

**LIVESTOCK
BREEDING**

OPERATIONAL GROUPS AND INNOVATIVE PROJECTS



Unión Europea

Fondo Europeo Agrícola
de Desarrollo Rural

Europa invierte en las zonas rurales



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DE ESPAÑA

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Y ALIMENTACIÓN



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OPERATIONAL GROUPS AND INNOVATIVE PROJECTS

Livestock Breeding

EsRuralEsVital

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Introduction

This publication is a compilation of **Operational Groups and Innovative Projects for livestock breeding** carried out in Spain and Europe. The **National Rural Network (NRN)** has been entrusted with creating this publication to meet its purpose of **disseminating and raising awareness about innovative initiatives and fostering the exchange and transfer of knowledge** from the sphere of research to practical applications.

Innovation is a fundamental instrument in all areas, but especially in rural areas since this is a disperse environment with difficult access to knowledge, the results from research, training, market developments and new technologies.

The main instrument to promote innovation in rural areas is the **European Innovation Partnership for agricultural productivity and sustainability (EIP-AGRI)**. The EIP-AGRI aims to **speed up innovation in the agri-food and forestry sector**, and therefore in rural areas, as well as **disseminating successful examples of experience in the territory** through specific innovative projects. In addition, it seeks to match the range of science available to the demand from different sectors and help solve specific problems or make the most of opportunities in order to help increase competitiveness and improve living conditions in rural areas.

The Operational Groups (OGs) are groups of stakeholders from different sectors: agriculture, livestock, forestry, agri-food and forest-based industries, from public or private R&D&I centres, training and consultancy centres, technology centres, non-profit institutions, and more. These parties get together to solve a problem or make the most of an opportunity using an innovative, multisectoral and collaborative approach via an innovative project. Their work is **subsidised by EAFRD** through **national and regional rural development programmes** to set up the group and prepare its innovation project, as well as to implement it.

Furthermore, in the European context, there are other policies with synergies appearing out of their commitment to innovation in rural areas. The **Horizon 2020 research framework programme** covers matters related to the agri-food and forestry sectors. Under this umbrella, there are thematic networks such as the ERA-NET programme and research projects.

This dossier gives the results from the exchange of experiences between **Operational Groups and Innovative Projects on livestock breeding**, organised by the NRN; and information units describing the Operational Groups and Innovative Projects, fostered by Measure 16 of the rural development programme in Spain in this matter and Horizon 2020 projects, with the aim of helping to disseminate them and enabling the different stakeholders to consult them.

Exchange of experiences between Operational Groups and Innovative Projects on the theme of livestock breeding

The National Rural Network organised an exchange of experiences on 11 February 2021 for members of Operational Groups, Innovative Projects and Horizon 2020 to share their experiences working on livestock breeding. More than 85 people representing research centres, companies, public administration, and agricultural organisations and cooperatives, came together to share and discuss innovative solutions to improve competitiveness and sustainability in livestock operations.

Objectives addressed:

The meeting was held with the following objectives:

- **Promoting the creation of networks and synergies** among stakeholders that work in or have an interest in livestock breeding.
- **Contributing to the exchange of information** and project results among Operational Groups, FEADER Innovative Projects and European Horizon 2020 Framework Programme projects working on livestock breeding.
- **Giving visibility** to the innovative work carried out by Operational Groups and Innovative Projects focused on livestock breeding.



Conference held in two stages:

- An analysis was made of the work being carried out by the NRN as regards disseminating the work by the Operational Groups and the Innovative Projects, including the H2020 Programme. Furthermore, the innovative measures in rural development programmes promoted by EIP-Agri and the H2020 Programme were also examined. Lastly, the basics of animal genetics were presented along with a reminder of their importance in making Spanish livestock operations more profitable, sustainable and able to meet CAP requirements and objectives.
- With the aim of bringing about an exchange of innovative solutions in the sphere to encourage improvements in livestock breeding, the attendees saw presentations by eight Operational Groups and Innovative Projects from EIP-AGRI and the H2020 programme, given in three parallel sessions. The thematic sessions focused on the value of native Spanish breeds, and the importance of research and innovative techniques to optimise genetics and higher quality in end products. After these thematic sessions, the key points discussed in each room were shared.

