ESAAF

European Science Alliance
for Agriculture and Food

Strengthening Climate Resilience in European Livestock Systems

ESAAF Roundtable, 26 June 2026

CSIC Office Brussels

The Science of Livestock and Climate Change

TOPIC

- Animal health, welfare and One Health in a changing climate

How can we Strengthen the Biological Resilience of European Livestock Systems?

Defining Biological Resilience in Livestock Systems

Resistance to Disease and Stress
Resistance is the ability of livestock to withstand diseases or environmental stress without losing function.

Adaptation Mechanisms
Adaptation involves physiological, behavioral, or management changes enabling animals to cope with new conditions.

Recovery Post Disturbance
Recovery is the capacity to return to normal functioning after disturbances, minimizing long-term impacts.

Strengthening Resilience
Resilience can be improved through genetics, management, preventive health, and environmental conditions.

Animal Health as the Foundation of Resilient Livestock Systems

Biological Resilience Focus
Healthy animals form the biological foundation essential for resilient and sustainable livestock systems.

Impact of Climate Change
Climate change alters disease patterns and environmental stresses, complicating livestock health management.

Animal Health and Adaptation
Centering animal health in adaptation strategies enhances livestock systems ability to resist and recover from shocks.

Broader Sustainability Connection
Animal health underpins economic, policy, and sustainability efforts ensuring food security and rural livelihoods.

How Climate Change Drives Animal Disease Risks

Heat Stress Impact

Heat stress weakens livestock immune systems, increasing susceptibility to infections and food safety risks. Furthermore, reduce feed intake and milk production in dairy cows, affecting animal physiology directly.

Vector Expansion

Rising temperatures allow disease vectors like mosquitoes and midges to expand geographically, spreading diseases such as Bluetongue virus.

Extreme Weather Effects

Flooding and drought events increase animal disease risks by contaminating water and disrupting ecosystems, promoting spillover events → Leptospira spp.

Spillover Events

Changes in wildlife-livestock-human interfaces raise spillover risks, exemplified by highly pathogenic avian influenza circulating between birds and poultry → highly pathogenic avian influenza (HPAI).

Disease Emergence at the Human–Animal–Environment Interface

Zoonotic Disease Emergence

Most emerging infectious diseases originate in animals, posing major health risks to humans.

Impact of Climate Change

Climate change reshapes ecosystems and species interactions, accelerating disease spillover.

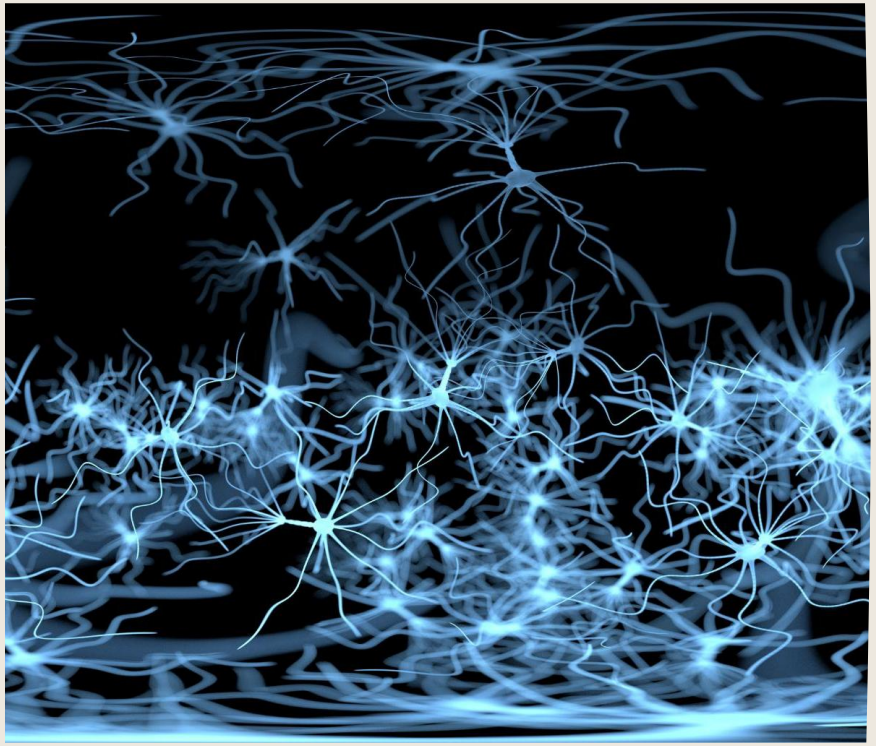
Global Spread & Economic Impact

Global trade and travel accelerate disease spread, disrupting food systems and economies.

