

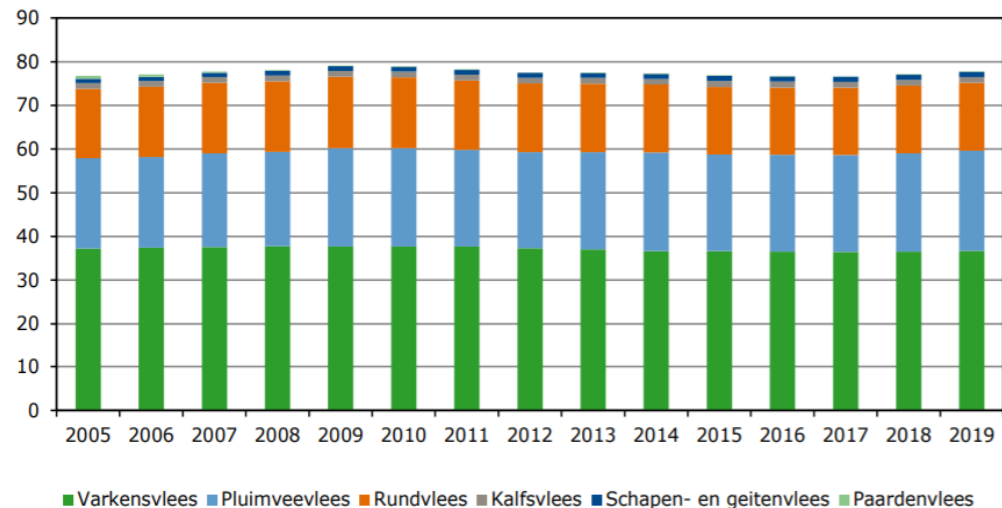
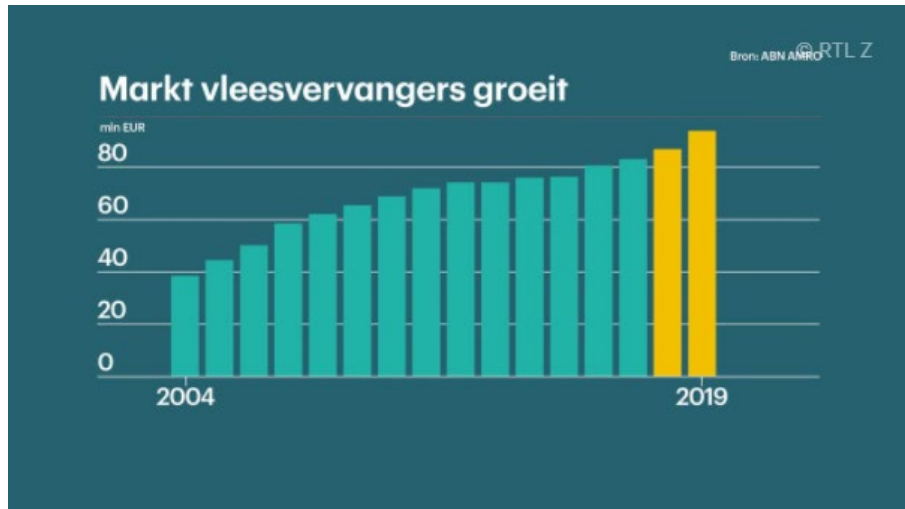
# Desirability and plausibility of meat alternatives

Barbara van Mierlo

Government Chemist Conference 23-24 June 2021



# Promising signs, but ambiguity



**Figuur 3.1** Vleesverbruik a) per hoofd van de bevolking in Nederland, 2005-2019 (kg)

# Diverging future visions

- Meat *or* all animal-based protein products?
- Protein products *or* fibre & nutrients?
- Just food *or* food & feed?
- Meat substitution “mimicking” *or* change of diets?
- Veganism *or* a better balanced diet?
- Self-sufficiency *or* efficient global value chains?
- Dutch consumption *or* also reducing export?



