

The Naturality and Processing of Stevia Leaf Extract and Emerging New Innovations



Ursula Wölwer-Rieck, PhD.

Department of Nutrition and Food Sciences, University of Bonn, Germany

Dr. Wölwer-Rieck holds a PhD in food chemistry and is a tenured academic Councilor in the Department of Nutrition and Food Sciences, University of Bonn, Germany. Her academic research is focused on steviol glycosides. She has published several papers on the analysis of steviol glycosides and their stability in food. Dr. Ursula Wölwer-Rieck is also a board member of the European Stevia Association (EUSTAS), whose petition for steviol glycosides led to their approval as food additives in Europe in 2011.

ABSTRACT

Steviol glycosides, are natural-origin sweeteners extracted from the shrub *Stevia rebaudiana* Bertoni and have been authorized all over the world as sweeteners with a purity of $\geq 80-95\%$. Their use is widespread worldwide in the food industry and is still growing as they are, in contrast to high intensity artificial sweeteners, of natural origin and stable during food processing. An overview of the traditional manufacturing process to obtain high purity stevia leaf extract has been discussed in the literature e.g., in the JECFA specifications of 2008 and the EU Regulation 231/2012 as well. The process starts with a hot water extraction of the dried leaves, followed by several purification steps to remove various constituents of the plant. After crystallization and spray drying a white powder with a purity of $\geq 95\%$ is obtained.

This presentation will include an overview of stevia processing based on existing literature and types of steviol glycosides and, will also elaborate on the data that supports the fact that none of the processing steps involved in the traditional extraction and purification of stevia leaf extract affect the chemical identity of steviol glycosides. Data from a recent study that used HPLC on a RP-column followed by UV and MS/MS-detection to analyze three different sample batches from commercial-scale production, each containing the dried leaves, the first water extract and the end product with $\geq 95\%$ purity of the same production batch will be presented. In this study it was possible to accurately separate and identify the nine steviol glycosides described by JECFA (2010) on the RP-phase in the leaves, the water extract and the $\geq 95\%$ high purity end product of each of the corresponding production batches that showed nearly the same distribution pattern across all samples. These data indicate that steviol glycosides are not affected nor, is their chemical identity modified by the manufacturing process, providing evidence for the naturality of high purity stevia leaf extract sweeteners.

Beside the traditional manufacturing process, new technologies and new agricultural varieties are currently being explored by the industry with a variety of different goals: to lower production costs, to apply green solvents or, to improve taste by producing specific steviol glycosides from non-plant sources or developing new plant varieties by selecting for better performing steviol glycosides. Some examples of these recent innovations will also be covered in this presentation.