11th International Conference on
Predictive Modelling in Food
Bragança, Portugal · 17-20 September 2019

11TH INTERNATIONAL CONFERENCE ON PREDICTIVE MODELLING IN FOOD (ICPMF11):

BOOK OF ABSTRACTS

Edited by:

Ursula Gonzales-Barron

and

Vasco A. P. Cadavez

September 17 – 20, 2019

Bragança, Portugal

Printed by: Image Services of IPB, Portugal

Title

11th International Conference on Predictive Modelling in Food: Book of Abstracts

Editors

Ursula Gonzales-Barron Polytechnic Institute of Bragança
Vasco Cadavez Polytechnic Institute of Bragança

Design

Atilano Suarez

Website

Nuno Carvalho, Ursula Gonzales-Barron, Vasco Cadavez

Edition

Instituto Politécnico de Bragança
Campus de Santa Apolónia
5300-253 Bragança
Portugal

Edition year: 2019

ISBN: 978-972-745-261-3

Handle: http://hdl.handle.net/10198/18567

URL: http://esa.ipb.pt/icpmf11/

Legal Deposit: 460552/19

ORGANISING COMMITTEE

Chair: Dr. Ursula Gonzales-Barron
CIMO Mountain Research Centre, School of Agriculture
Polytechnic Institute of Bragança, Portugal

Vice-Chair: Dr. Vasco Cadavez
CIMO Mountain Research Centre, School of Agriculture
Polytechnic Institute of Bragança, Portugal

Members
CIMO Mountain Research Centre, School of Agriculture, Polytechnic Institute of Bragança, Portugal

Elsa Ramalhosa
Ermelinda Pereira
Isabel Ferreira
Lillian Barros
Paula Rodrigues

Collaborators
School of Agriculture, Polytechnic Institute of Bragança, Portugal

Adília Alves
Ana Catarina Lima
Atilano Suarez
Beatriz Nunes Silva
Cidália Lino de Freitas
Diogo Félix
Eliana Pereira
Gisela Rodrigues
Maria de Jesus Nunes
Nuno Carvalho
Sara Fernandes

ICPMF Members

Mariem Ellouze (Nestlé, Switzerland)
Fernando Pérez-Rodríguez (University of Cordoba, Spain)
Tom Ross (University of Tasmania, Australia)
Donald Schaffner (Rutgers, The State University of New Jersey, USA)
Vasilis Valdramidis (University of Malta, Malta)
Fanny Tenenhaus-Aziza (CNIEL, France)
Anderson de Souza (University of Campinas, Brazil)
Régis Pouillot (Food and Drug Administration, USA)
Ursula Gonzales-Barron (Polytechnic Institute of Bragança, Portugal)
Maarten Nauta (Danish Technological University, Denmark)