# Transitions involve resistance & conflicts

## Animal source foods in ethical, sustainable & healthy diets

A dynamic white paper - #ALEPH2020

ALEPH2020

ASFs and Livestock

Ethics

Planet

Human health

Experts

Concept: what is this website about?



The ALEPH2020 initiative (Animal source foods and Livestock: Ethics, Planet, and Human health) was launched at the end of 2020 by an international and interdisciplinary consortium of >35 scientific experts. The acronym refers to the first letter of the Proto-Canaanite alphabet 'Aleph', which later also morphed into the Greek 'Alpha' and Latin 'A'. Originally, the letter was derived from the West Semitic word for 'ox' depicted in a Proto-Sinaitic glyph, on its turn likely obtained from an Egyptian hieroglyph showing a bovine head. As such, it not only represented a vocal sound and scriptural element, but also notions of strength, vitality, fertility, and generosity. Throughout human pre-history and history, animals (either hunted or domesticated) and animal source foods (ASFs) have always held these connotations, as they were essential for survival and sustenance.



Frédéric Leroy @fleroy1974 · 8 jan.

Here's the happy bunch together: EAT's founder (middle with dog), the Prince (right), & a couple of GFI-linked folks at the UN headquarters in UN, discussing transition options to a veganized future.

This was in 2018.



Vegan Political Leaders, CEOs, and Royalty Gather at the United Nation...

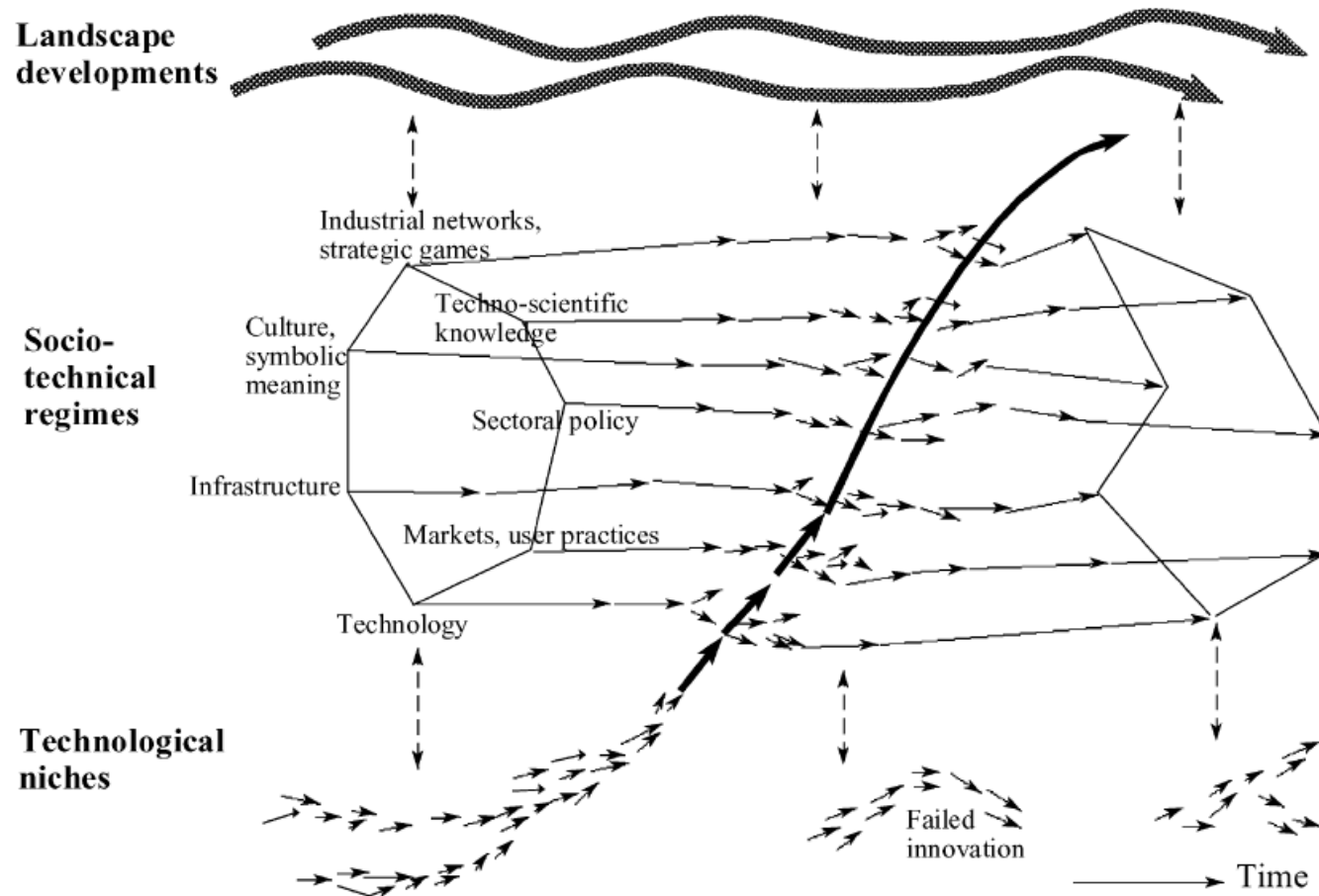
The 2018 Nexus Global Summit gathered vegan leaders at the United Nations New York HQ to discuss the future of food. Prince Khaled ...

