

# A NMR-based metabolomics study of minced pork meat inoculated with *Brochothrix thermosphacta*, *Leuconostoc gelidum* and *Pseudomonas fragi*

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## INTRODUCTION

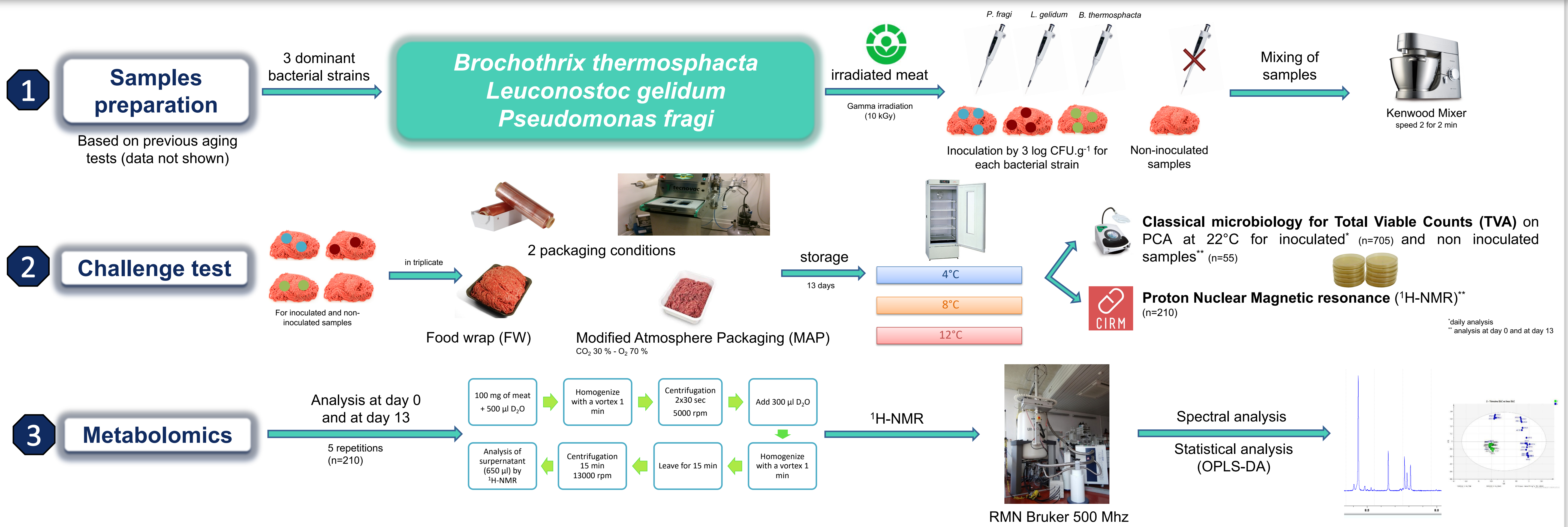
In order to control food waste, studies have highlighted the importance of monitoring the microbial diversity of food products.

## OBJECTIVES

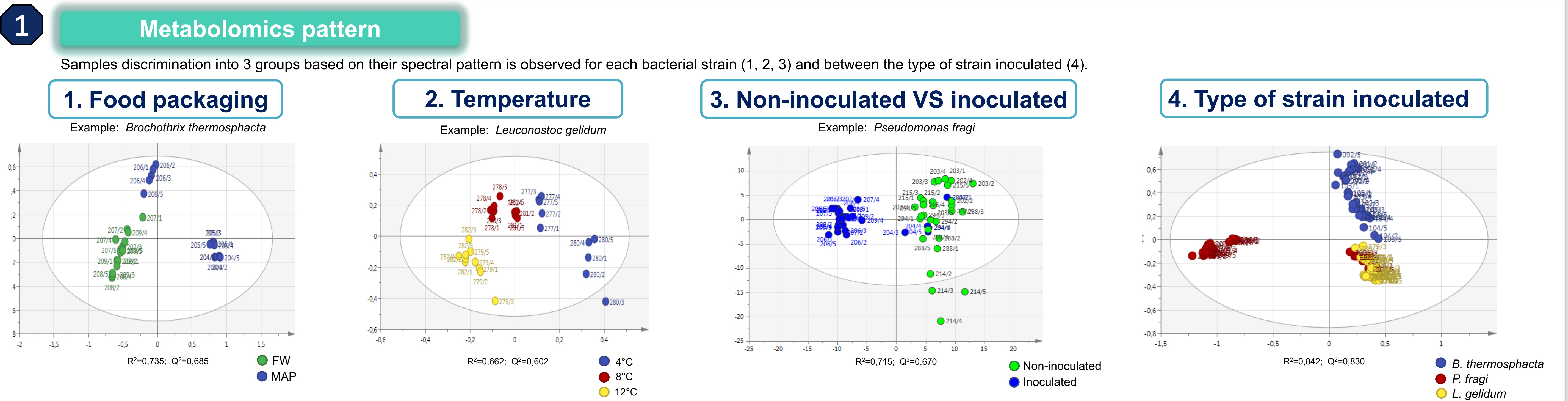


The aim of the current study was to assess meat spoilage through the evolution of bacterial counts and changes in the metabolic profile of minced pork meat using Proton Nuclear Magnetic Resonance (<sup>1</sup>H-NMR).

