

TOWARDS A RESPONSIBLE LIVESTOCK SECTOR IN EUROPE

—
A VISION FOR INNOVATION AND
SUSTAINABILITY
&
A STRATEGIC RESEARCH AND
INNOVATION AGENDA

Publications from the Animal Task Force

Challenges, ways of progress and suggested priorities for research for Horizon Europe to enhance innovation and sustainability in the livestock production sector of Europe's food supply chains





INTRODUCTION

A VISION FOR THE FUTURE OF THE EUROPEAN LIVESTOCK SECTOR

Livestock systems are critical to Europe's food, environmental, and socio-economic resilience. As the EU transitions towards a climate-smart, circular bioeconomy, livestock should be part of this transition.

Livestock farming is criticised for its environmental impacts and possible contribution to health issues, which should continue to be reduced despite progress having already been achieved. On the other hand, livestock have positive contributions to the environment, biodiversity and to society in general that should be enhanced, and animal sourced foods also make positive contributions to health and welfare (Figure 1).

ATF considers the diversity of farming systems and agro-ecological-based production systems as a strength and seeks to use research and innovation to improve all systems, including the sustainability of the current European intensive systems.

LOOKING TO THE FUTURE: THE FUTURE ROLE OF RESPONSIBLE LIVESTOCK IN SUSTAINABLE AGRI-FOOD SYSTEMS

We need to demonstrate how to maximise synergies and avoid trade-offs between priorities knowing that what livestock sustainability means in a specific situation will depend on a large range of factors. To fulfil their roles, livestock systems should evolve to provide a range of responsible goods and services that are as large as possible, sustainable and compatible, rather than being guided by the single goal of commodity production. **Livestock are more than food!**

We should redesign the place and role of livestock within sustainable agri-food systems, with livestock as a key component of the solution. Livestock are key as they are recyclers by nature (Figure 2):

- Recycling non-edible biomass into the food chain
- Providing nature based organic fertilisers to close the nutrient cycles
- Providing by-products for pharma, biofuel, textiles, feed
- Providing ecosystem services
- Enhancing crop diversification with additional benefits



FIGURE 2. LIVESTOCK ARE KEY AS THEY ARE RECYCLERS BY NATURE

The question should therefore be “How can we increase the net social and environmental benefit of livestock, while ensuring the costs are distributed equitably?”

The concept of **Responsible Livestock** provides the guiding vision: systems that contribute to food security, ecosystem services, and rural vitality while staying within planetary boundaries.

By “**Responsible Livestock**” we mean livestock farming contributing to circular and resilient agriculture ensuring food security while:

- keeping resources use within the planetary boundaries,
- promoting the provision of ecosystem services and biodiversity,
- reducing the negative net environmental impact associated with that production,
- ensuring high health and welfare standards for livestock,
- providing better human health and well-being,
- contributing to social and economic sustainability through vibrant rural livelihoods,
- enhancing the resilience of the sector by increasing its ability to withstand physical and financial shocks.

