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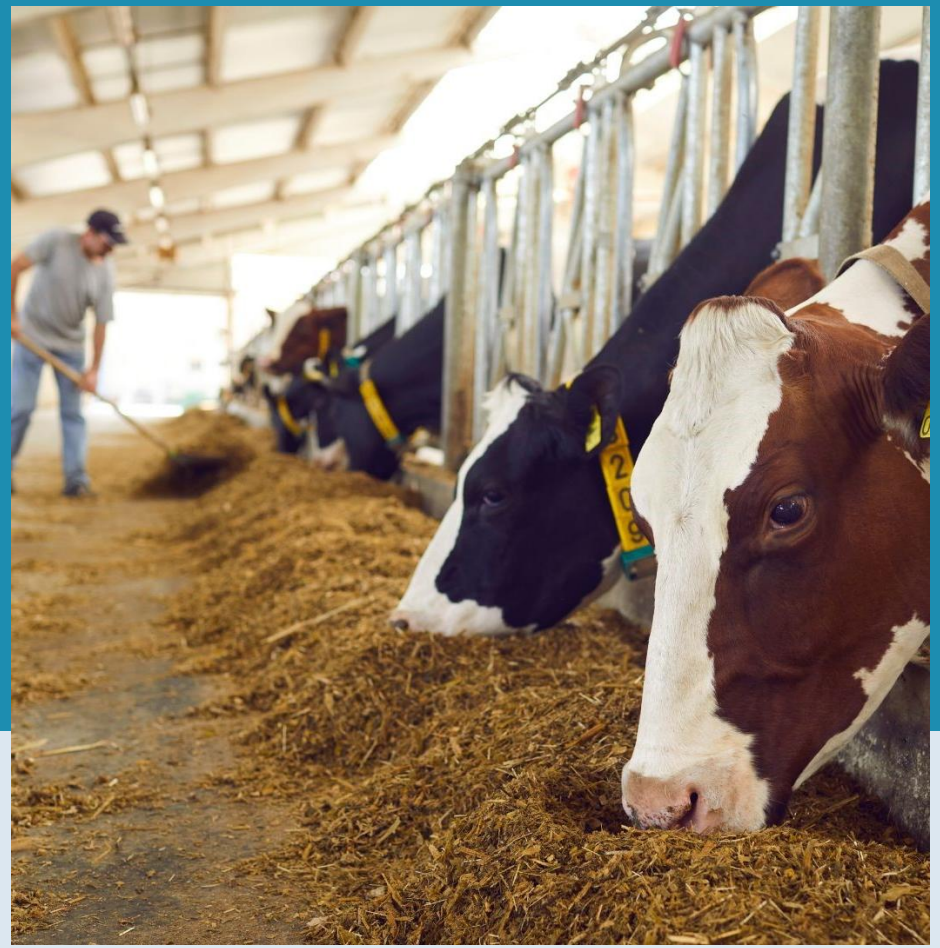
What Bio-Engineering students think about the role of livestock in future farming systems, and what they wish for the future



Claudia Leon Pedraza, Dries Mennen, Emilio Marques Reyes, Luiz Neyens, Marius Desmedt, Raven Vanneste, Tess Keppens