Key ideas:

- Innovative breeding techniques including the application of genomics, use of sensors and development of a germplasm bank are key tools to increase productivity and profitability in the Spanish livestock sector.
- Scientific research on breeding helps increase the sector's competitiveness and sustainability and adapt it to the objectives of CAP 2021–2027.

- Innovation in breeding ensures more efficient selection of breeding animals, which, among other things, helps maintain native breeds at risk of extinction and revitalise traditional extensive livestock.
- The formation of livestock cooperatives and associations is essential in promoting innovation and finding synergies that lead to creative solutions to common goals and challenges.
- Producer cooperatives can play a key role in transferring knowledge and best practices related to breeding.

For more information about the conference, click [here](#)



ANPSTAND: Quality standards for pig artificial insemination centres

1

RURAL DEVELOPMENT PROGRAMME

NRDP

YEAR CREATED

2018

PROJECT COORDINATOR

Asociación Nacional de Criadores de Ganado Porcino Selecto (ANPS)

PARTNERS

ANPS | Agropecuaria de Guissona S.Coop. Baró germans S.A. | Cefu S.A. | Centro de Selección y Reproducción Animal de Extremadura Polichi S.L. | Gepork S.A. | Hendrix genetics S.A.U. | Ibéricos puros de Extremadura S.L. | Pig Improvement Company España S.A. | Selección Batalle S.A. | Topigs Norsvin España S.L.U. | U.P.B. Genetic World S.A.



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Description

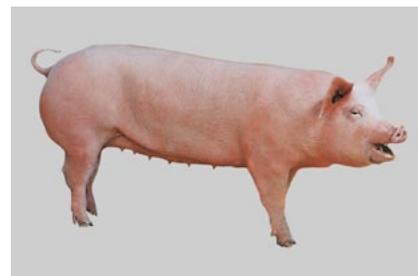
Spain is the fourth largest producer of pork in the world (after China, the United States and Germany), and second largest in Europe, responsible for 19% of tonnes produced. In the last few years, the pork sector has grown significantly in production, number of pigs and number of operations, and innovations in breeding have played an important role. To continue improving the quality of pork production, the Operational Group ANPSTAND is working to develop quality standards defining the minimum requirements for semen doses prepared by pig insemination centres across Spain. Standardising procedures and criteria in artificial pig insemination will have clear benefits such as intense sanitary control, rapid spread of genetic progress and lower costs for farms. In this way, Spanish livestock producers will improve their productivity and therefore their profitability. What's more, this will result directly in the creation of quality employment in rural areas, where most pork producers and insemination centres are located. Finally, the consumer will benefit from higher quality products, thanks to improvements starting at the farms themselves.

Objectives

- Defining and implementing quality standards, including minimum requirements, for doses of pig semen prepared in insemination centres in Spain.
- Creating a best practices manual for artificial insemination centres.

Expected results

- ▶ Standardisation of at least 75% of semen doses produced nationally and 63% of those produced in artificial insemination centres recognised by the Ministry of Agriculture.
- ▶ Improved productivity and profitability of pork operations in Spain.



"Technological development and research in artificial insemination in swine has allowed Spain to create pioneering materials and methodologies and made it an international leader in the field".

EXPORTGEN: Creating a commercialisation and export structure for genetic material

2

RURAL DEVELOPMENT PROGRAMME

NRDP

YEAR CREATED

2018

PROJECT COORDINATOR

Federación Española de Asociaciones de Ganado Selecto (FEAGAS)

PARTNERS

FEAGAS | Asociación Española de Criadores de Ganado Vacuno Selecto de la Raza Asturiana de los Valles (ASEAVA) | Asociación Nacional de Criadores de Ganado Vacuno Selecto de Raza Rubia Gallega (ACRUGA) | Asociación Nacional de Criadores de Caballos de Pura Raza Española (ANCCE)



Description

Spain has high-quality, genetically diverse livestock, a fact that, unfortunately, isn't widely known by the public in general even within Spain.

In spite of its rich genetic heritage, the Spanish livestock sector is not very competitive in the international market. For this reason, it was seen as necessary to establish a commercialisation and marketing channel for native Spanish breeds that would generate a brand image, promote communication and boost exports of genetic material for select breeds.

