



BETTER COST Action
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Overview of EU R&I projects linked to animal health, with a focus on biosecurity

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Definition of biosecurity (animal health)

REGULATION (EU) 2016/429 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2016 on transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law')

Article 4:

'biosecurity' means the sum of management and physical measures designed to reduce the risk of the introduction, development and spread of diseases to, from and within:

(a) an animal population, or

(b) an establishment, zone, compartment, means of transport or any other facilities, premises or location

Biosecurity...

Concept is clear but wide!

'Biosecurity' mentioned +/- 70 times in AHL (about compartment, zone, responsibilities, knowledge, disease prevention and control measures...)

Recital 43 of AHL:

"...The biosecurity measures adopted should be sufficiently flexible, suit the type of production and the species or categories of animals involved and take account of the local circumstances and technical developments. Implementing powers should be conferred on the Commission to lay down minimum requirements necessary for the uniform application of biosecurity measures in the Member States. Nevertheless, it should always remain within the power of operators, Member States or the Commission to promote prevention of transmissible diseases through higher biosecurity standards by developing their own guides to good practice..."

Almost all Implementing or Delegated Acts ([Delegated and implementing acts \(europa.eu\)](https://european-council.europa.eu/media/en/press-communications/infographic/infographic-delegated-and-implementing-acts-2015-2020-p11-en.pdf)) in some or many of their elements deal with some of the sub-elements of biosecurity. Biosecurity becomes very specific in certain rules.

EU R&I on Animal Health (terrestrial animals)

DOMAINS

- Emerging / Epizootic / Endemic Diseases
- Vaccinology
- Data for Epidemiology
- Diagnostic
- Antimicrobial Resistance
- Biosecurity *



- Collaborative research & Innovation projects
- Co-Fund actions
- International cooperation
- COST Actions
- EIP-AGRI
- Infrastructures

TYPES OF INSTRUMENTS

*: also a number of project in other boxes deal partly, directly or indirectly, with biosecurity

H2020 SC2 projects on animal health (1)

Collaborative projects

Emerging /
Epizootic /
Endemic
Diseases



- **PALE-BIu** (Jun2017-Nov2021; €6M) Understanding pathogen, livestock, environment interactions involving bluetongue virus <https://cordis.europa.eu/project/id/727393>; epidemio



- **DELTA-FLU** (Jun2017-Nov2022; €5.5M) Dynamics of avian influenza in a changing world <https://cordis.europa.eu/project/id/727922>; epidemio; risk modelling



- **DEFEND**^{MA} (Jun2018-Nov2023; €5.5M) Addressing the dual emerging threats of African Swine Fever and Lumpy Skin Disease in Europe <https://cordis.europa.eu/project/id/773701> (risk modelling; incl vaccinology)



- **PIGSs** (2017-2022; €5M) Program for Innovative Global Prevention of Streptococcus suis; (epidemio, HPI, diagnostics, vaccinology) <https://cordis.europa.eu/project/id/727966>



- **COMBAT** (Sep.2021 – Aug. 2025; €5,9M) COntrolling and progressively Minimizing the Burden of Animal Trypanosomosis <https://cordis.europa.eu/project/id/101000467>



- **PREPARE4VBD** (Sep.2021 – Aug. 2025; €6M) A Cross-Disciplinary Alliance to Identify, PREDict and prePARE for Emerging Vector-Borne Diseases <https://cordis.europa.eu/project/id/101000365>

MA : Multi-Actor approach

H2020 SC2 - Horizon Europe CL6 projects on animal health (2)

Collaborative projects

Vaccinology



- **PARAGONE** (2015-2019; €9M) Vaccines for animal parasites <https://cordis.europa.eu/project/id/635408/>



- **SAPHIR** (2015-2019; €9M) Strengthening Animal Production and Health through the Immune Response <https://cordis.europa.eu/project/id/633184/>;



- **VACDIVA^{MA}** (Oct2019-Sep2023; €9M) A safe DIVA vaccine for African Swine Fever control and eradication <https://cordis.europa.eu/project/id/862874/>; <https://vacdiva.eu/>