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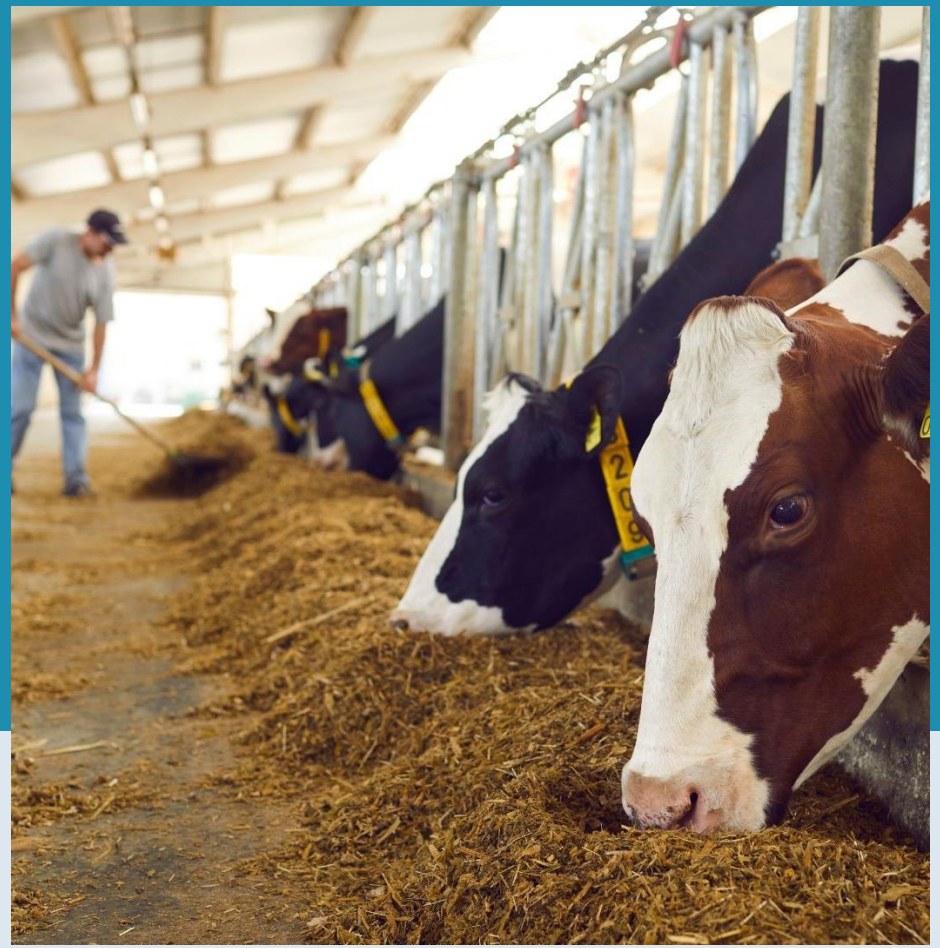
Master students of course Sustainable Precision livestock Farming

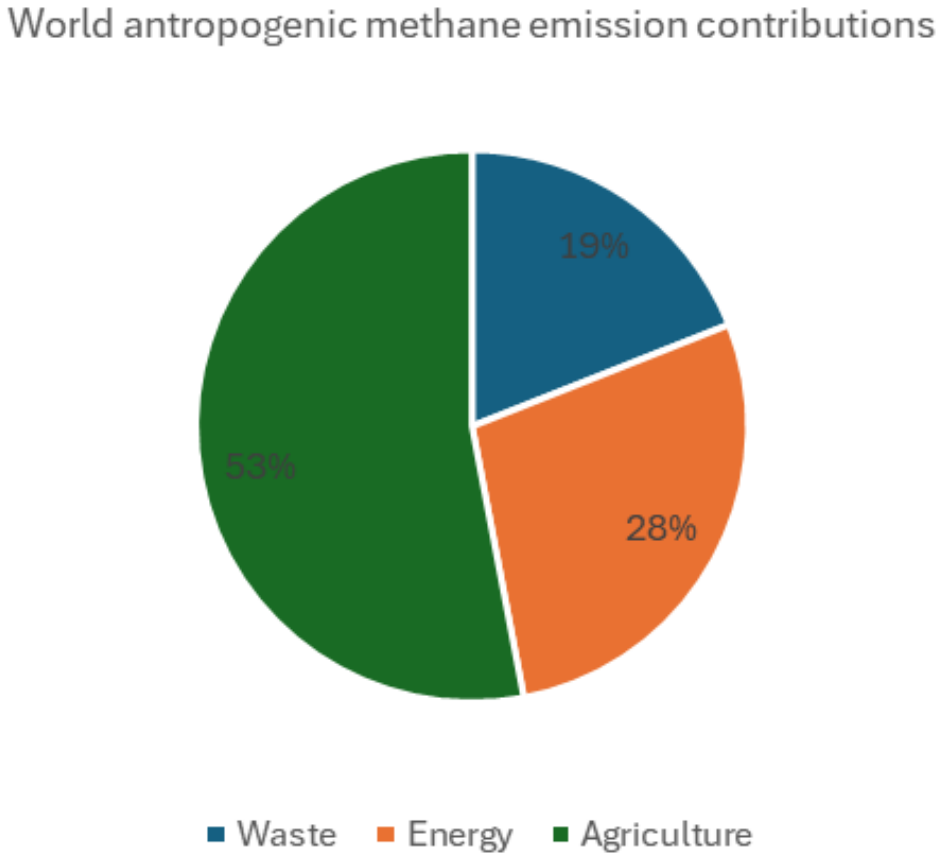
Claudia Leon Pedraza, Dries Mennen, Emilio Marques Reyes, Luiz Neyens, Marius Desmedt, Raven Vanneste, Tess Keppens



