

**IMPROVING
THE
MANAGEMENT
OF LIVESTOCK
OPERATIONS**



OPERATIONAL GROUPS AND INNOVATIVE PROJECTS



Unión Europea

Fondo Europeo Agrícola
de Desarrollo Rural

Europa invierte en las zonas rurales



**GOBIERNO
DE ESPAÑA**

**MINISTERIO
DE AGRICULTURA, PESCA
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OPERATIONAL GROUPS AND INNOVATIVE PROJECTS

**Improving the
Management of
Livestock Operations**

EsRuralEsVital

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Introduction

This publication is a compilation of Operational Groups and Innovative Projects on the theme of improving livestock operations 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 knowledge exchange and transfer** 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 to **disseminate 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 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 within 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 and research projects.

This dossier presents the outcomes from the exchange of experiences between Operational Groups and Innovative Projects on improving the management of livestock operations organised by the NRN. It includes information units describing the Operational Groups and innovative projects, fostered by Measure 16 of the rural development programme in Spain in this matter, thematic networks, and Horizon 2020 projects, with the aim of helping to disseminate them and enabling the different stakeholders to consult them.

Conference to exchange experiences between Operational Groups and Innovative Projects on the theme of improvements in livestock operations

The National Rural Network (NRN) organised a virtual conference for members of Operational Groups, Innovation Projects and Horizon 2020 to share their experiences. More than 60 people representing research centres, private companies, public government administrations, rural development groups and producer associations attended the virtual meeting.

Objectives addressed

The meeting was held with the following aims:

- **Promote the creation of networks and synergies** among stakeholders to reflect on innovative solutions for the improvement of livestock operation management from environmental, economic and technological points of view.
- **Contribute to the exchange of information** and project results among Operational Groups, FEADER Innovative Projects and European Horizon 2020 Framework Programme projects working on this topic.
- **Give visibility to the innovations** developed by Operational Groups and Innovative Projects focused **on the livestock theme.**



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 Horizon 2020. Furthermore, the innovative measures in rural development programmes encouraged by EIP-Agri and Horizon 2020 were also examined. Lastly, there was an explanation of organising principles and their importance for improving the sector.
- In order to bring about an exchange of innovative solutions related to improvements in livestock operations, attendees saw presentations by nine Operational Groups, Innovative Projects and projects from the H2020 programme, given in three parallel sessions, after which the key points discussed in each room were shared.

Key ideas:

- One of the sector's challenges is adapting to new factors, whether social or environmental, that have an influence in the marketplace.
- Consumers are increasingly aware of environmental challenges, climate change, animal well-being and traceability, all of which impact their consumption patterns.
- Differentiated products that are locally and sustainably produced carry increasingly more weight in the marketplace and represent new profit opportunities for the livestock sector, especially for extensive livestock.
- Along the same lines, CAP 2021-2027, and specific strategies led by Europe such as the Green Deal, Farm to Fork and eco-schemes, set guidelines for a more sustainable European common agricultural policy that also generates employment and environmental services.



- Innovation, in all its forms, presents an opportunity to modernise and reinvigorate the sector as well as adapt to new goals and challenges such as generational change.
- The formation of cooperatives and associations with livestock stakeholders, including those in adjacent sectors such as agriculture, is essential to promoting innovation and finding synergies that lead to creative solutions to common goals and challenges.
- Producer associations can play a key role in the transfer of knowledge and best practices and in supporting and familiarising livestock farmers with the use of new technologies that improve management of their business.
- New technologies that use sensors, such as robots that can measure different parameters to ensure animal well-being, and information technologies such as digital platforms to manage and control a farm and web applications to monitor animal parameters, can considerably increase the efficiency, sustainability, productivity and profitability of livestock operations.

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



EVNA: Increasing profits for producers of native breed nurse cows



RURAL DEVELOPMENT PROGRAMME

NRDP

YEAR CREATED

2017

PROJECT COORDINATOR

Federación de razas autóctonas españolas (FEDERAPES)

PARTNERS

FEDERAPES | SAT Ganadera Parda de Montaña | 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 Retinta (Acre) | Asociación de Criadores de Ganado Vacuno Pirenaico de Navarra (Aspina) Confederación de Asociaciones de Ganado Vacuno Pirenaico (Conaspi)



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Description

Spanish heritage livestock are closely linked to the diversity of the territory and are perfectly adapted to its climate and geography. With respect to cattle, Spain has a large number of native breeds of nurse cows, and many of those breeds are at risk of extinction because of their low productivity and profitability in extensive farming.

