EMBOT-ITS. Use of advanced technology and big data management to optimise sausage drying rooms

Summary

This project proposes a number of actions to be carried out by two representative companies (Splendid Foods, Patel) that have provided significant improvements in the economic and environmental sustainability, competitiveness and optimisation of production processes in the sector, thus boosting internationalisation.
In the project, resource use and manufacturing conditions associated with the cured sausage production were assessed, focusing on drying, but including prior processes that may have an effect on the former. For this reason, the production process was analysed to identify flows, resources used, properties of the raw material, environmental conditions, etc. in each of the phases.

Objectives

The objective of the project is to improve the efficiency of the sausage curing process through advanced data analytics and smart decision support systems.
Specifically, the aim is to study, monitor, model and apply control strategies to optimise sausage drying to reduce and standardise curing times so that product shrinkage is homogeneous and the quality of the products is maintained.

Description of the actions carried out in the project

Actions carried out:

- Study the drying processes employed by the companies
- Monitor the drying rooms
- Integration, standardisation and storage
- Analytics and decision-making

Final results and practical recommendations

Study data from the project by monitoring up to 22 cured sausage drying processes provides a better understanding of the behaviour of the dryer and verification that the behaviour of the temperatures and humidity in relation to height is different, thus drying strategies to offset the situation must be defined. In this context, together with Splendid, significant improvements were achieved in the production process, shortening it from 13-14 to 11-12 days, while increasing the dryer rotation capacity and therefore its productivity by 20%. In addition, the reaction of the products in the dryer also improved, thereby increasing homogeneity in the flora in relation to height without affecting quality, i.e. maintaining the required water activity and pH values. Finally, quality levels were maintained even while increasing the dryer density of 40 K to 60 K *fuet* cured sausages in processes 18 and 19 which are in fact two of those used to create prediction algorithms.

Conclusions

The cooperation among the project partners meant that a very precise system for monitoring the behaviour of dryers could be implemented and integrated into the production systems, while also creating a data history so improvements could continue to be made to the production processes, also thanks to the APIs developed to access the data. The technology was improved during the project to obtain a system that warns when there are problems in the sensors, so they can be solved and thus avoid large gaps in the data, where both spatial and categorical identification of the data is virtually automatic, and where data are already post-processed before being collected by the API in order to provide better quality data.

Thanks to the analysis of data from the drying process of the company Splendid Foods SLU, drying times have been shortened, reducing the total process length by two days. This optimisation provides energy savings for the company. It also provides documented control to ensure product quality in terms of both food safety and its organoleptic properties. Finally, optimisation has increased the company's profits.

Thus, there is a window of opportunity, not only for a company, but for the sector; specifically, for all meat processing companies.

Leader of the Operational Group

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Subject area(s) of application

- ☐ Agricultural production system
- ☐ Agricultural practice
- ☐ Agricultural equipment and machinery
- ☐ Livestock farming and animal welfare
- ☐ Vegetable production and horticulture
- ☐ Landscape / Territorial management
- ☐ Pest and disease control
- ☐ Fertilisation and nutrient management
- ☐ Soil management
- ☐ Genetic resources
- ☐ Forestry
- ☐ Water management
- ☐ Climate and Climate Change

☒	Energy management
☐	Waste and by-product management
☐	Biodiversity and environmental management
☒	Food quality/processing and nutrition
☐	Supply chain, marketing and consumption
☐	Competitiveness and agricultural and forestry diversification
☐	General

Geographical area(s) of application

PROVINCE(S)	REGION(S)
BARCELONA	OSONA

Dissemination of the project (publications, seminars, multimedia, etc.)

News on the INNOVACC website published on 28 November 2017 which gives information on obtaining subsidies for the project, a brief description, the participants, funding and the expected date of completion.

https://www.innovacc.cat/2017/11/28/projectes-presentats-en-la-linia-de-grups-operatius-2017-del-darp/

News on the INNOVACC website published on 23 July 2018, which gives information on obtaining subsidies for the project, a brief description, the participants, funding and the expected date of completion.
https://www.innovacc.cat/2018/07/23/el-projecte-embot-its-utilitzacio-de-tecnologia-avancada-i-gestio-de-big-data-per-a-optimitzar-assecadors-dembotits-curats-a-obtingut-un-ajut-de-grups-operatius-del-darp-20/

Project news published on the NACIÓ DIGITAL website on 20 February 2019. See links:

https://www.naciodigital.cat/osona/noticia/59593/splendid/foods/optimitzara/proc/curacio/dels/embotits

Project news published on the EUROCARNE website on 22 February 2019. See links:

- https://www.innovacc.cat/2019/02/22/splendid-foods-impulsa-el-projecte-embot-it-per-millorar-el-proces-de-curacio-dels-embotits/
- https://eurocarne.com/noticias/codigo/42351/kw/Splendid%20Foods%20impulsa%20el%20proyecto%20Embot-it%C2%B4s%20para%20mejorar%20el%20proceso%20de%20curaci%C3%B3n%20de%20los%20embutidos

Project news published on the EUROCARNE website on 8 September 2020. See links:

https://eurocarne.com/noticias/codigo/47527

Project news published on the NACIÓ DIGITAL website on 9 September 2020. See links:
https://www.naciodigital.cat/osona/noticia/64143/splendid/foods/redueix/temps/assecatge/dels/embotits/amb/tecnologia/avancada

Project website

https://www.innovacc.cat/2018/07/23/el-projecte-embot-its-utilitzacio-de-tecnologia-avancada-i-gestio-de- big-data-per-a-optimitzar-assecadors-dembotits-curats-a-obtingut-un-ajut-de-grups-operatius-del-darp-

More information on the project

PROJECT DATES	TOTAL BUDGET
Start date (month-year): June 2018	Total budget: €212,000.00
Completion date (month-year): September 2020	DARP funding: €86,640.00

Current status: Executed	EU funding: €65,360.00
	Own funding: €60,000.00

With funding from:

Project funded through Operation 16.01.01 (Cooperation for Innovation) through the Catalan Rural Development Programme 2014–2020.

Order ARP/133/2017 of 21 June, approving the regulatory bases for grants for cooperation for innovation by promoting the creation of European Association for Innovation operational groups in the areas of agricultural productivity and sustainability and the execution of innovative pilot projects by those groups, and Resolution ARP/1868/2017, of 20 June, announcing the call for the grant.

Generalitat de Catalunya
Departament d'Agricultura, Ramaderia, Pesca i Alimentació

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Europa inverteix en les zones rurals