FOODTEST.HU

PROFESSIONAL MATERIAL

Food intolerance – professional summary

Background on the mechanisms and symptoms of food intolerance and the significance of IgG-based diagnostics.

What is food intolerance?

Food intolerance is essentially an abnormal reaction to certain foods, which can manifest in many ways. It can result from many different mechanisms; the FOODTEST.hu Food Intolerance Centre, however, deals with food intolerances that develop **as a consequence of an immune response** (e.g. IgG antibodies are produced), and uses tests that detect the presence of such antibodies in a blood sample.

There are also many other mechanisms in which the immune system plays no part. Typical examples:

NON-IMMUNOLOGICAL

Enzyme insufficiency / deficiency

The role of lactase deficiency in lactose intolerance – associated with bloating, diarrhoea and abdominal pain.

NON-IMMUNOLOGICAL

Chemical / drug sensitivity

- **MSG** (monosodium glutamate) in Chinese food – headache, sweating, dizziness
- **Sulphites** in dried fruit, vegetables, wine and beer – asthmatic symptoms
- **Vasoactive amines**, e.g. phenylethylamine in chocolate and red wine – migraine

In brief

IgG-based food intolerance testing shows which foods the body produces increased amounts of antibodies against – that is, which foods may lie behind slowly developing complaints that are difficult to pin down.

Food allergy or food intolerance?

Many people think that food allergy and food intolerance are the same, but in fact there are many differences between them.

ASPECT	FOOD ALLERGY	FOOD INTOLERANCE
Onset of reaction	Usually an immediate reaction after eating the food	Causes symptoms later, even days after eating the food
Antibody	IgE antibody-mediated process	IgG antibodies are produced
Prevalence	Low prevalence	High prevalence
Cause	Mostly the result of infrequent exposure	The result of frequent consumption
Mechanism	Rapid release of histamine from mast cells	Slow formation of antigen–antibody complexes; the complexes deposit in tissues and cause inflammation
Symptoms	Classic symptoms: skin redness, sneezing, hay fever, breathing difficulties, asthma, even anaphylactic shock	Can affect any part of the body; patients usually report several symptoms
Danger	Can be fatal	Not associated with life-threatening conditions
Course	Can be lifelong	Reversible by eliminating the foods that trigger high IgG production
Skin prick test	Positive	Negative
Recognition	Often diagnosed by the patients themselves, as the trigger food is obvious	Difficult to tell from the symptoms what is causing them

This is why the IgG test matters

Because the symptoms of food intolerance are delayed and appear in many different forms, it is almost impossible to identify the trigger food from the complaints alone – food-specific IgG antibodies detected in the blood, however, provide a targeted starting point.

The mechanism of food allergy

In classic food allergy, inflammatory mediators are released from mast cells after IgE antibodies have bound to them. The sequence of events:

1. The food antigen stimulates a class of lymphocytes, the **Th2 helper T cells**.
2. The Th2 cells secrete cytokines that instruct B lymphocytes to produce antigen-specific **IgE**.
3. The IgE antibodies bind to mast cells. When the body encounters the allergen again, it binds to the IgE on the surface of the mast cells, and inflammatory mediators – including **histamine** – are released from the mast cell.
4. The inflammation is responsible for the classic allergic symptoms: sneezing, watery eyes, itching, skin redness, breathing difficulties, etc.

The mechanism of food intolerance

In food intolerance, **antigen–antibody complexes** form, which deposit in the tissues and there trigger tissue damage and the release of inflammatory chemokines. This can happen in any part of the body: the gut (IBS symptoms), the joints (joint inflammation), the brain (migraine symptoms), etc. The sequence of events:

1. Partially digested food passes between the gut cells into the bloodstream.
2. The body identifies these proteins as ‘foreign’ and starts producing food-specific IgG.
3. The IgG forms antigen–antibody complexes with the partially digested food. The complexes form gradually, which is why the symptoms appear later.
4. The complexes deposit in the tissues – anywhere in the body: the gut, the head, the skin, etc.
5. The complement system is activated: protein-degrading enzymes, mast cell mediators and vasoactive peptides are released from neutrophil white blood cells, and platelet aggregation follows.
6. The complement system and macrophages stimulate inflammation, although the complement system protects against smaller complexes turning into larger ones.
7. C2 and C5 (part of the complement enzyme cascade) can also release histamine.
8. Inflammatory mediators are released from macrophages: interleukin-1, tumour necrosis factor, reactive oxygen species and nitric oxide.

Note: the complement system is an enzyme cascade that helps protect the body against infections.

Symptoms of food intolerance

Many symptoms can be associated with food intolerance. Because the symptoms develop later, it is difficult to determine which food is causing the problem – which is why an IgG antibody test is particularly valuable. Symptoms may include:

- Arthritis, fibromyalgia, joint pain
- Asthma
- Anxiety, depression
- Autoimmune diseases
- Attention deficit, hyperactivity (ADHD: attention deficit hyperactivity disorder)
- Bedwetting and chronic bladder infections
- Bowel problems (colitis, IBD, IBS, constipation, diarrhoea, bloating, abdominal pain, flatulence)
- Chronic respiratory symptoms (breathlessness, bronchitis)
- Dark circles or puffiness around the eyes
- Exhaustion
- Headache or migraine
- Insomnia, lethargy, 'brain fog'
- Myalgic encephalomyelitis / chronic fatigue syndrome
- Palpitations
- Persistent cough, catarrh
- Sinusitis
- Skin conditions (eczema, skin redness, spots)
- Fluid retention
- Problems with excess weight

