

Gluten Facts



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What is gluten?

Gluten is a protein which is found in wheat and all *Triticum* species of plants which includes spelt, kamut or durum wheat, rye, and barley, and also any of the cross-bred varieties from these species. It is known as a 'storage' protein and its natural function is to provide the plant seedling with amino acids and nitrogen during germination. Extensive research has shown that it is the gliadin part of the protein which is toxic to anyone intolerant to gluten.

In recent years there has been a great deal of uncertainty around the question of whether oats are a safe food for people with gluten intolerance, be that coeliac disease or any other condition. There seem to be two key reasons for the confusion. First, that oat crops, like any other crop, can be contaminated with other prohibited cereal crops and this can occur anywhere along the food chain, from the field, during transportation, during milling, processing and even storage. This contamination (even at low levels) has meant that when batches are tested for gluten (gliadin) content they give a positive reading. Second, there are different types of test used to identify gluten, and some can give a false-positive reading even in uncontaminated samples of food. Knowing both of these facts has allowed producers and food manufacturers to bring 'safe' oat products onto the market and to increase the choice of foods available to those with gluten intolerance.

What is coeliac disease?

When someone with Coeliac disease eats food which contains gluten it triggers a reaction from their immune system. The response occurs within the small intestine and results in a localised attack on the villi – the parts of the small intestine which are responsible for absorbing nutrients from our food. When these cells are attacked they are destroyed and this leads to one of the key dangers of this disease, the inability to absorb sufficient nutrients from the daily intake of food.

What causes it?

Coeliac disease occurs in people who are genetically disposed to it and it is globally one of the most common lifelong health disorders. Its true prevalence is difficult to quantify as it is often clinically atypical or silent and diagnosis comes through very sensitive screening methods which are not always available in every country/region. For many years it was perceived that the disease was far more common in Europe than anywhere else in the world, however, recent studies have shown that its prevalence in the US, Australia, New Zealand and Argentina is at a similar level. Furthermore, it is increasingly being diagnosed in developing countries such as in North Africa and India.

Studies have also shown that people who already have another auto-immune disease such as type 1 diabetes and thyroiditis have an increased chance of having Coeliac disease. The

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diagnosis of Coeliac disease usually comes second, however, what is particularly interesting is that in such individuals a move to a gluten-free diet can have a significant effect on improving symptoms of the other condition as well. There are other genetic diseases, especially, Down's, Turner's and William's syndromes, which also show a higher prevalence of Coeliac disease and patients find that the associated digestive problems are significantly improved through adopting a gluten-free diet.

It has been suggested that in developed countries for every person diagnosed with Coeliac disease there are 5-10 who remain undiagnosed.

Symptoms

One of the biggest factors in the disease being under-diagnosed is that there are not always symptoms associated with it. That said, there are certain symptoms which are common when present.

Celiac disease with classic symptoms:

- Abdominal distension (bloating)
- Anorexia, irritability
- Chronic or recurrent diarrhoea
- Failure to thrive or weight loss
- Vomiting
- Muscle wasting
- Celiac crisis (rare)
- Fatigue (lethargy and tiredness)

Celiac disease with non-classic symptoms:

- Arthritis
- Aphthous stomatitis
- Constipation
- Dental enamel defects
- Dermatitis herpetiformis
- Hepatitis
- Iron-deficient anaemia
- Pubertal delay
- Recurrent abdominal pain
- Short stature

Associated diseases (or possibly secondary to untreated celiac disease)

Autoimmune diseases:

- Type I diabetes
- Thyroiditis

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- Sjogren's syndrome
- Others

Neurological and psychological disturbances:

- Ataxia
- Autism
- Depression
- Epilepsy with intracranial calcifications
- IgA nephropathy
- Infertility
- Osteopenia/osteoporosis
- Cancer

Genetic associated diseases

- Down's syndrome
- Turner's syndrome
- William's syndrome
- IgA deficiency

Gluten-free diet

The key treatment for Coeliac disease is a lifelong gluten-free diet. There is a huge range of naturally gluten-free foods available to coeliacs such as vegetables, salads, pulses, buckwheat, fruits, nuts, meat, fish, poultry, cheese, egg, and milk – all of which can be consumed as part of a normal balanced diet. In addition there is also a vast range of specially prepared gluten-free foods which are designed to imitate wheat-based products and so provide safe alternatives to such things as bread, cakes, biscuits, sauces and so on. For those who are careful to avoid gluten the biggest reward is that within 12-24 months the lining of the small intestine recovers and returns to normal, and the antibodies which the body produces (and which attack the gut lining) drop away. This means that the body not only recovers but can thrive just like anyone else on a good well-balanced diet.