livekindly.co

STOP THE  
VEGGIE  
BURGER  
BAN

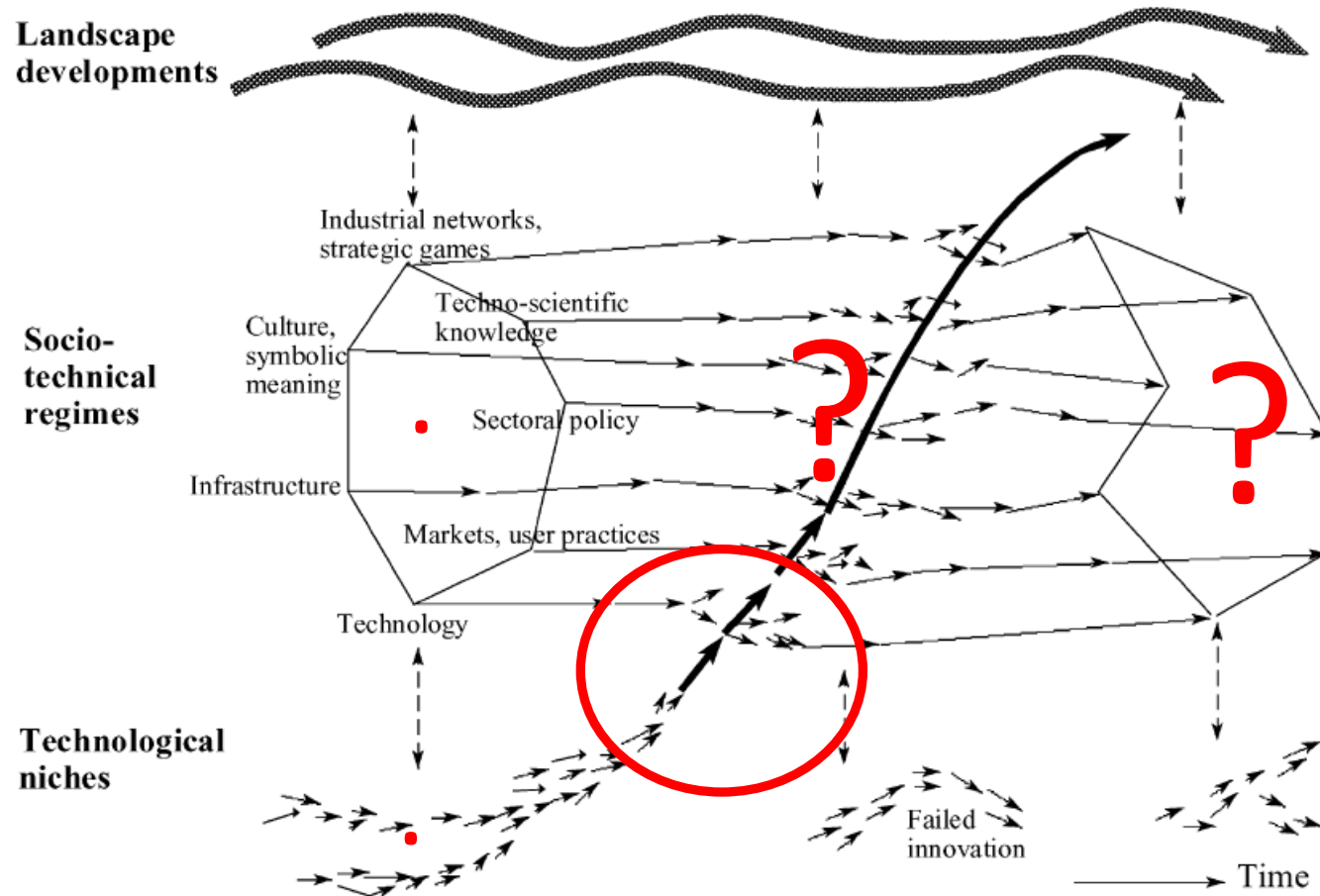
SIGN THE PETITION

# Multi-Level Perspective of transitions



Source: Geels, 2002

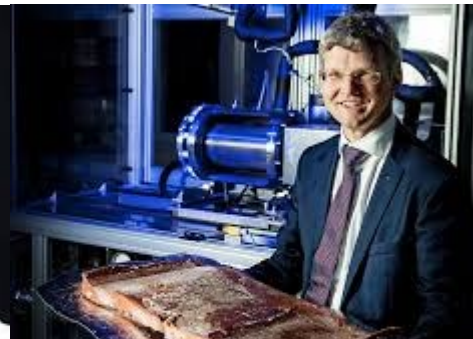
# Transitions involve fundamental uncertainty



Source: Geels, 2002

# Future outlook meat alternatives - interdisciplinary team WUR

- Cor van der Weele, Philosophy
- Peter H. Feindt, Strategic Communication
- Martinus van Boekel, Food Quality and Design
- Atze-Jan van der Goot, Food Process Engineering
- Barbara van Mierlo, Knowledge, Technology and Innovation



# Future outlook of meat alternatives

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- Whether and under what conditions could meat alternatives support a protein transition?
- Usually studied separately or from one perspective
- Integrative assessment of preconditions and implications

# Comparison of meat alternatives



Cultured meat

Algae

Insects



## Plant-based meat alternatives (PBMA)

A Plant Based Burger That  
BLEEDS ?!?!

