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# Circular food systems towards human and planetary health

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# Is there a role for animals in the food system?



Animals can have an important role if we redesign today's food system towards circular food systems



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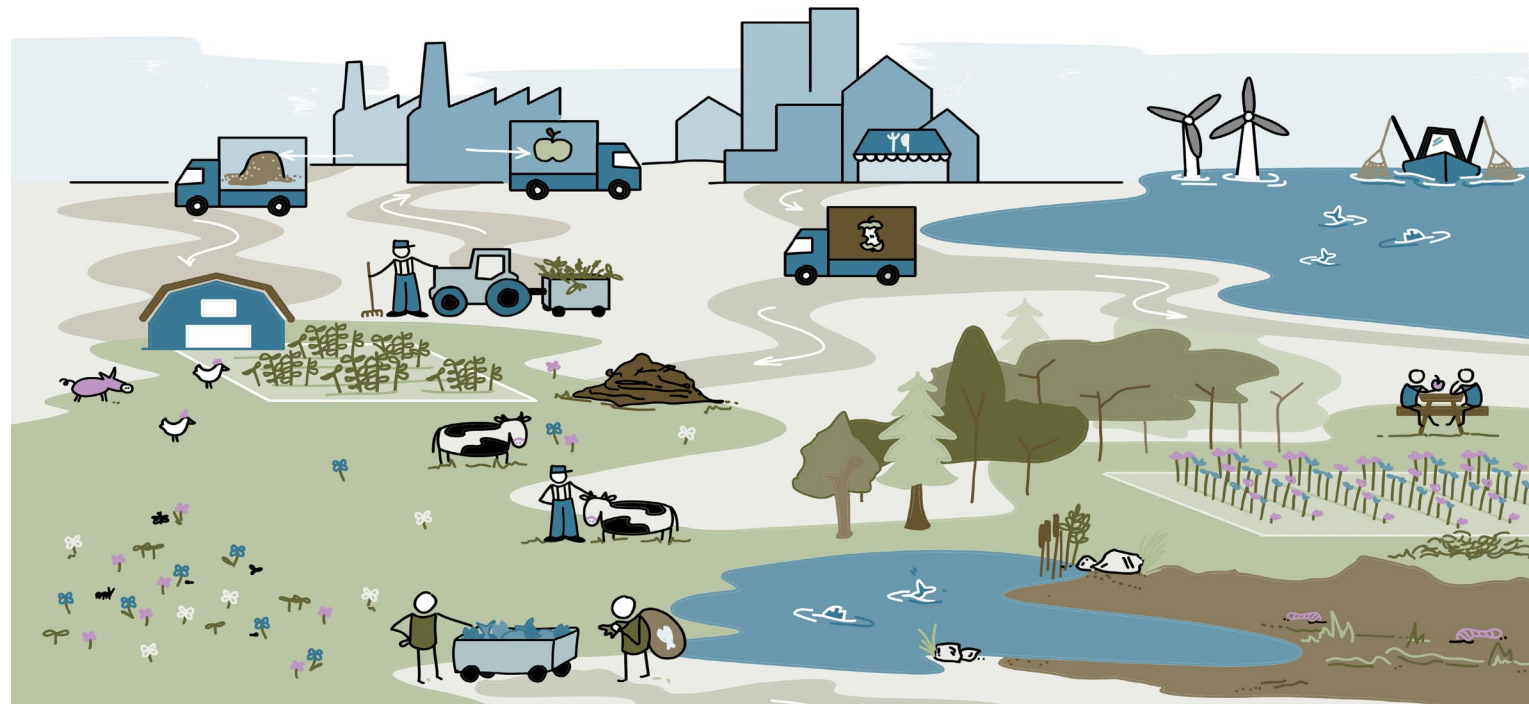




# How would such a circular food system look like?

## FUTURE FOOD SYSTEMS REDESIGN

van Zanten, 2020, WUR



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nature  
food

PERSPECTIVE

<https://doi.org/10.1038/s43016-021-00340-7>

Check for updates

Principles, drivers and opportunities of a circular bioeconomy

Abigail Muscat<sup>1</sup>, Evelien M. de Olde<sup>1</sup>, Raimon Ripoll-Bosch<sup>1</sup>, Hannah H. E. Van Zanten<sup>2</sup>, Tamara A. P. Metz<sup>2</sup>, Catrien J. A. M. Termee<sup>2</sup>, Martin K. van Ittersum<sup>2</sup> and Imke J. M. de Boer<sup>1</sup>