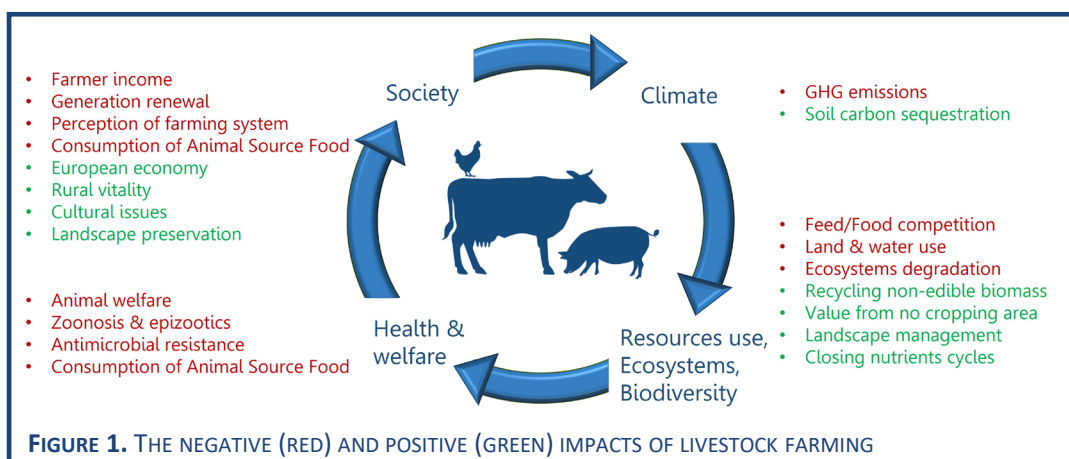


FIGURE 1. THE NEGATIVE (RED) AND POSITIVE (GREEN) IMPACTS OF LIVESTOCK FARMING



THE PATHWAYS OF PROGRESS

Rather than facing the challenges one by one as they emerge, it is necessary to increase efforts to develop more holistic approaches for designing innovative livestock systems. We propose a smart and coordinated approach based on:

- (i) innovations and science-based solutions; and
- (ii) transition to more sustainable systems and value chains supported by fair, inclusive and innovative governance.

To transition towards responsible livestock, we outline **three synergistic pathways of progress that should be investigated simultaneously** (Figure 3):

- **Efficiency:** Improve biological and system-level efficiency to reduce input use, emissions, and waste while maintaining productivity
- **Circularity:** Enhance integration across farms, sectors, and regions to reuse biomass, valorise by-products, and close nutrient loops
- **Diversity:** Promote genetic, system, and landscape diversity to increase resilience, complementarity, and ecological function

These pathways should guide innovation, investment, and policy design at every level - from individual animals to entire food chains.

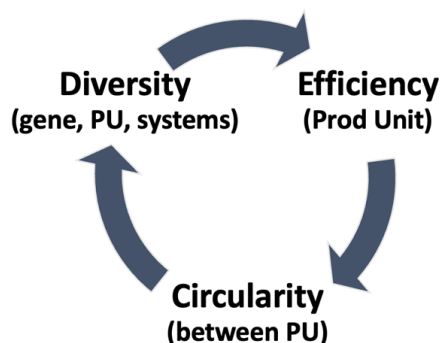


FIGURE 3. THE THREE SYNERGISTIC PATHWAYS

THE IMPORTANCE OF SUPPORTING R&I FOR SUSTAINABILITY AND COMPETITIVENESS IN EUROPE'S LIVESTOCK SECTOR

Research and innovation have contributed substantially to the competitive, balanced and efficient nature of the current European livestock industry. Continued support for research and innovation in the livestock sector will be fundamental to meet impending challenges at a time when livestock farming is at the heart of several controversies but where it can also contribute to strengthening the sustainability of our food systems.

The Animal Task Force proposes **coordinated, integrated, inclusive and interdisciplinary research** (Figure 4):

- Horizontal joint activities between different Horizon Europe clusters and pillars
- Vertical alignment between the EU and national/regional fundings
- Meet expectations of the different stakeholders
- Integrate all the production systems

