



Seminar Topic:
Rethinking Food Protein Waste

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Abstract

For each kilogram of food protein wasted, between 15 and 750 kg of CO₂ end up in the atmosphere. With this alarming carbon footprint, food protein waste not only contributes to climate change but also significantly impacts other environmental boundaries, such as nitrogen and phosphorus cycles, global freshwater use, change in land composition, chemical pollution, and biodiversity loss. This contrasts sharply with both the high nutritional value of proteins, as well as their unique chemical and physical versatility, which enable their use in new materials and innovative technologies. In this talk, I will discuss how food protein waste can be efficiently valorized not only by reintroduction into the food chain supply but also as a template for the development of sustainable technologies by allowing it to exit the food-value chain, thus alleviating some of the most urgent global challenges. I will showcase three technologies of immediate significance and environmental impact: biodegradable plastics, water purification, and renewable energy, and present original life cycle assessment (LCA) examples run ad hoc on both plant and animal waste proteins in the context of the technologies considered. I will finally conclude with an outlook on how such a comprehensive management of food protein waste is anticipated to transform its carbon footprint from positive to negative and, more generally, have a favorable impact on several other important planetary boundaries.