- **REPRODIVAC (HE)**; Sep2022-Aug2027; €3.1M) Next-generation vaccines and diagnostics to prevent livestock reproductive diseases of worldwide impact. - To better control 4 priority abortifacient diseases <https://cordis.europa.eu/project/id/101060813>



- **SPIDVAC (HE)**; Jul2022-Dec2025; €5M) Improved control of priority animal diseases: Novel vaccines and companion diagnostic tests for African horse sickness, peste des petits ruminants and **foot-and-mouth disease** <https://cordis.europa.eu/project/id/101059924> ; <https://spidvac.fli.de>

H2020 SC2 projects on animal health (3)

Collaborative projects

Data for Epidemiology

DECIDE 

- **DECIDE** ^{MA}(2021-2026; €10M) *Data-driven control and prioritisation of non-EU-regulated contagious animal diseases* (focus on respiratory and gastro-intestinal syndromes in livestock) <https://cordis.europa.eu/project/id/101000494>

Diagnostic

SWINOSTICS 

- **Swinostics** (2017-2021; €3M) *Field device based on sensing technology tested on 6 pig diseases incl CSF, ASF, Influenza, PRRS, PCV;* <https://cordis.europa.eu/project/id/771649>

VIVALDI 
Veterinary Validation of Point-of-Care Diagnostic Instrument

- **VIVALDI** (2018-Apr2022; €3M) *Veterinary Validation of Point-of-Care Detection Instrument.* <https://cordis.europa.eu/project/id/773422>

H2020 SC2 projects on animal health (4)

Collaborative projects and Thematic Network

Antimicrobial Resistance



- **HealthyLivestock** (2018-2023; €5M) Tackling Antimicrobial Resistance through improved livestock Health and Welfare; (intensive systems in pig and poultry) <https://cordis.europa.eu/project/id/773436>

<https://cordis.europa.eu/article/id/442234-curbing-antimicrobial-drug-use-in-livestock-becomes-more-viable> Strengthening biosecurity and animal resilience

The first step towards improving AH&W has been to analyse and score the main risk factors associated with the prevention of disease spread between and within farms. "We then established performance indicators to assess and monitor the health and welfare state. We developed and applied two innovative tools to assess **biosecurity** risks in pig and broiler farms and created tailor-made herd health plans for each farm,"



- **ROADMAP** ^{MA} (2019-2023; €6M) Rethinking Of Antimicrobial Decision-systems in the Management of Animal Production; (socio-economic drivers of AMU, strategies for change; multispecies)

<https://cordis.europa.eu/project/id/817626>

Among the objectives: « Develop & if possible validate integrative strategies for animal health, to foster minimal AMU i.e. breeding, feeding, **biosecurity**, good husbandry practices, animal welfare & farm management". Implement and improve strategies fostering prudent AMU to rethink health and welfare animal management. These strategies will include socio-economic and technical innovations to comply with social acceptability of practice change, and economic and technical feasibility. Action-research living-labs will be designed with animal health professionals and stakeholders (multi-actor approach framework).



- **DISARM** ^{MA} Thematic Network (2019-2022) Disseminating Innovative Solutions for Antibiotic Resistance Management. (best practice guides, multi-actor farm, health plans (multispecies)

<https://cordis.europa.eu/project/id/817591>

<https://cordis.europa.eu/project/id/817591/reporting> We have established an online community of practice which actors from the livestock industry, researchers and policy makers can join to meet each other and discuss and exchange knowledge and experience. All discussions take place in the framework of 10 specific topics that relate to disease prevention, **biosecurity**, optimal housing and animal management and alternatives for and prudent use of antibiotics. A freely accessible database has been established as a repository for all relevant information on innovations, strategies and best practices.