# Animals in circular food systems



Contents lists available at [ScienceDirect](#)

**Journal of Cleaner Production**

Global Food Security 24 (2020) 100333

Contents lists available at [ScienceDirect](#)

**Global Food Security**

Contents lists available at [ScienceDirect](#)

**Global Food Security**

journal homepage: [www.elsevier.com/locate/gfs](http://www.elsevier.com/locate/gfs)

**Global Food Security**

Volume 21, June 2019, Pages 18–22

Received: 18 December 2018 | Revised: 2 April 2018 | Accepted: 30 April 2018  
DOI: 10.1111/gfb.14321

**RESEARCH REVIEW**

**WILEY** **Global Change Biology**

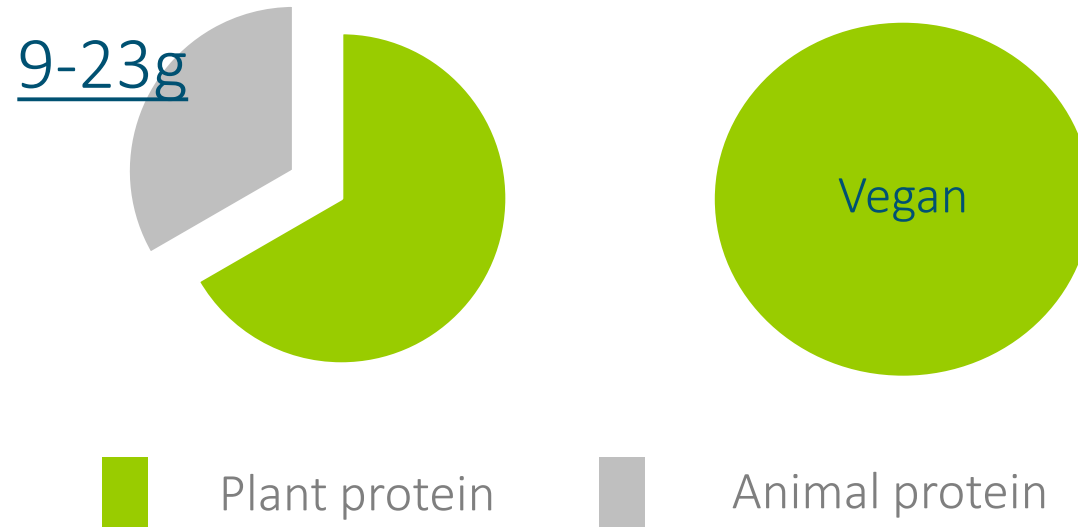
**Defining a land boundary for sustainable livestock consumption**

Hannah H. E. Van Zanten<sup>1</sup> | Mario Herrero<sup>2</sup> | Ollie Van Hal<sup>1</sup> | Elin Rööös<sup>3</sup> | Adrian Muller<sup>4,5</sup> | Tara Garnett<sup>6</sup> | Pierre J. Gerber<sup>1,7</sup> | Christian Schader<sup>4</sup> | Imke J. M. De Boer<sup>1</sup>