This innovative project seeks to improve the competitiveness of native breed cattle operations by improving the fertility and reproductive management of the herd. Among other things, the group plans to identify new phenotypes and use different innovative techniques such as marker-assisted selection, embryo transfer, sexed semen and in vitro fertilisation. In addition, the group will use male evaluation, study new feeding conditions during fattening and take action to improve awareness of native breeds.

Objectives

- Increasing profits for producers of nurse cows and native cattle through breeding and reproductive improvements.
- Developing a computerised tool to improve and optimise production, reproduction and genetic information.
- Lowering production costs through the use of this tool.

Expected results

- ▶ Evaluation and improvement of the reproductive efficiency of cattle operations with nurse cows.
- ▶ Identification of new phenotypes for selection and promotion of marker-assisted selection.
- ▶ Promotion of the use of innovative reproductive techniques.
- ▶ Increased understanding of bull fertility.
- ▶ Optimised fattening of replacement females (calves and heifers).

“What we are trying to do is improve Spanish nurse cow operations where we can still make an impact in terms of reproductive criteria, to increase their efficiency”.



AMALTEA: Implementing a support system to sustainably manage Andalusian goat herds

2

RURAL DEVELOPMENT PROGRAMME

RDP - Andalucía

YEAR CREATED

2018

PROJECT COORDINATOR

Federación Andaluza de Asociaciones de Caprino de Raza Pura (CABRANDALUCÍA)

PARTNERS

CABRANDALUCÍA | Universidad de Sevilla
Asociación Nacional de Criadores de Caprino de Raza Murciano Granadina (CAPRIGRAN)
Cooperativas Agroalimentarias de Andalucía



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Description

Goat herds play a key role in Andalusia. In the 2019 national census, the region counted one million head of goat, or 37% of the national total. Because goat herding is often done as a family business in areas that are unsuitable for agriculture, it represents an opportunity to maintain the vitality of rural areas in the region and generate employment in marginalised territories.

The Operational Group AMALTEA proposes new tools based in innovative digital technologies to improve competitiveness, profitability and efficiency of goat livestock operations. One of them is an online management platform drawing on data-based knowledge from Cabrandalucía and the University of Sevilla. The platform is organised as modules adapted to the sector's diverse needs including livestock management, yield control, DNA-genetics, economic and environmental variables and carbon footprint, stud centre, administration and management, and more.

Objectives

- Developing a data-based tool, drawing on the knowledge generated and programmes conducted to date, that makes it possible for technicians and operators to collect data related to goat keeping, analyse it from technical-economic and environmental points of view, and use it to support decision making.

- Incorporating into this tool a carbon footprint calculator for individual goat operations, taking into account emissions as well as carbon capture.
- Designing an ERP system in which all the information generated is available through a web application.
- Supporting the work of the Andalusian specialist goat centre, managed by Cabrandalucía.
- Creating a network of collaborating farms that periodically supply data to the Andalusian specialist goat centre.

Expected results

- ▶ Improvement in the management and decision-making capacity of goat sector farmers and technicians.
- ▶ Establishing and consolidating links between producers and researchers, adding value to the Andalusian specialist goat centre.
- ▶ Promoting innovation in rural areas, bringing digital resources to farmer.
- ▶ Preservation of biodiversity by helping improve the functioning of operations focused on native breeds.



“Our challenge and objective is to implement the use of new technologies among Cabrandalucía’s members and promote innovation in rural areas, enabling generational change”.

RODAPORK: Genetically selecting Duroc pigs as part of a traditional, differentiated production model

3

RURAL DEVELOPMENT PROGRAMME

RDP - Catalunya

YEAR CREATED

2018

PROJECT COORDINATOR

Associació Catalana D'Innovació del Sector Carní Porcí (INNOVACC)

PARTNERS

INNOVACC | Grup Gepork | Industrias Cárnicas Montronill | S.A.U. | Serveis Turístics Cabanyes S.L.U. | Universidad de Murcia | Escorxador Frigorífic d'Osona S.A.