H2020 SC2 projects on animal health (5)

Collaborative projects

Antimicrobial
Resistance

AVANT

- **AVANT** ^{MA} (2020-2024; €6M) ; *Alternatives to veterinary Antimicrobials in pigs*
<https://cordis.europa.eu/project/id/862829>

NeoGIANT

- **NeoGIANT** ^{MA} (2021-2025; €8.4M) *The power of grape extracts: antimicrobial and antioxidant properties to prevent the use of antibiotics in farmed animals.*
<https://cordis.europa.eu/project/id/101036768>

H2020 SC2 - Horizon Europe CL6 projects on animal health (6)

Co-Fund actions



- **One Health European Joint Programme co-fund** (2018-2023; budget €90M incl. €45M from EU) Promoting One Health in Europe through joint actions on foodborne zoonoses, antimicrobial resistance and emerging microbiological hazards <https://cordis.europa.eu/project/id/773830>; <https://onehealthjep.eu/about/> Main focus on tools, systems, data for surveillance, diagnostics, risk assessment. 30 JRP and JIP
 - **BIOPIGEE** *Biosecurity practices for pig farming across Europe*. Project developing a biosecurity protocol for Salmonella and Hepatitis E virus at primary production of pigs <https://onehealthjep.eu/jrp-biopigee/>



- **ICRAD ERA-NET** (2019-2024; budget €24M incl €8M from EU) International coordination of research on infectious animal diseases <https://cordis.europa.eu/project/id/862605>; <https://www.icrad.eu/>
 - **RODENGATE** *Future rodent management for pig and poultry health*

International cooperation



- **SIRCAH** (2016-2022; €3M) **SIRCAH2** (**HE**, Oct 2022-Mar2027; €1,2M) Secretariat for the International Research Consortium on Animal Health. Organisational, communication and technical support to the STAR-IDAZ International Research Consortium (IRC) on Animal Health. Vaccines, diagnostics, therapeutic, procedures and key scientific information/tools to support risk analysis and disease control <https://www.star-idaz.net/>

Projects on animal health : Other

Infrastructures



- **VETBIONET** (2017-2023; €10M) *Veterinary Biocontained facility Network for excellence in animal infectious disease research and experimentation* Transnational Access to infrastructures, Joint Research Activities <https://cordis.europa.eu/project/id/731014>; www.vetbionet.eu
 - *Follow up with other infrastructures (largely medical centric) : ISIDORe – HE, €21M - <https://cordis.europa.eu/project/id/101046133>*

COST Actions



- **ASF-STOP** (2016-2020) *Understanding and combating African **swine** fever in Europe* Surveillance, early detection, epidemiology, management tools, wild boar population management <https://www.cost.eu/actions/CA15116/>



- **ESFLU** (Nov2022-June 2026) *European Swine Influenza Network*; <https://www.cost.eu/actions/CA21132/>
- **ENOVAT** (2019-2023) *European Network for Optimization of Veterinary Antimicrobial Treatment* Development of antimicrobial treatment guidelines and refinement of microbiological diagnostic procedures www.enovat.eu



- **BETTER** (2021-2025) *Biosecurity Enhanced Through Training Evaluation and Raising Awareness* <https://better-biosecurity.eu/>



- **HARMONY** (2019-2023) *Novel tools for test evaluation and disease prevalence estimation* <https://harmony-net.eu/>

H2020 SC2 - Horizon Europe CL6 projects on animal health (7)

Thematic Network & Collaborative projects

Biosecurity



- **NETPOULSAFE** ^{MA} (**TN**; Oct2020 – Sep2023) Networking European poultry actors for enhancing the compliance of biosecurity measures for a sustainable production <https://cordis.europa.eu/project/id/101000728> ; www.netpoulsafe.eu/fr/
- **BIOSECURE** ^{MA} (**HE**, Jan2023 – Dec2026) Enhanced and cost-effective biosecurity in livestock production <https://cordis.europa.eu/project/id/101083923> ; <https://biosecure.eu/>
- **HE-FARM** ^{MA} (**HE**, Nov2022-Oct2025) Healthy environmental-friendly and resilient farm to fork <https://cordis.europa.eu/project/id/101084097>

NETPOULSAFE: Networking European poultry actors for enhancing the compliance of biosecurity measures for a sustainable production



Oct2020 – Sep2023; CSA; €2M; 16 participants (BE,ES,FR,HU,IT,NL,PL)

Coordination: Institut Technique de l'Aviculture, de la Cuniculture et de la Pisciculture-ITAVI, France

Meat chicken layers, turkeys, ducks. From hatchery to slaughterhouse

Objective : *to improve biosecurity compliance in poultry farming by compiling, validating and sharing supporting measures implemented or close to being into practice in 7 large poultry producing countries, thanks to a network of 7 National Poultry AKIS.*