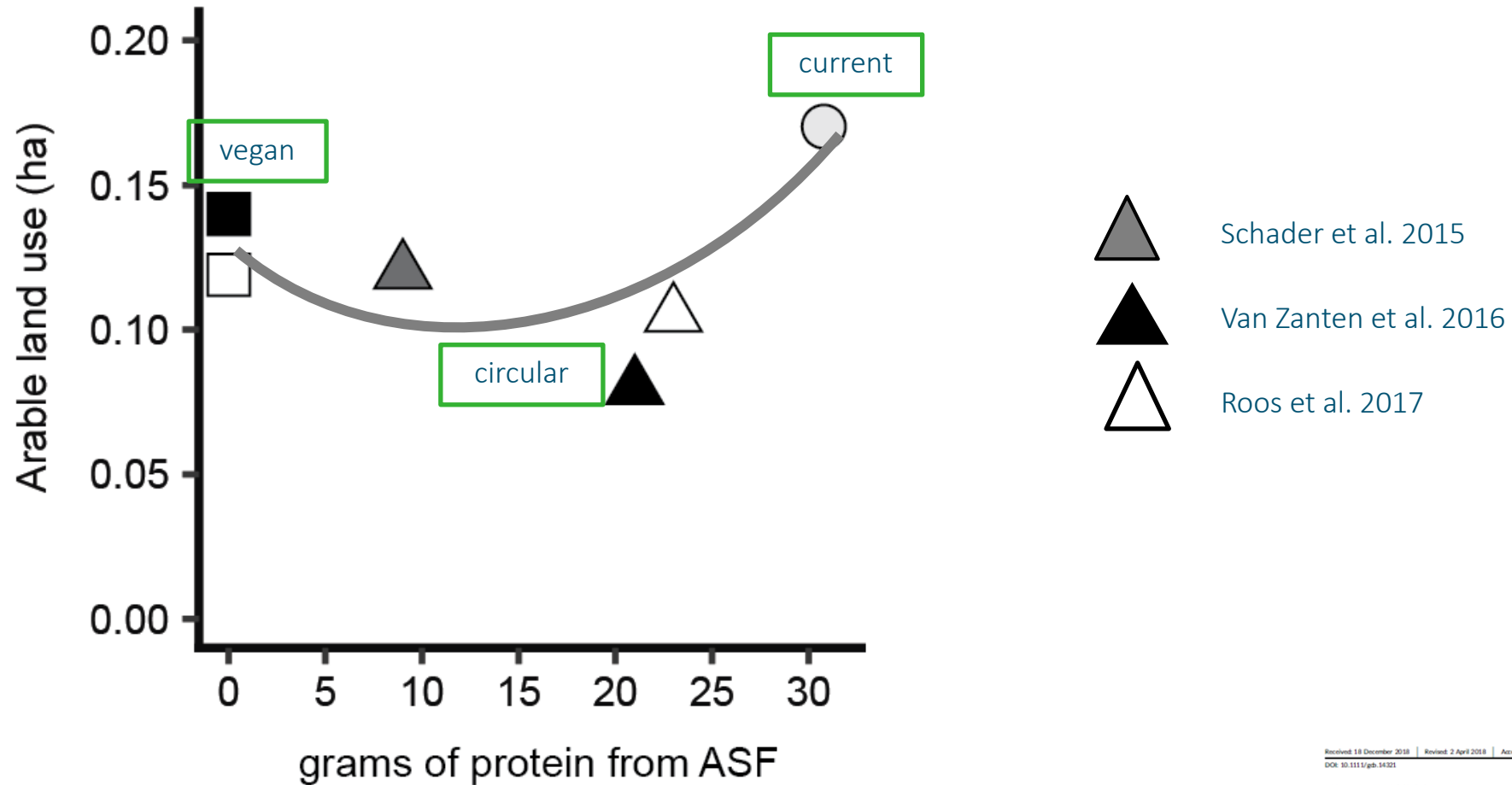


# Animals fed with the 'leftovers' from the