Thus, the Operational Group Exportgen was formed, which led to the creation of the digital marketplace "Livestock Genetics from Spain (LFGS)". This site seeks to be a leader in the international marketplace for the sale of genetic material and livestock from differentiated, native Spanish breeds. In addition to creating the online marketplace, other offline and online promotional activities were carried out including fairs; articles; interviews; market studies; promotional videos on social networks such as Twitter, Facebook and LinkedIn; and thematic virtual seminars.

An upcoming series of digital events will allow us to hear directly from customers and better understand their wishes and the needs we must address in order to add value and differentiate our product within the animal genetics sector.



www.exportgen.com



feagas@feagas.es

Objectives

- Creating a leading online information centre and marketplace for buying and selling genetic material from Spanish livestock.
- Driving communications and the promotion of native cattle breeds outside of Spain.
- Analysing current and future export potential and consolidating information and export protocols.

Results achieved

- ▶ Creation and promotion of the EXPORTGEN online platform, throughout the sector and open it up to all interested parties.
- ▶ Increased number of platform members.
- ▶ Increased and diversified opportunities in new markets (requests have come from Ukraine, Brazil, Uruguay, France and United Arab Emirates).

"EXPORTGEN's objective is to build a structure for commercialisation based on current needs with a strategic plan to grow and facilitate the export of genetic material for select breeds".



NOVISCAN: Innovative strategies for efficient growing-finishing management

3

RURAL DEVELOPMENT PROGRAMME
NRDP

YEAR CREATED
2017

PROJECT COORDINATOR

Cooperativa Ganadera del Valle de los Pedroches
(COVAP)

PARTNERS

COVAP | Fundación Centro de Investigación y Calidad Agroalimentaria del Valle de los Pedroches (CICAP) | Embriovet S.L. | Easi Vet Distribuciones S.L. | Servet Pedroches S.L.



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Description

The dairy cow sector represents 4.5% of Spain's agricultural output. Within livestock production, it's the fourth largest behind pork, poultry and beef, representing about 11.7% of livestock production output in 2018. The Operational Group NOVISCAN was created with the goal of carrying out a genetic study of representative dairy cow operations to identify genes that improve herd efficiency, with special interest in the growing-finishing stage of Spanish dairy cows. To do so, they aimed to establish personalised selection criteria and update the evaluations for animals studied by the project; maximise the efficiency of dairy operations through a program of embryo transfer that prioritises "elite genotypes"; and establish ultrasound indicators that allow for early monitoring of herd health with special interest in pathologies that slow growth in the first few years

Objectives

- Establishing an efficient growing-finishing programme for dairy cow operations based on the establishment of new selection criteria that optimise the herd's genetics.
- Early monitoring of heifers using innovative ultrasound analysis techniques.

Expected results

- ▶ Creation of an integrated growing-finishing programme for dairy cows that improves the operation's efficiency.
- ▶ Creation of a national network of specialists to advise livestock operators and specialised veterinarians using information and training that will result from the innovative project.
- ▶ Transfer of knowledge and technologies that come out of the research project to livestock operations with the goal of helping operators put them into practice.
- ▶ Evaluation of the medium- and long-term economic viability of Spanish dairy cow operations using mathematical simulation and prediction models.



"Spain's dairy sector is strategically positioned with an economic value of 2.224 billion euros in 2018".

REPROEQUI: Optimising the Asturian equine meat sector's productivity and competitiveness

4

RURAL DEVELOPMENT PROGRAMME

RDP - Asturias

YEAR CREATED

2019

PROJECT COORDINATOR

Asociación de Industrias Cárnicas (ASINCAR)

PARTNERS

ASINCAR | Asociación de criadores de Hispano Bretón de la Montaña Asturiana (ACGEMA) | Ganadería Casa Venturo S.C. Servicio Regional de Investigación y Desarrollo Agroalimentario (SERIDA)



Description

According to the Ministry of Agriculture, Fisheries and Food, in 2016 there were 187 548 operations in Spain dedicated to raising equine livestock. Of that total, 15 462 were focused on meat production, with 6 717 equine meat producers located in Asturias. Traditionally, all types of equine livestock were raised for meat (horses, mules, donkeys). Today, however, the equine meat subsector is limited to horses suitable for meat production such as Basque Mountain Horse, Hispano-Bretón, Asturcón and Asturian Mountain Horse. This project seeks to make equine meat operations more competitive by improving the Asturian horse breed for meat production through artificial insemination by previously evaluated and selected studs. The selection process is intended to address problems of inbreeding, morphologic defects, and risk of transmission of infectious disease through the use of untested studs. The project also comes from the need to grow this subsector, which is operated sustainably by taking advantage of natural resources at mid- and high-altitude and which contributes to the stabilisation of rural population, complementing other economic activities.

