

A new method for accurately measuring the amount of inulin in dairy products

What is this research about?

Inulin is a complex carbohydrate that can be found in a wide range of plants, where it functions as a store of energy. It is present in a variety of fruits and vegetables, but root vegetables are a particularly rich source. It is a type of dietary fibre as it is not digestible. Research shows that consumption of inulin is beneficial to health, and over the past few years, it has been increasingly added to dairy products, as it boosts fibre content and replaces fat while retaining the creamy texture of the product.

There is little research on how to measure inulin in dairy products, and the purpose of this study was to evaluate a different method that has recently been used to measure carbohydrates in beverages such as wine and beer. This method involves adding the enzyme inulinase to break inulin down into its basic sugar units (fructose and glucose), as these substances are easier to measure. The amount of inulin present can then be calculated. This study focused on measuring inulin in milk.

What did the researchers do?

A known quantity of inulin was added to raw skim milk, which was then curdled using an enzyme mixture, and the liquid portion (whey) was collected. Inulinase was added to the whey samples, and the amount of fructose and glucose present was measured. To ensure accuracy, the researchers compared a number of samples: plain whey containing different amounts of added fructose and glucose; plain whey and water samples with equal amounts of fructose and glucose; whey containing different types of inulin; and samples of water, milk whey, and ultra-filtered milk (all with inulin). Each sample was measured multiple times, and additional samples were taken and analyzed two weeks later.

Keywords:

Milk, cheese, dairy products, inulin, dietary fibre, inulinase

What did the researchers find?

When more inulin was added, the amount of fructose and glucose in the whey samples increased at the same rate. Measuring the amount of inulin in samples with known quantities showed that this new method gives accurate measurements. There was little variation between repeated tests of the same sample, or in samples taken two weeks apart. However, inulinase also breaks down lactose (another sugar), which led to glucose levels being overestimated. Inulins that were made up of longer chains of fructose were more likely to get stuck in the solid (curd) portion of milk during curdling.

What you need to know:

The amount of inulin in dairy products can be accurately measured by adding inulinase and measuring the amount of glucose and fructose that is produced by the breakdown of inulin.

How can you use this research?

Dairy food producers can use this research to learn about new methods to accurately measure the amount of inulin present in different dairy products.

Food scientists can further this research by improving the method of measuring inulin levels in dairy products.

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