

CP064

DOE: HIGH PRESSURE PROCESSING AS A PRE-TREATMENT FOR PRODUCTION OF RAW EWE MILK-CHEESE

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Serra da Estrela protected designation of origin cheese is produced with raw milk from a specific geographical area, which has been becoming scarcer given the many hurdles. However, high pressure (HP) milk treatment may lead to cheese yield increment, yet the pressure intensity, holding time under pressure, and waiting time before and after HP treatments still need to be studied to do so, hence were established as the main objectives of this research work. In a first step, a screening experimental design was performed (100 – 300 MPa; 5 – 30 min; 1 – 48 h waiting time before HP; 1 – 24 h after HP, according to the four variables selected), and the results achieved allowed to pinpoint that the pressure intensity, holding time under pressure, and time after HP are the most important factors. Then, a second screening experiment (100 - 400 MPa; 5 min; 48h, 24h) revealed that HP at 400 MPa was a too intense treatment for beneficial microbiota to contribute positively to cheese ripening. Finally, the application of a response surface model (100 – 300 MPa; 5 – 30 min, 24h before HP, 24h after HP), considering of high importance a lower reduction of lactococci, lactobacilli, and enterococci viable cell numbers, allowed to achieve as optimum HP conditions the treatment at 121 MPa for 30 min. After the model was validated, having been confirmed the predicted results given by statistical software, a further scale-up experiment was performed. In such real production environment, a cheese yield increase of 10.4% was achieved with milk pre-treated under the optimal conditions. Furthermore, HP milk treatment led to some microbial reduction in milk, small effect on curd and without significant differences in ripened cheese microbiota (total mesophilic, lactococci, enterococci, staphylococci, *Enterobacteriaceae*, coliforms, *E. coli*, and yeasts and moulds viable cells number) and with interesting impact on sensory attributes. Based on the above results, HP can be seen as a promising non-thermal treatment for ewes milk to inactivate contaminant bacteria yet with no negative effect on lactic acid bacteria responsible for the unique flavor, texture and taste of Serra da Estrela Cheese.

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