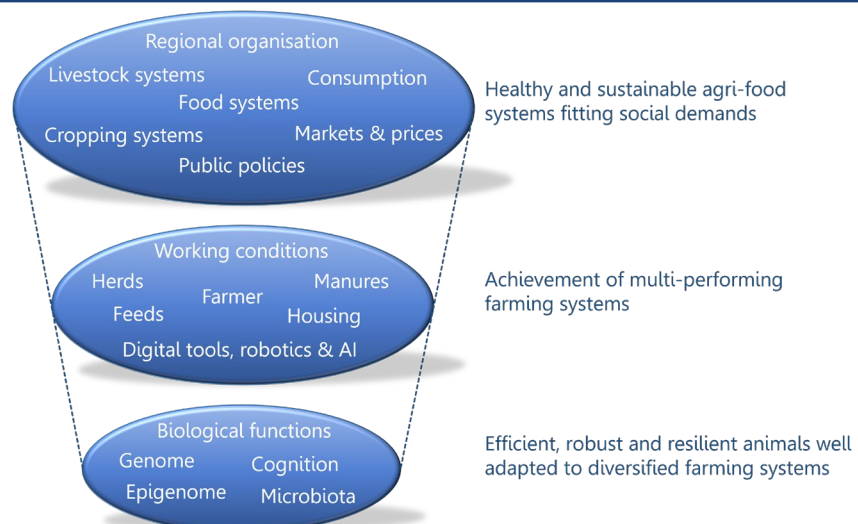


FIGURE 4. COORDINATED AND INTEGRATED, INCLUSIVE AND INTERDISCIPLINARY RESEARCH

STRATEGIC RESEARCH AND INNOVATION AGENDA (SRIA) FOR A SUSTAINABLE LIVESTOCK SECTOR IN EUROPE

The SRIA sets a roadmap for research and innovation (R&I) to support a **sustainable, resilient, and competitive livestock sector in Europe**. It promotes the concept of **responsible livestock**: systems that ensure food security, provide ecosystem services, respect animal welfare, and operate within planetary boundaries.

To guide the transition towards more sustainable, resilient, and inclusive livestock systems in Europe, the SRIA structures its research and innovation priorities **around four interrelated sustainability domains**.

These domains reflect the key societal, environmental, and economic challenges that livestock farming must address (Figure 5) - and the contributions it can make when managed responsibly. Rather than treating issues in isolation, this integrated framework acknowledges the **systemic nature** of sustainability, where progress in one domain (e.g., climate mitigation) must be balanced with gains in others (e.g., animal welfare, food security). Each domain offers a lens through which to shape R&I agendas, policy design, and on-the-ground innovation, while the **cross-cutting focus on the animal as a system** ensures that livestock biology, welfare, and performance are central to the transformation. Together, these domains provide a roadmap to reimagine livestock not as a linear input-output model, but as a **multifunctional, circular, and adaptive component of Europe's agri-food future**.

