

Lay summary of steviol glycoside LCA in International Journal of Life Cycle Assessment:

There is growing concern about the negative health effects of consuming too much sugar in food and drink products, which can contribute to obesity, diabetes, and tooth decay. Non-nutritive sweeteners (NNS) are being explored as a healthier alternative to sugar. However, it is important to ensure that replacing sugar with NNS does not have negative consequences for the environment. There is a growing body of evidence, to which the EU SWEET Project is contributing, on the health effects of consuming NNS instead of added sugar. In addition, the Project is investigating both the environmental impact of NNS, such as steviol glycosides found in the stevia plant.

Sustainability of NNS is not something often addressed in public discourse and is not always on the minds of food or drink manufacturers either. But with an increasing focus on sustainability of the foods we eat as a whole, greater attention is being given to NNS. Most importantly, it is crucial to understand that if NNS are recommended from a health perspective, that this does not come at an unforeseen consequence for the environment or wider society. This is another important area that SWEET is contributing new knowledge.

This latest research from SWEET is the environmental impact of producing the NNS steviol glycosides, found in the leaves of *Stevia rebaudioside*, a plant which originated in Paraguay, but now grown throughout the world. SWEET researchers were able to work with a cooperative of farmers in Greece, who grow stevia, and a company in France which extracts steviol glycosides from dried stevia leaves. Both companies provided data on steviol glycoside production which enabled the environmental study.

The study was in the form of a life cycle assessment (LCA), a recognized ISO standard method for calculating environmental impact of a product or service. An LCA measures environmental impact across a wide range of impact categories, including global warming potential, acidification potential, or ozone depletion. It is an important tool for identifying whether a product is better or worse for the environment than another, or to identify if there are trade-offs. A well-known example might be diesel cars, which emit less carbon dioxide per km driven than petrol cars, but produce more particulates: a problem for city dwellers.

Steviol glycosides are perceived as being about 250-times sweeter than sugar. This means that approximately 4 g of steviol glycosides can provide the same intensity of sweetness as 1 kg sugar! The results of the study show that steviol glycosides cause less environmental impact across all measured impact categories when replacing an equivalent sweetness of sugar. For example, in terms of global warming potential, the impact is approximately 10% that of sugar.

Therefore, replacing added sugar with steviol glycosides in drinks is likely to show a reduction in environmental impact. This work is currently being extended by SWEET in two areas: firstly, with more studies into other NNS, and secondly extending the investigation to

include more food and drink products and the change in environmental impact with replacement of added sugar. Results from both will be made available when published by the SWEET project team.

The publication on environmental impact of steviol glycosides is freely available open access to anyone at the International Journal of Lifecycle Assessment webpage:
<https://link.springer.com/article/10.1007/s11367-022-02127-9>