EU funded research on livestock production: from HORIZON 2020 to HORIZON EUROPE

Feed-a-Gene final Conference, Rennes, 22-23 January 2020

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The presentation shall neither be binding nor construed as constituting commitment by the European Commission
Outline

• The current EU framework Programme for R&I: Horizon 2020
• Strategic approach to EU agriculture research & innovation
• Livestock production research: portfolio of H2020 projects (terrestrial animals)
• Multi-Actor Approach
• Insight into Horizon Europe
HORIZON 2020

Budget €79,000 million (current prices)

Duration 2014-2020
What is the EU Framework funding for research?

EU research funding has been crucial for:

- Transnational scientific collaboration
- Integration, pooling of resources
- Transfer of know-how, mobility of researchers and training
Budget for SC2: > €3,8 billion around double of FP7 budget
Structure of Horizon 2020

**Part I: Excellent Science**
1. European Research Council
2. Future and Emerging Technologies
3. Marie Sklodowska-Curie Actions
4. Research Infrastructures

**Part II: Industrial Leadership**
1. Enabling & Industrial Technologies
   1.1 Information and communication technologies
   1.2 Nanotechnologies
   1.3 Advanced materials
   1.4 Biotechnology
   1.5 Advanced manufacturing
   1.6 Space
2. Access to Risk Finance
3. Innovation in SMEs

**Part III: Societal Challenges**
1. Health and wellbeing
2. Food security, sustainable agriculture, marine research and the bioeconomy
3. Secure, clean and efficient energy
4. Smart, green and integrated Transport
5. Climate Action, Environment, Resource Efficiency
6. Inclusive, innovative and reflective societies
7. Secure societies

**Spreading excellence ad widening participation**
**Science with and for Society**

European Institute of Innovation and technology
Euratom
Joint Research Centre
SC2 activities:
Co-management DG RTD - DG AGRI

2.1 Agriculture and forestry
2.2 Agri-food sector for a safe and healthy diet
2.3 Aquatic living resources
2.4 Bio-based industries and bioeconomy
2.5 Marine and maritime research
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Strategic approach to EU agricultural R&I

- Ensure food and nutrition security in the long term
- Address the environmental sustainability and resilience of competitive land-based primary production for food and non-food systems
- Boost the sustainable growth of rural territories
Strategic R&I priorities

315 projects – 1,9 M€ under Horizon 2020

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From strategy to action: 12 big themes under H2020

https://ec.europa.eu/agriculture/research-innovation/documents-links_en

Update June 2019
Livestock: preliminary statements

1. European agriculture is characterised by its diversity: landscape, production systems, farm size, livestock vs crop production, food cultures, standard of living...
   - No single challenge, no single solution

2. Animal agriculture/industry is part of a complex and dynamic production system, part of an economy, part of a territory, part of society: influences, challenges and opportunities depend on many drivers, global and local ones
   - Multifaceted challenges

3. EU is a large exporter of food products, still most of the production is consumed in EU: living with two strands...
A safe operating space for Livestock? (RISE Foundation report)

Adjustment on two fronts

1. **Reduce negative impacts of livestock production**
   - Resource efficiency: feed, water, animal health and welfare
   - Manure management, processing and reuse
   - Reducing density and concentration of livestock
   - Large scope for innovation in: breeding, nutrition, housing, pollution, waste capture & reuse

2. **Shift and reduce consumption** of livestock products
   - Changing the species balance of consumption
   - Substituting new protein sources: insect, algal, cultured
   - Changing diets to less protein and plant based protein

The indications are that route 1 alone is not sufficient. Acting on current consumption is unavoidable.
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H2020 projects on livestock production

At least 30 specialised projects (2014-2020)

Around 200 M€ contribution (2014-2020); mostly from SC2

Key themes

Animal production systems
Genetic resources/breeding; nutrition
Animal Welfare
Digital transformation
Sustainable circular and innovative value chain
Thematic Networks
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The Multi-Actor Approach

« The value of an idea lies in the using of it »

Thomas Alva Edison – inventor of the light bulb
Key elements of the Multi-actor approach

The most important **interactive innovation principles** are (as in EIP OGs):

1. To **focus on end-users’ problems/opportunities** and develop innovative solutions which cover **real needs**. End-users like farmers, foresters or businesses will be more motivated to use the project results, because they were incorporated in generating them and therefore feel "**co-ownership"."

