

**Date of poster presentation: 12 April 2022**

## **MICROBIOME@WUR: CIRCULAR AGRI-FOOD PRODUCTION SYSTEM AS A FRAMEWORK FOR MICROBIOME RESEARCH**

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The microbiome is defined as all microorganisms in a given environment and their theatre of activity. They are natural resources found in all ecosystems. The microbiome can be harnessed to provide various services that have a positive impact on pressing societal problems. The European Commission has recognized the potential of microbiomes and highlights them as one of the key priority research areas for the transformation of the food system and the transition to a circular economy. Transition to a circular economy in agri-food could provide sustainable solutions for farmland fertilization, nutrition and climate change mitigation. However, the transition may also pose particular risks to food safety through the potential spread of antimicrobial resistance, increased accumulation of microbial toxins, and potential cross-system transmission of microbial pathogens. As we move toward a circular agri-food production system, we need to assess what impacts the microbiome has as it traverses the various ecosystems in the food production chain, and we need to identify trade-offs or synergies and explore the benefits. With advances in our understanding of microbiome dynamics across temporal and spatial gradients, a conceptual framework can be created in which microbiome knowledge and discoveries can be interrogated and interpreted. Circular agri-food production systems can provide such a framework. This will enable researchers to understand the complex interactions between the microbiome and the multidimensional and interconnected components both within and between ecosystems of circular agri-food systems.

As a leading organization in health, safe and sustainable food systems, Wageningen University & Research (WUR) can bring together existing expertise in human, animal, plant, soil, water and environmental health. In addition, global food systems, economic and social developments, food safety and security, ethics and policy are important aspects to consider simultaneously. Microbiome@WUR is a WUR-wide platform for research collaborations involving researchers from a range of scientific disciplines, including animal, human, plant, food and soil health. The desire for a more holistic approach to microbiome research, sharing knowledge from different ecological systems and scientific disciplines, is the main driver for this initiative. Such an integrated scientific knowledge program can meet several needs, such as: (a) the translation of academic knowledge into practical benefits; and (b) of service providers in collaboration with

industry. Microbiome@WUR aims to provide policy and decision makers with a framework and platform to transform food systems to deliver benefits to human health, the climate, the planet and our communities within safe planetary boundaries.

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*Keywords: microbiome, circular agri-food systems, health, climate, research policy*