## MATERIALS AND METHODS



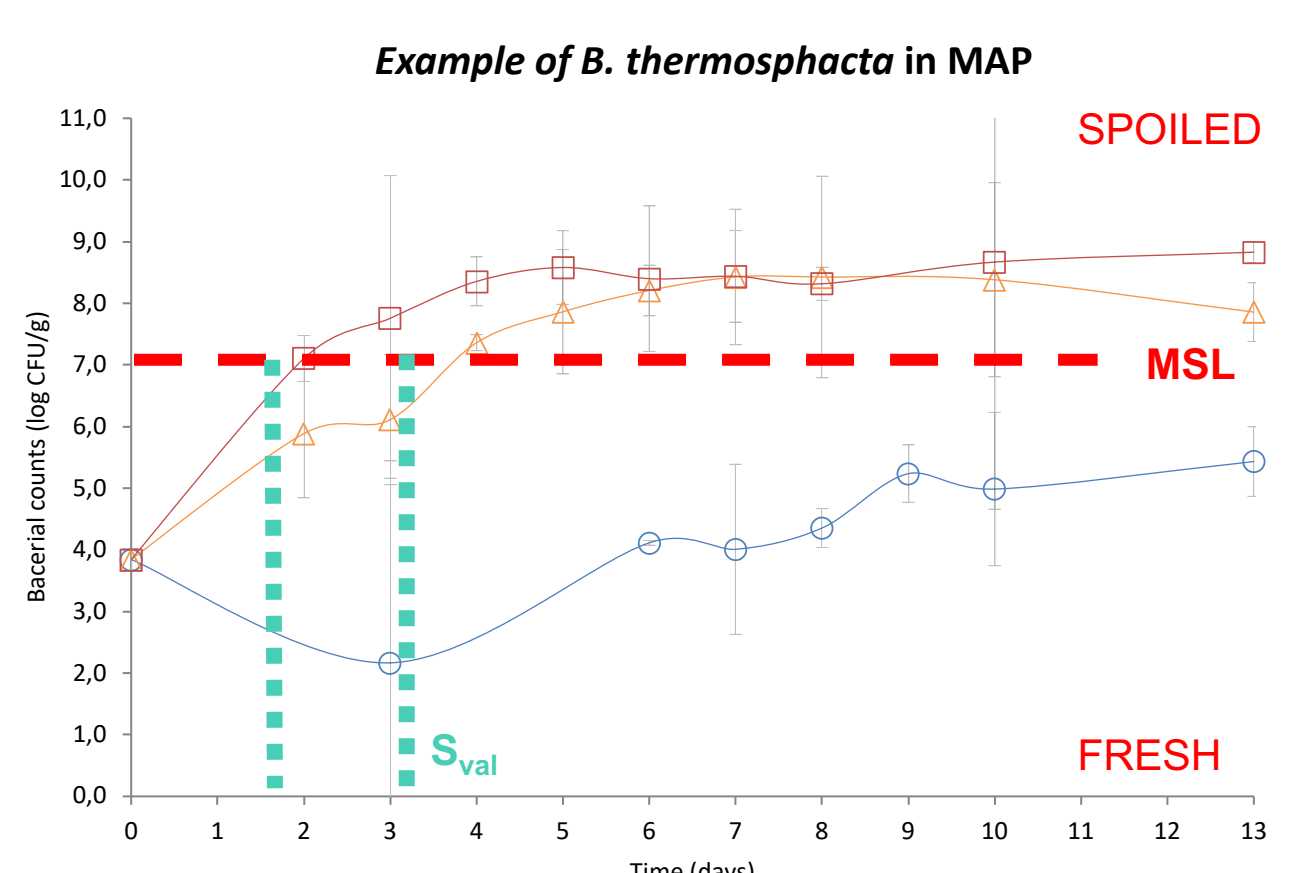
## RESULTS AND DISCUSSION



## 2 Association to bacterial counts

Estimation of the Minimal Shelf Life (MSL) of samples which is defined by the time when TVC reached 7.0 log CFU.g<sup>-1</sup> (Spoilage Value, S<sub>val</sub>).

A S<sub>val</sub> is obtained for each conditions and could be statistically correlate to metabolomics results in further analysis (data not available)



## 3 Metabolites

Statistical metabolites descriptors explaining the difference between groups: some metabolites are significantly increased (p<0,05) for each inoculated samples by bacterial strains (bacterial metabolic activity), and for the non-inoculated samples (natural degradation of minced pork meat).

<i>B. thermosphacta</i>	<i>P. fragi</i>	<i>L. gelidum</i>	Non-inoculated
Acetate Glycerol	Threonine Glycine	Betaine Lactate	Glucose Taurine Lactate Lipoproteins

## CONCLUSIONS

Exploration of the correlation of these metabolites with microbial counts (Spoilage Value (S<sub>val</sub>) at 7.0 log CFU.g<sup>-1</sup>) suggested their use as possible spoilage indicators. These results support the use of NMR-based metabolomics as a valuable tool to provide information on pork meat spoilage and to follow intrinsically the evolution of the metabolomics pattern linked to a specific strain in a complex bacterial ecosystem.