2. To bring together the **most relevant partners** with the needed **complementary type of knowledge** which helps solving problems and tackling opportunities e.g.: farmers, advisors, researchers, suppliers, processors, agencies and/or other actors.
Key elements of the Multi-actor approach

3. Partners **co-operate** and co-innovate **in project activities from the beginning till the end (co-decision)**. **End-users (OF THE PROJECT RESULTS)** and practitioners are to be involved, not as a study-object, but in view of using their entrepreneurial skills and tacit knowledge for developing solutions. **Building blocks for innovation are expected to come from practice as well as from science and intermediaries. End-users' co-ownership of results speeds up the acceptance and dissemination of new ideas.**

4. The project should result in practical knowledge made easily understandable and accessible, which **feeds into the existing dissemination channels most consulted by end-users in countries.**
Key elements of the Multi-actor approach

5. For **EU wide communication**, this knowledge should also be assembled into a substantial number of 'practice abstracts' in the **EIP common format**


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• *Livestock production research: portfolio of H2020 projects (terrestrial animals)*
• *Multi-Actor Approach*
• *Insight into Horizon Europe*
Horizon Europe: structure

Pillar 1: Excellent Science
- European Research Council
- Marie Skłodowska-Curie Actions
- Research Infrastructures

Pillar 2: Global Challenges and European Industrial Competitiveness
- Health
- Culture, Creativity and Inclusive Society
- Civil Security for Society
- Digital, Industry and Space
- Climate, Energy and Mobility
- Food, Bioeconomy, Natural Resources, Agriculture and Environment

Pillar 3: Innovative Europe
- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

Widening Participation and Strengthening the European Research Area
- Widening participation and spreading excellence
- Reforming and Enhancing the European R&I system

Proposed overall budget: €100 billion; around 50% on Pillar 2

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What is in it?

7 Intervention Areas (IAs)

- Sustainable management and efficient use of natural resources
- Climate mitigation and adaptation
- Plant health
- Animal health and welfare
- Use and delivery of ecosystem services
- Sustainable forest management
- EU plant protein production
- Sustainable land use, rural development and territorial linkages
- Digital innovations
- AKIS; advice, building skills, participatory approaches and information sharing
- International partnerships for sustainable agriculture for food and nutrition security
Challenges: six cross-cutting long-term impacts

- Climate neutrality and adaptation
- Halt of biodiversity decline
- Sustainability and circularity of resources
- Knowledge and innovation
- Behavioural, socio-economics and demographic changes
- Governance models enabling sustainability

- Environmental Observation
- Biodiversity and Natural Resources
- Agriculture, Forestry and Rural Areas
- Seas, Oceans and Inland Waters
- Food Systems
- Bio-based innovation systems in the EU Bioeconomy
- Circular Systems
Priorities: short- & medium term impacts

Environmental Observation
Biodiversity and Natural Resources
Agriculture, Forestry and Rural Areas
Seas, Oceans and Inland Waters
Food Systems
Bio-based innovation systems in the EU Bioeconomy
Circular Systems

Short- & medium-term impacts
short- & medium-term impacts

- climate- and environmentally-friendly practices in farming and forestry systems
- “de-fossilisation” of land-based primary production
- LULUCF activities in the mitigation of climate change
- forest management
- diversity in farming and forestry systems
- better-adapted crop varieties and animal breeds
- climate neutral and resilient rural communities
- resource use efficiency in agriculture and forestry and alternatives to scarce resources
- circular economy: better linking rural and urban resource flows, small-scale bio-based solutions, innovations at the interface between agriculture, aquaculture, forestry
short- & medium-term impacts

- farming and forestry systems that protect, restore and enhance agrobiodiversity, wild biodiversity and ecosystem services across a range of scales
- implementation and upscaling of agro-ecological approaches in primary production, including organic and mixed farming or agroforestry
- conservation, management and use of agrobiodiversity
- impacts of primary production on biodiversity, identify the ecological boundaries of the bioeconomy
- nature-based solutions to enhance biodiversity
- prevent, monitor and control animal and plant pests and diseases including emerging risks, and to address antimicrobial resistance
- safe and environmentally friendly methods for plant protection and weed control that substantially reduce the use of contentious pesticides
- improved animal health and welfare
short- & medium-term impacts

