

QUESTIONS FOR ELIN ROOS, WP LEADER, WP 5

WP5 – Re-Assessment of livestock farm systems

-Introduce yourself, your professional background and your role within the Re-Livestock project

My name is Elin Röö. I am an associate professor at the Swedish University of Agricultural Sciences, in Uppsala, Sweden. I work broadly on the topic of food system sustainability, that is in a nutshell how we can feed a growing world populations healthy diets while minimizing negative environmental impact. My main expertise lays in assessing the environmental impacts of different types of foods and agricultural production systems, including livestock systems. In Re-Livestock I lead the WP on environmental assessment.

-Describe Re-livestock in 1 sentence

Re-livestock is a large truly interdisciplinary projects that brings together expertise within animal feeding, breeding and management and us working with environmental and animal welfare assessment with the aim to make future livestock systems more sustainable and resilient.

-What are the main activities being carried out within your work package?

First we work on method development, more specifically compiling information on how to account for changes in carbon stocks when assessing livestock systems, how different metrics can be used and which functional units that are recommended. We will then apply life cycle assessment (LCA) to a selection of experiments to investigate what kind of environmental improvements these can bring. We will also look at correlation between different indicators to identify where we have synergies and trade-offs. In addition, we develop methods and indicators to measure animal welfare aspects and resilience of livestock systems. Finally, we will compile information on existing assessment tools and investigate how these can be improved based on the knowledge developed in the project.

-You are exploring the efficiency and resilience of innovative technologies tested in feeding, breeding and farm management. Could you explain how these topics are interrelated?

Resilience and efficiency in livestock farming are closely connected and often work hand in hand to ensure the sustainability and success of farming operations. However, there

might also be trade-offs. Efficient livestock farming involves maximizing output (e.g., meat, milk, wool) while minimizing inputs (feed, water, energy). This efficiency can in one way contribute to the farm's resilience by ensuring the most effective use of resources. However, if efficiency is increased through the use of imported feed for example, it might decrease the resilience regarding potential feed shortages or price fluctuations. Resilient livestock farming also involves the ability to adapt to changing environmental conditions such as extreme weather events or shifts in climate patterns. Efficiency plays a role here by promoting practices that reduce environmental impact and increase the farm's ability to adapt. For example, implementing sustainable grazing practices or investing in infrastructure that conserves water resources contributes to both efficiency and resilience. Manage disease and health of the livestock also contributes to efficiency, but also the resilience of the farm by reducing risks associated with diseases and improving overall productivity. In summary, resilience and efficiency in livestock farming are interconnected. Building resilience involves strategies to withstand various challenges, while efficiency ensures that resources are utilized optimally to support the farm's ability to adapt, recover, and thrive in changing conditions. Both aspects are critical for the long-term sustainability and success of livestock farming operations.

-What type of tools you will use? What is the potential and utility of models? (Try to put stress on the practical use of models sometimes seen as just sophisticated artifacts consuming data and giving results difficult to apply?)

We will use Life Cycle Assessment (LCA) that has been a valuable tool in evaluating the environmental impact of livestock systems. LCA helps quantify the environmental footprint of livestock systems, considering factors like greenhouse gas emissions, land use, water consumption, and energy use throughout the entire life cycle of the product (from feed production to processing and consumption). LCA is useful for identifying specific stages of the livestock production chain that have the most significant environmental impact. It helps pinpoint areas where improvements can be made, such as optimizing feed composition, reducing waste, or implementing more efficient animal management practices. It also allows for the comparison of different livestock production systems (e.g., grass-fed vs. grain-fed beef) to determine which might be more environmentally sustainable. This comparison aids in decision-making for farmers, policymakers, and consumers aiming to support more eco-friendly practices. Overall, LCA has been instrumental in providing a comprehensive understanding of the environmental implications of livestock production systems, facilitating informed decision-making, and driving improvements towards more sustainable practices in the industry.

We will also use data collected from the case study farms using the PG-tool. We will analyse this data using methods such as Principal Component Analysis and Fuzzy Cognitive Mapping to identify possible trade-offs between sustainability dimensions.

In addition, we will do more explorative work in relation to how animal welfare and resilience can be measured using different indicator based frameworks.

-Is Re-Livestock just using existing models or will the project improve them?

There is an explicit aim in WP5 to also improve models and tools, especially in novel areas as the assessment of animal welfare and resilience.

-What will be the outcomes and results you expect to obtain from your WP? (these can be technical or other type of innovations, advance in methods and knowledge, recommendations for practices or policies, insights to what may happen in the future so as to guide policies...).

The outcome from this WP will be twofold. First, we will get results on how the different innovations tested in the experiments deliver in terms of reduced negative impact on the environment, animal welfare and resilience. This knowledge will be crucial for policy maker and farmers alike when deciding in which direction to move to make livestock systems more sustainable. Second, in this WP will further develop and improve methods and tools for assessing livestock systems which will advance this field of research and provide better tools to researchers and practitioners.

-What do you think may be the main benefits of Re-Livestock for the sector and for society in general (linking to the WP challenge/s)

There are a set of challenges to current livestock systems and much work is needed to improve them. Re-livestock will develop a lot of knowledge in different areas related to the feeding, breeding and management of livestock and how these improvements deliver in terms of decreased negative environmental and animal welfare impacts both at farm, product and food system scale. Hopefully, with this knowledge we can all help moving livestock systems in a more sustainable direction.