food system

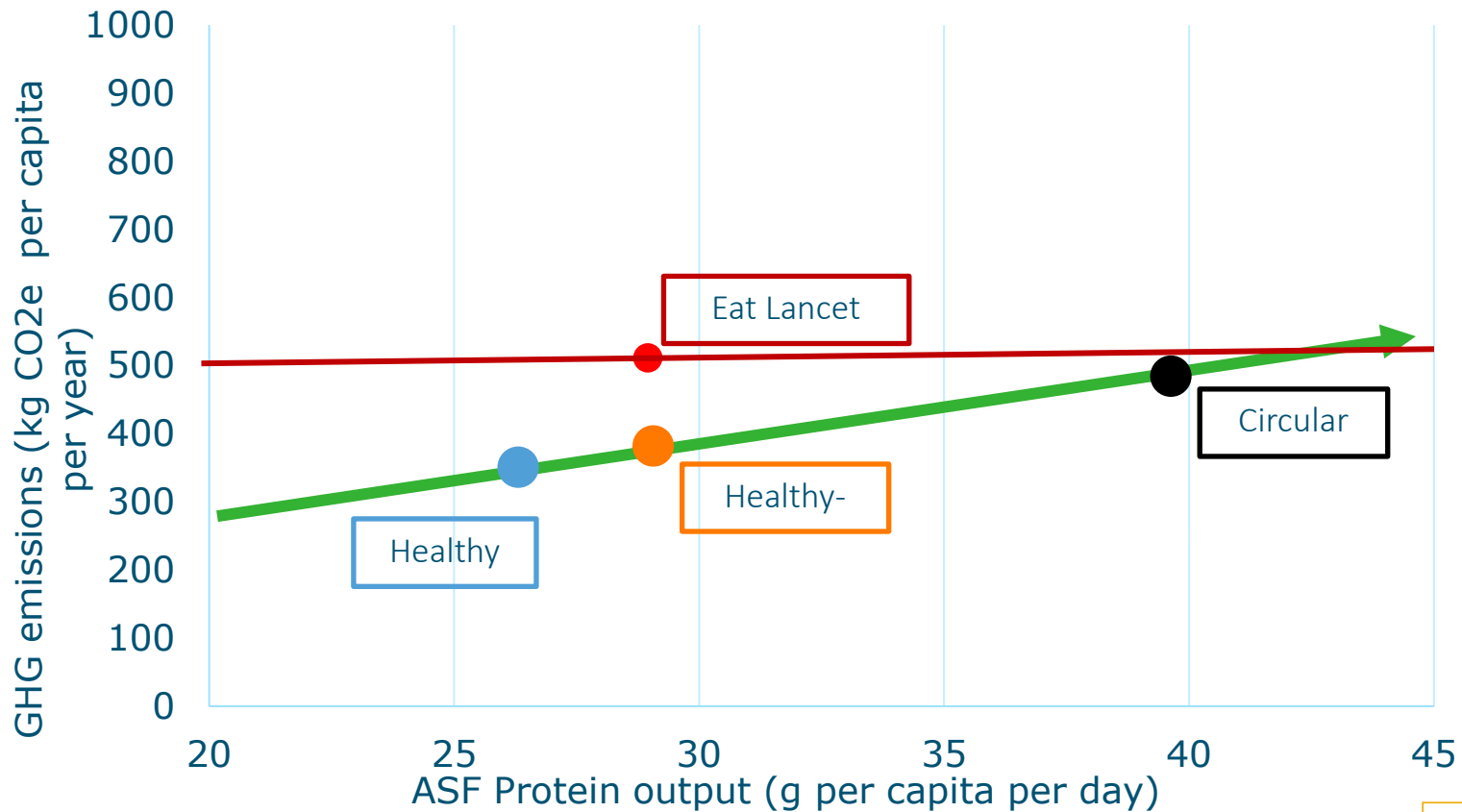
Daily protein requirement (60g)



