

# More turkey dinners for people with celiac disease?

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People with celiac disease may find themselves more comfortable with extra Thanksgiving turkey dinners.

An international team of researchers led by McMaster University has found that [tryptophan](#), an amino acid present in high amounts in turkey, along with some probiotics, may help them heal and respond better to a gluten-free [diet](#).

The study, published in *Science Translational Medicine*, set out to investigate whether the breakdown of tryptophan by [gut bacteria](#) was altered in celiac [disease](#) and whether this pathway could be targeted as a potential therapy.

The findings highlight the potential therapeutic value of targeting tryptophan metabolism in the gut in celiac disease to better control symptoms, despite the gluten-free diet, and accelerate intestinal healing.

"The only treatment for celiac disease is a strict adherence to a gluten-free diet, which is difficult to follow, and doesn't always lead to complete recovery of the gut or symptom resolution," says Elena Verdu, lead researcher of the study and a professor of medicine at McMaster's Farncombe Family Digestive Health Research Institute. She also holds the Canada Research Chair in Nutrition, Inflammation and Microbiota.

Tryptophan is an essential amino acid, which cannot be produced by the body and needs to be consumed through foods such as poultry, chocolate, bananas and [cruciferous vegetables](#) such as broccoli, cabbage and cauliflower.

Tryptophan is necessary for many functions in the body and can be broken down by bacteria in the gut, producing bioactive molecules (called "metabolites") that interact with receptors in the gut lining which control inflammation. One of these receptors is the aryl hydrocarbon receptor, or AhR, and suboptimal activation of this receptor has been implicated in chronic intestinal inflammation, including inflammatory bowel diseases such as ulcerative colitis and Crohn's disease.

"Celiac disease is the destruction of the lining of the upper gut, when a person with certain predisposing genes consumes gluten in the diet," said Heather Galipeau, co-author of the study and a research associate at the Farncombe Institute.

"However, not everyone with celiac genes and eating gluten will develop the disease."

Verdu added: "Our team at the Farncombe Institute has pioneered the study of impaired bacterial metabolism of wheat proteins, as an additional environmental driver in celiac disease." The researchers studied three groups: patients with active celiac disease, patients two years after a gluten-free diet, and healthy people.

Celiac patients had evidence of lower bacterial metabolism of tryptophan, and their gut microbiota did not appropriately stimulate the AhR pathway which controls inflammation and protects the gut barrier.

These alterations were partially improved in patients after two years of a [gluten-free](#) diet. Using mice that express the genes for celiac disease, the authors showed that two strains of lactobacilli, bacteria known to breakdown tryptophan, activated AhR and reduced inflammation caused by gluten.

The study findings highlight the potential therapeutic value of targeting tryptophan metabolism in the gut in [celiac disease](#) to better control symptoms.

Future clinical studies would examine therapeutic strategies, such as tryptophan supplementation in combination with specific probiotics that produce AhR ligands from the diet, in celiac patients who do not respond to the [gluten-free diet](#).

**More information:** B. Lamas et al., "Aryl hydrocarbon receptor ligand production by the gut microbiota is decreased in celiac disease leading to intestinal inflammation," *Science Translational Medicine* (2020).

[stm.sciencemag.org/lookup/doi/10.1126/scitranslmed.aba0624](https://stm.sciencemag.org/lookup/doi/10.1126/scitranslmed.aba0624)

Provided by McMaster University

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