Pulses



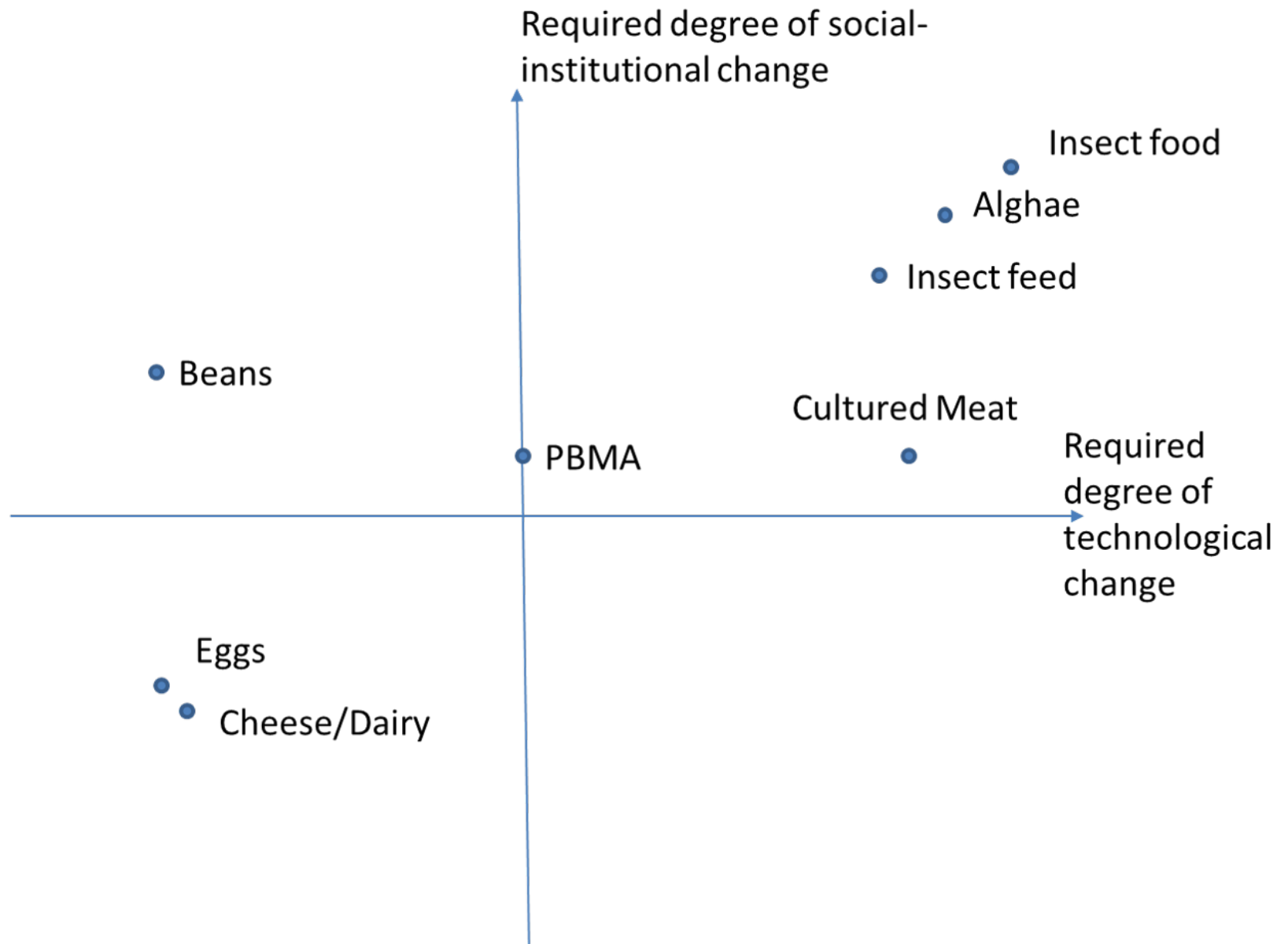
# Reflexive Integrative Comparative Heuristics

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- Social-institutional
  - cultural, social and institutional changes required
- Technological
  - state of the art, challenges
- Public health and safety
  - nutritional value
- Environmental sustainability
  - protein efficiency and energy input for processing

# Environmental issues

Cultured meat	Hygiene requirements and estimated high energy input. Inefficient protein conversion
Algae	Potentially high energy use for processing. Less land use. Impact at sea?
Insects	Efficiency depends on processing. Protein loss due to extraction No energy gains expected compared to beef
PBMA	Energy use depends on processing Use of less purified materials promising for protein efficiency
Pulses	High potential gains, little processing Gains for soil



# Conclusions

- The more transformation and processing of new products, the less certain the sustainability gains
- Widespread expectation that break-through technologies are required, but:
  - Existing and viable alternatives (legumes)
  - Social-cultural-institutional changes needed for transition pathways of break-through technologies
  - Potential competition between niche players for media attention, funding and niche market

