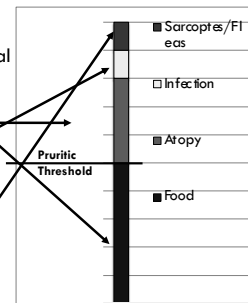
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### Yu-ski “Cut (do not peel) the Onion” Dietary Trial Approach

- Dietary trial
  - 4-week assessment; 8-12 weeks total
- Symptomatics for atopy
  - 6 weeks
  - Steroids, CSA – poor response
  - Jackson et al. Vet Derm 2006;17(5): 358
- Antimicrobials
  - Min 4 weeks based on cytology
- R/O Sarcoptes
  - Isoxazolines



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## 10 Diet Challenge - Time To Flare

Olivry and Mueller BMC Veterinary Research (2020) 16:158  
https://doi.org/10.1186/s12917-020-02379-3

BMC Veterinary Research

RESEARCH ARTICLE Open Access

Critically appraised topic on adverse food reactions of companion animals (9): time to flare of cutaneous signs after a dietary challenge in dogs and cats with food allergies

Thierry Olivry<sup>1</sup> and Ralf S. Mueller<sup>2</sup> 


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## DIET Challenge OR Change DIET

- If any worsening of skin or GI signs
  - As early as 15 minutes
  - Most often 24-48hrs out to 14 days
- It often takes MORE than one diet
  - Continue trials if clinical signs consistent e.g. Unis Stanturf
  - DOGS: Ears, feet, rears, dorsothoracolumbar, GI
  - CATS: Head and neck, rears, GI
- If signs return after being controlled 6 months
  - Rare but might need to change diets every 6 months, then return to the first diet if exhausted diet options

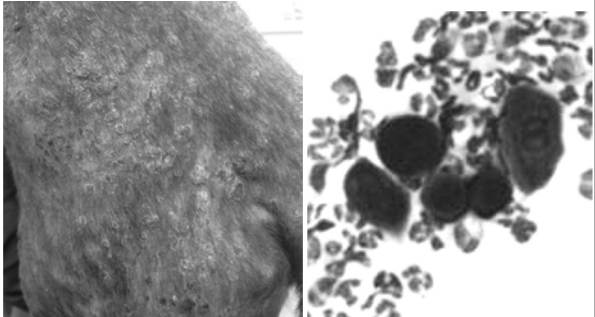
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## Bane - 1yr MN Mastiff X



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## Bane - Food-induced Pemphigus



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## Bane – Food-induced Pemphigus

- Diagnostics
  - Acantholytic cells
  - Biopsy confirmation
    - PF AND Allergies
- Clinical clues
  - Young dog
  - Pruritic
  - Difficulty putting on weight
- Treatment
  - Diet trial – RC HP
  - Prednisone + Azathioprine
    - Tapered off with improvement



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## Bane – Food-induced Pemphigus 6-weeks post treatment



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### Above all, do no harm!

- Consider a work-up for food allergies:
  - ▣ IBD vs lifelong steroids/IS agents
  - ▣ Anal Gland Disease vs surgery
  - ▣ Asthma vs chronic anti-inflammatory medications
  - ▣ Chronic recurrent otitis externa vs. TECA-BO
  - ▣ Idiopathic Epilepsy vs lifelong Pheno/KBr/Keppra
  - ▣ Behavioural (ADD, Aggression) vs euthanasia
  - ▣ Immune-mediated disease to eliminate trigger vs lifelong IS medications
- ▣ **What have you got to lose?**

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- ▶ Membership is \$50 per year - pay online
- ▶ Two Bulletins per year
- ▶ Access to Members Only section



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