Represented by Tess Coppens

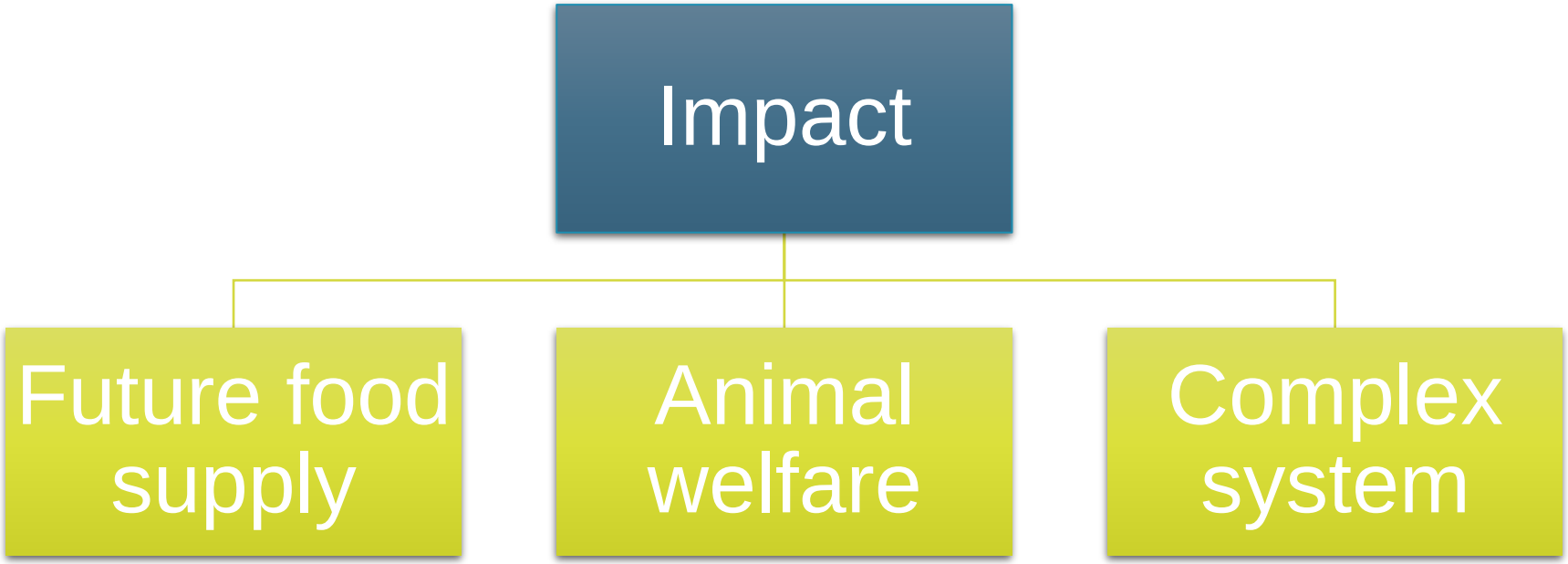
Coordinated Prof Tomás Norton

Why is the Livestock Sector Important?



Source: Yusuf et al. 2012

What attracts us



Major Challenges Facing Livestock Production

Production efficiency	⟷	Animal welfare
Possible young farmers	⟷	Limited attractiveness of careers Lots of regulations and rules
Relative 'old' farmers	⟷	Adopting new technologies

The Role of Technology in Modern Farming

Benefits and Appeal

Shifts due to technology

Defining the Ideal Agricultural System

No perfect universal system; it depends on prioritised values (welfare, climate, economics) and location.

