

# Is a Leaky Gut Syndrome a Cause of Food Allergy?

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## Mini Review

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### ABSTRACT

The work of the leaky gut syndrome was described. The relationship between this syndrome and the occurrence of allergies in susceptible individuals is presented. The causes of the intestinal barrier disorder have been described.

## INTRODUCTION

Food allergies are one of the more common diseases in dogs. Allergens contained in eaten food, in sensitive individuals cause clinical symptoms of allergy in the form of itching and in extreme cases may result in anaphylactic shock in the extreme.

This is a real problem affecting the accompanying animals. Especially that the occurrence of the phenomenon of sensitization (co-sensitization) and consequently cross-reactions to allergens has been described. Individuals with food allergies must receive food allergen-free and allergic to allergies. Hypoallergenic food for dogs with food allergy may be prepared or prepared at home. It is important to keep the dog under constant control of the veterinarian.

The digestive tract begins with the oral cavity, which feeds are collected, digested in the distal digestive tract and nutrients are absorbed into the blood and distributed throughout the body. On the surface of the intestinal villi, there are intestinal epithelial cells (enterocytes). These cells are located on the basal membrane. There is no absorption of digested nutrients into the bloodstream. This barrier is tight, foreign bacteria or antigens do not penetrate through it. Preservation of integrity between intestinal epithelial cells allows for proper balance between absorption mechanisms as well as immune mechanisms and GAL etc., Intestinal imbalance through foreign microorganisms, chemicals, etc., contributes to increased permeability of this barrier to foreign substances. Get them into the bloodstream and trigger the body's immune response against them. They are treated as foreign antigens.

### Leak Gut Syndrome

It is described as a disease consisting in the intestinal epithelial cells entering the body of foreign substances. This pathological condition leads to many different intestinal disorders. This leads to infiltration of inflammatory cells, and as a result of prolonged occurrence of these disorders, there is a pathological reaction in inflammatory infiltration cells and negative influence on neighboring tissues. Bowel dysfunction disorders are associated with such human diseases as celiac disease, IBD (Inflammatory Bowel Diseases), food allergy, Clinical manifestations of food allergy, except pruritus, skin lesions manifest as abdominal pain, vomiting diarrhea (these symptoms have been described in humans, the dog will look similar).

It has been found that there are so-called intestinal epithelial cells. "Tight connections," condition the integrity of the intestinal barrier on the one hand and protect the body against the entry of various factors from the intestinal lumen. Antigens from food intake are absorbed into the body using M cells, via endocytosis, are cleaved by various proteases in endosomes, and with MHC II proteins are presented to immune cells <sup>[1]</sup>.

Some allergens have been shown to be able to pass through the intestinal epithelium without the involvement of M cells. These allergens include milk allergens, Brazil nut allergies, and egg allergens. They cross between strict connections. Allergen can also affect allergen transport. Exact connections are located in the apical portions of membranes of neighboring enterocytes. They are made of proteins, among others (Okludynines, kladines and others).

The solubility of the protein and its aggregation affect the mode of transport through the mucous membrane, and this also applies to the allergen. Insoluble antigens/allergens are reserved for M cell uptake. Allergens soluble are critical for the development of food allergies. Allergens originating, for example, from heat treated peanuts are less soluble than those derived from raw peanuts. Heat treatment lowers allergen city. Insoluble allergens have no ability to pass through the intestinal mucosa but only through M. cells.

There are two processes of allergen transport. In one case, the allergen may cross the mucous membrane of the intestinal mucosa, and in the latter, it may impair the proper functioning of the junction, because of its lytic properties, thus making Der p1 (protease) leading to increased permeability (allergen Der p 1 is derived from Home Dust Mite *Dermatophagoides pteryginus*)<sup>[2]</sup>.

Correctly functioning close links maintain a balance between immune tolerance and antigenic responses<sup>[3]</sup>. Conjunctival protein (HP) is made up of two covalent bonding chains<sup>[4]</sup>. There are three phenotypes of Hp, Hp1 and Hp2.

The Hp2 phenotype is associated with a higher risk of immunological diseases, including foodborne gastrointestinal<sup>[4]</sup> exact strains provide an effective barrier against the ingestion of foreign antigens or bacteria from the gastrointestinal tract<sup>[5]</sup>. In intestinal inflammation, this barrier is disturbed, the penetration of foreign matter, foreign antigens is facilitated. Foreign antigens are absorbed by T lymphocytes and presented to APC cells leading to increased secretion of proinflammatory cytokines leading to the development of inflammation. It has been found that cytokines such as TNF alpha, IL-1 beta, IL-12 produced by stimulated T-lymphocytes can lead to damage to the junction and increase the permeability to foreign antigens. IL-10 and TGF beta protection functions are closely linked<sup>[5]</sup>.

B-lymphocyte-synthesized IL-4, which exacerbates inflammatory processes (cytokine level predominates in people with atopic dermatitis and Th2 lymphocytes), has the ability to increase epithelial permeability<sup>[6]</sup>. Mast cells, as a result of their activation, induce the secretion of ions from the epithelial cell and thereby increase the permeability of the various substances in the cellular regions<sup>[7]</sup>. Non-steroidal anti-inflammatory chemicals (alcohol) can damage the intestinal barrier and thereby increase its permeability<sup>[6]</sup>.

An affected stress agent can also lead to increased intestinal barrier permeability. Stress-induced mast cells release mediators of inflammation, affecting T lymphocyte stimulation for pro inflammatory cytokine synthesis and development in the gut of inflammation contributing to increased permeability<sup>[7]</sup>. Increased stress response is seen in people with atopic dermatitis, elevated levels of depression, Various types, also, various types of infections, genetic factors affect cell permeability for foreign antigens<sup>[6,8]</sup>.

It is known that the bacterial flora that is present in the digestive tract plays a role in regulating the immune function associated with the gastrointestinal mucosa is responsible for digestion, vitamin synthesis, etc.<sup>[7]</sup>. Between the intestinal flora and the system Intestinal immunity is tolerated, with no immune response to the antigens present in the bacteria. When studying the processes of immunological tolerance, on the mouse model, it was found that in the so-called. "Germ free" animals, no immune response to food antigens is observed. Th1 lymphocytes mediate in this process in response to the production of IgG2, IFN gamma, and the effect is abolished during Th2, IL-4, IgG1, IgE synthesis. Tolerance has been restored by administering mice to *Escherichia coli*, *Bifid bacterium infantis*. In another study, increases in IgE, IgG1 and IgG2a levels were observed during administration of mice to the intestinal flora destroying the intestinal flora and development of inflammatory responses<sup>[7]</sup>. Disorders in the pathogenesis of food allergy are complex and require further investigation. Introduction to the so-called food. Probiotics will restore the correct composition of the bacterial flora as well as create a favorable environment for other bacteria (prebiotics)<sup>[9,10]</sup>.

Dogs should not get the same food that their owner eats. And this fact is often overlooked by him (the owner) which results in the development of many different symptoms of allergies. In case of food allergy, the most important factor in effective treatment is avoiding potential contact with the allergen.

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