



STELLA PLAZZOTTA

CURRENT ROLE

Assistant professor (researcher RTDb) at the Department of Agri-Food, Environmental and Animal Sciences of the University of Udine in SSD 07/F1 - AGR/15 - Food Science and Technology

Personal information

Tolmezzo, 7/2/1989

Citizenship Italian

🏠: Udine, via Sondrio 2/A

✉: stella.plazzotta@uniud.it

☎ +39 0432 558170

Work experience

21/12/2021 - now

Assistant professor (researcher RTDb) at the Department of Agri-Food, Environmental and Animal Sciences of the University of Udine in SSD 07/F1 - AGR/15. Project title: "Technological strategies to implement the bioavailability of bioactive molecules naturally contained in raw materials of food and interest".

16/04/2021 - 20/12/2021

Post-doc research fellow at the Department of Agri-Food, Environmental and Animal Sciences of the University of Udine in SSD 07/F1 - AGR/15. Project title: "Development of sustainable foods through a process design approach".

01/11/2018 - 09/09/2020 and 11/02/2021 - 03/04/2021

Post-doc research fellow at the Department of Agri-Food, Environmental and Animal Sciences of the University of Udine in SSD 07/F1 - AGR/15. Project title: "Technological strategies for the development of oleogels for the food sector".

01/01/2015 - 31/10/2015

Research fellow at the Department of Agri-Food, Environmental and Animal Sciences of the University of Udine in SSD 07/F1 - AGR/15. Project title: "Development of sustainable technological interventions to extend the shelf life of minimally processed foods".

Education

01/03/2019

PhD in Food and Human Health, University of Udine. Thesis title: "Technological strategies for the sustainable valorization of fruit and vegetable waste".

06/10/2014

Master degree in Food Science and Technology, University of Udine, 110/110 cum laude. Thesis title: "Effect of combined treatments of high pressure homogenisation and ultrasound on the physical characteristics and stability of O/W emulsions".

16/07/2012

Bachelor in Food Science and Technology, University of Udine, 110/110 cum laude. Thesis title: "Intraspecific characterization of *S. cerevisiae* by molecular methods".

Publications

Author or co-author of over 30 scientific publications in international peer-reviewed journals related to the field of Food Technologies.

Co-author of 5 chapters in books with international circulation.

Research activity

From 2014 to today S. Plazzotta carries out continuous research on various topics related to food technology.

Initially, the focus was on the potential of innovative technological treatments in non-thermal stabilization of food and the preparation of food nanoemulsions. Subsequently, as part of the doctoral course, the theme of the upcycling of food waste was addressed, which was then taken up in the post-doctoral course, which focused on the possibility of extracting proteins from vegetable waste. To date, the studies of S. Plazzotta are mainly focusing on the development of new food structures that allow to obtain foods with specific functionality.

The main research topics are described in detail below.

Study and development of applications of innovative technologies to the food sector

Initially, the research activity of S. Plazzotta focused on the study of the application potential of innovative technologies for the stabilization of fresh food. In addition, the possibility of using high-pressure homogenisation in combination with ultrasonic treatments has been evaluated with a view to improving energy efficiency in the preparation of nanoemulsions. More recently, the study of the effect of light-based technologies on proteins in both model and food matrices has also been addressed. The application of new technologies has also been a common denominator in subsequent research activities.

Development of a rational approach to the exploitation of plant waste

During the PhD program, the research activity was focused on the valorization of waste from the food industry, a central theme within the European funding program Horizon 2020 and Horizon Europe, with a view to promoting a transition from a linear economy to a circular economy and increasing the sustainability of the food supply chain. In particular, the aim of the PhD project was to develop a rational approach to the exploitation of plant waste, able to ensure the production of high-added value products, as well as their technical feasibility, not to mention estimating the level of consumer acceptance and the economic and environmental impact.

The application of several innovative technologies, including high-pressure homogenisation, ultrasound, microwaves, pulsed electric fields and supercritical drying, has also been central in this area.

Particular attention has been paid to the extraction of proteins from vegetable waste, with a view to obtaining new protein ingredients of non-animal origin, which is also considered central to promoting sustainable development, as stated in the Green Deal 2020.

In this context, the market potential of upcycling products has also been evaluated, in terms of sensory acceptability and consumer attitude. Finally, the application of a 'multi-objective' method allowed to estimate the economic and environmental impact of the proposed strategies in the event of industrial-scale production. The validity of this approach has been recognised by three national awards. In particular, the award in memory of Prof. Mario Bonsembiante, recognized "the great scientific rigour combined with the desire to reach solutions susceptible to industrial applications" and that "the data produced by the thesis work, including those of feasibility, constitute the basis for a sector industrial initiative, worthy of productive investments".

Development of new food structures to obtain foods with specific functionalities

The most current research of S. Plazzotta is aimed at the possibility of obtaining new food structures exploitable in the formulation of foods with specific functionality. In this context, research has focused mainly on:

- (i) Development of fat substitutes. These studies aim at the development of strategies to convert liquid oils into semi-solid systems that can be used in the formulation of foods with low-saturated fatty acid and trans isomer content, without compromising structure and sensory quality. In this context, emulsified systems containing monoglycerides have been developed, which led to the filing in Italy in 2017 and worldwide in 2018 of a patent on the production process of a substitute of concrete fats. Further studies have focused on the possibility of structuring liquid oils through the so-called aerogel-template approach.
- (ii) Development of food bioaerogels. Several studies have addressed the development of food aerogels, that is, bio-compatible and extremely porous and light nanostructured materials, which have been obtained by applying freeze-drying and supercritical drying techniques to different matrices (plant tissues, biopolymer gels based on polysaccharides and proteins). The bioaerogels developed, by

virtue of their characteristics, have great potential in the food sector, where they could be applied as key ingredients in the development of functional foods. In particular, such systems can be used as delivery systems with controlled release, oil structuring agents and lipid digestion modulators.

Patents

Calligaris, S., Manzocco, L., Plazzotta, S. (2018). Method to make fat-substitute and/or fat-imitator compounds. 2018-01-11 WO2018007399A1. Brevetto internazionale.

Conferences

S. Plazzotta participated in several national and international conferences with oral contributions held in first person (10) and poster presentation (11).

Teaching activities

AA 2022/2023 Lecturer of the course "Materials and Packaging Systems" (SSD 07/F1 - AGR/15) (5 CFU) of the course "Food Sciences and Technologies" (University of Udine).

AA 2020/2021 and 2021/2022 Lecturer of the module "Food Technologies" (SSD 07/F1 - AGR/15) (2 CFU) of the course "Food Science" of the Bachelor's Degree course "Prevention techniques in the environment and in the workplace". Inter-university course (University of Udine and Trieste).

Supervisor and Co-supervisor of master's theses and internship reports of students of the three-year and master's courses of the course of Food Science and Technology of the University of Udine (SSD 07/F1 - AGR/15).

Autorizzo il trattamento dei miei dati personali ai sensi dell'art. 13 D. Lgs. 30 giugno 2003 n°196 – "Codice in materia di protezione dei dati personali" e dell'art. 13 GDPR 679/16 – "Regolamento europeo sulla protezione dei dati personali"

Date, 02/05/2023

Stella Plazzotta