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Description

Production of pork with white coat genotypes (including Duroc) depends on the optimisation of the cost-benefit ratio. However, every day new market niches emerge, each demanding a high-quality, differentiated product where quality is often measured in gastronomic and ethical terms.

The RODAPORK project's objective is to breed animals capable of delivering a differentiated meat while optimising zootechnical parameters for more efficient and competitive production. Currently, different groups of matings have been carried out to study genetic and nutritional variability from the use of the Duroc genotype with different grades of intramuscular fat with different feeding combinations and programmes.

- ▶ Improved uniformity of products obtained from the established selection programme.
- ▶ Lower feeding costs through electronic monitoring of nutritional behaviour of the different genotypes studied.
- ▶ Increased nutritional, organoleptic and technological quality of meat from "heavy pigs" (animals that achieve their full growth potential).
- ▶ Improved carcass composition and meat quality of pigs crossed with Duroc, their slow growth efficiency and meat quality.

Objectives

- Designing, developing and validating a production model with an appropriate genetic selection of Duroc pigs.
- Bringing back a production model capable of generating a high-end differentiated product that delivers a unique raw material that can occupy a segment of the high value-added market.

Expected results

- ▶ Increased adaptability to a precision production model as well as efficiency in reproduction and production.



"The project makes it possible to obtain an optimal animal, capable of yielding a differentiated meat with a series of specific attributes that respond to current needs of an emerging market that is very concerned with its food".

APRES: Using rotational grazing in the oak groves of Madrid's Sierra Norte mountains

4

RURAL DEVELOPMENT PROGRAMME

RDP - Comunidad de Madrid

YEAR CREATED

2018

PROJECT COORDINATOR

Asociación Enrama (ENRAMA)

PARTNERS

ENRAMA | Instituto Madrileño de Investigación y Desarrollo Rural, Agrario y Alimentario
Ayuntamiento de Cabanillas de la Sierra
Asociación de Criadores de Ganado de Raza Berrenda de la Comunidad de Madrid (ABEMA)
Grupo de Acción Local Sierra Norte de Madrid (GALSINMA) | Ganadería Fernando Guzmán Guzmán



Description

The population density in the Sierra Norte mountains of the Autonomous Community of Madrid is 20 inhabitants/km². This mountainous area is an internationally recognized natural area, however, it presents important management issues that local authorities aren't capable of addressing.

In recent years, habitat changes have been observed such as land fragmentation, abandonment of traditional land use, fires, increased pollution, invasive species, loss of biodiversity, reduced ecosystem services, and increase in desertification and other effects caused by climate change.

The APRES project began with the objective of demonstrating the viability of targeted land management, such as rotating grazing between different oak plots, that can be exported to a significant area of Madrid's forest land. The project uses as a reference different studies of sustainable land management that have been successfully applied in different parts of the world.

Objectives

- Demonstrating the potential of grazing to mitigate and reverse threats associated with global change.
- Spreading knowledge about the ecology of the Sierra de Madrid silvopasture systems and land regeneration.
- Creating a demonstration site for sustainable land management through the efficient use of local resources.



www.facebook.com/GOApres/



info@pastoreorotativosierranortemadrid.com

Expected results

- ▶ Development of sustainable management practices adapted to the current state of agroforest systems.
- ▶ Reduced number of fires.
- ▶ Improved soil conditions.



“This initiative evaluates the viability of rotational grazing to manage the territory sustainably”.

AGRIGGA: Optimising the production of mature beef with differentiated quality through the use of local resources

5

RURAL DEVELOPMENT PROGRAMME

RDP - Galicia

YEAR CREATED

2016

PROJECT COORDINATOR

Agrigga Carne Sociedad
Cooperativa Galega

PARTNERS

Agrigga Carne | Frigoríficos Bandeira S.L.
Fundación Centro Tecnológico da Carne (CETECA)



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Description

The excellent reputation of mature Galician beef, together with the scarcity of finishing steers, has caused this product to be reconsidered. The majority of mature beef carcasses produced in Galicia come from the slaughter of beef or dairy cattle whose lower production value, from advanced age or other reasons, has been improved through fattening.