Objectives

- Advancing genetic progress, contributing to improved equine meat production in Asturias that is differentiated from other equine meat producers.



<https://www.asincarc.com/actualidad/repro/>



sergio@asincarc.com

- Availability of studs that have been evaluated for health and morphology that will improve meat quality without transmitting hereditary malformations, defects and illnesses.
- Achieving an accumulated artificial insemination success rate of 75%.
- Producing colts with excellent conformation and good growth.

Developing a livestock population that yields more uniform carcasses for sale.

Results achieved

- ▶ Nine colts were selected from the meat production herd as future studs, using morphologic criteria for the prototype Asturian Mountain Horse.
- ▶ The health, morphology and sperm quality of the nine selected colts were evaluated and their fitness as studs determined for the 2020 artificial insemination program.

"The combination of scientific and technological animal reproduction knowledge and techniques has led to a new reproduction service using artificial insemination in which 90 mares were inseminated with doses from the nine selected studs".

QOLOR: Strategies to obtain meat with no boar taint

5

RURAL DEVELOPMENT PROGRAMME

RDP Cataluña

YEAR CREATED

2019

PROJECT COORDINATOR

Selección Batallé S.A.

PARTNERS

Selección Batallé S.A. | Associació Catalana d'Innovació del Sector Carni Porcí (INNOVACC)
Grup Gepork S.A. | UPB Genetic World S.L.
Frigoríficos del Nordeste S.A.



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Description

Boar taint is a significant problem in entire male pigs raised for meat. Boar taint is a disagreeable odour and taste caused by the accumulation of two compounds, androstenedione (AND) and skatole (SKA), and is estimated to affect 10% of entire male pigs produced in Spain. Some consumers are more sensitive to the odour than others, and it can cause them to reject affected meat. Different factors influence the presence of this odour including genetics, nutrition, fattening conditions, pre-slaughter handling (stress during loading, transport and waiting time, etc.), or whether the pig has been immunocastrated. This project seeks a way of eliminating this odour through different interventions. First, new guidelines were developed for immunocastration to get rid of boar taint and achieve a high-quality carcass and meat. Second, genetic markers and indicators of aggressiveness were used to reduce boar taint. Third, a proposal was made to use a portable Raman sensor to allow for faster, more precise detection of boar taint in whole male carcasses.

Objectives

- Guaranteeing the production of high-quality, taint-free pork.

Results achieved

- ▶ A proposal for a model of forestry company for Asturias based on a legal technical analysis and consultations with forest owners.

Expected results

- ▶ Development of new immunocastration guidelines to eliminate boar taint and improve meat and carcass quality.
- ▶ Validate the Raman equipment by comparing 50 samples with laboratory results for the detection of androstenedione and skatole.



"The biggest challenge is avoiding boar taint without significantly increasing the production cost per kilo and making sure the quality of the finished product is optimised for its intended market".

FILOTAT: Developing new genetic selection processes to increase the competitiveness of Spanish merino wool

6

RURAL DEVELOPMENT PROGRAMME

RDP Extremadura

YEAR CREATED

2018

PROJECT COORDINATOR

Comercial Ovinos S.C.L.

PARTNERS

Comercial Ovinos S.C.L. | University of Córdoba (UCO) | Centro de Investigaciones Científicas y Tecnológicas de Extremadura (CITYTEX) | Asociación Española de Ovinos Precoces (AECOP) | Centro de Selección y Reproducción Animal de Extremadura (CENSYRA)



<http://filotat.comercialovinos.com/>



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Description

Wool produced in Spain today lacks uniformity, which affects the final price of the product. Specifically, the fibre diameter varies, making it less competitive with wool from other places such as Australia. To penetrate the European textile market, which is willing to pay higher prices, Spanish wool fibre must improve current values for length, fibre diameter and yield. The Operational Group FILOTAT formed to address these needs, with the objective of developing new genetic selection processes and commercial classification tools in order to make uniform lots of high-quality Spanish merino wool. The Operational Group will work with more than 1 900 sheep operations located in La Serena and Campiña Sur, areas with rurality indices of 11.31% and 20.84%, respectively, that are heavily focused on livestock. The group seeks to develop a common knowledge base in innovation and continuing education in rural areas, strengthening the link between livestock production and R&D&I, and promoting the long-term modernisation and improvement of economic results of producers.

