



International Research Network for Food Quality and Health

Seminar 18th of October, from 09.00-10.00 am CET at zoom

Temperature-optimized and Sustainable Fruit Juice Processing

The workshop is free of charge, but you have to sign up at shb@nexs.ku.dk, just write FQH as subject and you will receive a zoom link for the meeting

Program:

09.00-09.05 am welcome by FQH Carola Strassner

09.05-09.35 am



Fabian Weber was educated at the Technische Universität Braunschweig/Germany and graduated in Food Chemistry in 2006. He obtained his doctorate at the Institute of Food Chemistry at the same university in 2012

From 2011 to 2012 he was a Post Doc at the Competence Center for Wine Research, DLR Rheinpfalz. From 2012 to 2023 he was working at the Institute of Nutritional and Food Sciences – Molecular Food Technology at the University of Bonn/Germany. In 2020 he obtained his habilitation for Chemistry and Technology of Plant-derived Food from the University of Bonn. From 2020 to 2021 he was assigned a temporary professorship for Food Safety in Bonn.

Since 2023 he holds a full professorship for Organic Food Quality at the University of Kassel within the Faculty of Organic Agricultural Sciences.

His main research interests are nutritional and sensory properties of plant secondary metabolites with a special emphasize on the interactions of these compounds and other compounds like polysaccharides and proteins. He employs different analytical and preparative chemical tools to reveal molecular interactions and reactions and correlate the findings with sensory studies. His aim is to show new valorization possibilities for agri-food products, side-streams, and other agricultural products.

09.35-09.55 am discussions in plenum or breakout-rooms (dependent on the numbers of attendants)

09.55-10.00 am wrap-up, presentation of next workshop and goodbye

Abstract

Temperature-optimized and Sustainable Fruit Juice Processing

In addition to the market-dominating juices made from oranges and apples, juices made from red berries are becoming increasingly popular, as they not only offer variety to the diet but are also rich in plant secondary metabolites such as anthocyanins. These are associated with a variety of positive health effects and the juices fulfil the consumer desire for healthy and functional foods.

Enzymatic maceration plays an important role in the production of these juices, as it breaks down the abundant pectin from the cell walls. The primary aim of this is to reduce the viscosity of the mash and thus increase the pressability and juice yield. In addition, maceration also improves the extraction of plant secondary metabolites. After the pressing process, sometimes more than 20 % of the fruit is left as pomace, which still contains large quantities of valuable components. The great potential of the pomace is only insufficiently utilized, as only parts of it are used directly in the food industry. The aim of sustainable processing is therefore, on the one hand, to optimize juice production in terms of temperatures and times and, on the other hand, to find new strategies to revalorize the remaining pomace without extensive processes.

As the different berries have different pectin structures and quantities, it makes sense to adapt the parameters of the enzymatic treatment to enable a reduction in temperatures. The simultaneous use of ultrasound (US) can make an important contribution to better extracting and stabilizing valuable ingredients. Ultrasound-assisted enzymatic maceration (UAEM) leads to a reduced pomace yield and favors cell wall polysaccharide degradation. UAEM improves the heat and storage stability of anthocyanins in juices.

After grinding, the remaining pomace can be divided into different fractions by sieving, which can be used in different ways. The fine powdery fraction of the berry skins can be used, for example, in the form of a coloring foodstuff. A less fine fraction can be used as a base for wraps or baking molds, for example. High levels of plant secondary metabolites and the intact cell structure ensure high storage stability of the anthocyanins.