

New homogenisation strategies in pork production based on the use of liquid feed and the incorporation of computer vision tools and neural networks to control and monitor the weight of the pigs

Summary

The main objective of this project is to improve the profitability of pork production by optimising its costs, in addition to the growth and fattening curve to ensure regular and homogeneous production. This also results in environmental impact improvement, given that optimisation of the growth curve enables a reduction in the nitrogen levels in the feed. In this sense, the project involves all the agents in the value chain and focuses mainly on optimising the feeding strategies, through the use of liquid feed, and the management/homogenisation of the growth of the animals, incorporating latest-generation technologies such as computer vision and neural networks.

Objectives

The following specific objectives are proposed in this project:

1. Homogenisation of the growth of the animals in the pens.
2. Automation of the feeding processes and adaptation to the needs of the animals: optimisation of the feed.
3. Homogenisation of the weight of the animals entering the slaughterhouse.
4. Integration of data in terms of feed, genetics, growth and production.

Description of initiatives outlined in the project

The actions to be carried out to achieve the proposed objectives are:

- + Implementation of the liquid feed system at the farms.
- + Implementation of an automated weight control system using computer vision tools at the farms, to control weight evolution, and at the slaughterhouse, to control the weight and dirtiness of each animal.
- + Implementation of neural networks for data processing, resulting in a decision-support system. This system, which is fed by the weight control data, will enable the fully automated adaptation of the feed formulations, quantities and frequencies to the evolution of the weight of the animals.

Expected results and practical recommendations

- + A significant increase (40%) is expected in the homogenisation of the growth of the animals, obtaining batches with minimal weight variability,
- + Automation of the feeding system and its adaptation to the requirements of the animals. The number of different types of feed will change from the 6 to 8 currently used throughout the animal's life (approximately one per month) to 25 (approximately one per week).
- + The animal weighing and counting process at the slaughterhouse will be automated and as the batches will be more homogeneous, fewer penalties will be imposed. The levels of pig dirtiness could also be controlled, enabling better planning of the slaughter tasks and thereby optimising production and preventing unwanted contamination. In conclusion, the work of the slaughterhouse will be

streamlined, producing more homogeneous carcasses.

+ The aim is to establish a decision-support system that enables breeders to make decisions about the animals' feed and the point at which the pigs are ready to be sent to the slaughterhouse. This will enable the automation of a system that is currently extremely manual and the prevention of possible errors, optimising the process and reducing costs.

Task force leader

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Typology of entity:
Agri-food company

Task force coordinator

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Typology of entity:
University

Subject area(s) of application

Animal husbandry and welfare
Food quality/processing and nutrition
General

Geographical area(s) of application

Province(s)	Region(s)
Barcelona	Vallès Occidental Berguedà Bages

Dissemination of the project *(publications, conferences, multimedia...)*

- Participation in livestock fairs, possible organisation/participation in round tables:
 - + Vic Palm Market (<http://www.vicfires.cat/fires.php?idm=1&subpg=4>)
 - + Sant Narcís de Girona Fair (<http://www2.girona.cat/ca/firesdesantnarcis>)
 - Scientific and technical publications, especially in the field of computer vision applied to the pork industry.
 - Events organised to disseminate the results to the scientific community.
 - Participation in technical seminars: specifically, the technical seminars of the Annual Technology Transfer Plan (PATT) organised by the Ministry of Agriculture, Livestock, Fisheries and Food (DARP).
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- Publications on social media and websites.
- Presence in the media.
- Video of the project.

Project website

More information on the project

Project dates	Budget	approved
Starting date (month-year): June	Total	budget: €211,957.60
2018 End date (month-year):	<i>DARP funding:</i>	€86,622.67
Current status: <i>Underway</i>	<i>EU funding:</i>	€65,346.93
	<i>Own funding:</i>	€59,988.00

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Order ARP/133/2017, of 21 June, approving the regulatory bases of grants for cooperation for innovation through the promotion of the creation of European Association for Innovation task forces in terms of agricultural productivity and sustainability and the execution of innovative pilot projects by these groups.

Resolution ARP/1868/2017, of 20 July, calling for applications for grants for the year 2017.

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