Multi-actor groups, gathering around 500 people, to be chaired and interconnected through Network Facilitators who will stimulate knowledge cross-fertilisation and exchange both at National and EU scales. Supporting measures will be collected from field and literature and analysed from technical and socio-economic point of view to be either validated in pilot farms or directly disseminated to farmers, operators and advisors (incl. vets). In-depth analysis of National contexts will enable to define tailored dissemination strategies. Material (incl. audio-visuals, factsheets, Practice Abstracts, e-learning modules) will be co-constructed with the National Poultry AKIS to ensure its acceptance and shared through most consulted channels and dedicated platform. Synergies with on-going activities, especially EIP-AGRI Operational Groups, will increase project impacts.

BIOSECURE: Enhanced and cost-effective biosecurity in livestock production

Jan2023–Dec2026; €4.8M; 16 beneficiaries+1 affiliated entity (BE,DK,EE,ES,FR,HU,IE,IT,NL,RO,SE) + 2 partners (FAO+UK)

Coordination: Gent University, Belgium

Objective : *to improve the capacity for key actors and decision-makers in livestock farming to understand, prioritise and implement evidence-based, cost-effective and sustainable biosecurity management systems in current and future terrestrial livestock production chains for pigs, poultry, cattle and small ruminants. By:*

- *Setting up and facilitating a multi actor stakeholder forum to support interactive knowledge exchange, bottom-up behavioural change and uptake of the key exploitable results.*
- *Collecting existing biosecurity intelligence throughout the livestock production chain and creating biosecurity risk maps at an EU level for improving future risk analysis.*
- *Quantifying the impact of biosecurity practices through quantitative risk assessment and mathematical models as tools to quantify the probability of introduction and spread of pathogens at farm and sector level.*
- *Improving and extending biosecurity scoring tools for accurate measuring the level of biosecurity and providing adapted and science based advices.*
- *Evaluation and improvement of biosecurity measures through experiments and field studies.*
- *Assessing the socio-economic impact of biosecurity measures both at farm level and beyond*

HE-FARM: Healthy environmental-friendly and resilient farm to fork

Nov2022-Oct2025; €5M; 12 beneficiaries +2 affiliated entities (ES,FR,HU,IT,PL,RO)

Coordination: University de Alcala, Spain

Objectives :

To create and validate a cost-effective & Standardizable Experimental Channel-resolved Biosecurity Assessment Methodology -including formally proposing a CEN Workshop Agreement towards an EN standard. (poultry, pigs, cattle, sheep farms; transport ad slaughter/meat industry)

To create and validate a Standardizable Channel-resolved cost&benefit Biosecurity Prediction Methodology and software/APP

Development, assessment and validation of technologies : Fast integrated air-borne virus smart detector (PRRS and AI); sanitization by low-toxicity biocides & dynamic aggregation; low-toxicity insecticides & repellents & dynamic aggregation application & env-friendly insect and arachnids barrier and prevention techs; rapid vehicle decontamination station; biosecure & env-friendly hall & heat venting and cooling; portable low-cost test-device for fast measuring microbiological metabolism; cold plasma farm water sanitization.

EIP-AGRI on animal health

EIP-AGRI

- EIP-AGRI Focus Group 'Animal husbandry - Reduction of antibiotic use in the pig sector'
<https://ec.europa.eu/eip/agriculture/en/focus-groups/animal-husbandry-reduction-antibiotic-use-pig>
Final report <https://ec.europa.eu/eip/agriculture/en/publications/eip-agri-focus-group-reducing-antibiotics-pig>
The group identified three main interrelated areas for the reduction of antibiotic use:
 - General enhancement of animal health and welfare to reduce the need for antibiotic use. This concerns disease elimination and reduction in particular through improvement of **biosecurity**, management, husbandry, facilities, and training of personnel, veterinarians and advisors.
 - Specific alternatives to antibiotics including vaccination, feeding approaches and breeding.
 - Changing attitudes, habits and human behaviour (farmers, agri-advisors and veterinarians) and improving the dissemination of information.
- EIP-AGRI Focus Group Reducing antimicrobial use in poultry farming (2021):
<https://ec.europa.eu/eip/agriculture/en/publications/eip-agri-focus-group-antimicrobial-use-poultry-report>
- **EIP-AGRI workshop on biosecurity at farm level** (2015): factsheet
https://ec.europa.eu/eip/agriculture/sites/default/files/eip-agri_factsheet_biosecurity_2015_en.pdf

EIP-AGRI workshop on biosecurity at farm level (2015)

- **Report:** https://ec.europa.eu/eip/agriculture/sites/default/files/field_event_attachments/2015-ws-biosecurity_report_20150618_0.pdf

Principles of biosecurity

BIOSECURITY is the combination of all measures that are taken to reduce the risk of introducing and spreading diseases in a herd, at regional or country level.

