



# Safety Issues in a Circular Food System

TEAM C

Considering the recycling of biomass (organic matter and nutrients) back into the food system in a way that adds the most value to the entire system, raises questions concerning human and animal health.

Questions that arise, can be classified on an animal, an excreta, the environment and food & feed level. What kind of production animals fit in a circular food system? How can we ensure their health and wellbeing, when their feed will change rigorously? How to overcome safety issues with recycling human excreta? How to relieve environment and improve the soil with animal manure and e.g. slaughterhouse waste? And how to overcome feed safety risks when feeding table and kitchen waste to insects, pigs or e.g. chickens.

Understanding, monitoring and evaluation safety issues in a circular food system will be the ultimate goal for the next decades, and thus contribute to human and animal health.

A transformation towards a more circular and sustainable food system is hindered by many safety concerns. These concerns can be targeted at different levels: I) animal, II) excreta, III) environment (water, soil, air) and IV) Food & Feed (see Figure 1).

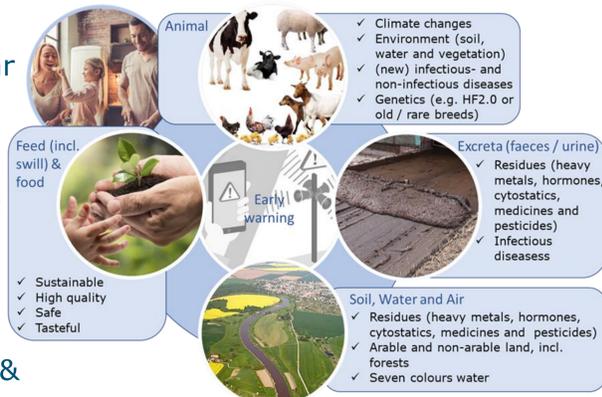
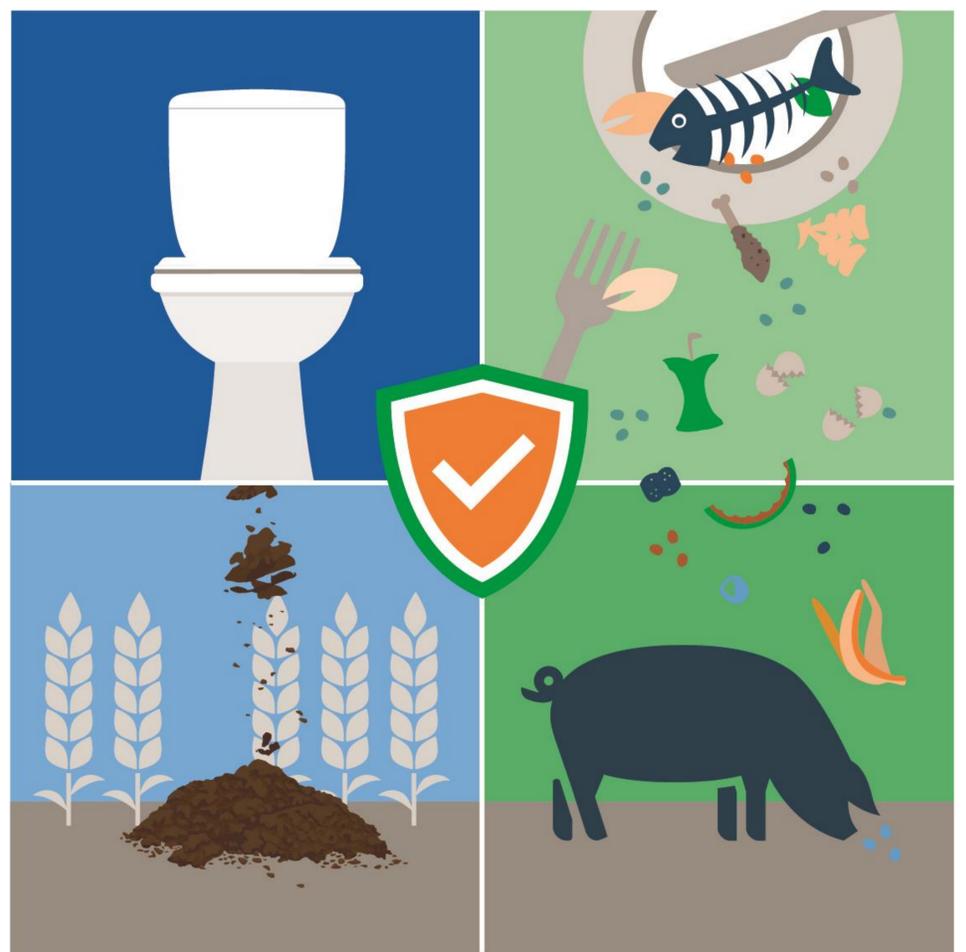


Figure 1 Complex challenges require a multidisciplinary, WUR-wide plus approach

TEAM C has been focusing on the role of ruminants (mainly cattle), pigs, chicken and insects in a circular food system, on the role of human excreta in a circular food system and safety concerns regarding animal (manure) and human excreta, the effect of e.g. animals and excreta on the environment and on biological hazards in food and feed.

Researchers, from both inside and outside WUR, will have to work together on complex questions, which often arise from concerns about the health of our (production) animals during the transition to a new food system. The growth of the world population to nearly 10.9 billion people is putting enormous pressure on food production. Farmers will have to produce healthy and sustainable food, increasingly guided by research, education, government, entrepreneurs and citizens. Complex challenges that require a multi-disciplinary, WUR-wide plus approach. Other knowledge institutes that will be involved include the Faculty of Veterinary Medicine, the Animal Health Service, Wetsus and RIVM. These initiatives are in line with concerns and needs from the field, will have reached a different technology readiness level after completion and therefore require financing from different financial resources. Finding answers together, is the ability to work together toward a common vision and a common goal of promoting and monitoring human and animal health.



The ultimate goal would be feeding the world population in a sustainable and safe way.

A balanced nutritious diet, shifting from conventional animal based proteins (such as meat, fish, poultry, eggs and dairy), towards plant-based proteins and proteins derived from our seas or aquaculture, will help us towards a sustainable food production.

The shift towards a circular society brings new challenges with regard human and animal health. Regarding these health risks we, among other things, focus on the use of human excreta and other waste streams.

Research will guide in our shift from an linear towards a circular society and help to expand our world safely.

## TEAM C

This sheet is a product of TEAM C, an agile team that has worked on one circular food system based on the principles of Imke de Boer and Martin van Ittersum on behalf of Martin Scholten

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