Objectives

- Developing new genetic selection processes to achieve higher-quality merino wool.

- Begin using commercial classification tools in order to make uniform lots of high-quality fibre.

Results achieved

- ▶ Production of offspring that are genetically optimised to produce high-quality merino wool that can compete internationally with other fine wool.



“At the end of the project, Filotat seeks to increase wool's commercial value by producing uniform lots of optimal quality, taking into account that the most sought-after wool combines a fibre diameter of less than 23 microns and length greater than 7 centimetres”.



IBERDEFENSE: Increasing the productive and qualitative potential of certain at-risk varieties of minority Iberian pigs

7

RURAL DEVELOPMENT PROGRAMME

RDP Extremadura

YEAR CREATED

2018

PROJECT COORDINATOR

Asociación española de criadores de cerdo ibérico (AECERIBER)

PARTNERS

AECERIBER | Ibéricos Puros de Extremadura S.L. (IBERPEX) | Consejo Regulador de la DOP "Dehesa de Extremadura" | Diputación de Badajoz | Centro de Investigaciones Científicas y Tecnológicas de Extremadura (CICYTEX) | Centro de Selección y Reproducción Animal de Extremadura (CENSYRA) | Centro de Investigación y Desarrollo del Cerdo Ibérico (CIDCI – INIA) Señorío de Montanera S.L. | Solano veterinaria y nutrición S.L. | IMASDE Agroalimentaria



<https://iberdefense.com/>



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Description

Certain native breeds of Iberian pigs are at risk of extinction because they are no longer raised commercially. Examples from the region of Extremadura include the Torbiscal, Black lampiño, and Manchado de Jabugo. The genetic resources of these genetically distinct breeds are not being used efficiently, consistently or sustainably by livestock producers. However, these breeds represent a genetic heritage that is exclusive to the Extremadura region and could contribute added value to producers of Iberian pigs linked to the dehesa (wooded pasture) ecosystem. IBERDEFENSE seeks to defend and promote the sustainable use of native Iberian breeds and the creation of a germplasm bank for the conservation of genetic material from these breeds. To do so, they will analyse polymorphism in genes of interest to locate the markers related to high-quality meat, for example in the case of the Lampiño, or higher yield, in the case of the Torbiscal. Once the markers have been located and their phenotype evaluated, genetic crossings can be carried out to improve the quality of pure Iberian pigs.

Expected results

- ▶ Demonstration of the added value and commercial profitability of using crossings among genetic minority breeds, making the most of hybrid vigour.
- ▶ Increased and improved conservation of the dehesa (wooded pasture area), which is a heritage symbol for the autonomous community of Extremadura.
- ▶ Maintaining the biodiversity of Iberian lineages at risk of extinction through creation of a germplasm bank.
- ▶ Setting the base to defend and promote pure Iberian pigs in the market.



"Thanks to the great diversity and complementarity of its members, IBERDEFENSE can help promote an efficient livestock sector using genetic resources that are unique in the world".

Objectives

- Demonstrating the yield and quality potential of specific breeds of native Iberian pigs in Extremadura, some of which are at risk of extinction.

GENOMAD: Implementing genomic selection for dairy cattle in the Autonomous Community of Madrid

8

RURAL DEVELOPMENT PROGRAMME

RDP - Madrid

YEAR CREATED

2017

PROJECT COORDINATOR

Asociación Frisona de Madrid (AFRIDEMA)

PARTNERS

AFRIDEMA | Miguel González de Parla | Rufino Juan de Dios de la Iglesia Gil | Madrid Institute for Rural, Agricultural and Food Research and Development (IMIDRA)



