

Putting the metrics behind sustainability at Infinity Foods.



Infinity Foods - Wageningen University Unlocking the Value of Food Waste Streams



The Challenge

Several companies and the Wageningen research institute Food & Biobased Research collaborated within the Infinity Food public-private partnership to increase the value of waste streams originating from vegetable production. From a technical and economic perspective, extracting food elements from residual vegetables is potentially interesting. To determine the real value of obtaining these elements from waste streams, however, the environmental impacts must be acquainted too. Therefore, PRé was asked to perform a life cycle analysis on different production chains of dietary fibres and beta-carotene. The purpose of the LCA was to see how the environmental impacts of beta-carotene and fibre production from residual carrots compare to other production technologies, such as production from carrots that were specifically grown for this purpose, the so-called dedicated carrots. Six production technologies were compared:

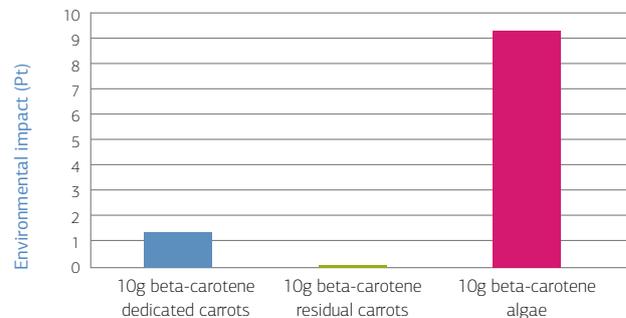
Beta-carotene	Fibres
Dedicated carrots	Citrus
Residual carrots	Residual carrots
Algae	Residual chicory

Within the Infinity Vegetables project, primary data was collected in the field and taken from literature and calculations from experts. Sensitivity analyses were performed on the most important input values and model choices.

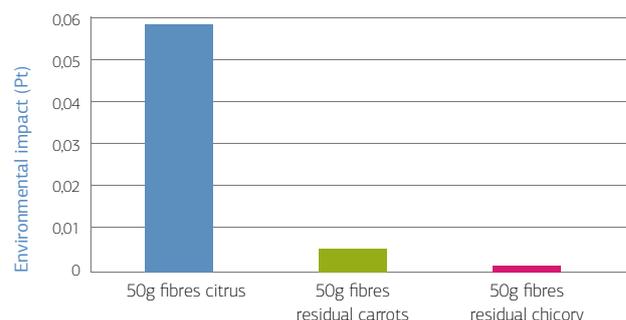
PRé Solution

A cradle-to-gate comparison of beta-carotene from residual carrots, dedicated carrots, and algae showed clear differences between the production technologies. At the moment, the standard production method for beta-carotene is from dedicated carrots. The environmental impact of beta-carotene production from residual carrots was much lower than from dedicated carrots. The environmental impact of beta-carotene production from algae is much higher than other production methods, namely a factor of 7 compared to dedicated carrots. This can be explained by the use of oil in the extraction process. Despite the limited data, the comparison showed convincing potential for the production of beta-carotene from residual carrots.

The standard production method for fibres is currently from citrus. A comparison of fibre production from citrus, residual chicory from inulin production, and residual carrots showed that fibres



from citrus have the largest impact. Compared to this, fibres from residual chicory have about 3% of the environmental impact and fibres from residual carrots about 8% of the impact. Most of the impact from citrus-based fibre production comes from the electricity used to pulverise the citrus peel and press the crushed citrus peel.



Business Value

- The 'Infinity Foods' partners gained valuable insight into the environmental performance and the hotspots of the different production methods.
- The cradle-to-gate LCAs showed potential for getting value from residual carrots and residual chicory from inulin production. The residual vegetables could be used for production of beta-carotene (carrots) and fibres (carrots and chicory). Beta-carotene production from algae and fibre production from citrus appeared less favourable.
- The insights of this study can be used when setting up a production facility for getting value out of residual vegetables.



Creating Business Value Through Sustainability Metrics

Sustainability Metrics Consulting

Sustainability in business has become a core business concern and a driving factor in creating business value. PRé offers a range of consulting services, provided by a team of experts who will work with you to choose, create and deliver the right metrics for your sustainability goals.

PIONEERING Developing Innovative New Metrics For New Challenges

Societal and stakeholder expectations for implementing sustainability in business are becoming more demanding. Sometimes, off-the-shelf metrics cannot help you answer their questions. PRé has extensive experience in life-cycle-based metrics pioneering: implementing cutting-edge new product metrics and developing completely new, scientifically sound and robust metrics. PRé has been the driving force behind many ground-breaking initiatives like ReCiPe or the Handbook for Product Social Impact Assessment.

INTEGRATION Integrating Sustainability Metrics In Your Business

To create business value from sustainability, your business needs to integrate sustainability metrics across its business functions. You can't improve what you can't measure. PRé has the expertise required to help you choose the right metrics and to integrate sustainability into your day-to-day operations. PRé also supports you in increasing the efficiency of your LCA work and in empowering your LCA practitioners.

DELIVERY Expert LCA Knowledge To Measure Sustainability Performance

LCA has proven to be a robust and science-based way to measure and communicate your sustainability performance. PRé can review your LCA studies, deliver EPDs, footprints and other metrics, and provide you with completely new LCA studies to measure your impact. Our consultants are renowned for their expertise in specific topics, such as impact assessment, uncertainty, normalisation, toxicity, social sustainability and databases. PRé offers training courses and in-house training that build a solid knowledge base to help you conduct LCA studies yourself.

Get In Touch With PRé
We're always happy to discuss your sustainability challenges with you. If you have any questions, feel free to contact our offices in the Netherlands and the US.

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We look forward to being your partner in putting the metrics behind sustainability.

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Those Who Have Gone Before – Market-leading Businesses That Are Creating Value From Sustainability Metrics

PRé has built a worldwide reputation as a leader on environmental and social impact assessment. We work with organisations and institutes such as the European Commission, European Space Agency, Heineken, BASF, Philips, L'Oréal and DSM.



About PRé

PRé has been a leading voice in sustainability metrics and life cycle thinking, since 1990, pioneering the field of product and supply chain sustainability metrics. We've developed some of the world's most widely recognised and applied environmental impact assessment methods, as well as the world's leading LCA software, SimaPro. From the very first, we have not only focused on developing the science of LCA, but also its application – helping companies create value by using state-of-the-art measuring, monitoring and analysis methodologies to improve their sustainability performance.

Find out more about what we can do for your organisation at www.pre-sustainability.com