Improved biosecurity aims at safeguarding and even promoting animal health, which in turn is translated into better health and production performances, lower medication needs and better prices for the products. Biosecurity measures are seen as the fundamentals of every animal health programme. They are based on the principle of avoiding direct and indirect contact between groups of animals and reducing the general infection pressure. Therefore, biosecurity measures are grounded in knowledge on disease transmission processes.



Report of EIP-AGRI workshop on biosecurity : some results to questionnaire

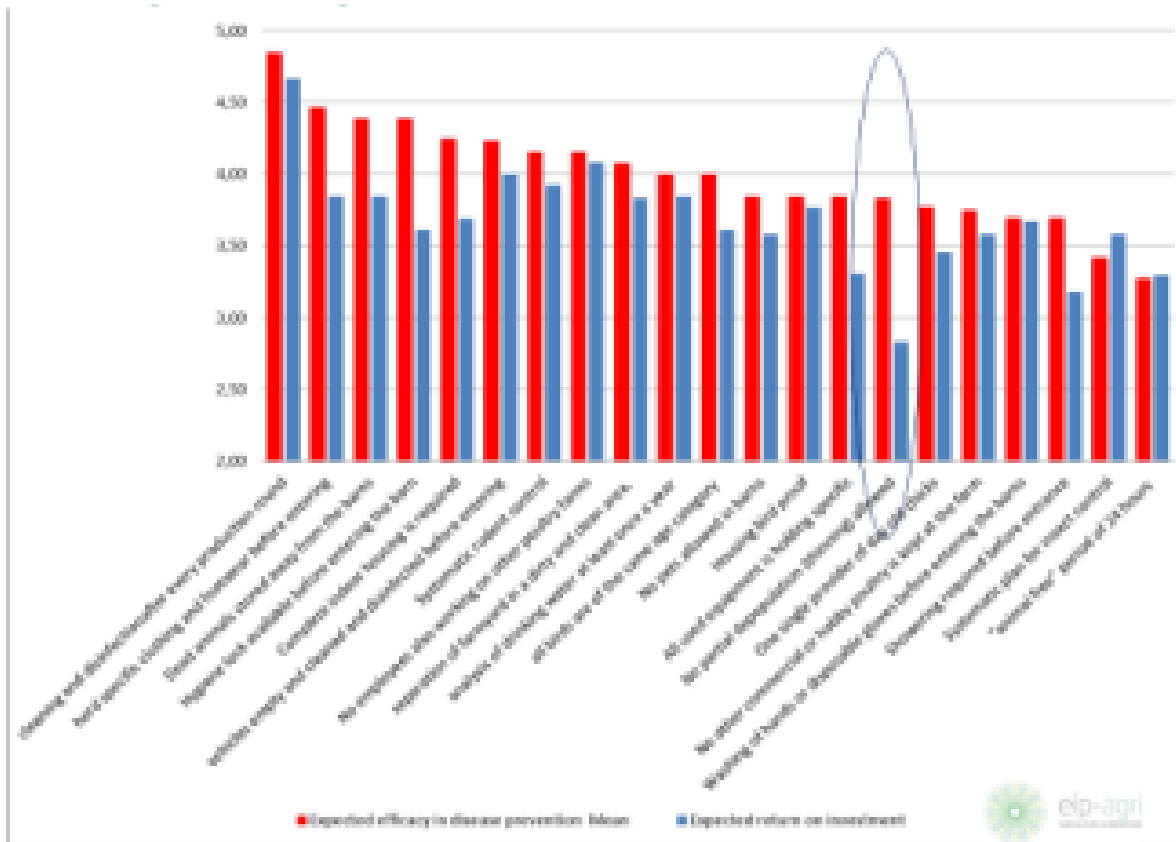
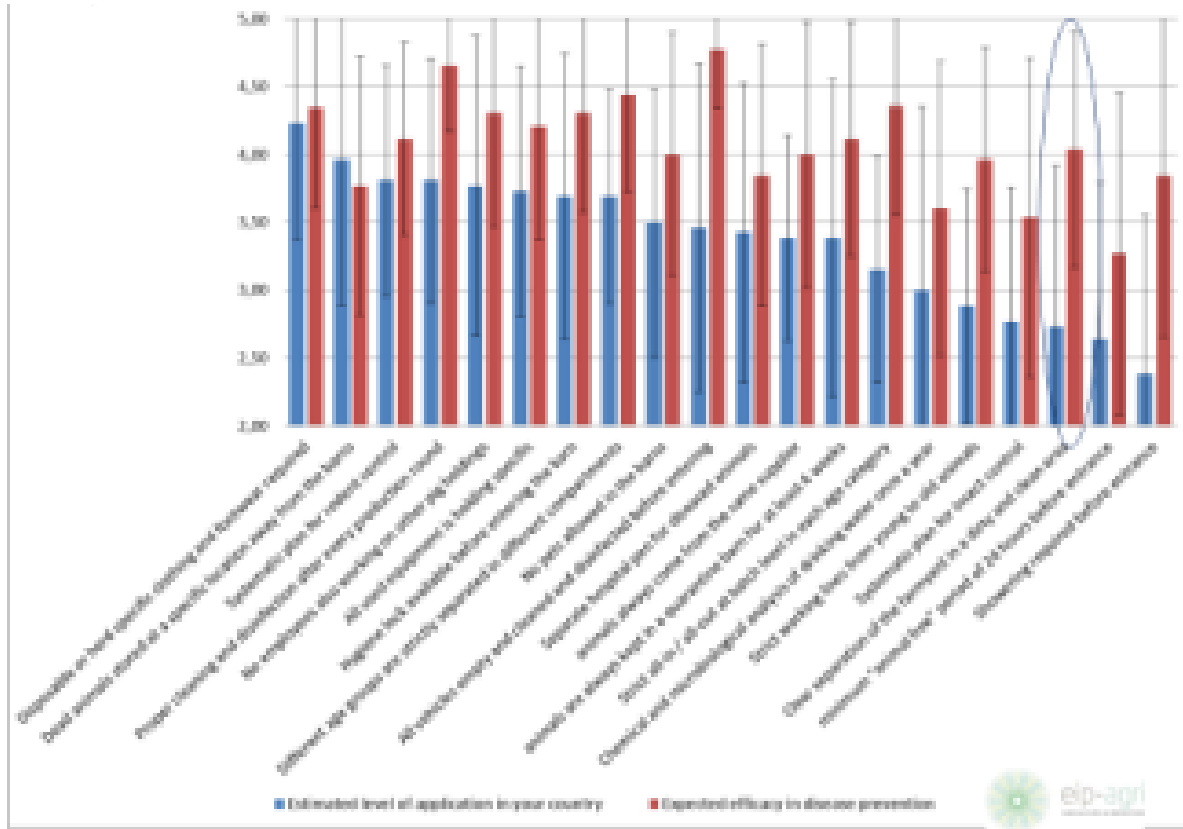


Figure 4 – Poultry: Efficacy vs ROI

The measure of avoiding partial depopulation (thinning) in poultry farming is considered very effective, while the expected return on investment is very low.

Report of EIP-AGRI workshop on biosecurity : some results to questionnaire



The measure of clearly separating the farm into a clean and a dirty area is considered highly effective, while the level of application is low.

