

Portable food allergen test designed to check 'free-from' meals

June 22 2017, by Sarah Cox, Brunel University London



Credit: Brunel University

A portable food allergen testing device and app has been designed by a Brunel University London student, with the potential to go to market at a fraction of the cost of comparable products.

Created by BSc Product Design Engineering student Imogen Adams, 'Ally' is a pocket-sized, lightweight device designed to ease anxiety for

allergy sufferers during meals out through a quick and easy test for different food allergens.

Ally users begin by crushing a small food sample and a few drops of water inside a small flexible silicone pod. They dip in a test strip and then insert the strip into a slot in the Ally – a Bluetooth enabled doughnut-sized electronic device inside a hard plastic casing.

When the accompanying app is opened on a mobile phone, and the button in the middle of the 'doughnut' is pressed, it takes 60 seconds for the app to process the test.

Feedback on the food's allergen status appears on the app, while the Ally device also signals a positive or negative result with a quick vibration – useful for anyone who would prefer not to appear rude by checking their phone at the dining table!

Within the app you can log your results, share them within an online community, and leave reviews about how 'allergy friendly' local restaurants are.

The strips used to test food samples are a modified glucose test strip containing lactase enzyme on half the strip. If lactose is present within a sample the glucose strip will change colour, with a greater colour change indicating more lactose present. This information is then read by a colour sensor in the electronic device.

A preferred type of [test strip](#), which was too expensive to use during the product's development stage but could be used if Ally were to go to market, is ELISA (enzyme-linked immunosorbent assay) technology, a sensitive method in which to measure the concentration of antigen (the molecule capable of inducing an immune response in a person) in a sample.

This method is commonly used in pregnancy testing, when the urine is checked for the presence of a particular hormone. With the Ally, the same theory could be used to check for a protein specific to the allergen being targeted.

Imogen estimates that Ally could be mass produced for little more than £30 per unit, with each test costing the user less than 20p. A comparable product designed to test for gluten is currently on sale in the US for £210 with tests costing around £5 a time.

Imogen chose to trial her design as a [test](#) for lactose, as one of the most common food intolerances (with milk one of the top eight food allergies). Many people develop lactose intolerance between the ages of 20-40 and it is particularly prevalent in people of Asian and Afro-Caribbean origin.

She is now in the process of developing testing for different allergens, and hopes to also develop a 'vegetarian checker' for traces of meat or fish - which was the original inspiration for the project.

"As a vegetarian travelling abroad last summer I wanted a way of making sure the food I was eating was truly vegetarian," she says. "During research into a [food](#) analysis device I decided to focus on allergies first, as they can be life threatening."

Imogen's product was the only student project named runner-up in this year's AXA PP Health Tech and You Award in the Future category among almost 50 entries, submitted largely by established companies.

She received funding from the James Dyson Foundation in January this year, and her prototype was recently exhibited in London's Design Museum and at Brunel's annual student design showcase, [Made in Brunel](#). It will also be exhibited in early July as part of the New Designers

showcase in London.

Provided by Brunel University

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