The Codex Alimentarius, which is often referred to when talking about gluten-free foods, is the commission set up by the WHO/FAO to set food standards around the world. Until recently they had set the threshold for gluten content at 200ppm as being a 'safe' level for anyone with Coeliac disease. This meant that for food to be described as 'gluten-free' or suitable for Coeliacs it had to be tested and shown that there were less than 20mg per 100g of food. Now the threshold has been reduced to 20ppm and any foods which carry the label of 'gluten-free' must be proved to comply with this very rigorous standard. (For more information on how the standard is set please [click here](#)).

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Not surprisingly there have been a number of studies into whether it is possible to influence the onset of Coeliac disease in infancy. In those babies who are born and who are genetically disposed to develop the disease breastfeeding is thought to delay or reduce the risk of developing Coeliac disease. In Sweden, for example, they now advise mothers to introduce some gluten into the baby's diet by way of complementary food prior to giving up with breastfeeds. This advice also holds true for any mother who intends to stop breastfeeding before the baby is 6 months old. Since switching to this regime the evidence shows that the risk of Coeliac disease has indeed been reduced.

Wheat allergy

This is a different condition from Coeliac disease, and is not a lifelong condition. It is usually treated in the same way, that is, through a gluten-free diet.

Lactose intolerance in Coeliac disease

People who are diagnosed with Coeliac disease have also been reported to be lactose-intolerant owing to the fact that the lactase enzyme (which breaks down lactose ready for use in the body) is not produced by the villi - the cells which become damaged and destroyed by ingesting gluten.

Nutritional balance in the gluten-free diet

Due to the fact that gluten-free products generally are not enriched or fortified in the same way that regular cereal products are (think of breakfast cereals and supermarket breads) and are frequently made from refined flour or starch, they may not contain the same levels of nutrients as the gluten-containing counterparts they are intended to replace. It can be very difficult to know whether patients with Coeliac disease living on a gluten-free diet are enjoying a nutritionally balanced diet. What we do know, however, is that certain gluten-free grains are not only comparable to wheat, barley, rye and so on, but can, in fact, have a better nutritional content. Good examples are buckwheat flour, millet flour and Teff flour (brown and white). Buckwheat flour is rich in thiamine, riboflavin, and niacin, and millet flour also has high riboflavin and niacin concentrations (all higher than in wheat or rye).

Teff flour is even more of a gluten-free hero and gives a lot of bang for its buck. It is considered a complete protein because it contains all 8 essential amino acids. Its high calcium content is a great plus for coeliacs, and phosphorus, iron, copper, magnesium, potassium, zinc and thiamin are also present in high levels. One particular amino acid, lysine, is present in significant quantity (far higher than in wheat or barley and slightly less than rice or oats) and human studies have shown that a reduced lysine intake can lead to anxiety. According to

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animal studies, lysine deficiency also causes immunodeficiency, something which coeliacs may be particularly mindful of given the profile of the disease. The iron content of Teff is four times greater than that of wheat flour -another great boon for Coeliac sufferers – and is an excellent source of fibre. If you have diabetes, then Teff can be especially useful as it can assist with controlling blood sugar levels.

Having Coeliac disease means you become much more aware of your own diet and how your body functions. You become very aware of what makes you feel good and energised and what doesn't. Our purpose at Innovative is to be as knowledgeable as possible about what is good for coeliacs (and why) and to offer you the best possible alternatives for a healthy diet.

References

This information comes from our own research and also with reference to 'Gluten Free Cereal Products and Beverages' edited by Elke K Arendt and Fabio Dal Bello, University College Cork and published by Academic Press. For more information on the publication visit

www.elsevierdirect.com