AGRIRESEARCH
FACTSHEET

# ANIMAL PRODUCTION SYSTEMS

## Why do research and innovation on animal production systems matter?

The livestock sector plays a significant economic and social role in EU with its 4.1 million livestock farming and a value of livestock production and livestock products equal to EUR 163 billion (36% of the total agricultural activity). Between 2010 and 2020, the number of livestock farming fell sharply, and moving towards a more sustainable livestock production systems is becoming more challenging. Climate change, a growing population, rising income and global demand for livestock-derived foods at global level will further increase the pressure on natural resources. Research and innovation play a key role in the sustainable transformation of the livestock sector. It tackles the various dimensions of resource use, looking at approaches at the level of animals and of agro-ecosystems and throughout value chains, embracing themes such as animal breeding and genomics, microbiomes, feeding, manure management, circularity, livestock systems diversification and animal welfare. An integrated approach to livestock systems needs to be further explored, taking into account the different components of the agricultural system as a whole and bringing together different perspectives on and dimensions of the value chain, including challenges (exposure to weather events, $CO_2$ emission targets, food and nutrition security, biodiversity and ecosystem restoration) and societal expectations (animal health and welfare, more sustainable food choices).

## Animal production systems under Horizon 2020 and Horizon Europe

### CORDIS search keywords
animal husbandry, animal welfare, feeding grazing livestock, sustainability, resilience ecosystems

### Nb of projects
27  Horizon 2020
13  Horizon Europe

### EU contribution
€  130 million
€   66 million

Figures comprise Horizon 2020 Societal Challenges 2 and Horizon Europe Cluster 6 projects, including Work Programme 2023-2024 expected projects / Selection of a few projects logos

# Success stories dedicated to animal production systems

## Sustainable livestock production systems

Several projects aim to bridge the gaps between practice and science communities and to provide solutions to assess and improve the sustainability of farmed animals. Projects address several production systems and various husbandry practices. Examples of projects on grazing-based animal production systems include **Inno4Grass**, **EuroSheep**, **EuroDairy**, **SheepNet** and **BovINE**. These projects were active in creating networks of stakeholders and provided numerous practice-driven innovations to improve the economic performance and sustainability of dairy, beef and sheep production in Europe.

Projects on resilient livestock systems such as **iSAGE** and **Sm@rt** (both on small ruminants), **4D4F** and **R4D** (both on dairy cattle), **EU PIG** and **Pathways** developed sustainable practices and advanced tools (e.g. precision livestock farming, decision support systems, digital technologies) to respond to challenges like climate change, resource use efficiency and food security. Pilot projects, demonstrations, practice hubs and living labs are used to support farmers.

## Animal welfare

Some projects are dedicated to exploring and testing sustainable animal welfare practices and welfare assessment tools in conventional, low-input, extensive or organic farming systems.

Examples of projects on animal welfare include **Hennovation**, **PPILOW**, **ClearFarm** and **TechCare**. Hennovation tested novel practices in laying hen (feather pecking amongst laying hens and during transport). PPILOW aims to improve health and robustness in pigs and poultry and avoid the killing of day-old male chicks by providing novel tools (e.g. in-ovo sexing, novel male chick rearing systems, new pig farrowing systems). ClearFarm uses precision livestock farming in pigs and dairy cattle by integrating animal welfare, along with environmental and economic sustainability information. TechCare will develop novel welfare approaches to improve and validate tools, early warning systems and indicators for the efficient identification of welfare issues.

## Animal feeding

Many projects aimed to optimise feed formulations in different breeds and management conditions, improve the feed efficiency and sustainability of livestock production systems and explore novel feed sources.

**Feed-a-Gene** (on monogastric animals) made progress on new feed resources (e.g. protein-rich feed from clover, lucerne, soybean and rapeseed), on animal breeding (e.g. traits and models for digestive efficiency and robustness) and on novel precision feeding systems to improve efficiency and competitiveness (two precision feeding system prototypes for growing pigs have been built). The integration of a variety of new or alternative protein sources is the object of projects such as **OK-Net EcoFeed** (on organic and regional feed), **ProFuture** (on microalgae), and **SUSINCHAIN** and **NextGenProteins** (both on insects).

# Horizon 2020 and Horizon Europe collaborative projects on animal production systems

**Follow the CORDIS link** for more information on the start-end date, EU contribution, coordinator and results.
List sorted by ascending start date.

