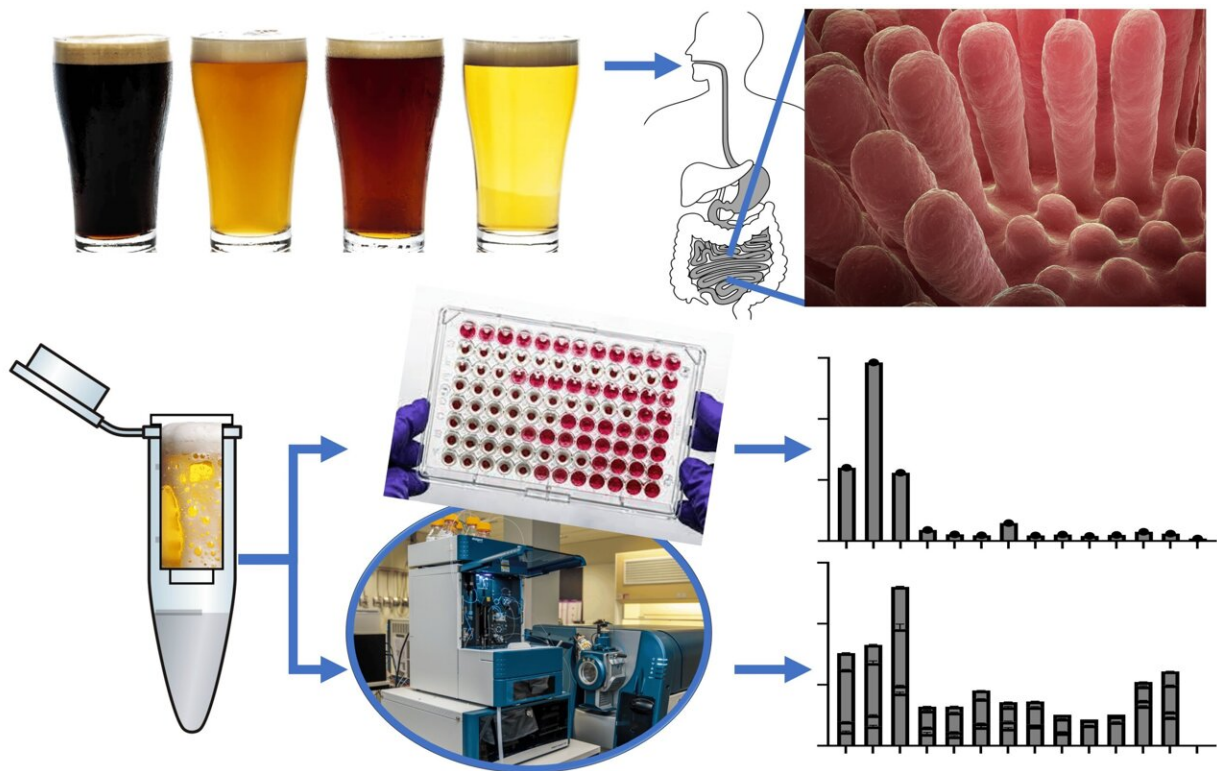


Low-gluten beer still a risk for those with celiac disease, says study

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Graphical Abstract. Credit: *Foods* (2023). DOI: 10.3390/foods12173252

Celiac disease (CD) sufferers could be persuaded to forego beer as research from Edith Cowan University (ECU) found that several purportedly low or reduced gluten beers contain equivalent or higher amounts of gluten proteins than regular beers.

CD is a common but under-diagnosed immune-based condition triggered by gluten. In those with CD, the body's immune system reacts to gluten by attacking itself. The resulting inflammation can lead to many different symptoms.

It is estimated that 1 in 70 Australians are living with CD (with only 20% diagnosed), adding those who choose a gluten-free diet equates to a growing customer base for food and beverage producers.

A survey conducted by Professor Michelle Colgrave and post-doctoral research fellow Dr. Mitchell Nye-Wood at ECU investigated gluten content in a range of beers and found that while some regular and gluten-reduced beers contained very low levels of gluten proteins, others did not fare as well.

Gluten is normally detected using the enzyme-linked immunosorbent assay (ELISA) method. However, in foods or beverages containing barley and where a [fermentation process](#) is used, the ELISA method can deliver variable results as gluten proteins are broken down into fragments that may be unrecognizable by the ELISA antibodies.

Beer production involves multiple steps where gluten proteins can be modified, degraded or precipitated. The remaining gluten concentrations are typically above CD regulatory thresholds but can be further decreased by treatments that aim to precipitate and filter out the gluten. Alternatively, enzymes can be added to digest gluten proteins.

"Beer, by definition, contains barley, and while we saw that some beers have very low levels of gluten protein, there are always difficulties with batch-to-batch consistency and ensuring no contamination. An exception does exist; there is a new variety of barley that was bred by the Commonwealth Scientific and Industrial Research Organisation not to contain any appreciable level of gluten; this is called Kebari barley and

has been used to make beer," said Professor Colgrave.

"While this beer is safe for those with CD, it is not commercially available in Australia. Instead, those with CD could consider beer made using non-gluten grains like millet, sorghum, buckwheat, or corn instead of barley malt."

"To be safe, people with CD should avoid [beer](#) made using [cereal grains](#) irrespective of the gluten reduction method. Despite the reduced gluten label, there is a risk that it contains gluten [protein](#) fragments that can provoke a reaction in their gut."

For brewers, Professor Colgrave said that the sandwich ELISA method would be sufficient for gluten quantitation of raw ingredients used in the production of gluten-free beers to test for the presence of contaminants.

However, for beers produced using gluten-reduction strategies, even competitive ELISA may deliver variable results. Techniques such as liquid chromatography-mass spectrometry (LC-MS) offered an alternative for quality control assessment.

"When using traditional barley malts, there will be several hurdles that will be difficult to overcome. Not all maltsters or breweries will have access to equipment like we have in our lab that provides a highly sensitive and accurate method for detecting gluten. There would be an ongoing need to assess treatment efficiency, batch-to-batch consistency, and the risk of contamination. In summary, our paper shows that in practice, most low-gluten products have detectable [gluten](#)," Professor Colgrave concluded.

The study is [published](#) in the journal *Foods*.

More information: Mitchell G. Nye-Wood et al, Low Gluten Beers

Contain Variable Gluten and Immunogenic Epitope Content, *Foods* (2023). [DOI: 10.3390/foods12173252](https://doi.org/10.3390/foods12173252)

Provided by Edith Cowan University

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