

BrIAS Workshop W03

Upcycled food: challenges and opportunities

Tuesday February 8th 13.00 pm – 16.30 pm (CET)

Location: *In person* at ULB La Plaine Campus, Salle Solvay, Building NO 5th Floor*
Online via Microsoft Teams. To participate, please use this [link](#).

Organisers: Antonella Pasqualone & Frits Heinrich.

- 13.00 ***Introduction. Waste or rest-product? Historical and archaeological perspectives on food waste, recycling, upcycling, and commoditization.***
ir. Annette M. Hansen & Dr. ir. Frits Heinrich, Social and Cultural Food Studies (FOST), Department of History, Vrije Universiteit Brussel (VUB), Belgium.
- 13.25 ***Leftovers, Abundance, and Changing Attitudes to Food.***
Prof. Dr. Helen Veit, Department of History, Michigan State University, East Lansing, MI (USA).
- 13.50 ***Upcycling food with dignity: A case study from Canada.***
Prof. Dr. Kate Parizeau, Department of Geography, Environment and Geomatics, University of Guelph, Canada.
- 14.15 ***From food waste to functional foods: application to the cereal supply chain.***
Prof. Dr. Antonella Pasqualone, Department of Soil, Plant and Food Science (DISSPA), University of Bari, Italy.
- 14.40 ***Food up-cycling, isn't it food recycling?***
Prof. Dr. David Cannella, Crop Production and Biostimulation Laboratory (CPBL), Université Libre de Bruxelles, Belgium.
- 15.05 ***Food waste recycling: potential safety concerns related to chemical hazards.***
Prof. Dr. Marie-Louise Scippo, Department of Food Science Laboratory of Food Analysis FARAH - VPH (Fundamental and Applied Research for Animal & Health, Veterinary Public Health), Université de Liège, Belgium.
- 15.30 ***Consumer acceptance of upcycled food.***
Prof. Dr. Jonathan Deutsch, Department of Food and Hospitality Management, Drexel Food Lab, Drexel University, Philadelphia, PA (USA).
- 15.55 **Roundtable and discussion**
- 16.30 ***Closing statement***

The Covid Safe Ticket (CST) is required for in-person access to the event. Wearing a mask is mandatory while seated in the room.

About BrIAS

The newly founded Brussels Institute for Advanced Studies (BrIAS), co-founded by the Université libre de Bruxelles (ULB) and the Vrije Universiteit Brussel (VUB), aims to expand upon the mission of other IASes as an incubator of ideas and research by focusing on current and urgent themes with a great societal impact. Located in the heart of Brussels, it aims to attract the very best scientists, artists or designers, coming from various fields or countries and with no philosophical or political restriction, and provide the opportunity to work in an atmosphere of complete freedom, collaboration, mutual emulation and cross-fertilisation. In this context, BrIAS aims to facilitate collaborations with countries facing critical challenges pertaining to sustainability. For more information and updates about BrIAS, our upcoming events, and our current research theme *The past, present and future of food, climate and sustainability*, Follow us on our [webpage](#), [LinkedIn](#), [Facebook](#) and [YouTube](#)!

Abstracts

Introduction. Waste or rest-product? Historical and archaeological perspectives on food waste, recycling, upcycling, and commoditization.

Annette Hansen & Frits Heinrich

This paper provides an introduction into the theme of the workshop from ancient, historical, archaeological and archaeobotanical perspectives. By using examples from these disciplines, we aim to illustrate how recycling and upcycling were not strange concepts in antiquity, but in fact were crucial aspects of everyday life and the functioning of ancient economies (and premodern economies at large). Instead, we will argue that ‘waste’, especially in the manner and on the scale that we understand it, was relatively rare before the modern era, making premodern economies, especially in terms of organic materials, naturally circular. Many rest-products or by-products of one production process or activity moreover fed into other production processes as resources in their own right, sometimes leading to their commoditization, trade over longer distances and the active consideration of the opportunity cost for mutually exclusive uses. This paper will touch on a range of examples of the ancient (re)use of crop/food processing ‘waste’ in among others food, fodder, fuel, fertilizers and building materials.