- **sustainability-oriented redesign of food and non-food value chains**, 
- fairer distribution of value added and better balanced power relations, 
- reconnected producers, consumers and nature, 
- revalued environmental, health and socio-economic impacts 
- strategies and policies to describe and close the divide between rural and urban areas and benefit rural dwellers and workers and generational renewal in farming and rural communities, with special attention to vulnerable groups 
- digital services and skills, co-created with and for rural people 
- social networks, social capital and social innovation processes and allow for innovations in rural communities that support the sustainability agenda locally
short- & medium-term impacts

- data, knowledge base and impact measurements for improving monitoring and evaluation of EU policies addressing agriculture, forestry, related value chains and rural areas in the period 2021-2027 and beyond
- observation networks of European forests
- Agricultural knowledge and innovation systems (AKIS)
- place-based innovations, strengthening synergies with other EU Funds in particular smart specialisation strategies, reinforcing the multi-actor approach and establishing a network of living-labs in agro-ecology
- ICT as an enabler, allowing to build an open digital environment and supporting bottom-up innovation in agriculture, forestry, related value chains and rural areas
Towards the first Horizon Europe Work Programme 2021-2022

- **Summer 2019**: Early involvement and exchanges with Member States, online consultation with stakeholders and the public at large, establishment of Mission Boards.

- **Autumn / winter 2019/2020**: Co-creation at Research & Innovation Days 24 – 26 September, exchanges with the new European Parliament, envisaged endorsement by new Commission of Strategic Plan.

- **Spring / summer 2020**: Drafting of Horizon Europe Work Programme 2021-2022 on the basis of the Strategic Plan.

- **November 2020**: Pre-publication of Work Programme 2021-2022, opening of first 2021 calls.

“The best way to predict the future is to create it”
A. Lincoln

Thank you for your attention!

More about agricultural research and innovation:
http://ec.europa.eu/agriculture/research-innovation/index_en.htm
www.eip-agri.eu
Additional information
A SIGNIFICANT CONTRIBUTION TO GLOBAL ENVIRONMENTAL ISSUES

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Springmann et al., 2018
A safe operating space for Livestock? (RISE Foundation report)

**Benefits and negative impacts of livestock**

<table>
<thead>
<tr>
<th></th>
<th>Benefit</th>
<th>Negative</th>
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<tbody>
<tr>
<td>1</td>
<td>Human nutrition and health</td>
<td>Hi quality nutrients</td>
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<td></td>
<td></td>
<td>Overconsumption</td>
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<td>2</td>
<td>Utilisation of pastures &amp; by-products</td>
<td>Cultural landscape</td>
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<td></td>
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<td>Over-grazing</td>
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<tr>
<td>3</td>
<td>Culture and livelihoods</td>
<td>We enjoy it! Provides jobs</td>
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<tr>
<td>4</td>
<td>Climate harm</td>
<td>GHG emissions</td>
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<tr>
<td>5</td>
<td>Nutrient cycles</td>
<td>Manure Agro-Eco</td>
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<tr>
<td></td>
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<td>Water &amp; air pollution</td>
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<tr>
<td>6</td>
<td>Biodiversity</td>
<td>HNV systems</td>
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<td></td>
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<td>Simplification &amp; specialisation</td>
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<tr>
<td>7</td>
<td>Land use and soil degradation</td>
<td>Pressure for feed</td>
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<tr>
<td>8</td>
<td>AMR and Zoonoses</td>
<td>Dangers for human health</td>
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<tr>
<td>9</td>
<td>Animal welfare</td>
<td>Looking after animals</td>
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<tr>
<td></td>
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<td>Treatment, housing, transport</td>
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www.risefoundation.eu

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H2020 projects on livestock production

At least 30 specialised projects (2014-2020); around 190 M€ contribution (2014-2020); mostly from SC2

Key themes and projects (calls 2014-2019)