- Collaboration
- Balance
- Education
- Global regulations

Future Outlook and EU's Position

Sector Future:

- Meat vs dairy & eggs
- PLF→ **sustainability**, **efficiency** and **animal welfare**

- EU challenges:
  - Regulation → **high costs** → hard to compete
  - **Slower** adoption of new tech

- EU advantages:
  - High standards → **consumer trust**
  - **long-term global advantage**

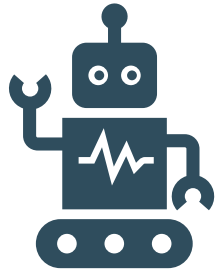
What about a Future Career in the Livestock Sector?

Considered Areas of Employment:

Bridge between actors

&

Alternatives



Technology-Driven Roles:

Specific interest: sensor development in the sector

Student quotes

“Will we still eat meat in 100 years?”

“From cozy farms to industrial systems: is this evolution or a compromise?”

“Is such a complex puzzle even solvable?”

“Innovation and ethics can go hand in hand, if we design them that way.”

“Transparency and collaboration are the keys to progress.”

“The future of farming isn’t about choosing sides, but finding balance.”

THANKS for listening

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Starting PhD Students' Perspectives on the Role of Livestock in Future Farming Systems

Presenter: Amélie Canon

Promotor: Prof. Tomas Norton

M3-BIORES

KU Leuven

About Me: From Sociology To Bioscience Engineering

Always passionate about understanding the world around me, I started a bachelor in **sociology**. However, I quickly realized that it would not give me enough tools to have an impact.

I decided to continue with **bioscience engineering** because it was the best way to get knowledge on my other favorite topics such as the environment, climate change and nutrition.

