

1S2: Healthy foods produced in circular food systems

April 12th, 11.30 h

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Today's global food system is responsible for about a quarter of all human-induced greenhouse gases, one third of global terrestrial acidification, the majority of global eutrophication, and covers 40% of the world's ice and desert-free land. Simultaneously, people still lack sufficient food, consume low-quality diets, or eat too much food (triple burden of malnutrition). Consequently, these unhealthy diets result in serious health risks such as diet-related obesity and diet-related non-communicable diseases including coronary heart disease, stroke, and diabetes. Humanity, therefore, now faces the grand challenge making healthy diets accessible to all people while safeguarding the planet's health.

An increasing body of literature suggests that a transition towards circularity in the food system might be an important solution to reduce the environmental impact. However, to what extent can a circular food system secure nutritious healthy foods for a growing population? Or, in other words, can dietary recommendations be met in circular food systems while respecting our planetary boundaries?

Within the current literature numerous healthy and environmentally friendly dietary guidelines have been proposed. Such dietary guidelines aim to reduce environmental impacts (e.g., GHG emissions, deforestation, soil degradation, eutrophication and biodiversity loss) while simultaneously reducing the risk of non-communicable diseases (e.g., cardiovascular disease, colorectal cancer and type-2 diabetes). One prominent example of a healthy and environmentally sustainable dietary guidelines is the one of the EAT-LANCET commission. Within the proposed dietary guidelines circular agriculture is however not considered. In a circular food system arable land should be primarily used to produce nutritious healthy foods from plant biomass that fulfil the majority of the nutritional requirements of humans. During the production and consumption of foods from plant sources several by-products are produced, such as crop residues, co-products from industrial food processing and food waste. Such residual streams should be recycled in the food system in order to maintain or improve the soil and fertilize crops, or to feed animals. The availability of those residual streams depend on the plant-based-foods that are consumed and on the way how the raw materials are processed into foods.

The question we, therefore, aim to address in this session is how can we secure healthy nutritious diets while at the same time stimulate a transition towards more circular food systems that reduce the environmental impact. We aim to answers questions like:

'which crops should be grow and which animals should we keep to provide healthy nutritious diets produced in circular food systems?', 'what are the consequences of circular agricultural practices on ecosystems?' and 'what is the impact of food processing on food quality and how does this affect circularity (e.g. refine versus whole grains)?'. With this session we aim to develop a better understanding of how circular food systems can contribute to improving human and planetary health.