Antimicrobial Resistance Challenges

Increased disease pressure and environmental shifts promote antimicrobial use and the spread of resistant organisms

Key Uncertainties and Knowledge Gaps



1. **Predicting Pathogen Evolution**

   Predicting pathogen and vector evolution under climate change is complex due to biological and ecological factors

2. **Challenges in Surveillance Integration**

   Current surveillance methods lack the sensitivity and integration needed to detect emerging risks early and effectively.

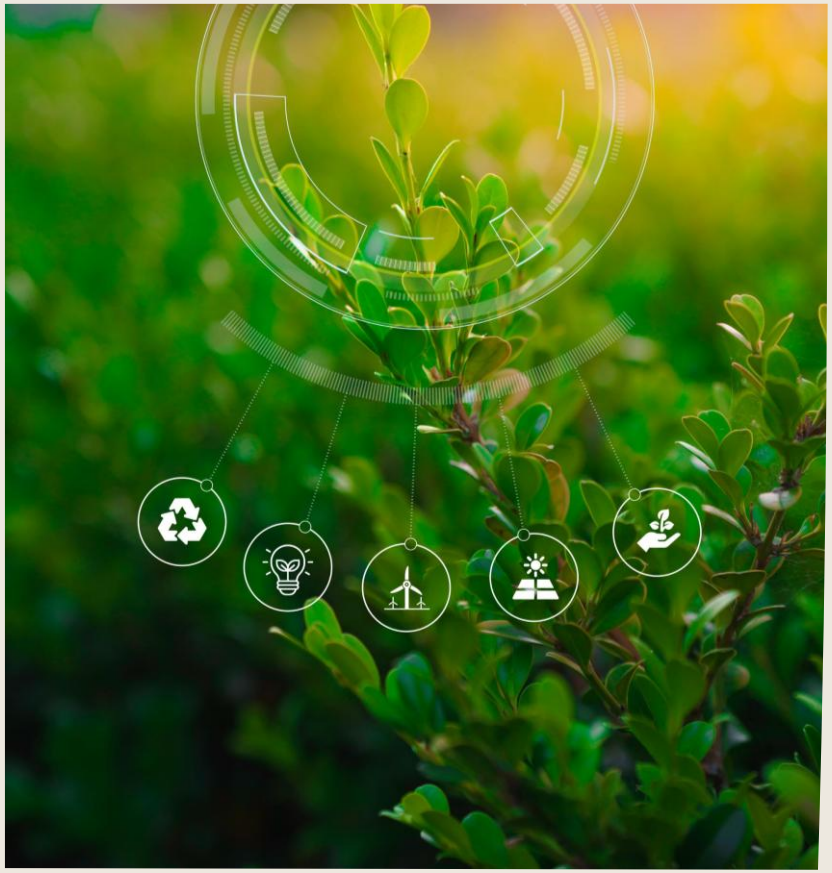
3. **Strategic Research Investment**

   Data integration, monitoring, and research are crucial to close knowledge gaps and improve preparedness.

4. **Transparent Policy Dialogue**

   Acknowledging uncertainties fosters realistic science-policy discussions and informed decision-making.

Key Messages for Policymakers



1 **Urgency on Decision Action**

Scientific evidence supports immediate action on animal health and One Health to address climate change risks

2 **Stay Flexible**

Policies must adapt to new information and remain responsive to changing conditions

3 **Integrated One Health**

One Health integration helps manage complexity and avoid unintended consequences in policy design

4 **Invest Proactively**

Proactive policies reduce vulnerability, enhance resilience, and align with ethical and economic values.

ESAAF

European Science Alliance
for Agriculture and Food