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# PROCESSING FRESH MUSSELS (*M. GALLOPROVINCIALIS*) BY *SOUS VIDE* TECHNOLOGY: EFFECT ON THE MICROBIOLOGICAL CHARACTERISTICS

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## INTRODUCTION

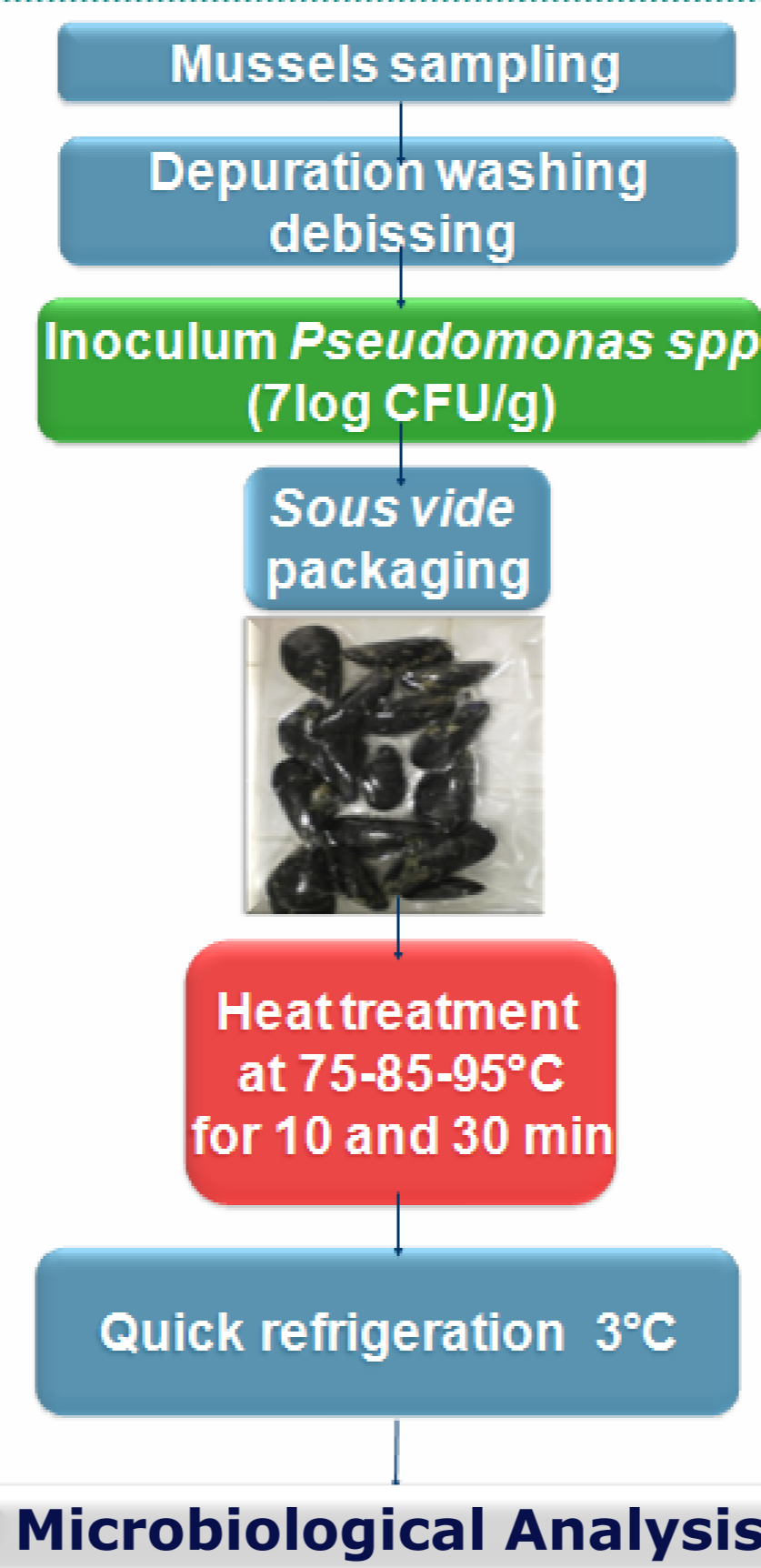
*Sous-vide* cook-chilled (SVCC) refers to food that is subjected to vacuum-pack and then mild heat treated under controlled conditions (t and T) and subsequently rapidly cooled and stored at chilled conditions until heated before serving (Rhodehamel, 1992; Hansen *et al.*, 1995). Few studies reported the application of this process for aquaculture products (Espinosa *et al.*, 2016; Shakila *et al.*, 2009), such as trout fillets (Gonzalez-Fandos *et al.*, 2004), salmon (Garcia-Linares *et al.*, 2004, Gonzalez-Fandos *et al.*, 2005; Diaz *et al.*, (2009) and carp (Can, 2011) and there is no evidence of the application of this technology in molluscs.

### AIM

Evaluate the effect of SVCC technology on the microbiological characteristics of mussels (*M. galloprovincialis*).