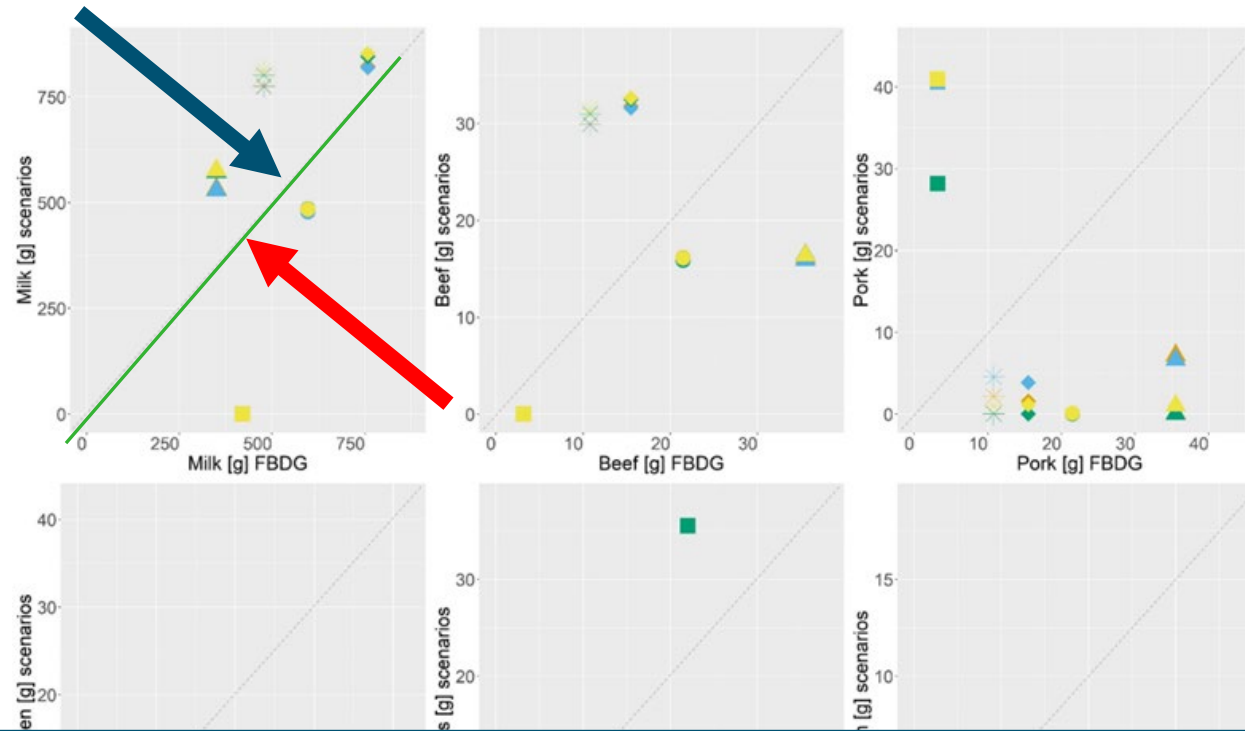
# Eating food from recyclers results in lowest land use



# GHG emissions reduced but healthy diets $\neq$ circular diets



# National dietary guidelines incompatible with circular food system principles



Guidelines based on health and environment

✕ Bulgaria ■ Malta ● Netherlands ▲ Sweden ▼ Switzerland ● MaxProtein ● MaxPolyUnsats ● MaxMinerals ● MaxVitamins

S2543-5196(22)00119-X  
 June 2022 /  
 Dietetics: Primary Research  
 GbM OA, CC BY-NC-ND 4.0 license

21TLPlanet0135  
 Articles  
 Rachel B

The compatibility of circularity and national dietary recommendations for animal products in five European countries: a modelling analysis on nutritional feasibility, climate impact, and land use

Anita Falck, René P M Cadornich, Imke J M de Boer, Adrien Muller, Christian Schuler, Benjamin van Soest, Ollie van Hal, Galia Pestaru, Sabina Rohmann, Mario Herrero, Henk H van Zanten



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# Recycling livestock no-regret solution



CIRCULARITY

## Upcycled non-competing feedstuff

Farm animals in circular food systems upcycle non-competing feedstuff and therefore reduce feed-food competition. This can increase global food supply while reducing pressure on the Earth's system.