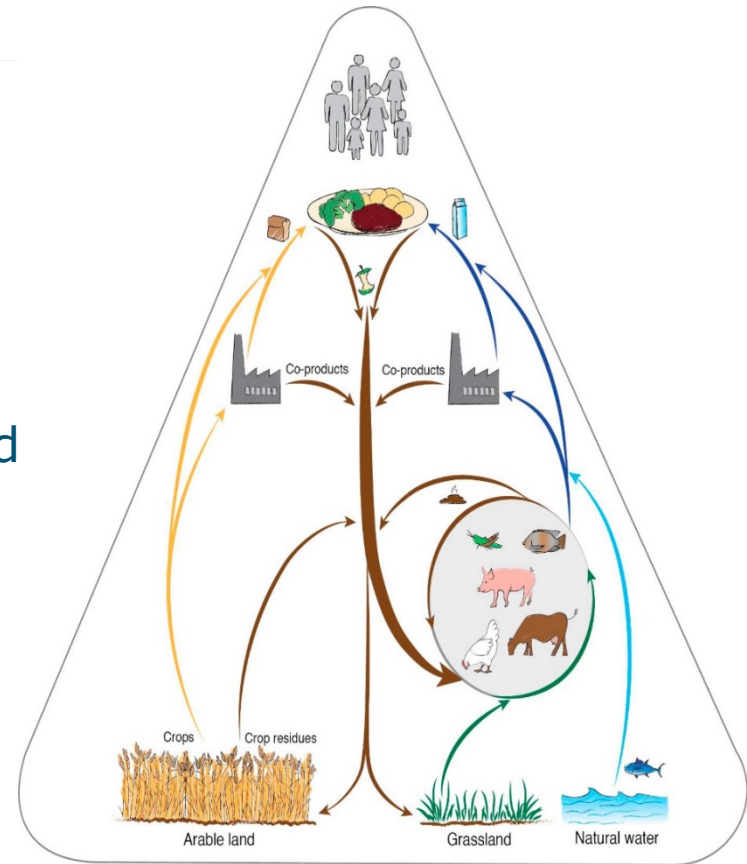
# Limited role social sciences

Research themes	Plant-based meat and milk alternatives	Cell-based meat and milk alternatives
Promissory narratives and tensions on markets	12 articles	17 articles
Consumer preferences, attitudes and behavioral change	38 articles	22 articles
Politics and ethics	8 articles	26 articles

# Priorities for social science research

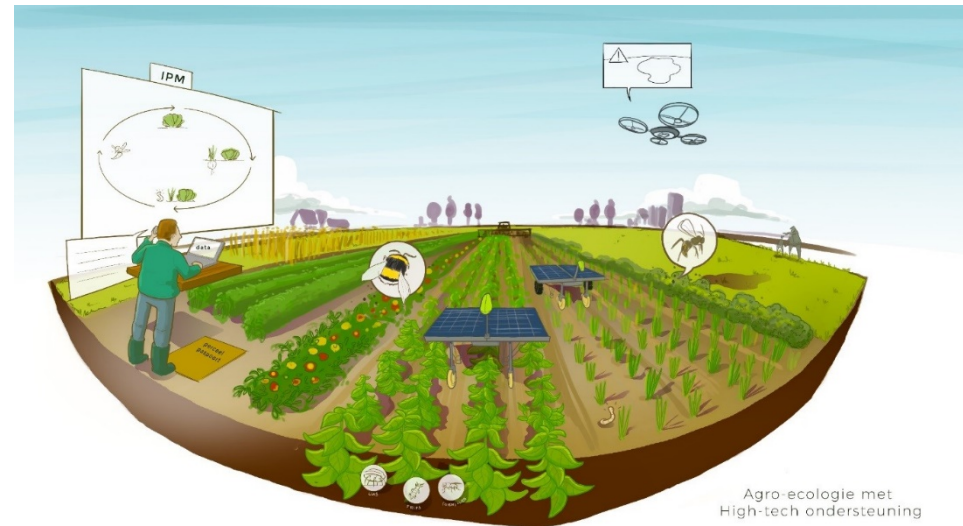
by Morris et al. 2021

- In- and exclusion in debates
- Transforming spaces for moving beyond animal-based food systems
- The roles and meanings of animals in food systems
- Eating practices and identities
- Impact on livestock farmers and input suppliers, rural communities



# Opening up

- Focus on “meat substitution” transition pathway, but neglect of alternative pathways:
  - Veganism
  - Alternative farming systems
- Focus on new technologies, neglect of necessary institutional changes



Agro-ecologie met  
High-tech ondersteuning

# Many thanks!

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Link to article:

<https://www.sciencedirect.com/science/article/pii/S0924224418308409>