INTERNATIONAL SCIENTIFIC COMMITTEE

Abani Pradhan
University of Maryland, USA

Anderson Sant'Ana
University of Campinas, Brazil

Annemarie Pielaat
Unilever, UK

Antonio Valero
University of Cordoba, Spain

Donald Schaffner
University of Rutgers, USA

Eduardo Esteves
University of Algarve, Portugal

Eduardo Figuereido
Federal University of Mato Grosso, Brazil

Fanny Tenenhaus-Aziza
CNIEL, France

Fernando Pérez-Rodríguez
University of Cordoba, Spain

Fouad Achemchem
University Ibn Zohr – Agadir, Morocco

Francis Butler
University College Dublin, Ireland

Frank Devlieghere
Ghent University, Belgium

Jean Christophe Augustin
Danone, France

Jeanne-Marie Membré
National Institute of Agricultural Research (INRA), France

Juan Salvador Aguirre
University of Chile, Chile

Judith Kreyenschmidt
University of Bonn, Germany

Kirk Dolan
Michigan State University, USA

Lihan Huang
ARS, US Department of Agriculture, USA

Marcel Zwietering
Wageningen University, the Netherlands

Marciane Magnani
Federal University of Paraiba, Brazil

Mariem Ellouze
Nestle, Switzerland

Maarten Nauta
Danish Technological University, Denmark

Matthias Brunner
Tsenso, Germany

Moez Sanaa
ANSES, France

Panos Skandamis
University of Athens, Greece

Paulo Fernandes
Polytechnic Institute of Viana do Castelo, Portugal

Paula Teixeira
Catholic University of Porto, Portugal

Paw Dalgaard
Danish Technological University, Denmark

Roger Djoulde
University of Ngaoundéré, Cameroon

Sara Bover-Cid
Institute of Agrifood Research and Technology, Spain

Shigenobu Koseki
Hokkaido University, Japan

Sofia Ribeiro Duarte
Danish Technological University, Denmark

Tom Ross
University of Tasmania, Australia

Ursula Gonzales-Barron
Polytechnic Institute of Bragança, Portugal

Vasco Cadavez
Polytechnic Institute of Bragança, Portugal

Vasilis Valdramidis
University of Malta, Malta

Vijay Juneja
ARS, US Department of Agriculture, USA

CONTENT

122: EFFECT OF PHYSICOCHEMICAL CHARACTERISTICS OF LAMB MEAT ON ITS MICROBIOLOGICAL DETERIORATION

Diogo Félix-Oliveira[1], Sara Coelho-Fernandes[1], José Manuel Lorenzo[2], Vasco Cadavez[1], Ursula Gonzales-Barron[1]

[1]CIMO Mountain Research Centre, School of Agriculture, Polytechnic Institute of Bragança, Bragança , Portugal. [2]Meat Technology Centre Foundation of Galicia, Ourense, Spain

Introduction: A common strategy to improve the tenderness of lamb meat of autochthonous Portuguese breeds is to mature vacuum-packed (VP) meat for ~7 days. Nonetheless, the extent to which microbial spoilage is delayed by VP depends upon the meat intrinsic properties. The objective of this study was to appraise how the growth rate of deteriorating bacteria in VP lamb meat is affected by the initial microbial load and physicochemical characteristics.

Methodology: Fifteen four-month old animals from Bordaleira-de-Entre-Douro-e-Minho (BEDM) and 15 from Churra-Galega-Bragançana (CGB) breeds were slaughtered at the same abattoir (day zero), and after 24-hour chilling, *L. dorsi* sections were vacuum-packed for microbiological analysis of mesophiles [MES], psychrothrophic [PSY], lactic acid bacteria [LAB] and *Pseudomonas* spp. [PSE] on days 3, 9 and 15. Proximate composition (db), pH and water activity of meat were determined on day 1. For each bacterium, mixed models were adjusted to assess the effects of breed and maturation in separate interaction with every intrinsic property.

Results: A high meat pH (F value=0.72 for MES, F=0.97 for LAB, F=1.17 for PSE and F=0.13 for PSY) was not as determinant of higher initial microbial counts as it was of faster microbial growth (F=84.2 for MES, F=28.6 for LAB, F=20.3 for PSE and F=65.2 for PSY). Fat content (F=13.6 for MES, F=4.43 for LAB, F=2.95 for PSE and F=10.3 for PSY) also affected microbial growth rates, yet not as much as Aw (F=82.3 for MES, F=28.1 for LAB, F= 20.4 for PSE and F=63.6 for PSY) and protein content (F=80.6 for MES, F=29.4 for LAB, F=20.8 for PSE and F=63.3 for PSY). Although BEDM lamb meat presented higher initial counts ($p<0.05$) than CGB meat in all bacterial groups, the effect of breed on spoilage indicator counts (F=8.3 for MES, F=14.8 for LAB, F=6.34 for PSE and F=9.90 for PSY) was not as strong as the effect of meat intrinsic properties.

Conclusion and Relevance: To extend current shelf-life of VP Portuguese lamb meat, it is key to implement practices that ensure a fast drop of carcass pH at slaughter, and to investigate the factors causing the higher spoilage bacteria counts associated with the BEDM breed.

Keywords: Lactic acid bacteria; psychrotrophic; *Pseudomonas*; spoilage; pH