| Website | Project | CORDIS |
|---|---|---|
| Hennovation | Practice-led innovation supported by science and market-driven actors in the laying hen and other livestock sectors | 652638 |
| Feed-a-Gene | Adapting the feed, the animal and the feeding techniques to improve the efficiency and sustainability of monogastric livestock production systems | 633531 |
| iSAGE | Innovation for sustainable sheep and goat production in Europe | 679302 |
| SusAn | ERA-NET on Sustainable Animal Production Systems | 696231 |
| ERA-GAS | ERA-NET for Monitoring and Mitigation of Greenhouse Gases from Agri- and Silvi-Culture | 696356 |
| EuroDairy | A Europe-wide thematic network supporting a sustainable future for EU dairy farmers | 696364 |
| 4D4F | Data driven dairy decisions 4 farmers | 696367 |
| Inno4Grass | Shared innovation space for sustainable productivity of grasslands in Europe | 727368 |
| SheepNet | Sharing expertise and experience towards sheep productivity through networking | 727895 |
| EU PiG | EU pig innovation group | 727933 |
| OK-Net EcoFeed | Organic knowledge network on monogastric animal feed | 773911 |
| PPILOW | Poultry and pig low-input and organic production systems' welfare | 816172 |
| HoloFood | Holistic solution to improve animal food production through deconstructing the biomolecular interactions between feed, gut microorganisms and animals in relation to performance parameters | 817729 |
| SUSINCHAIN | Sustainable insect chain | 861976 |
| TechCare | Integrating innovative technologies along the value chain to improve small ruminant welfare management | 862050 |
| BovINE | Beef innovation network Europe | 862590 |
| NextGenProteins | Bioconversion of underutilized resources into next generation proteins for food and feed | 862704 |
| FERTIMANURE | Innovative nutrient recovery from secondary sources – Production of high-added value fertilisers from animal manre | 862849 |
| ClearFarm | Co-designed welfare monitoring platform for pig and dairy cattle | 862919 |
| ProFuture | Microalgae protein ingredients for the food and feed of the future | 862980 |
| EuroSheep | European network for interactive and innovative knowledge exchange on animal health and nutrition between the sheep industry actors and stakeholders | 863056 |
| Code Re-farm | Consumer-driven demands to reframe farming systems | 101000216 |
| INTAQT | Innovative tools for assessment and authentication of chicken meat, beef and dairy products' qualities | 101000250 |
| mEATquality | Linking extensive husbandry practices to the intrinsic quality of pork and broiler meat | 101000344 |
| Pathways | Pathways for transitions to sustainability in livestock husbandry and food systems | 101000395 |
| SM@RT | Small ruminant technologies – Precision livestock farming and digital technology for small ruminants | 101000471 |
| R4D | Resilience for dairy | 101000770 |
| Re-Livestock | Facilitating innovations for resilient livestock farming systems | 101059609 |
| Grazing4AgroEcology | European network to promote grazing and to support grazing-based farms on their economic and ecologic performances as well as on animal welfare | 101059626 |
| B-THENET | Best practices and innovations for a sustainable beekeeping | 101059812 |
| BroilerNet | Practice and science broiler production innovation network | 101060979 |
| EUNetHorse | European network for knowledge exchange and peer-to-peer learning between actors and stakeholders of the horse sector to improve the resilience of equine farms | 101086551 |

# Relevant sources of information supporting animal production systems

Other instruments and other programs, like the 'European Innovation Partnership for Agricultural productivity and sustainability' (EIP-AGRI), Partnerships and EU missions also help maximise the adoption and development of animal production systems.

## Animal production systems under EIP-AGRI activities – Focus Groups and Operational Groups

Relevant EIP-AGRI Focus Groups include:

- Robust and resilient dairy production systems
- Grazing for Carbon
- Reducing emissions from cattle farming
- Mixed Farming Systems: Livestock/Cash crops
- New feed for pigs and poultry
- Profitability of permanent grassland
- Protein crops
- Sustainable beef production systems

## Animal production systems under other Horizon 2020 sections

There are numerous projects on livestock production funded under other Horizon 2020 pillars. Examples are listed below.

- European Research Infrastructures (including e-Infrastructures):
  SmartCow – An integrated infrastructure for increased research capability and innovation in the European cattle sector
  PIGWEB – An infrastructure for experimental research for sustainable pig production
- Marie Sklodowska-Curie Actions: CHICKENSTRESS – Variations in stress responsivity in hens: matching birds to environments
- SME Instrument: Proton – Recycling industrial $CO_2$ into cost-competitive protein for high-value, sustainable animal feed

## In the pipeline and future funding opportunities

- HORIZON-CL6-2022-BIODIV-02-03-two-stage: Resilient beekeeping
- HORIZON-CL6-2023-FARM2FORK-01-6: Towards sustainable livestock systems: European platform for evidence building and transitioning policy
- HORIZON-CL6-2023-ZEROPOLLUTION-02-1-two-stage: Optimisation of manure use along the management chain to mitigate GHG emissions and minimize nutrients/contaminants dispersion in the environment
- HORIZON-CL6-2024-GOVERNANCE-01-13: Developing EU advisory networks on sustainable livestock systems
- HORIZON-CL6-2023-GOVERNANCE-01-14: Digital and data technologies for livestock tracking
- HORIZON-CL6-2024-FARM2FORK-01-1: Agro-pastoral/outdoor livestock systems and wildlife management
- HORIZON-CL6-2024-FARM2FORK-02-5-two-stage: Animal nutritional requirements and nutritional value of feed under different production management conditions

#AgriResearch

European Commission