About Me: Master thesis - Modeling methane emissions in goats

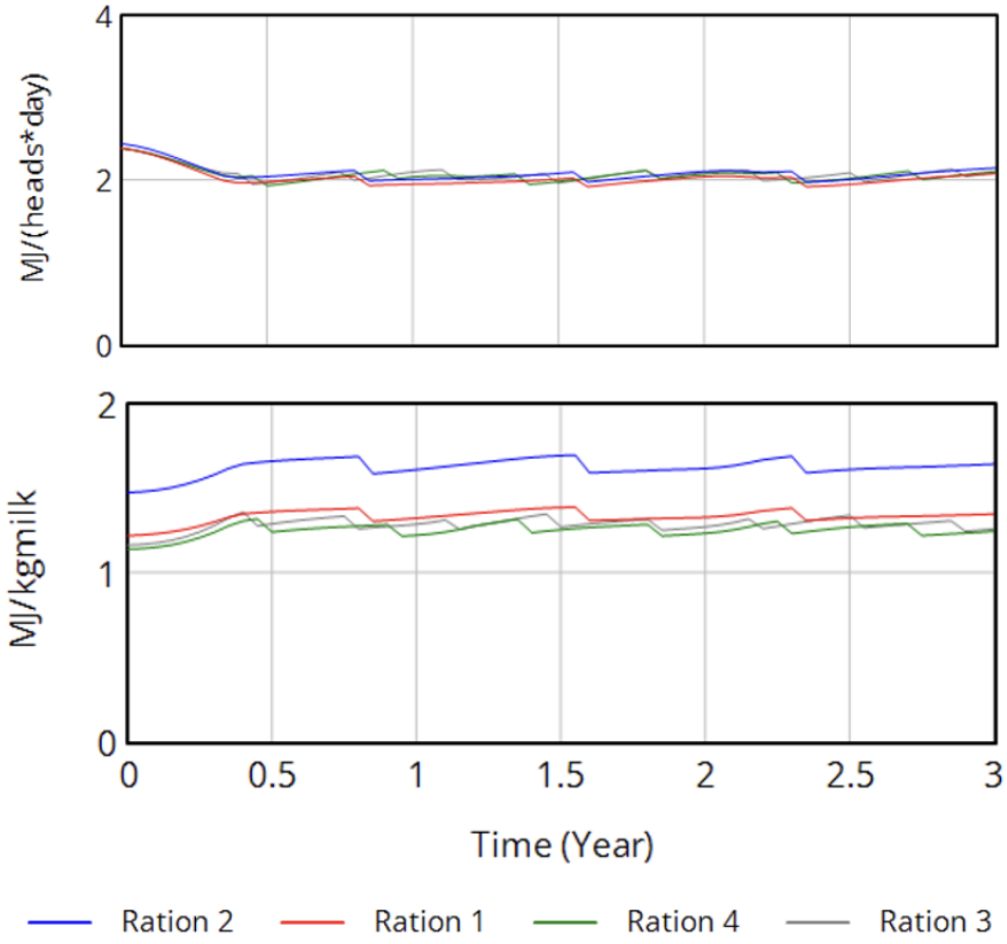
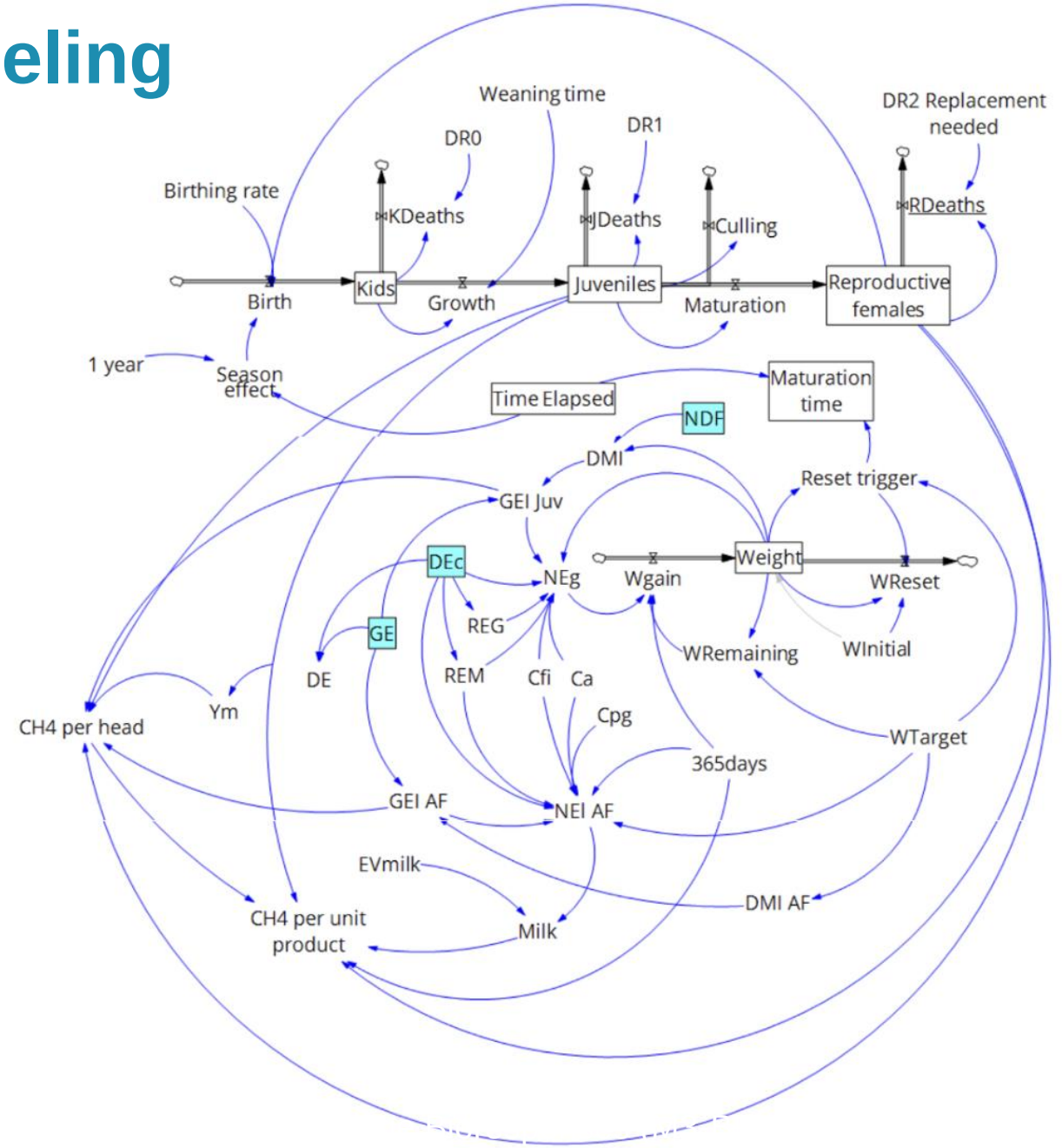


Figure 18: Absolute enteric CH_4 emissions per goat per day (MJ/day) (top) and emission intensities (MJ-CH_4/ kg milk) (bottom) for the four rations. Both are considered at herd level, therefore including emissions from juveniles and reproductive females.