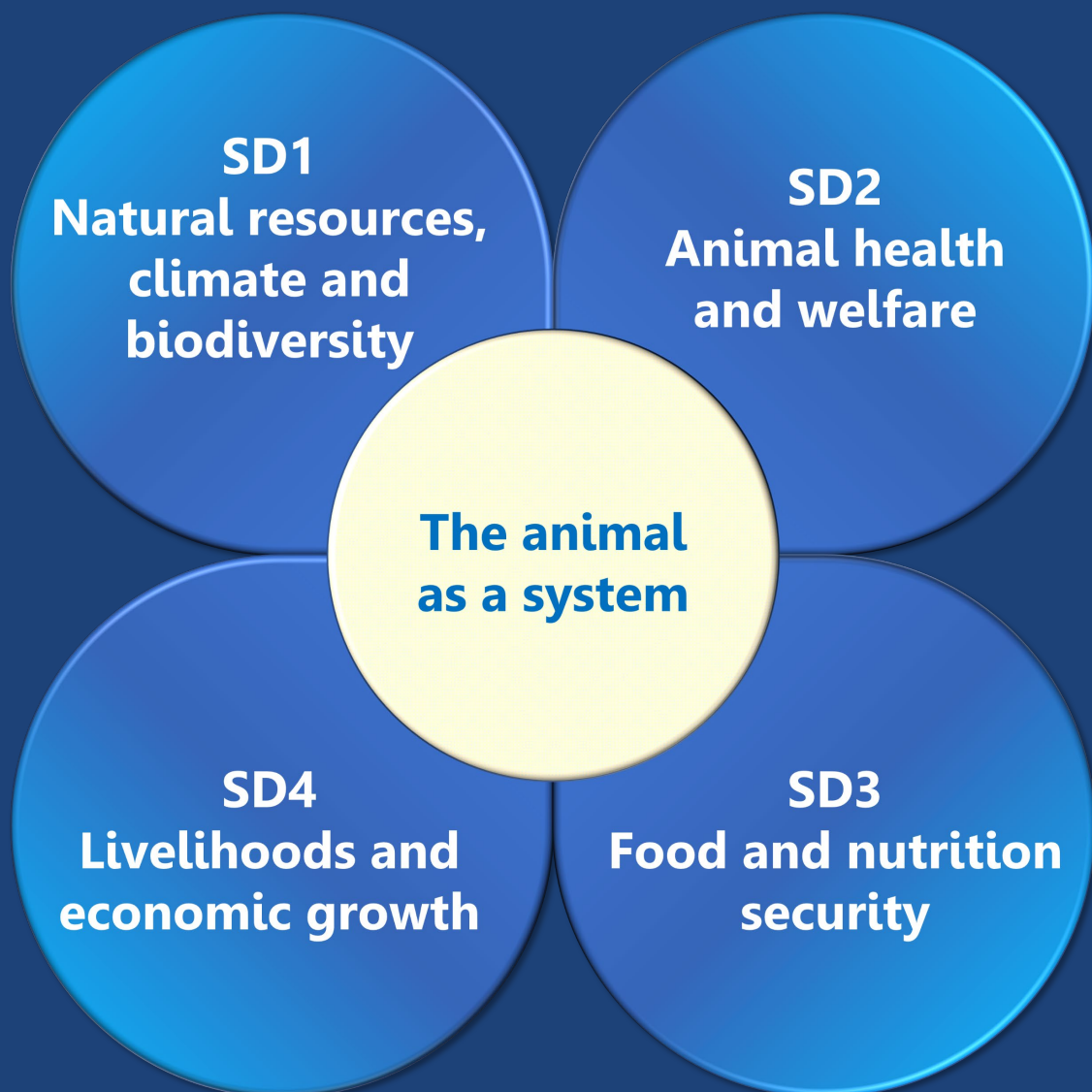


FIGURE 5. FOUR SUSTAINABILITY DOMAINS (SD)

STRATEGIC RESEARCH AND INNOVATION AGENDA (SRIA) FOR A SUSTAINABLE LIVESTOCK SECTOR IN EUROPE

Four Sustainability Domains (SD)

1. Natural resources, climate & biodiversity (SD1)

- Reduce GHG emissions, improve manure management, promote carbon sequestration
- Strengthen synergies between livestock and cropping systems
- Enhance resilience to climate risks like heat and drought

2. Animal health & welfare (SD2)

- Adopt One Health approaches to prevent disease and reduce antimicrobial use
- Promote positive animal welfare through better housing, handling, and health management

3. Food & nutrition security (SD3)

- Understand the role of animal-source foods in healthy diets
- Improve nutritional, sanitary, and functional qualities of these foods

4. Livelihoods & economic growth (SD4)

- Support fair incomes, rural employment, and multifunctional farming
- Guide socio-technical transitions through policy, governance, and innovation

Cross-cutting issue: The animal as a system

Research must also advance understanding of the **animal itself** - including genetics, physiology, microbiomes, and adaptation to climate stress - using high-tech, data-driven tools to design robust, multi-performing animals for sustainable systems.

Policy and innovation alignment

The SRIA aligns with EU goals under the **Green Deal, Farm to Fork, Bioeconomy Strategy**, and several **EU Partnerships** (e.g., Animal Health & Welfare, Agroecology, Sustainable Food Systems). It calls for **interdisciplinary research, living labs, and stakeholder co-creation** to generate place-based solutions.



Key expected outcomes of the SRIA:

Environment & climate

- Lower greenhouse gas emissions and improved carbon sequestration
- Reduced nutrient pollution and better manure management
- Increased biodiversity and water-use efficiency

Animal health & welfare

- Reduced antimicrobial use and disease risk
- Widespread adoption of positive welfare practices
- More resilient animals, adapted to climate and health challenges

Food & nutrition

- Safer, more nutritious, and traceable animal-source foods
- Better understanding of livestock's role in healthy diets
- Use of functional properties in animal products and co-products

Economic & social

- More resilient and diverse farming systems
- Stronger rural livelihoods and fairer value chains
- Improved sector attractiveness for future generations
- Knowledge & innovation
- Integrated, multi-actor innovation ecosystems (e.g., living labs)
- Smarter, more inclusive governance and policy tools
- Stronger alignment with EU missions and partnerships

Contributing to moving forward on the transition towards more sustainable, resilient, and inclusive livestock systems in Europe, taking us closer to the **RESPONSIBLE LIVESTOCK** concept proposed.



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Animal Task Force

A VISION PAPER FOR A SUSTAINABLE LIVESTOCK SECTOR IN EUROPE



A STRATEGIC RESEARCH AND INNOVATION AGENDA FOR A SUSTAINABLE LIVESTOCK SECTOR IN EUROPE



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