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

Summary

Improved efficiency in the sausage curing process. Specifically, the aim of the proposed project is to study, monitor, model and apply control strategies to optimise sausage drying, enabling a reduction in the curing times and standardising them so that product shrinkage is homogeneous. The task force of this project is made up of two companies representative of the sector, Splendid Foods SAU and Patel SAU, in addition to the Catalan Association of Innovation in the Pig Meat Industry (INNOVACC) as the project coordinator, which will work together to identify options to improve the management of these resources. The project also includes the participation of the Eurecat Foundation, a centre that specialises in advanced data analytics and the creation of intelligent decision support systems and platforms, and the technology company Delsys, which specialises in the implementation of production process monitoring and management systems.

Objectives

The main objective: improvement in the efficiency of the sausage curing process by means of advanced data analytics and intelligent decision support systems. The aim of the project is to study, monitor, model and apply control strategies to optimise the drying of sausages, enabling a reduction in the curing times and standardising them so that product shrinkage is homogeneous. The ultimate objective: make progress in the improvement of the productivity, sustainability and internationalisation of cured meat product manufacturing companies.

Description of initiatives outlined in the project

The Embot-Its project aims to model the behaviour of drying rooms by using data from sensors. The installation of different types of sensors in different locations in the three-dimensional space of a drying room and the electronic identification of the cages will enable the behaviour of each drying room to be studied and will facilitate management. The data collected by these new sensors will be stored using an architecture based on big data technologies designed to work with major volumes of data and also on real time analytics. The envisaged activities are as follows:
Activity 1: Study the drying processes employed by the companies
Activity 2: Monitor the drying rooms
Activity 3: Integration, standardisation and storage
Activity 4: Analytics and decision-making

Expected results and practical recommendations

The first activity will study the technology to be used to monitor the processes for which data is necessary and the best sites for its installation. To achieve these results it is necessary to work in various directions:
- Distribute sensors in the drying rooms to obtain the temperature, humidity and other data required for analysis.
- Use RFID tags in the curing cages to identify the elements that are brought into and removed from the drying rooms.

- Install Bluetooth low energy beacons to locate each cage in the drying rooms.
- Install a continuous weighing system, with load cells, applied to certain hooks to act as telltales, with the aim of continuously measuring the shrinkage.
- Collect the data for exploitation in a big data system, with the aim of:
  - o Modelling the data for decision-making.
  - o Studying behaviour models.
  - o Constructing thermal maps of the drying rooms.
  - o Studying whether the rotation of the cages, in the drying rooms, allows the objectives to be met.

In a subsequent activity all available data sources related to the production processes will be studied: weighing of the meat, mincing of the meat, vacuum mixing, maceration, packing and linking, drying and curing. These sources of data may be internal to each company, mainly from sensors in the current production systems, the controls of the machinery used and the enterprise resource planning (ERP) systems. External sources of data will also be used, such as data from suppliers in relation to the properties of raw materials and deliveries, in addition to data from external agents such as meteorology organisations, which could be used in the next production process optimisation stage. The integration of all the data in a single storage platform will be a difficult task due to the heterogeneity of the data sources. The use of standards will facilitate this task by homogenising the data for better communication between all those involved and using mass storage technologies (big data) for subsequent processing.
The project contemplates the detailed study of all the data collected from the various sources with the aim of optimising the production processes. This study envisages a preliminary stage (probably the most important stage) for the cleansing and preparation of the data to be studied and used.

Task force leader

Entity: **Splendid Foods, SAU**

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info@splendid-foods.com	**Agri-food company**

Task force coordinator

Entity: **INNOVACC**

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innovacc@olot.cat	**Innovation centre**

Other task force members (grant beneficiaries)

Entity: **Patel, SAU**

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patel@patel.es	**Agri-food company**

Other task force members

Entity: **Fundació Eurecat**

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Subject area(s) of application

Geographical area(s) of application

	Province(s)	Region(s)
Energy management Food quality/processing and nutrition	Barcelona	Osona

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

News article in the INNOVACC newsletter of November 2017 explaining the submission of the subsidy application: http://www.innovacc.cat/2017/11/28/projectes-presentats-en-la-linia-de-grups-operatius-2017-del- darp/

News article in the INNOVACC newsletter of July 2018 notifying of the awarding of the subsidy for execution of the project: http://www.innovacc.cat/2018/07/23/ajuts-obtinguts-per-a-6-projectes-pilots-de- grups-operatius-del-darp-2017/

Publication of information on the project on the INNOVACC website: http://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 website

http://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/

More information on the project

Project dates

Starting date (month-year): June 2018

Completion date (month-year):

Current status: *Underway*

Budget approved

Total budget:	**€212,000.00**
DARP funding:	*€86,640.00*
EU funding:	*€65,360.00*
Own funding:	*€60,000.00*

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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.

Project ID: 021_2017