Method development for the simultaneous determination of sweeteners, including neotame and steviol glycosides

Area of research interest: Chemical hazards in food and feed
Study duration: 2011-03-01
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Conducted by: LGC Ltd. with ChromaDex
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Background

Our organisation have previously funded projects to develop methods to simultaneously determine intense sweeteners in food. The methods needed to be extended to cover newly permitted sweeteners: neotame and steviol glycosides.

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Research Approach

The first step of the project was to conduct a literature search to establish which methods were available for the determination of a variety of intense sweeteners in foods. It was agreed at the outset that the developed method should be suitable for use by Public Analyst laboratories.

The selected method was then refined and internally validated by LGC Ltd following single laboratory validation protocols. The method was then trialled by the sub-contracted organisation (ChromaDex) and validated by collaborative trial.

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Results

An HPLC-UV method was developed for the simultaneous determination of the following sweeteners: acesulfame K, aspartame, saccharin, NHDC, steviol glycosides (ie rebaudioside A (Reb A) and stevioside) and neotame. Biscuit, jam, fruit squash, carbonated soft drink and yoghurt were chosen for the validation exercise to represent high carbohydrate (eg sugars), high aqueous and high fat foods. The in-house validation showed that the method was suitable for the determination of all of the sweeteners. However, the recoveries obtained for NHDC were generally lower in the high fat samples (yoghurt and biscuits).

Samples of three of the matrices used to validate the method were sent to a second laboratory (ChromaDex) as a method check. The repeatability and reproducibility obtained by ChromaDex was comparable to that obtained by LGC.

A total of 14 laboratories participated in the collaborative trial and analysed five food types; jam, blackcurrant flavour juice drinks (two types) and yoghurt (high and low fat varieties). The results from the trial indicated that the method was suitable for the analysis of a range of sweeteners in jam and drinks. However, there were difficulties in the analysis of neotame, NHDC and aspartame in yoghurts.

Research report

England, Northern Ireland and Wales

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