Animal production systems
- **SusAn ERA-NET** Sustainable Animal production 5M EUc (Mar. 2016 – Feb. 2021)
- **iSAGE** Innovation for Sustainable Sheep and Goat Production in Europe 7M EUc (Mar. 2016-Feb. 2020)
- **Microbiome: HoloFood** Holistic solution to improve animal food production through deconstructing the biomolecular interactions between feed, gut microorganisms and animals in relation to performance parameters 9.5M EUc (Jan. 2019 – Dec. 2022) Chicken&Salmon; also **CIRCLES** (6 food systems incl. poultry, pigs, aquaculture), **MASTER** (incl. rumen)
- **SUPER-G** Developing SUstainable PERmanent Grassland systems and policies 10M Euc (Jun.2018 – May 2023)
- **RELACS**: Replacement of Contentious Inputs in organic farming Systems (plants&animals): e.g. reduce copper, mineral oil, manure from conventional farms, AMU in dairy cattle, provide alternatives to excessive use of anthelmintics in small ruminants
H2020 projects on livestock production

Key themes and projects (calls 2014-2019)

Genetic resources/breeding (/nutrition):
- **GenTORE** Tools to Optimise Resilience and Efficiency Genomic management 7M EUc (Jun. 2017- May 2022)
- **Treasure** Diversity of local pig breeds and production systems for high quality traditional and sustainable pork chains 3,4M EUc (Apr.2015-Mar.2019)
- **Feed-a-Gene** Adapting the feed, the animal and the feeding techniques to improve the efficiency and sustainability of monogastric livestock production systems 9M EUc (Mar.2015-Feb.2020)
- **Image** Innovative Management of Genetic Resources 7M EUc (Mar.2016-Feb.2020)
- **BovReg** Identification of functionally active genomic features relevant to phenotypic diversity and plasticity in cattle 6M EUc (Sept.2019-Aug.2023)
- **SMARTER** Small RuminanTs breeding for Efficiency and Resilience 7M EUc (Nov. 2018-Oct.2022)
- **GENE-SWitCH** The regulatory GENomE of SWine and CHicken: functional annotation during development 6M EUc (Jul.2019-Jun.2023)
H2020 projects on livestock production

Key themes and projects (calls 2014-2019)

Digital transformation:
• **SmartCow** Integrated infrastructure for increased research capability and innovation in the European cattle sector  5M EUc (Feb. 2018 - Jan. 2022)
• **SmartAgriHubs** Connecting the dots to unleash the innovation potential for digital transformation of the European agri-food sector  20M EUc (Nov. 2018-Oct. 2022).
• **IoF2020** Internet of Food and Farm 2020 30M EUc (Jan. 2017-Dec. 2020)

Sustainable circular and innovative value chain
• **Nutri2Cycle** Transition towards a more carbon and nutrient efficient agriculture in Europe 7M EUc (Oct. 2018 – Sep. 2022)
• **Fertimanure** Innovative nutrient recovery from secondary sources – Production of high-added value FERTIlisers from animal MANURE  8M EUc (Jan. 2020- Dec. 2023)
• **NOAW** No Agro-Waste 6,9 M Ecc (Oct. 2016 – Sep. 2020); also VALUEWASTE or WaysTUP! (urban biowaste into food&feed, biobased fertilisers etc)
• **AGRIFORVALOR** Bringing added value to agriculture and forest sectors by closing the research and innovation divide 2M EUc (Mar.2016 - Aug. 2018)

Bees: B-GOOD; (POSHBEE)
H2020 projects on livestock production

Key themes and projects (calls 2014-2019)

Animal Welfare
- **PPILOW** Poultry and Pig Low-input and Organic production systems’ Welfare
  10M EUc (Sep 2019-Aug 2024)
- **Clearfarm** Co-designed Welfare Monitoring Platform for Pig and Dairy Cattle 6M EUc (Nov. 2019- Sept. 2023)

Thematic Networks (2M EUc each):
- **Hennovation**: laying hens and welfare (Jan. 2015 – Aug. 2017)
- **EU Pig**: pig production (Nov. 2016 – Oct. 2020)
- **OK-NET EcoFeed**: monogastric animal feed (Jan. 2018 – Dec. 2020)
- **Bovine**: beef innovation (Jan. 2020 – Dec. 2022)
Animals and health under Horizon 2020 / SC2

24 SC2 projects (2014-2020); around 200 M€ contribution (2014-2020)

Key themes and projects (calls 2014-2019)

Vaccines/vaccinology:
- **SAPHIR**: Strengthening Animal Production and Health through the Immune Response
- **PARAGONE**: vaccines for animal parasites (helminths and ectoparasites of ruminants&poultry)
- **VACDIVA**: A safe DIVA vaccine for African Swine Fever control and eradication