## MATERIALS AND METHODS

### Trial 1 effect of *sous vide* cook and chill on inoculated mussels



### Trial 2 effect of *sous vide* cook and chill on natural bacterial load



### Analysis

Total Bacterial Count (TBC)  
Lactic acid bacteria (LAB)  
Clostridia sulphite reducing bacteria  
*Pseudomonas spp.*  
pH of homogenate  
3 Packs per treatment  
(15 mussels/pack)

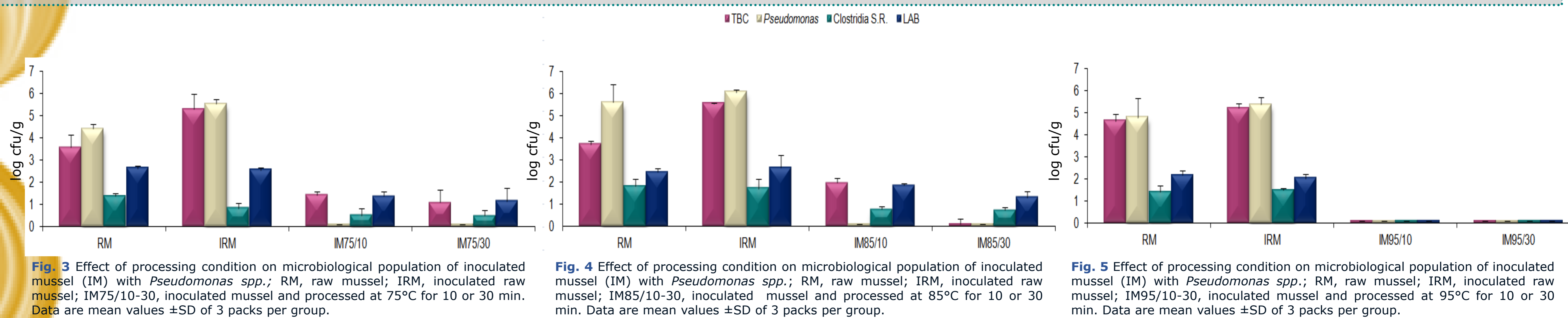
Fig. 1 Experimental design and analytical determination.



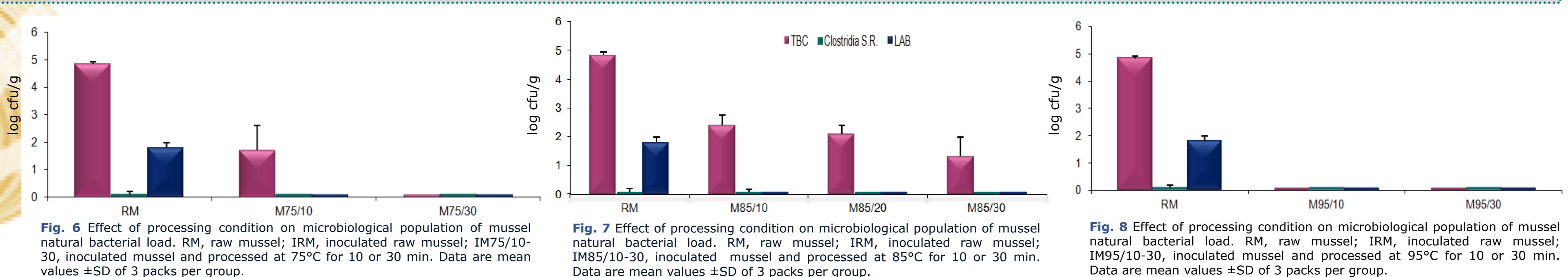
Fig. 2 Preparation of inoculated mussels (A), packaging (B), cooking (C), temperature monitoring (D), microbiological analysis (E).

## RESULTS

### TRIAL 1. EFFECT OF SOUS VIDE COOK AND CHILL ON INOCULATED MUSSELS



### TRIAL 2. EFFECT OF SOUS VIDE COOK AND CHILL ON MUSSELS NATURAL BACTERIAL CONTAMINATION



- All t/T combinations resulted in a substantial reduction of the *Pseudomonas spp.* population (<1 log CFU/g) both in raw (4.9 log CFU/g) and experimentally inoculated (5.7 log CFU/g) mussels.
- The pH values (6.22) of the homogenate resulted not affected by the heat treatments (data not shown).
- Similar results were observed on natural microbial contamination of mussel. A TBC reduction (2.4 log and 3.5 log, respectively) was registered after treatment at 85 °C for 10 or 30 min, while the highest reduction (4.8 log) was observed at 95 °C for 10 min confirming the efficacy of *sous vide* cook treatments even for fresh mussels.

## CONCLUSIONS

- The present study confirms the effectiveness of SVCC technology to reduce the microbial population present in raw mussels.
- Future research will be aimed to assess technological and sensorial traits of these products, as well as their stability both under refrigeration and thermal abuse conditions during storage.

## REFERENCES

- Can Ö. P. (2011). *World Academy of Science, Engineering and Technology*, 56, 1225-1230; Diaz *et al.*, 2009. *Fishing Chimes*, 23 (1), 131-136; Espinosa *et al.*, 2016. *Food Science and Technology International*; Garcia-Linares *et al.*, 2004. *Journal of Food Quality*, 27, 371-387; Gonzalez-Fandos *et al.*, 2004. *Food Microbiology*, 21,193-201; Gonzalez-Fandos *et al.*, 2005. *Food Control* 16, 77-85; Hansen *et al.*, 1995. *International Journal of Food Science and Technology*, 30, 365-378; Rhodehamel, 1992. *Food Technology*, 46, 73-76; Shakila *et al.*, 2009. *International Journal of Food Science and Technology*, 44, 2120-2126.

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