

## GLUTEN

Contrary to popular belief, gluten is not a protein found in wheat and some other grains.

The word **gluten** comes from the Latin *glutinum* which means *bond* or *glue*. This term refers to "a network structure that forms during the hydration and kneading of wheat flour".

**Gluten is therefore a complex obtained during the manufacture of a hydrated dough.**

It is mainly composed of two types of proteins:

- prolamins (including gliadins) and
- glutelins (glutenins for wheat in particular).

They are water-insoluble. These two families are also found in other cereals. Glutenins provide elasticity, cohesion and resistance to deformation to the dough. The gliadins in wheat give the dough its properties of extensibility and fluidity.

The most toxic forms of gliadins are  $\alpha$ -gliadins,  $\beta$ -gliadins and  $\gamma$ -gliadins. They are rich in sulfur.

Their toxicity seems to stem from the difficulty our digestive enzymes have in transforming them. As a result, these proteins arrive intact in the intestine. Once on the intestinal epithelium, they bind to a membrane receptor which will trigger a chain reaction leading to the production of **Zonulin**, the role of which is to increase intestinal permeability by opening tight junctions. This phenomenon causes an immune response leading to chronic inflammation.

Brazilian researchers have studied the impact of a gluten-free and gluten-free diet on mice. A group receives a diet rich in fat and sugar but WITHOUT gluten. The other group receives the same type of food but WITH gluten. After 8 weeks of testing, the mice in the 2 groups that ate comparable amounts of food did not look quite the same:

Those who followed the WITH gluten diet were almost double the weight of the others. They were also in a latent inflammatory state, probably due to an increase in intestinal permeability.<sup>1</sup>

### Eating gluten-free: fad or reality?

Much information has crescendoed to the general public until 2014 claiming that a gluten-free diet was the panacea for maintaining health.

This fact was not new, however, since Dr Seignalet already spoke about it in his first book published in 1996 "Food or third medicine", a compilation of his research started in 1985.

During his numerous studies and experiments, Dr Seignalet underlines that cereals have undergone numerous modifications since they began to be cultivated (7 to 10 thousand years). These modifications are essentially due to a series of hybridizations leading to genetic modifications.

His clinical observations show the harmful effects of cereals and more particularly of wheat on different systems (digestive, nervous, osteo-articular, mental ...). Studies have shown that a diet rich in gluten promotes a chronic inflammatory state of the intestine.

As is often the case, it is mainly celebrities who have helped to publicize the subject.

The agri-food industry, always on the lookout for new markets in order to derive maximum profit, is seizing the opportunity to develop a market for "gluten-free" foods, thus helping to reinforce this fad.

Without real information provided to the general public, unexpected problems then arose, weight gain for example, or type II diabetes, or even the appearance of a metabolic syndrome. Another problem is the foods offered where gluten is absent, of course, but whose levels of sugars, fats and additives are absolutely appalling. It is necessary to examine the labels of these products.

According to Julien Vernesson<sup>2</sup>: "the sick have replaced wheat pasta with gluten-free pasta, cookies with gluten-free cookies, bread with gluten-free bread. These "gluten-free" foods are sold in

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<sup>1</sup> <https://www.julienvenesson.fr/une-alimentation-sans-gluten-diminue-linflammation-et-fait-maigrir/>

<sup>2</sup> Julien Vernesson : <https://www.julienvenesson.fr/manger-sans-gluten-fait-grossir-et-rend-diabetique/> Auteur du livre « Gluten - Comment le blé moderne nous intoxique » 20 juin 2013 Editions Souccar

specific departments and cost more than their traditional counterparts, but above all, their manufacturing method uses many poor quality additives, starches and refined flours. "

### **Allergy, intolerance or sensitivity?**

✚ **Allergy** is rare and affects only 0.2% of the French population (certainly more).

The allergic phenomenon is clear: the immune reaction is rapid and sometimes violent. It involves antibodies of the immunoglobulin E (or IgE) type. Signs of allergy appear a few minutes to 2 hours after eating the food. The symptoms vary in intensity depending on the individual:

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- Skin with itching, redness, swelling
- Respiratory such as difficulty in breathing, feeling of suffocation, angioedema
- Cardiovascular such as pallor or fainting
- Digestive with abdominal cramps, vomiting.

A wheat or gluten allergy usually appears in young children. It is a serious, potentially fatal disease (in France, 50 to 80 people die each year from a food allergy). Its only treatment is to completely avoid foods that contain the offending protein.

### ✚ **Celiac disease or intolerance**

(similar to but a little different from Crohn's disease) would affect 5% of the population, but this figure is most likely underestimated because the disease is poorly diagnosed.

Often classified as autoimmune diseases (this is partially false because it is not an attack against the self but against an external element - the peptides of gliadins), this intolerance causes the production of immunoglobulin A ( IgA). The immune system then produces cytotoxic T lymphocytes which destroy the villi in the intestinal wall, which is why it is classified as autoimmune diseases.

Blood tests can confirm the diagnosis:

- Anti-tissue transglutaminase immunoglobulins A (IgA tTG): these antibodies are almost always present and are produced when the immune system meets the gluten modified by transglutaminase 2. They are very specific for celiac disease and necessary for initiation of destruction of intestinal villi.
- Anti-endomysium immunoglobulins A (IgA EMA): endomysium is connective tissue found in muscles, where transglutaminase is found. It is therefore a target for antibodies in celiac disease.
- Anti-gliadin immunoglobulins A (IgA AGA): these antibodies are not specific for celiac disease, but signal an immune reaction of the body against gliadin, the prolamine of wheat. They are important in many associated diseases.
- Serum immunoglobulins A (total IgA): one of the roles of IgA is to protect the mucous membranes from infections. However, people who have a genetic predisposition to celiac disease (HLA-DQ2) frequently have an IgA deficiency. When this is the case, the dosages of IgA tTG, IgA EMA and IgA AGA are distorted and it will then be necessary to measure the immunoglobulins G (IgG tTg, IgG EMA and IgG AGA) which are higher in people. IgA deficient.

### ✚ **Sensitivity or hypersensitivity**

it doesn't really trigger an immune system response in the same way as allergies or celiac disease. It would concern 55% of the French population according to Dr Roger Mussi. The reactions are of the inflammatory type. People who have it show digestive (or other) symptoms as soon as they have ingested cereals, which may suggest an intolerance or more. In common parlance a lot of people use the phrase "I am allergic to gluten"!

“There are several avenues of research and it is not known whether gluten is really involved. Two avenues are now favored: wheat fructans or trypsin amylase inhibitors produced by plants to protect themselves.”<sup>3</sup>

We are not all equal when it comes to gluten sensitivity. Some people can take a certain dose before having a reaction, and for others, the reactions are immediate.

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<sup>3</sup> <https://www.maviesansgluten.bio/difference-entre-allergie-maladie-coeliaque-hypersensibilite/>