Current project: PhD at KULeuven

System Dynamics Modeling of Grassland Recovery for Improved Management of Mobile Chicken Coops

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Current project: PhD at KULeuven

System Dynamics Modeling of Grassland Recovery for Improved Management of Mobile Chicken Coops

Fundamental management questions:

1. Time it takes for given number of animals to consume a given area
2. Time for the same given area to fully recover the vegetation
3. Total carrying capacity of the pasture (N' of animals)
4. Pasture quality sustainability over time

My Perspective on the Role of Livestock

(Boyle & Stevenson, 2024; Schillings, Bennett & Rose, 2021; Phillips, 2024; Mullan et al., 2024).

The future of livestock depends on addressing ethical, social, and sustainability challenges directly.

I argue for:

1. Ethics at the center
2. Public research enabling transition
3. Fewer animals, higher welfare
4. Strong support for farmers

1. Ethics Must Take Center Stage

- Animal welfare is a pillar of sustainability, not an optional add-on.
- “Techno-fixes” risk ignoring animals’ behavioral and emotional needs.
- Precision Livestock Farming (PLF) raises ethical risks: animals may be “objectified,” systems may favor sensors over natural behavior.

2. Public Research Should Support Transition

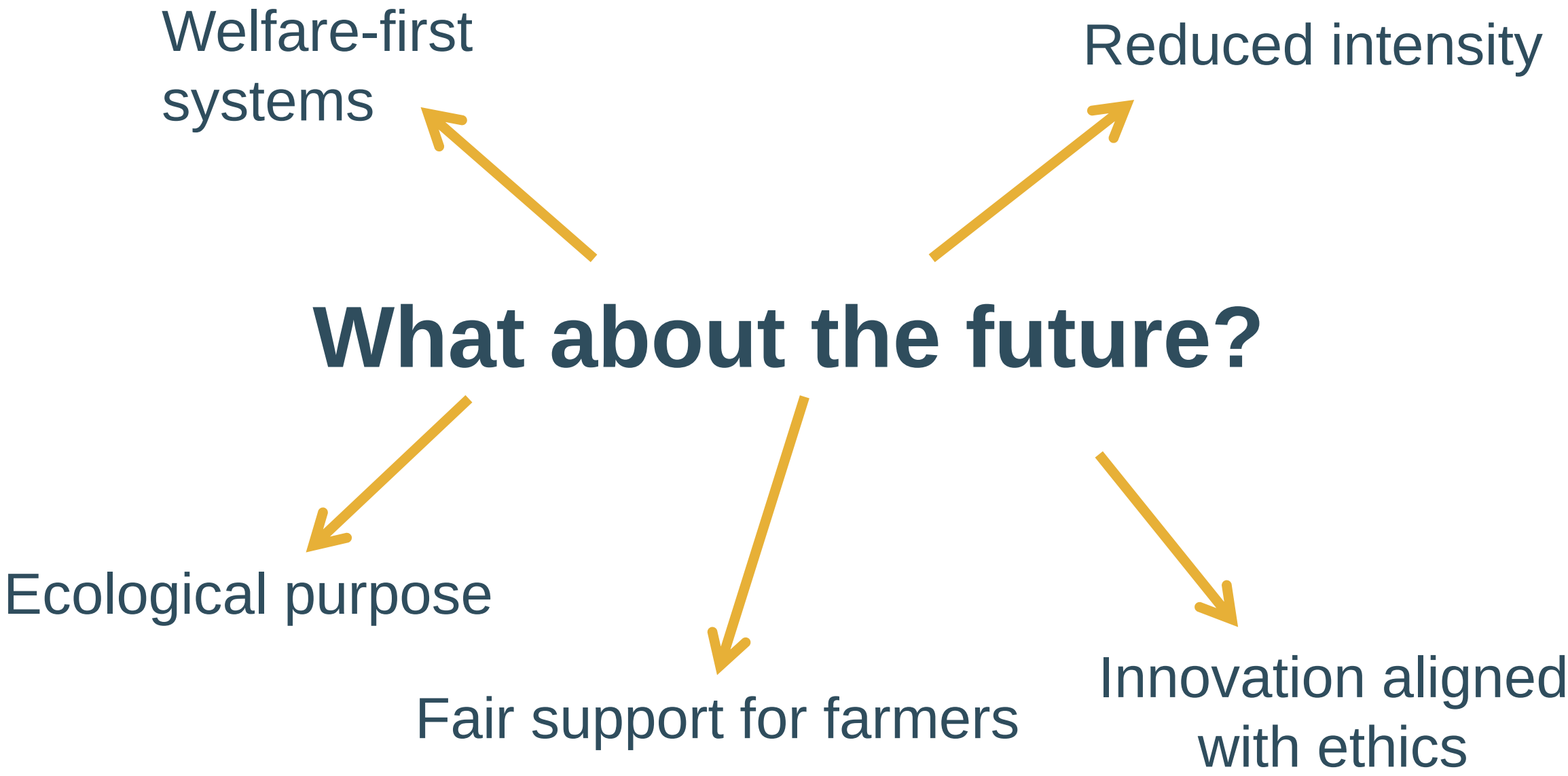
- Research should drive system-level transformation, not only refine intensive models.
- Optimizing existing high-intensity systems may not solve wider sustainability or legitimacy issues.
- A multi-disciplinary approach (ethics, economics, animal science, policy) is essential.