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Description

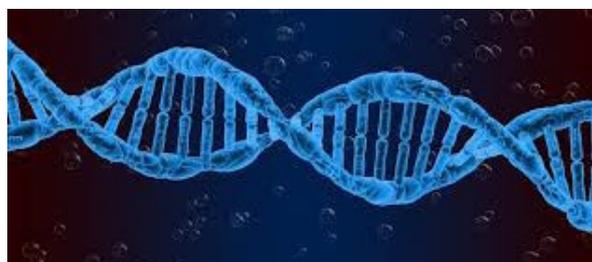
Friesians are the most common dairy cows in Spain, making up approximately 96% of the total, or 756 750 animals distributed across 6 500 farms, according to the 2016 census by the Ministry of Agriculture, Fisheries and Food. AFRIDEMA is the Madrid region's Friesian cattle association and is made up of 20 members with 6 365 registered animals, which is equivalent to around 75% of the region's total dairy cow census. Among the association's main activities are the collection of health traits and biological samples, consulting services and evaluation of new traits and the identification of studs and mothers of studs. The project began when the breed's genomic selection was being carried out at the individual farm level and it was seen as an excellent opportunity to extend the initiative to the entire Madrid region.

Objectives

- Increasing the reliability of genetic assessments, correcting recording errors and decreasing population defects through the identification of haplotypes and recessive genes.
- Increasing genetic progress in Madrid's Friesian cattle operations.

Expected results

- ▶ Genotype determined for all females born in the Autonomous Community of Madrid.
- ▶ Evaluation of the current state of member livestock operations with respect to the most common diseases.
- ▶ Selection of growing-finishing specimens and creation of a mating design.
- ▶ Identification of the best cow families.
- ▶ Preliminary genomic tests of male calves performed to identify genetically superior animals.



"The Operational Group's main challenge is ensuring continuity for the project we started, given that we need more time to see the impact in a subsequent generation of dairy cows".

MEJOREPROAVI: Evaluation and optimisation of the reproductive yield of Avileña-Negra pigs

9

RURAL DEVELOPMENT PROGRAMME

RDP Madrid

YEAR CREATED

2018

PROJECT COORDINATOR

Asociación Española de Raza Avileña-Negra Ibérica (AECRANI)

PARTNERS

AECRANI | Instituto Madrileño de Investigación y Desarrollo Rural (IMIDRA) | Universidad Complutense de Madrid (UCM) | Centro de Vigilancia Sanitaria Veterinaria (VISAVET)



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Description

The native Iberian breed Avileña-Negra is one of the most common in the mountainous zones of the Central System of the Iberian Peninsula. Totally adapted to its environment, this breed is extensively raised in difficult-to-reach but environmentally valuable mountain regions where it contributes to maintaining the landscape and biodiversity. The Operational Group grew out of the need to track the incidence of reproductive diseases and improve general and reproductive handling in Avileña-Negra operations in the Community of Madrid. The project seeks to evaluate and optimise the reproductive yield of this type of livestock with a holistic focus. At the genetic level, a tool is being developed to select for fertility traits. To improve health, a monitoring system has been put in place to determine the prevalence of reproductive diseases. Nutritional adjustments are being verified depending on animal needs and, in terms of reproduction, fixed-time artificial insemination is being optimised and new techniques for preserving semen are being applied.

Objectives

- Using genetics to improve fertility and profitability of extensive Avileña-Negra operations.

- Improved synchronisation and collaboration among producers.

Expected results

- ▶ Optimisation of the reproductive yield of extensive Avileña-Negra operations.
- ▶ Improved profitability of livestock operations through optimised vitrification (cryopreservation of bovine sperm) and artificial insemination.
- ▶ Development of an ultra fast cryopreservation protocol for bovine semen that costs less and is less technically difficult than conventional freezing methods.
- ▶ Updated and optimised ex situ conservation tools in CENSYRA (Extremadura Government Centre for Animal Selection and Reproduction) through creation of a germplasm bank and by updating the frozen sperm bank to maximise production diversity and quality.



"The native Iberian breed Avileña-Negra is known for its perfect adaptation to the resources in the mountainous area of the central Iberian Peninsula and for its capacity to have a calf with an approximately one-year interval between births".

