

## Innovative solutions to optimize the use of nitrifying substances in processed cooked meat while maintaining food safety and organoleptic quality

### 01 Summary

max. 1.500 characters

The project consists in carrying out a "Big Data" analysis of variables of the process of elaboration of a wide range of cooked meat products as well as analyzing the formulation, time and temperatures of processing, cooking technologies and their effect on the content of nitrite and nitrate residual and in the sensory characteristics of the product. Together with the trials of physical and chemical alternatives in real products, it will give us the key parameters to control.

Thus the project will be addressed in two directions:

- a) bibliographic analysis that allows to distinguish casuistry from the effects of nitrifiers when they are studied in model solutions with respect to when they are in real products.
- b) pilot tests with physical alternatives (radiofrequencies, high pressures) and chemical alternatives (extracts and other additives) that give us applied information on the parameters to be controlled.

### 02 Objectives

max. 600 characters

The main objective of the project is to answer the questions:

- What must be done so that no functional nitrite is lost during the process? When and how it is added. What parameters help to preserve its functionality.
- What adjuvants (chemical and technological) enhance the functionality of residual nitrite?

### 03 Description of project activities

max. 600 characters

The companies must assure the quality of the elaborated ones during long times and know that only a part of the added nitrites are present after the cooking and it is necessary that these maintain the activity throughout the time of commercialization to assure the products. The actions to undertake are:

1. Meta-analysis on the kinetics of nitrites in cooked.
2. Test of chemical and physical alternatives in meat masses inoculated with *Clostridium sporogenes* ("surrogate" of *C. botulinum* accepted by trials).
3. Evaluate the organoleptic effects that affect quality and sales. Evaluation of the effect of the raw material and the production process on the content of nitrite and residual nitrate and the sensory characteristics of the product.

### 04 Expected results and practical recommendations

The expected results are the ones shown below:

- Synthesis of the knowledge of the kinetics and functionality of nitrifying salts from the literature, depending on the treatment parameters and formula.
- Critical points of the current elaborations so that the residual concentrations of nitrite are maintained in sufficient quantity to ensure the product in long-term commercialization.
- Critical points for the organoleptic quality in the previous cases and possibility of establishing conditions that achieve both objectives.
- Matrix of equivalent treatments (depending on product and concentrations of additives and non-meat ingredients, process) to achieve the objective of safety. Similar to what has been done for the establishment of meat transport temperature, in the style of what the Codex Alimentarius 2.017 is questioning (see Annex 1).

- Forms and concentrations of plant extracts that may be useful depending on the target products (real matrices and not model systems).
- Radiofrequency heating parameters that lead to good synergy with nitrifiers for both food safety and organoleptic quality.
- Parameters of high isostatic pressure that provide safety in sliced meat with reduction of nitrifiers and / or salt.
- Organoleptic aspects of the new products that can influence in a more transcendental way in the acceptance by the consumers.

### 05 Keyword-category

- |                                     |  |
|-------------------------------------|--|
| <input type="checkbox"/>            | Agricultural productyion system                        |
| <input type="checkbox"/>            | Farming practice                                       |
| <input type="checkbox"/>            | Farming equipment and machinery                        |
| <input type="checkbox"/>            | Animal husbandry and welfare                           |
| <input type="checkbox"/>            | Plant production and horticulture                      |
| <input type="checkbox"/>            | Landscape / land management                            |
| <input type="checkbox"/>            | Pest / disease control                                 |
| <input type="checkbox"/>            | Fertilisation and nutrients management                 |
| <input type="checkbox"/>            | Soil management / functionality                        |
| <input type="checkbox"/>            | Genetic resource                                       |
| <input type="checkbox"/>            | Forestry   |
| <input type="checkbox"/>            | Water management                                       |
| <input type="checkbox"/>            | Climate and climate change                             |
| <input type="checkbox"/>            | Energy management                                      |
| <input type="checkbox"/>            | Waste, by-products and residues management             |
| <input type="checkbox"/>            | Biodiversity and nature management                     |
| <input checked="" type="checkbox"/> | Food quality / processing and nutrition                |
| <input checked="" type="checkbox"/> | Supply chain, marketing and consumption                |
| <input type="checkbox"/>            | Farming / forestry competitiveness and diversification |
| <input type="checkbox"/>            | General  |

### 06 Territorial scope

PROVINCE	COUNTY
Girona	La Selva, Gironès, Garrotxa

### 07 Project dissemination (publications, seminars, multimedia...)

News to the INNOVACC bulletin for the month of November 2017 explaining the presentation of the aid application: <http://www.innovacc.cat/2017/11/28/projectes-presentats-en-la-linia-de-grups-operatius-2017-del-darp/>

News bulletin of INNOVACC for the month of July 2018 informing of the obtaining of the help for the realization 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 project information on the INNOVACC website: <mailto:http://www.innovacc.cat/2018/07/23/el-projecte-solucions-innovadores-per-a-reduir-lus-de-nitrificants-en-elaborats-carnis-cuits-mantenint-la-seguretat-alimentaria-i-la-qualitat-organoleptica-a-obtingut-un-aju/>

## 08 Project website

<mailto:http://www.innovacc.cat/2018/07/23/el-projecte-solucions-innovadores-per-a-reduir-lus-de-nitrificants-en-elaborats-carnis-cuits-mantenint-la-seguretat-alimentaria-i-la-qualitat-organoleptica-a-obtingut-un-aju/>

## With the support of:

Project funded by Operation 16.01.01 (Cooperation for innovation) of the Rural Development Program of Catalunya 2014-2020.

*Basic regulation: Ordre ARP/133/2017, de 21 de juny, per la qual s'aproven les bases reguladores dels ajuts a la cooperació per a la innovació a través del foment de la creació de grups operatius de l'Associació Europea per a la Innovació en matèria de productivitat i sostenibilitat agrícoles i la realització de projectes pilot innovadors per part d'aquests grups, i Resolució ARP/1868/2017, de 20 de juliol, per la qual es convoca l'esmentat ajut.*



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



Fons Europeu Agrícola  
de Desenvolupament Rural:  
Europa inverteix en les zones rurals