Figure 5 – Pig: implementation vs efficacy

Report of EIP-AGRI workshop on biosecurity : knowledge exchange and research needs

Needs on knowledge exchange and demonstration:

The most frequent aspects and needs identified by the participants were:

- ▶ Cost/benefit ratio analysis and data on biosecurity measures, preferably based on regional data
- ▶ Social aspects including coaching, motivating and effective communication (both peer-to-peer systems of exchange and official supporting material)
- ▶ Best practices on operational procedures, hygiene standards and monitoring of the biosecurity status
- ▶ Evaluation methods for quick assessment of biosecurity levels and for identifying technical improvements
- ▶ Disease transmission routes in relation to effective measures
- ▶ Legislation and complying with regulations and standards
- ▶ Biosecurity throughout the chain, for instance who is the main responsible person in what part of the chain

Report of EIP-AGRI workshop on biosecurity : knowledge exchange and research needs

Research needs:

The most frequent research needs identified by the participants are about **behavioural aspects** focusing on the different actors like farmers, but also veterinarians, consumers and citizens. The main question is how to motivate and influence behaviour.

Other aspects that were highlighted relate to:

- ▶ Comparing different biosecurity schemes at different levels
- ▶ Designing real-life farms, taking into account sustainability, for instance striking the right balance between being protected and keeping a positive image for the general public (to avoid that farms look like prisons)
- ▶ Costs and benefits of biosecurity, indicators and ways of measuring success
- ▶ Effective ways to balance biosecurity with wildlife control
- ▶ Ways and measures to effectively transfer knowledge on biosecurity
- ▶ Precision livestock farming (for instance remote sensing)

In general, the workshop did not offer enough time to get a full overview. Further identifying the gaps and research needs should be a topic for further research as well.

Report of EIP-AGRI workshop on biosecurity : drivers and obstacles

Drivers and obstacles for biosecurity

Divided in small groups the participants were asked to discuss drivers and obstacles for implementing biosecurity measures. As Table 1 below shows, the three sectors identified different drivers and obstacles, but at the same time they refer to common themes. Concerning the drivers, five main areas were addressed in all sectors. These are

- (1) economic aspects**
- (2) legislation**
- (3) collective initiatives (assurance, control programmes)**
- (4) values and awareness and, finally,**
- (5) advice and training.**

Concerning the obstacles, again, four relevant blocks can be identified in all three sectors:

- (1) economic aspects related to different dimensions of cost-benefit functions,**
- (2) unclear or incoherent institutional set-up,**
- (3) gaps in knowledge and communication on biosecurity linked to path dependency in the sectors and, finally,**
- (4) some obstacles linked to the inherent needs of production systems (including structures and facilities).**

Report of EIP-AGRI workshop on biosecurity : overcoming obstacles

Overcoming obstacles: increasing implementation	Group 1	Group 2	Group 3
Explanation cost-benefit	x		
Benefits: cost-benefit analysis			x
Lower costs / higher income	x		
Training / education / repetition	x		
Benchmarking	x		
Anonymous scoring system		x	
Stakeholder meeting (open minds, common sense, champion farmer)		x	
Action plans	x		
Adopting core biosecurity on farm (e.g. implementation)			x
Translate science to economical / practical		x	
Risk communication	x		
Communication			x

Table 2: Potential actions to increase the implementation of biosecurity measures

Part of general conclusions

There is a general belief that a lack of application of measures is largely due to a lack of information and/or motivation among the farmers. It was concluded that these lacks should be addressed to improve biosecurity. Collective initiatives involving different farmers could be beneficial for motivating each other.

Challenges and opportunities

- Diversity of situations, diversity of possible solutions: challenge of adapting the biosecurity measures to the type of production and the categories of animals involved. Challenge of outdoor farming.
- There is no '0' risk. Challenge to quantify and mitigate risks (also based on pathogen pathways, disease situation...).
- Challenge of evolving situations: taking into account the local circumstances (e.g. diseases situation).
- Certain biosecurity measures (e.g. buildings...) can have high cost. Need to know efficiency of measures (which differs according to pathogens). There are CAP measures to support investment*.
- Technical developments can help
- Not all measures are costly...but they require daily commitment!
- Sector guidelines?
- Dissemination/communication (think of EIP-AGRI) ; training/education; Advisory services (CAP)

** CAP plans : under investments grants wide investments could be supported such as equipment and facilities for decontamination, disinfection and disinsectisation for means of transport, staff, surfaces and air; construction of protective fences of livestock buildings/facilities or demarcation areas for animals; facilities and equipment for the improvement of animal feed/delivery ramps; facilities and equipment to improve the feed system etc*

Thank you



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