

Tiny gluten traces trigger coeliac response, challenging global food labelling laws

A discovery by Australian researchers could rewrite global food labelling standards.

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Australian researchers have made a groundbreaking discovery that people with coeliac disease experience an immune response to tiny amounts of gluten even when symptoms do not appear and at levels far below the threshold some countries use to determine if a food is “gluten-free”.

The discovery has prompted calls for a rewriting of global food labelling laws. Researchers hope their work helps to raise awareness about the dangers of cross-contamination and provides patients with greater safety.

“This is the first time we’ve been able to demonstrate, with certainty, that even very small gluten exposures can activate the immune system in people with coeliac disease,” said report lead author James Daveson, director of the Coeliac Disease and Immune Health Research Program at the Wesley Research Institute.

His team conducted a randomised, double-blind, placebo-controlled trial by giving patients various doses of gluten or a placebo. They then used an advanced biomarker known as interleukin-2 (IL-2) – a cytokine – to identify immune responses.

“So we said, let’s start at 1000 milligrams and go all the way down to 1mg and work out when they stop producing this inflammatory cytokine,” Dr Daveson said. “And we found that people at 3mg did release it, but people at 2mg didn’t.”

For context, a single slice of bread contains between 2000mg and 4000mg of gluten. In Australia and New Zealand, gluten must be “undetectable” in food for it to be labelled as “gluten-free”, usually around 0.75mg.



Dr James Daveson from the Wesley Research Institute hopes his team's findings help to improve safety for patients. Picture: Lyndon Mechielsen

However, not everywhere is as strict. In the US and Europe, for example, packaged foods can be labelled “gluten-free” so long as they have a concentration lower than 20 parts per million of gluten, which equates to roughly 5mg of gluten in a product of 250 grams.

That's why these findings raise such serious questions about the strength of global food labelling laws and why, according to researchers at the Wesley, the findings are already being reviewed by global food standard bodies.

Coeliac is [an auto-immune disease](#) that can cause short-term harms including fatigue, painful bloating, discomfort, vomiting and diarrhoea. But it can cause serious long-term harm too, including damaging the small intestine and causing bones to thin, and can lead to infertility. People with coeliac disease also have a greater risk of developing coronary artery disease and bowel cancers.



For people who have it, [coeliac disease is triggered when they ingest gluten](#) – proteins found in wheat, barley, rye and triticale. It is also often found unexpectedly in foods such as some sauces, spices, beer, whiskey and even some deli meats. Cross-contamination poses a significant risk even from appliances such as toasters, cutting boards and fryers.

There is no treatment for the disease. Patients instead need to avoid gluten, which can be both challenging and expensive.



There are calls for a rethink of global food labelling laws around what is and is not 'gluten-free'. Picture: iStock

Occupational therapist Kira Perry did not even know she had the disease after she developed it as an adult. She was diagnosed following the birth of her third child after experiencing low iron and thyroid issues.

“My endocrinologist asked why I hadn’t been following my gluten-free diet because my coeliac markers were elevated,” she said.

“I asked her what she meant and she realised that was me finding out I had it, and she apologised and said, ‘oh, I could have done that better!’.

“They think it may have been caused by a reaction to the stress of three pregnancies, one soon after the other. So auto-immune diseases are often triggered by significant stresses on the body. Sometimes that’s something healthy like pregnancy, or sometimes it can be a significant virus.”

Knowing the harm gluten can cause her body, she now avoids it completely. Testing shows all of her children have a genetic predisposition to the disease, although it has developed in only two of them so far.

“That was one of the biggest sadnesses for me; knowing how difficult it was going to be for my children to socialise and eat out and travel safely, and how restrictive it is,” Ms Perry said.



Kira Perry has coeliac disease and says inconsistent international food labelling laws create confusion – even for something as simple as gluten-free Oreos. Picture: iStock

She hopes these findings trigger greater community awareness and acceptance of the disease and a realisation that coeliac disease is not just people “being picky” – it is a serious medical condition that can cause actual harm. She also hopes it prompts a rewriting of international food guidelines.

“Planning family holidays, we don’t just have to pre-consider accommodation and activities, we always research the food,” Ms Perry said.

“When we travel overseas it can be really difficult because the labelling, and then particularly what the research is looking at with the allowable levels, is just so different.

“For example, you can purchase gluten-free Oreos in the US, but they actually contain oats, which here in Australia are not considered gluten-free because the proteins within oats are so closely linked to gluten that some coeliacs will react to it.”

Ironically, the more that people who have the disease avoid gluten, the more extreme their acute symptoms become when they do finally ingest it. But because the disease causes internal damage, ignoring the diagnosis and eating gluten is not advised.

The big question now is whether prolonged exposure to those very low gluten levels also causes internal damage including to the gut.

“It makes sense that it does, but we haven’t proven that,” Dr Daveson said.

“So the next studies would be to replicate the findings, but also to try and show whether people are actually developing harm in their bodies from these very small amounts of gluten.”

His ultimate hope is that research such as this helps scientists narrow down therapies that cure the disease or at least offer therapeutic relief.

The research was conducted by the Wesley Research Institute in Brisbane and published in the latest edition of the journal Gastroenterology.

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