



Innovative Bio-interventions and Risk Modelling Approaches for Ensuring Microbial Safety and Quality of Mediterranean Artisanal Fermented Foods ArtiSaneFood

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Summary: The Object of this project is to develop efficient bio-intervention strategies, enhanced process criteria, and an easy-to-use food safety decision support IT tool for participating artisanal food producers, aiming to the reduction and control of food-borne pathogens in 15 artisanal fermented foods of meat or dairy origin produced in Portugal, Spain, Italy, France, Greece, Morocco, Tunisia and Algeria.

The project will be developed through an integrated risk-based approach sustained by the concepts of:

- (i) extensive tracking surveys in the artisanal food chains, in order to identify origin, routes of contamination, risk factors favouring pathogens' survival, and technological causes for lack of homogeneity in the quality/safety of end-products;
- (ii) bio-preservation, whereby functional starter cultures and natural extracts will be assessed as extra hurdles to ensure safety and extend shelf-life;
- (iii) fate studies of pathogens, predictive dynamic modelling,
- and (iv) risk process modelling, for the delineation of the most effective biointerventions, optimisation of process variables and norms/standards, and design of quality monitoring tools.

International Consortium

Participant No	PI name	Organisation	Country
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1 (Coordinator)	Ursula Gonzales- Barron ArtiSaneFood	Polytechnic Institute of Bragança	Portugal
2 Partner 2	Bettache Guessas	University of Oran	Algeria
3 Partner 3	Antonio Valero	University of Cordoba	Spain
4 Partner 4	Lihan Huang	USDA Agricultural Research Service	United States of America
5 Partner 5	Fanny Tenenhaus- Aziza	Centre National Interprofessionnel de l'Economie Laitière	France
6 Partner 6	Jean-Christophe Augustin	French Agency for Food, Environmental and Occupational Health and Safety	France
7 Partner 7	Spyridon Kintzios	Agricultural University of Athens	Greece
8 Partner 8	Gerardo Manfreda	University of Bologna	Italy
9 Partner 9	Achemchem Fouad	University Ibn Zohr	Morocco
10 Partner 10	Nourhene Boudhrioua Mihoubi	Institut Supérieur de Biotechnologie Sidi Thabet, Manouba Université	Tunisia

Tunisian Consortium

ISBAM & IRA, Mednine/ Gabes Univ. 05 researchers (2 seniors, 2 PhD, 01 Engineer)

INAT & IRESA/ Carthage Unv 05 researchers (4 seniors, 1 PhD)

ISBST/ UMA

02 LR

08 researchers (05 seniors, 3 PhD)

industrial VACPA manager, date extracts)

ISSBAT / Elmanar Univ. 01 senior

CAMU-Public (02 seniors)

Contribution of Tunisian Partners: Participant to WP2-WP8 & Lead of WP9 (Dissemination and communication)

WP2: Tracking surveys in the artisanal food production Microbiological of mid-, products and environment Physicochemical of mid- and products; Manufacture process variables; Pathogenic strains by molecular methods

Mapped level of pathogens, contamination patterns, manufacturing faults and risk factors

WP3: Biopreservation by lactic acid cultures

Assessment of commercial cultures

Development of *functional* cultures: Isolation of indigenous LAB; Selection of bacteriocinogenic strains; Selection of strains of good technological

properties; PCR identification

WP4: Biopreservation by natural extracts

Selection of potential natural extracts Characterisation in-vitro of antimicrobial activity against

pathogens Determination of the mode of application and dose not affecting organoleptic quality

Potential biopreservation strategies tested in-vitro and in-situ (food)

WP5: Fate studies of pathogens in artisanal foods Single- and/or multi-pathogen inoculation trials to assess their viability under distinct manufacturing variants (traditional, using

Dynamic data of physicochemical properties, and pathogens' and lactic acid bacteria counts in artisanal foods throughout processing and storage

enhanced process variables and with biopreservation methods)

WP6: Dynamic modelling and process safety optimisation

Determination of kinetic parameters of pathogens and most effective process variables

WP7: Intervention strategies Identification of the most efficient intervention strategies Derive norms/standards and quality monitoring tools

Working dynamic predictive microbiology models, risk process models and meta-models

WP8: Safety decision-support tool

Design and programming of an IT tool for artisanal producers to assess the safety of their traditional and biopreservationbased processes and design sampling plans/control charts

A prototype of the ArtiSaneFood decision-support tool

Schematic of the nine work packages of the ArtiSaneFood project with brief descriptions of tasks (grey boxes) and main objectives (green boxes). Notice sequence and interrelationships between WPs









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