3. Fewer Animals, Better Treatment

- E.g.: Boyle & Stevenson (2025) estimate that to switch to higher-welfare broilers in the EU, production would need to drop ~ 30%.
- Public concern for welfare is increasing and diverging from producers' attitudes, indicating societal legitimacy issues.
- Framing farming under One Welfare / One Health aligns welfare, human health, and environmental concerns.

4. Farmers Must Be Supported, Not Blamed

- Farmers face constraints (climate change, resource costs, social licence) which limit their ability to improve welfare.
- Effective transition needs policy support: incentives, training, risk-sharing.
- Ethical reforms must be feasible in real-world farming contexts.


Welfare-first systems
Reduced intensity
What about the future?
Ecological purpose
Fair support for farmers
Innovation aligned with ethics

To contribute: Livestock Innovation Environmental Future - Centre of Vocational Education

- Erasmus+ Centre of Vocational Education and Training in Sustainable Livestock Production
- 14 Partners from 8 EU Countries: Belgium, Greece, Portugal, Italy, Romania, France, Luxembourg, & Spain

LiveCoVET
LIVESTOCK INNOVATION ENVIRONMENTAL FUTURE: CENTRE OF VOCATIONAL EDUCATION

- Urgent need for sustainable practices in the EU livestock sector.
- Sector faces environmental challenges (climate change, GHG, resources, pollution).
- Gap exists between current VET skills and industry needs (green & digital skills).

To contribute: Livestock Innovation Environmental Future - Centre of Vocational Education

- Establish a Centre of Vocational Excellence (CoVE) bridging the gap between VET and the sustainable livestock sector.
- Empower learners (students, farmers, professionals) and VET providers.
- Equip stakeholders with necessary green and digital skills across Europe.

Develop & Implement a Modular VET Curriculum tailored to sustainable livestock practices

Create a user-friendly Digital Platform for education, knowledge sharing, and collaboration

Enhance VET Provider Capacity by training educators on sustainable farming education

Train 1200 Farmers & Professionals across 8 countries (BE, GR, PT, RO, FR, LU, IT, ES)

Foster a Collaboration Network of farmers, VET providers, industry, and policymakers

→ Overall Goal: To enhance the capacity of VET providers and empower learners with the necessary green and digital skills for sustainable livestock farming practices across participating EU regions.

LiveCoVET
LIVESTOCK INNOVATION ENVIRONMENTAL FUTURE: CENTRE OF VOCATIONAL EDUCATION

Project Title: Livestock Innovation Environmental Future: Centre of Vocational Education

Project Acronym: LiveCoVET

Project Number:101193890

Co-funded by the European Union

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