To produce this differentiated meat, operators must take advantage of forage on their own farm, which is influenced by the geography, climate, soil and vegetation specific to Galicia. Because the nutritional needs for this type of cattle are high, forage resources need to be managed to make sure there is a sufficient daily supply.

The project seeks to fine-tune the production of mature carcasses, starting with cows culled from dairy production and leveraging traditional grazing complemented with fodder and grain produced on the same farm. To this end, a group of operators and animals were selected to carry out feeding trials and studies of ration size and duration of the fattening period. After monitoring the animals and measuring production parameters, the sensory and physicochemical characteristics of the meat they produced were analysed.

Objectives

- Describing the current production process in Galicia of mature carcasses brought to market.
- Establishing criteria before cows are culled from milk production so the process can be adapted to their initial physical condition and characteristics.
- Adapting production of mature carcasses to an extensive or semiextensive system.
- Characterisation of the product by defining the differences in meat composition (fatty acids, sensory characteristics, consumer preference, etc.) based on the characteristics of these animals.

Expected results

- ▶ Establishment of a quality seal representing traditional farming practices.
- ▶ Promoting cooperation among farmers, the processing industry, research centres and consumers.



“Through the development of this project, we have laid the groundwork to continue building a value chain for the meat thanks to new awareness of producers in our shared work”.

EXTRAPASTO: Strategies for making Galician sheep herds more competitive and sustainable

6

RURAL DEVELOPMENT PROGRAMME

RDP - Galicia

YEAR CREATED

2018 – 2020

PROJECT COORDINATOR

Asociación Galega de Cooperativas Agroalimentarias (AGACA)

PARTNERS

AGACA |
Asociación de Criadores
de Ovino y Caprino de Galicia (OVICA) |
Fundación Centro Tecnológico da Carne (CETECA)
As Sabugueiras S.C. |
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Description

The traditional Galician sheep and goat sector is adapted to the agroclimatological profile of the region. The sector is also present in 80% of the autonomous community's towns, contributing directly and in a special way to rural development.

Sheep and goat meat are valued for their taste, but Galician sheep operations are notably small and widely dispersed, making production more difficult and more expensive.

The project seeks to develop mechanisms for the standardisation and telematic management of sheep and goat production so that operators can earn a livelihood in rural Galicia while maintaining the quality of the local environment.

Objectives

- Standardising production systems based on current categories (extensive nursing, extensive weaning, semiextensive outdoors and semiextensive indoors).
- Developing a telematic system so that Galician sheep and goat productions can be competitive, taking advantage of natural resources through shepherding.

Results achieved

- ▶ Pastores de Galicia (Shepherds of Galicia) brand sheep meat was categorised according to the main traditional production categories.
- ▶ A telematic system was developed to take advantage of natural resources through shepherding.
- ▶ A mobile and web-based application was developed to control the herd and plan births, among other functions.
- ▶ The results were shared and training on agri-food quality provided to partners.



“The project provided a large amount of information about typical production systems. It was difficult for the cooperative to standardise their production taking into account commercial carcass yield, meat quality and consumer preference”.

Innovation in Majorcan sheep farming

7

RURAL DEVELOPMENT PROGRAMME

RDP - Illes Balears

YEAR CREATED

2017

PROJECT COORDINATOR

Cooperatives agro-alimentàries
Illes Balears (UCABAL)

PARTNERS

UCABAL

Camp Mallorquí Fruits S.Coop.

Pastores Grupo Cooperativo



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cooperatives
agro-alimentàries
Illes Balears



Description

The Balearic Islands sheep sector is in decline and experiencing a reduction in the number of operations. This is due to different factors including competition with more profitable economic activity such as tourism and higher production costs because of insularity.

The project seeks to increase Majorca sheep operation profitability through innovations in handling and management, using the sheep production and commercialisation experience of Pastores Grupo Cooperativo in Zaragoza. Between 2017 and 2020, five pilot activities defined as Plan EVOLucionaria were carried out: elimination of unproductive ewes, testing and evaluation of males, out-of-season reproduction, control of mastitis, and quality criteria for fattening lambs.

Objectives

- Increasing profitability of sheep operations in Majorca.
- Increasing the productivity of the Balearic Islands sheep sector.