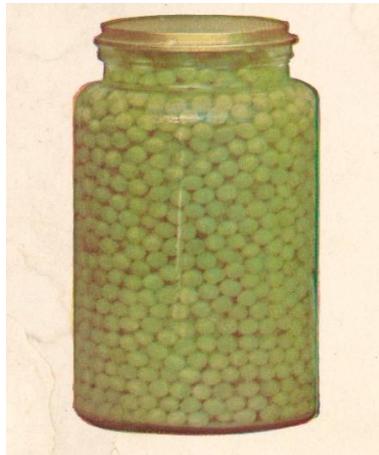


Archaeological (left, Ottoman Period) and modern (right) sundried mud-bricks in which crop processing ‘waste’ (chaff and chopped straw) served as temper, Sai Island, Sudan, January 2015 (photo: F.B.J. Heinrich).

Leftovers, Abundance, and Changing Attitudes to Food.

Helen Veit

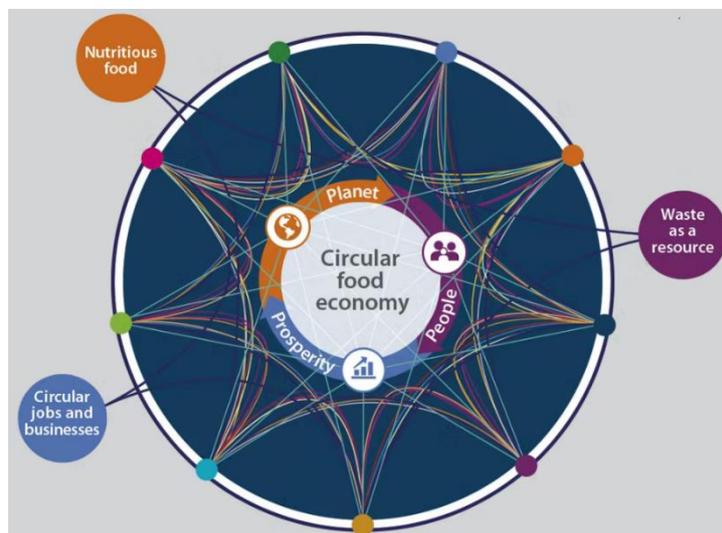
Today, “leftovers” usually refers to the remnants of a cooked meal. Using up leftovers, we know, is an important way to prevent food waste. While that’s true, our modern approach to leftovers is unprecedentedly narrow, and it reveals how insulated residents of affluent countries are from the fundamental relationship between food, time, and decay. In the past, home cooks were much more likely to anticipate leftovers than to deal with them only after the fact. Home cooks in the nineteenth century constantly appraised ingredients on a months-long time horizon, and to prevent waste they preserved food by cooking it in special ways. In many cuisines, in fact, cooking was virtually inseparable from food preservation. Today, if we’re not constantly aware of the relationship between food preservation and survival, it’s only because we live in an environment where preservation has been outsourced to factories and where massive food waste has been normalized. In this environment, activities like home canning or food drying are quirky hobbies, not valuable skills. But there’s nothing normal – and nothing sustainable – about the current food system. We may all have to become intimately reacquainted with food’s perishability and ways to forestall it in the future.



Upcycling food with dignity: A case study from Canada

Kate Parizeau

This presentation will discuss food recovery and upcycling initiatives in the context of an emergent circular economy for food in Guelph-Wellington, Ontario, Canada. There are logistical and interpersonal challenges associated with food upcycling, and I will discuss a case study of the development of The SEED's Upcycle Kitchen in order to highlight some of these issues.



From food waste to functional foods: application to the cereal supply chain

Antonella Pasqualone

Food waste is an environmental, economic and ethical issue. There are several points in the supply chain where it is possible to intervene to reduce food waste. At the home level, one of the causes is a progressive generalized loss of culinary skills, which included the ability to reuse any type of leftover. On the other side, the food industry produces large amounts of waste and by-products, which in many cases contain several residual nutrients and bioactive compounds. Assuming these materials are safe, they still remain substantially underutilized. Cereal-based food products are largely consumed and can be easily functionalized by adding extracts of waste/by-products obtained by means of green extraction techniques. Alternatively, waste/by-products can be used directly, after drying and powdering. A number of case-studies will be presented, where dry and fresh pasta, biscuits, bread and other baked goods have been effectively fortified with industrial residuals from the milling of wheat and pulses, wine-making, olive oil production, artichoke canning, and almond confectionery industry. By balancing the level of fortification, the enriched products become carriers of bioactive compounds but maintain a good technological quality. Upcycling these waste/by-products represents a possible strategy to improve the sustainability of the food industry, adding value and satisfying consumers demand for functional foods.



