

ECOCARNE – Extension of the shelf-life of certified organic pork and beef meat derivatives

Summary

The general objective of the project was to increase the current shelf life of different certified organic pork and beef derivatives (pork hamburgers, whole *bull blanc* sausages and sliced *bull blanc* sausages) and to provide the two companies in the consortium (Carnes de confianza – Pirinat – and Embotits Salgot SA) with the necessary tools to increase their competitiveness in the market with the aim of making them a benchmark in the national meat sector.

Objectives

Achieving the general objective involved assessing the pork and beef-related organisation, technology, know-how, hygiene, packaging and logistics in these two companies.

The following specific technical objectives were set:

- Assess the hygienic and technological quality of the meat as a raw material to ensure the highest quality when processed into meat derivatives.
- Monitor and manage critical factors on which the shelf life of the assessed meat derivatives depends.
- Assess the most suitable materials, packaging systems and environmental conditions (temperature (T), relative humidity (RH)) for better preservation of meat derivatives in terms of safety and quality.
- Integrate improvements in the industrial process (additives and ingredients, processing and packaging) to obtain high-quality products.

Description of the actions carried out in the project

The following activities were planned to meet the specific objectives:

- Activity 1. Identification and quantitative assessment of the factors determining the durability of meat derivatives in different, reasonably foreseeable scenarios, through the application of predictive tools and experimental tests.
- Activity 2. Experimental verification of the best strategy taking into account the quality and durability of meat derivatives, assessing the development of microbial growth and visual/olfactory characteristics during their shelf life.

Final results and practical recommendations

The main results of the study include verification by means of experimental tests of the relevance of the different factors affecting the shelf life of fresh and cooked organic meat products, such as the type of raw material and its physical and chemical characteristics, temperature management during all phases of production and marketing and the use of ingredients with the capacity to improve the visual appearance of the product and slow down the action of spoilage microorganisms, among other factors.

This study provided very favourable results for the shelf life of organic cooked meat derivatives, such as organic sliced *bull blanc* sausage, by applying high hydrostatic pressure technology and studying the efficacy of the pasteurisation process.

For fresh organic meat products, such as hamburgers, the study showed that there are ingredients on the market that improve the visual appearance and prevent the development of olfactory sensory defects due to microbial activity, giving the product a longer shelf life.

In terms of labelling organic meat derivatives, the study also showed it is possible to replace certain additives with other ingredients of natural origin, whose combination can produce synergies that improve shelf life in line with the companies' strategies, in line with the clean label objectives. Through improvements in the control of factors that negatively affect the shelf life of meat derivatives, it is envisaged that some of the ingredients could be removed from their formulation, providing the consumer with cleaner labelled foods.

Conclusions

The application of predictive microbiology as a tool to assess the impact of factors relevant to microbial growth shows that a faster carcass cooling rate provides meat of a higher microbiological quality and that vacuum packaging, preservation at optimal refrigeration temperatures and the application of lactate increases the shelf life of the product, with sensory improvements related to reducing the growth of spoilage microorganisms and improving food safety by reducing the growth of *L. monocytogenes*.

Leader of the Operational Group

ORGANISATION: Carns de Confiança, SL

Coordinator of the Operational Group

ORGANISATION: Catalan Meat and Alternative Protein Cluster (INNOVACC)

Other members of the Operational Group (grant recipients)

ORGANISATION: Embotits Salgot, SA

Other members of the Operational Group (not recipients of the grant)

ORGANISATION: -

Geographical area(s) of application

PROVINCE(S)	REGION(S)
GIRONA	RIPOLLÈS
BARCELONA	VALLÈS ORIENTAL

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

Publications in the INNOVACC newsletter:

- INNOVACC November 2019 Newsletter, where a news story on the grant application was published.
- INNOVACC June 2020 Newsletter, where a news story on the approval of the project was published.
- INNOVACC August 2021 newsletter, where the news item "Us mostrem els casos d'èxit publicats a la revista anual d'INNOVACC publicada el juny-2021" (Success stories published in the June-2021 INNOVACC annual magazine) about this and other projects was published.

Presentations at the INNOVACC Assemblies:

- Presentation of the project to the Ordinary General Assembly of INNOVACC, on 15 June 2020.
- Presentation of the project to the Extraordinary General Assembly of INNOVACC, on 21 December 2020.
- Presentation of the project to the Ordinary General Assembly of INNOVACC, on 21 June 2021.
- Presentation of the project to the Extraordinary General Assembly of INNOVACC, on 21 December 2021.

- Presentation of the project to the Ordinary General Assembly of INNOVACC, on 20 June 2022.

Links to publications on the INNOVACC website:

<https://www.innovacc.cat/2019/11/21/projectes-presentats-en-la-linia-de-grups-operatius-2019-del-darp/>

<https://www.innovacc.cat/2020/06/29/6-projectes-presentats-en-la-linia-de-grups-operatius-2019-del-darp-obtenen-resolucio-favorable/>

<https://www.innovacc.cat/2020/09/30/grups-operatius-2019-projecte-ecocarn-extensio-de-la-vida-util-de-derivats-carnis-de-certificacio-ecologica-procedents-de-porci-i-de-bovi/>

<https://www.innovacc.cat/2021/08/31/us-mostrem-els-casos-dexit-publicats-a-la-revista-anual-dinnovacc-publicada-el-juny-2021/>

Links to participants' publications:

PIRINAT: https://www.pirinacat.com/noticies/?action=show_noticia&id=72#

IRTA: <https://www.irta.cat/ca/projecte/ecocarn-extensio-de-la-vida-util-de-derivats-carnis-de-certificacio-ecologica-procedents-de-porci-i-de-bovi/>

SALGOT: <https://salgot.com/ca/rd/>

Links to INNOVACC magazine publications

https://www.innovacc.cat/wp-content/uploads/2021/06/disseny-revista-innovacc-2021_ok.pdf (page 26)

https://www.innovacc.cat/wp-content/uploads/2022/07/disseny-revista-innovacc-2022_BR.pdf (page 15)

Links and presentations at the INNOVACC project conferences

https://www.innovacc.cat/2022/09/13/27-i-28-09-2022-jornades-de-projectes/?utm_source=mailpoet&utm_medium=email&utm_campaign=proximes-activitats-mes-de-marc-2022_4

<https://www.innovacc.cat/wp-content/uploads/2022/09/Programa-Jornada-27-setembre-2022.pdf>

Project website

More information on the project

PROJECT DATES	TOTAL BUDGET
Start date (month-year): July 2020	Total budget: €140,964.52
Completion date (month-year): September 2022	DACC funding: €57,609.27
Current status: Completed	EU funding: €43,459.63
	Own funding: €39,895.62

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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/1531/2019, of 28 May, announcing the call for the grant.