Results achieved

- ▶ Plan EVOLucionaria was implemented on 13 pilot farms, and identified unproductive ewes, presence of mastitis, and male fertility as the most significant factors affecting profitability.
- ▶ Births increased 30% and the sale of lambs per ewe per year increased from 0.8 to 1.5 through planning and out-of-season reproduction.
- ▶ The profitability of grass-fed lambs was compared with that of lambs given feed.

“We have the challenge of expanding the project to more farms and sharing knowledge with all of the farmers in the Balearic Islands. We want to keep working on the improvement needs of each farm so they not only survive but grow”.

GOCEBO: Streamlining the environmental and land use aspects of beef production through community management of local forage resources

8

RURAL DEVELOPMENT PROGRAMME

RDP - País Vasco

YEAR CREATED

2016

PROJECT COORDINATOR

Unión Agroganadera de Álava (UAGA)

PARTNERS

UAGA | José Antonio Gorbea Alonso
Iñai Rueda Ugarte | Luis Vidal Ruiz de Lezana
Castillo | Alberto Ruiz de Loizaga Cámara
Aitor Oraa Salazar | Neiker-Instituto
Vasco de Investigación y Desarrollo
Agrario S.A. | Agricultores y ganaderos
de Álava S.COOP. (AGA) | Miba S.COOP.



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Description

The project brought together operations dedicated to raising nurse cows with an orientation to the sale of grazing calves (animals between seven and eight months of age that have stayed in the field with nurse cows eating a diet of grass and forage), in order to form two fattening groups that would be raised together.

The fattening groups were raised on one farm with the goal of comparing classic "feed and straw" fodder with a diet closer to local agricultural production, based primarily on forage obtained from the farms' own harvest.

Objectives

- Taking advantage of synergies among livestock and agricultural operations, balancing out land use differences and improving sustainability.
- Increasing the number of beef cattle operations, giving work to Basque farmers.
- Increasing the final value of beef cattle and strengthening the commercial position of producers.
- Enhancing demand for forage crops and increasing addition of organic matter to agricultural land.
- Promoting collaboration among individual producers, researchers, advisors and groups that represent the sector.

Results achieved

- ▶ Technical and economic information was generated for the two groups of beef cattle used in the experiment, with determined age, breeds and initial weights.
- ▶ After the pilot test, the effect of minimising costs for corn silage and feed was determined to result in a wider margin and economic profitability for the operation.
- ▶ Accurate forecasting of necessary supplies and the sale date of meat was shown to be important to the profitability of a community fodder operation.



"The project's current challenges are: reach agreements between farmers and livestock growers, adjust animal dates of entry and slaughter, and commercialise quality products".

CHIKENBOY: A robot that improves the productivity and well-being of chicken

9

**EUROPEAN HORIZON 2020
PROGRAMME**

YEAR CREATED
2016

PROJECT COORDINATOR

Farm Robotics and Automation S.L.
(FAROMATICS)

PARTNERS

FAROMATICS



investment@faromatics.com

Description

Precision Livestock Farming (PLF) is oriented to the development of technologies that improve the efficiency of livestock operations and the quality of animal products.

Among other applications, it helps farmers detect animal needs as quickly as possible through real-time monitoring using sensors. Meeting these needs increases animal health and well-being and therefore farm productivity.

ChickenBoy is a robot capable of measuring different parameters in industrial poultry operations 24 hours a day. It's the result of a Horizon 2020 project initiated in 2016, after which various experts in animal health and precision livestock farming founded the Faromatics company to develop it. The robot is capable of detecting dead animals, wet spots in sand, defective water dispensers, and the early stages of disease based on fecal droppings.

What's more, it can generate a thematic map of the operation showing temperature, humidity, air quality, light intensity, distribution of birds, and other parameters.

This innovation can considerably improve the quality of life of chickens in industrial farms and reduce mortality and economic losses.

Objectives

- Increasing animal well-being and productivity of poultry farms through precision livestock farming.
- Detecting animal needs as quickly as possible through real-time monitoring to diminish animal mortality in industrial farms and increase profitability.

Expected results

- ▶ Increase in production cycles from six to seven annually with continuous high yield.
- ▶ Dramatically lower mortality of chickens and waste on industrial farms through continuous monitoring of different parameters that increase animal well-being.

"In one year of implementation in 1 000 industrial chicken houses, ChickenBoy has doubled the profits of poultry farmers".



ChickenBoy

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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