Biscuits added of dried almond skins, an underutilized residue, rich of antioxidants, from the almond confectionery industry (Pasqualone et al., *Foods*, 2020, 9:1705).

Food up-cycling, isn't it food recycling?

David Cannella

If looking at the mass of food waste daily produced, one could definitively find something still edible right away, yet would call this food upcycling. As it is easily guessed, unfortunately this can be applied to a small fraction of the total food waste, that accounts for 40% of food mass produced. Yet, transforming food waste into stable and direct edible ingredients is regarded as one of the greener way to meet the requirements of improving the quantity of food available for an ever growing population. Therefore, specific biotechnology needs to be developed being able at targeting the wider possible spectrum of molecules and isolate them into separated streams for successive human consumption. Biocatalysis might help in these regards: enzymes possess the requirements of specificity and biocompatibility for separating/transforming specific classes of carbohydrates, lipids, proteins and antioxidants into edible forms for complementing the nutritional values of already consumed food. Afterall spoiled food might not taste as bad as it looks like.

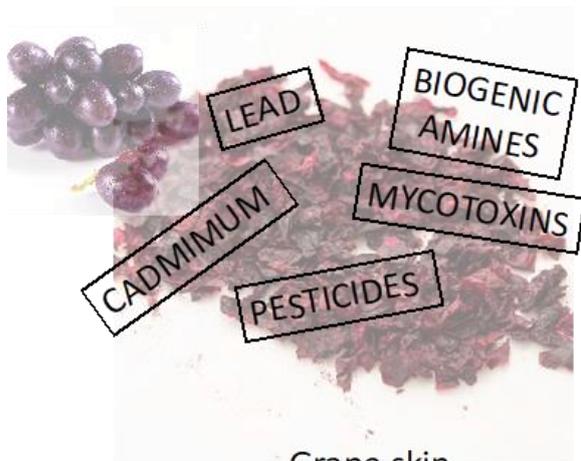
Food waste recycling: potential safety concerns related to chemical hazards.

Marie-Louise Scippo

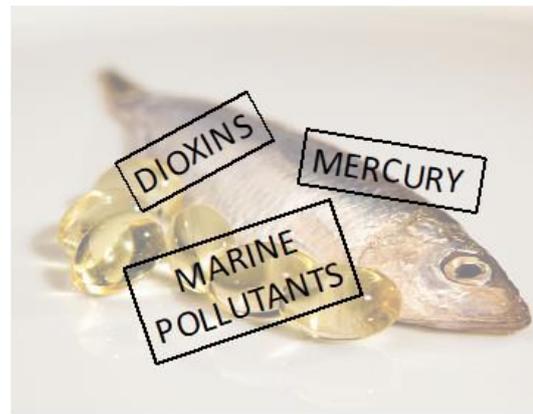
Food waste recycling to feed domestic animals is known for ages. About twenty years ago, this practice led to the dramatic “Belgian dioxin crisis”, which was followed by other smaller dioxin crises in Europe, also caused by food waste recycling in the feed chain, resulting in meat contamination, and health concerns for the consumer. Nowadays, food wastes are more and more used to produce so called “functional foods” intended for human consumption. Well known

examples are fruits and vegetables by-products, which are valorised for their bioactive compounds content, of fish by-products, such as fish liver oil, which is interesting for its polyunsaturated omega 3 fatty acids content. However, each of these products can contain and reintroduce in the food chain chemical hazards, such as pesticides residues, biogenic amines, mycotoxins or heavy metals in plant materials, or marine pollutants (such as dioxins or mercury) in fish oil. Since the dioxin crisis, the European legislation about food safety is continuously reinforced, and maximal limits have been fixed for numerous chemical contaminants in both feed and food, to protect consumer health. Even if, currently, there are no specific maximal limits for chemical contaminants in by-products, they must meet the general requirements of the European food law regarding the consumer safety.

Chemical hazards in food by-products



Grape skin



Cod liver oil

Consumer acceptance of upcycled food.

Jonathan Deutsch

Consumer acceptance of upcycled foods is key to the successful and transparent marketing of these food products. For decades, the food industry has been concerned about needing to discount or apologize for upcycling food that would otherwise be wasted. Working with colleagues from marketing and biomedical engineering, as well as the Upcycled Food Association, the Drexel Food Lab has conducted a suite of research on consumer attitudes to upcycled foods that can provide guidance for food manufacturers and marketers.