Host-Pathogen Interaction, epidemiology:
- **DELTA-FLU**: Dynamics of avian influenza in a changing world
- **PALE-Blu**: Understanding pathogen, livestock, environment interactions involving bluetongue virus
- **PIGSs**: Program for Innovative Global Prevention of Streptococcus suis

Control/Emerging threats:
- **DEFEND**: Addressing the dual emerging threats of African Swine Fever and Lumpy Skin Disease in Europe

Diagnostics:
- **Swinostics**: Swine diseases field diagnostics toolbox
- **Vivaldi**: Veterinary Validation of Point-of-Care Detection Instrument
Animals and health under Horizon 2020 / SC2

Key themes and projects (calls 2014-2019)

One Health/ AMR:
- **OneHealth EJP co-fund**: Promoting One Health in Europe through joint actions on foodborne zoonoses, antimicrobial resistance and emerging microbiological hazards; €45mio EUc; Jan2018 – Dec2022
- **HealthyLivestock**: Tackling Antimicrobial Resistance through improved livestock Health and Welfare;
- **ROADMAP**: Rethinking Of Antimicrobial Decision-systems in the Management of Animal Production; Jun2019 – May2023
- **AVANT**: Alternatives to Veterinary ANTimicrobials - Jan2020-Dec2024
- **RELACS**: Replacement of Contentious Inputs in organic farming Systems (plants&animals)
- **DISARM (TN)**: Disseminating Innovative Solutions for Antibiotic Resistance Management

Bee health: POSHBEE; B-GOOD

International cooperation: SIRCAH (=secretariat of STAR-IDAZ International Research Consortium)

ERA-NET co-fund: ICRAD (international coordination of research on infectious animal diseases)

Additionally, in other parts of H2020: e.g.SC1 (e.g. COMPARE, IMI-2 : ZAPI); Infrastructures (e.g.VetBioNet); MSCA (e.g. Treat2ReUse-animal waste treatment to reduce GHG); COST (e.g. ASF-STOP, NEOH, Euro-FBP, PiGutNet, COREMI) …
Connecting policies: the bigger EIP picture

CAP/Rural development (regional/national level)
- OG preparation
- OG projects
- Innovation support services

Research projects
- Multi-actor projects
- Thematic networks
  (interactive innovation)

Operational Group

Involvement of OGs is strongly recommended

Unique EU knowledge repository
of contacts and practice abstracts

Spread the results
set of basic elements characterising the project includes one (or more) "practice abstract"(s)

Two main objectives:
- enable contacting partners and exchange knowledge
- disseminate results to practitioners in a concise and easy understandable way

Can be used to provide information all along the life-cycle of the project:
- Start: explain what you are going to do
- Mid-term: update
- End: disseminate results

Counts as a "deliverable"
• **Short and easily understandable title (native and English)** (one key sentence, max 150 char.)

• **Short practice info in easily understandable language** (max 1500 char.)
  
  = *practice abstracts* (PAs):
  
  • Objective of the project in English and native language
  
  • Short summary for practitioners in native language on the outcomes (1000-1500 characters) (in English optional but preferred)
    
    - Main results/outcomes of the activity (expected or final)
    
    - The main practical recommendation(s)

• **Contact data**: Project coordinator (+ contact details), text editor, project partners (+ address, e-mail, telephone), geographical location, project period, funding source & budget, link to project website and to a website where info stays long-term available
R&I Missions are...

Portfolios of actions across disciplines intended to achieve a bold, inspirational and measurable goal within a set timeframe with impact for society and policy making as well as relevance for a significant part of the European population and wide range of European citizens.
Adaptation to climate change, including societal transformation

- 5 Mission areas

  - Healthy oceans, seas, coastal and inland waters
  - Climate-neutral and smart cities
  - Soil health and food
  - Cancer
New approach to European partnerships: overview

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key features

- Simple architecture and toolbox
- Common set of criteria
- Coherent life-cycle approach
- Strategic orientation

Co-programmed
Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by Horizon Europe

Co-funded
Based on a joint programme agreed by partners; commitment of partners for financial and in-kind contributions & financial contribution by Horizon Europe

Institutionalised
Based on long-term dimension and need for high integration; partnerships based on Articles 185 / 187 of TFEU and the EIT-Regulation supported by Horizon Europe