Foods commonly associated

cow's milk | egg | nuts and oilseeds | wheat | gluten | soya | yeast

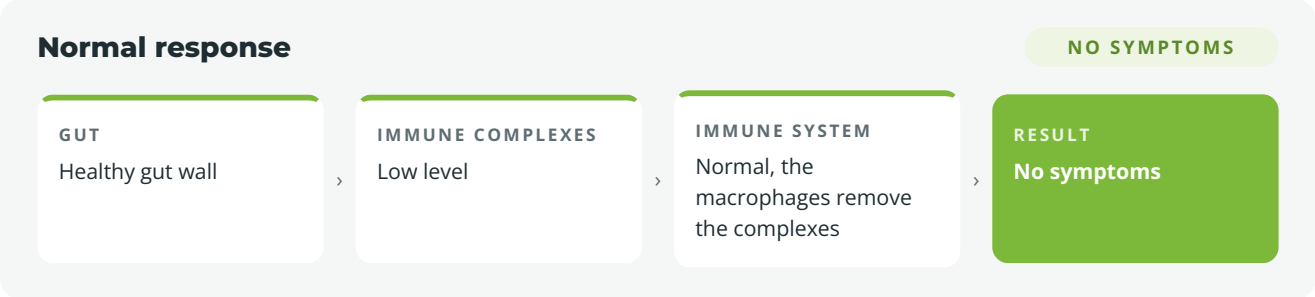
The link between IgG antibodies and symptoms

IgG antibodies are always produced as part of a healthy immune response, but they do not cause symptoms if **a)** the immune system works effectively and/or **b)** intestinal permeability has not increased. Symptoms can be expected if the immune system is not working perfectly and/or intestinal permeability has increased. On the following pages we compare these two situations with the normal response.

1. The normal response to food

In any healthy individual, a small amount of undigested food passes between the gut cells, enters the bloodstream and provokes an immune response:

- The gastrointestinal tract and the immune system are healthy.
- Foods are digested into their basic units (glucose, amino acids, fatty acids), absorbed and passed into the bloodstream.
- A small amount of partially digested food also passes between the gut cells directly into the bloodstream.
- IgG antibodies are produced against it, and antigen–antibody complexes form.
- A well-functioning immune system (i.e. the macrophages) removes these complexes.
- No complexes remain to deposit in the tissues.
- So neither tissue damage nor inflammation develops.
- No symptoms are therefore observed – even though an immune reaction has taken place.



Consequently, antibodies against foods are also produced as part of the normal response, but this causes no problem because the immune system works effectively.

2. The response when the immune system is impaired

The sequence of events is similar, but the macrophages do not function well enough to remove the immune complexes:

- The gastrointestinal tract is healthy, but **the immune system is affected**.
- Foods are digested into their basic units (glucose, amino acids, fatty acids), absorbed and passed into the bloodstream.
- A small amount of partially digested food also passes between the gut cells directly into the bloodstream.
- IgG antibodies are produced against it, and antigen–antibody complexes form.
- The macrophages do not function well enough to remove all the immune complexes.
- As a result, many immune complexes enter the bloodstream and then deposit in the tissues (anywhere in the body).
- Inflammation and tissue damage follow – and these cause symptoms to appear.

Impaired immune system

SYMPTOMS

GUT	IMMUNE COMPLEXES	IMMUNE SYSTEM	RESULT
Healthy gut wall	Low level	Impaired, the excess deposits in the tissues	**Symptoms**

3. The response when gut wall permeability is increased

The immune system works perfectly, but the gut wall is more permeable: more undigested food enters the bloodstream and the immune system becomes overloaded:

- Normal, healthy immune system, but **increased gut wall permeability**.
- More partially digested food passes between the gut cells and into the bloodstream.
- Antibodies are produced against the partially digested foods, forming antigen–antibody complexes.
- These flood the immune system, which becomes overloaded.
- The macrophages are unable to remove all the immune complexes.
- The large amount of immune complexes entering the circulation deposits in the tissues (anywhere in the body).
- Inflammation and tissue damage follow – and so symptoms develop.

Leaky gut

SYMPTOMS

GUT	IMMUNE COMPLEXES	IMMUNE SYSTEM	RESULT
Permeable gut wall	High level	Normal, but overloaded	**Symptoms**

Factors that aggravate leaky gut

The following factors can all harm the patient's health and lead to increased intestinal permeability:

- Low secretory IgA

  Secretory IgA is an immune marker and provides first-line defence in the gut against bacteria, food residues, fungi, parasites and viruses.

- Stress

  It can deplete secretory IgA, weakening the body's defences, and it reduces the number of 'good' bacteria, making room for 'bad' bacteria and fungi (e.g. Candida).

- Imbalanced gut flora
- Damage to the mucosa from infections or certain medicines

  Non-steroidal anti-inflammatory drugs (NSAIDs), e.g. aspirin, damage the gut wall and cause inflammation with increased permeability.

- Parasites

  By causing inflammation of the gut wall, they also lead to increased permeability.

- A diet that is not varied enough

  E.g. eating too much gluten.

- Reduced stomach acid production
- Reduced secretion of pancreatic enzymes

  Damaged intestinal villi absorb less of the nutrients needed to make digestive enzymes; incompletely digested food enters the bloodstream and provokes an antibody response.

- Poor nutritional status

  Reduced nutrient absorption impairs the gut's ability to regenerate, leading to further problems with digestion and absorption.

How does FOODTEST 200+ help?

From a single small blood sample, it measures the amount of IgG antibodies against 226 foods and food ingredients, with a numerical result. The result is the starting point for an elimination diet put together by a dietitian or other professional.

Source: Cambridge Nutritional Sciences Ltd., March 2016

Our laboratory partners

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