UPDATES ON FOOD ALLERGY IN DOGS.

Pascal PRELAUD
Centre Hospitalier Vétérinaire ADVETIA
Service de Dermatologie
9 avenue Louis Breguet, 78140 Vélizy-Villacoublay
FRANCE

Food allergy is still an active area of fundamental and clinical research. It is important to differentiate acute and chronic allergic diseases.

Terminology and pathogeny

WAO/EAACI

- **Hypersensitivity**: Hypersensitivity causes objectively reproducible symptoms or signs, initiated by exposure to a defined stimulus that is tolerated by normal subjects.
- **Non-allergic hypersensitivity**: Non-allergic hypersensitivity is the preferred term to describe hypersensitivity in which immunological mechanisms cannot be proven.
- **Allergy**: Allergy is a hypersensitivity reaction initiated by immunological mechanisms. Allergy can be antibody-or cell-mediated. In the majority of cases the antibody typically responsible for an allergic reaction belongs to the IgE isotype and these individuals may be referred to as suffering from an IgE-mediated allergy. Not all IgE associated ‘allergic’ reactions occur in ‘atopic’ subjects.
- **Atopy**: Atopy is a personal and/or familial tendency, usually in childhood or adolescence, to become sensitized and produce IgE antibodies in response to ordinary exposure to allergens, usually proteins. As a consequence, such individuals can develop typical symptoms of asthma, rhinoconjunctivitis, or eczema. The terms ‘atopy’ and ‘atopic’ should be reserved to describe the genetic predisposition to become IgE-sensitized to allergens commonly occurring in the environment and to which everyone is exposed but to which the majority do not produce a prolonged IgE antibody response. Thus, atopy is a clinical definition of an IgE antibody high-responder. The term atopy can not be used until an IgE sensitization has been documented by IgE antibodies in serum or by a positive skin prick test.

- **Food Allergy**
  - o **IgE mediated**:
    - ✥ Dose independant
    - ✥ Acute onset (ex : urticaria [1, 2])
    - ✥ Prick tests, IDT (only used in experimental models)
    - ✥ Sp. IgE
  - o **Non-IgE mediated**:
    - ✥ Dose dependant
    - ✥ Late phase response (ex : CAD)
    - ✥ Patch testing

Frequency (Dog)

Frequent improvement by new diet, but only 6 – 18 % AFR in CAD [3]

There is no data of the frequence of dogs with CAD full cured by elimination diet alone.

Clinical signs

Food hypersensitivity is an etiological entity, not a clinical entity like canine atopic dermatitis. There is no typical clinical signs of food hypersensitivity but a lot of non specific clinical signs:

- **Dog**
  - o CAD (minor or classical)
  - o Localized pruritus
  - o Recurrent skin infection
- Urticaria
- Anal furunculosis
- Cat
  - Miliary dermatitis
  - Head and neck pruritus
  - Self induced alopecia
  - Eosinophilic plaques or granuloma
  - Urticaria

Perioral involvement or facial pruritus is not more frequent in the cat or dog in case of food hypersensitivity

Allergens

Food allergen sources
Compared to human medicine (i.e.; peanut) there is no risky food for the dog and cat.
In the dog: beef, dairy products, chicken, and wheat
In the cat: beef, fish and chicken.

Allergenic components
Using patch testing which is the most appropriate allergy testing for chronic allergy, 90% of dogs with positive test to crude meat have same reactions with cooked proteins [4].
Using an IgE based technique it seems that cooking reduce the number of epitopes recognized by allergic dogs [5].

Allergenic components and major allergens in the dog are almost unknown in the dog (no data for cats):

- Meat (beef, lamb): Immunoglobulins, albumin, phosphoglucomutases
- Soy: 33-35 kD: 7S globulin fraction, 30 kD: 7S, Gly m Bd 30K, 28 kD, very low MW bands
- Poultry: albumin
- Hen egg: ovomucoid, ovalbumin (ovotransferrin) [6]

Cross reactivity
There is some evidence of cross reactivity between mammalians meat due to phosphoglucomutases or albumin or immunglobulin heavy chains.
Cross reactivity between poultry meats and between fishes is suspected

Hidden allergens
- Contamination of selected protein diets with other sources of proteins. Any clinical effect?
- Contamination of hydrolyzed diets with starch (however GBSS sp. IgE have no clinical impact)

Elimination diet

Hypoallergenic (hydrolyzed) diet
The most hydrolyzed diet is the best choice as it has been demonstrated in experimental models[7].

New proteins source
Prefer home made and chose new protein sources.
Industrial food with selected protein can help but is not the most efficient tool for elimination diet.
Home made diet is not a gold standard.

Duration
The optimal duration of an elimination diet with 90% sensitivity is 8 weeks in the dog and cat (it is not shorter in the cat) [8].

Interpretation
- Improvement alone is not diagnostic
Allergy testing
Despite numerous development of techniques to identify offending allergens in AFR, the best diagnostic procedure to identify AFRs in small animals still remains an elimination diet with subsequent provocation trials [9].

IgE, IDT
No diagnostic value (any techniques, any reagents, any allergens!)
Western blot with crude extracts of hypoallergenic industrial diets could help choose the best food for elimination diet but it does not help diagnose food allergy [10].

Patch test
Highly sensitive and specific for most meats (70 % to 100%) in one study [4]. Almost impossible in practice.

Treatment
There is very few data on allergen specific immunotherapy to food allergens in the dog. Preliminary results of sublingual ASIT are encouraging[11, 12]. However these small studies are not true efficacy studies.

12. Maina E, Cox E: A double blind, randomized, placebo controlled trial of the efficacy, quality