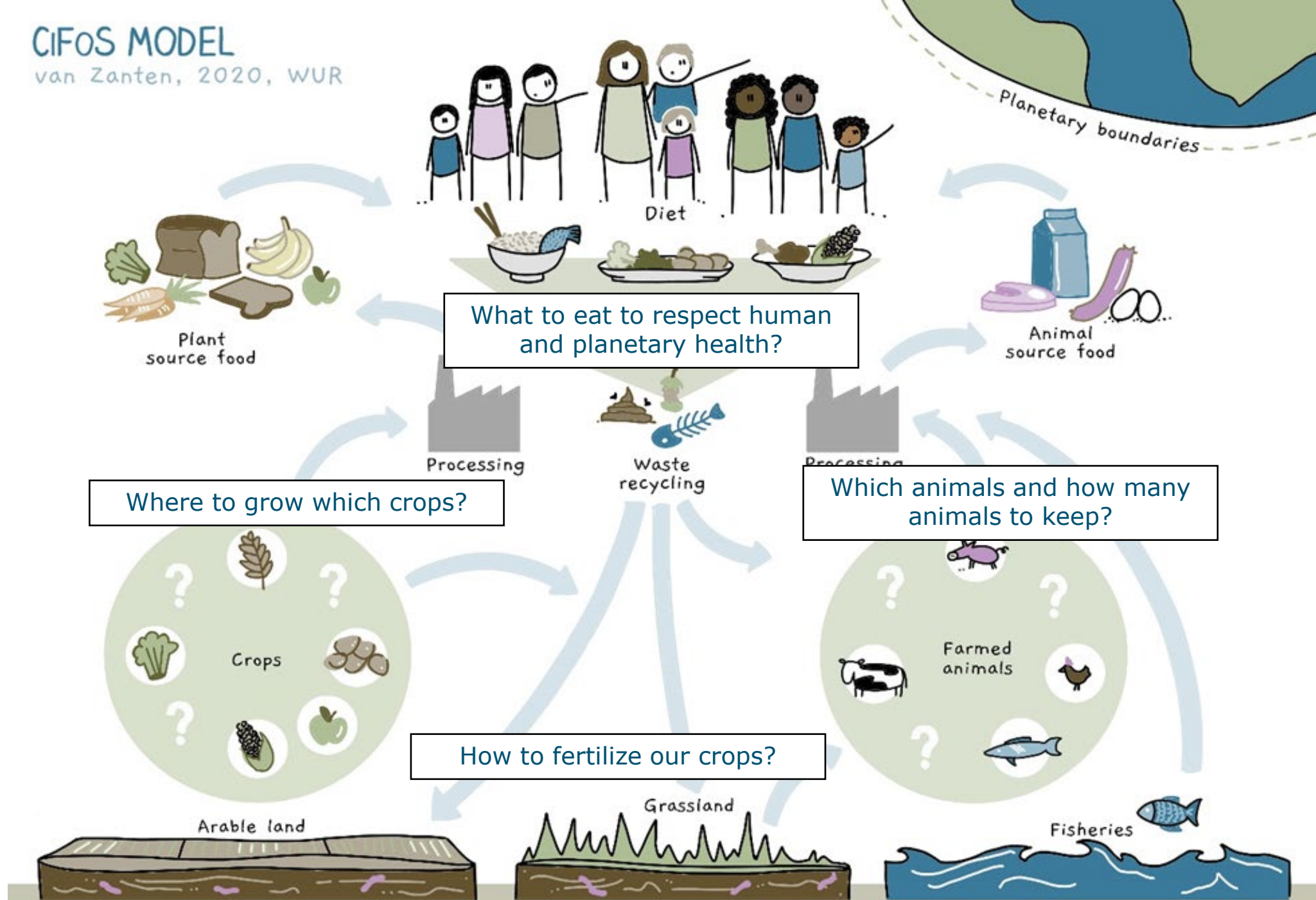
Hannah H. E. van Zanten

But their role depends on how we redesign the food system



# CiFoS MODEL

van Zanten, 2020, WUR



**Scenario AgriBase**

**Scenario CirAgri**

**Scenario CirHealth**

**Scenario CirPop+**

**Scenario AgriBase**

**Scenario CirAgri**

**Scenario CirHealth**

**Scenario CirPop+**















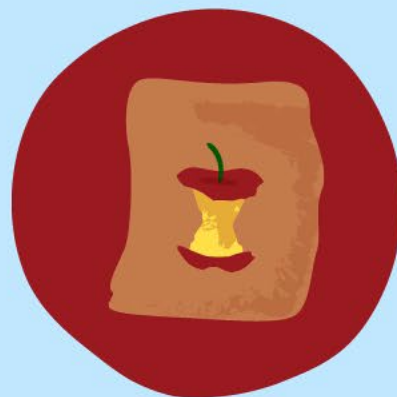














# The role of animals in future food systems

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- If we redesign the food system animals can play a role in future food systems
- This role will however largely be reduced
- This requires both production (crop and livestock) and consumption changes
- Careful research is needed based on a food systems approach