SMARTER: SMALL RuminanTs breeding for Efficiency and Resilience

10

HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME

YEAR CREATED
2019

PROJECT COORDINATOR

Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (INRAE)

PARTNERS

FR: INRAE, Capgenes, IDELE, IT, RDF
GR: AUTH, FRIZARTA | **IT:** ARAL, S-ICAR, EAAP, CNR | **CH:** FiBL | **UY:** INIA-UY | **UK:** SRUC, UEDIN, TEXELS, Y-DG, AbacusBio
ES: UNILEON, NEIKER, OVIGEN | **IE:** TEAGASC
HU: UNIDEB | **CA:** UGUELPH | **RO:** BUAS, **NO:** NSG | **CN:** CAS



<https://cordis.europa.eu/project/id/772787/es>



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Description

Infectious diseases cause a decline in fertility rates, productivity and survival in livestock around the world. The increased cost of fighting these diseases greatly reduces the profitability of animal production. Thanks to recent advances in genomic and phenotyping technologies and gene editing, accompanied by promising advances in statistical methods, it's possible to raise livestock that are more resilient to disease. Following this line of work, the SMARTER project seeks to develop innovative strategies to improve traits related to resilience and efficiency (R&E) in sheep and goats. Resilience is understood as the capacity of an animal to maintain or rapidly return to a high level of production and health. Efficiency refers to the relationship between the amount of feed consumed by the animal and the energy it gains and greenhouse gases it generates.

Objectives

- Characterising phenotypes and understanding new traits related to resilience and efficiency in sheep and goats.
- Improving and developing new techniques of genomic prediction.
- Establishing new breeding and handling strategies for these new traits associated with resilience and efficiency according to their importance and relevance for different systems, breeds and environments.

Results achieved

- ▶ Rearing of small ruminants adapted to types of agriculture and livestock operations in the EU (conventional, organic and agro-ecological) to make animals productive even in the toughest conditions.
- ▶ Sustainable solutions available for breeders and farmers associations to tackle the expensive problem of endemic diseases.



"Controlling infectious diseases is still very complicated for livestock producers and the animals they raise [...] Applying new statistical methods to massive data sets from automatic genomic registries makes it possible to raise livestock that are more resilient to infection".

IMAGE: Innovative management of animal genetic resources

11

HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME

YEAR CREATED
2016

PROJECT COORDINATOR

Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (INRAE)

PARTNERS

INRAE | Food and Agriculture Organization of the United Nations (FAO) Friedrich-Loeffler-Institut (FLI) | Instituto Nacional de Tecnología Agropecuaria (INTA) | Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA) | Wageningen Universiteit (WU)



<https://www.imageh2020.eu/>



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Description

One of the key challenges for handling and conserving genetic resources is integrating and making available large quantities of information stored in more than 60 gene banks in 20 European countries. The IMAGE project was created to give access to the enormous quantity of non-standardised data distributed across different locations, formats and languages. The IMAGE web portal integrates the data from gene banks and collections with genomic information and geographic information systems. Several steps were taken to make the project successful. First, a set of metadata rules were defined to guarantee that data are high-quality and comparable across diverse collections stored in different formats and languages. Second, a tool was developed to help administrators of germplasm banks improve, harmonise, label and send data from their bank to a Common Data Pool that integrates all of the germplasm bank registries across Europe.

Objectives

- Demonstrating the benefits brought by gene banks to the development of more sustainable livestock farming systems.

- Enhancing the usefulness of genetic collections to allow the livestock sector to respond to new environmental constraints and market needs.
- Optimising complementarity between ex-situ and in-situ conservation to maximise resources for the future.
- Making use of the latest developments in DNA technology and reproductive physiology in collecting, storing and using biological resources.

Results achieved

- ▶ Creation of a germplasm bank for animal genetic resources (EUGENA) with the support of the FAO's European Regional Focal Point on animal genetic resources.
- ▶ Harmonised protocols for exchange and access to genetic resources through an integrated database that connects genomic information to genetic collections along with search and analysis tools.
- ▶ Development of new protocols and procedures to preserve biological samples.
- ▶ Creation of new genomic knowledge about local breeds and new methods to value their adaptive traits.

"IMAGE is an innovative portal that integrates and presents gene bank data with genomic data and geographic information".

The NRN is the hub connecting all of the people and entities related to the rural environment with the aim of raising awareness of Rural Development Programmes and providing access to them. At the same time, its purpose is to make the population aware of the importance of the rural environment for our present and our future.

The unit responsible for the NRN is the Subdirectorate General for Rural Revitalization within the Directorate General of Rural Development, Innovation and Agrifood Training of the Ministry of Agriculture, Fisheries and Food.

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