

Title: Effect of LT-LT and HT-ST sous vide cooking approaches on hygienical and physico-chemical properties of beef (*Semitendinosus*) muscle

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Abstract: In this study, beef *Semitendinosus* muscles were sous vide cooked by applying two different treatments: low temperature-long time (LT-LT) for 36 hours at 75 °C (SV75) and high temperature-short time (HT-ST) for 2 hours at 100 °C (SV100). Changes in pasteurization values, weight loss, texture, colour, vitamins of B group as well as volatile compounds profile were evaluated. HT-ST treatment proved to achieve a pasteurization value sufficient to exclude *Clostridium perfringens* risk, while, on the contrary, LT-LT confirmed to be a sous vide cooking approach that is subjected to this microbiological hazard. Total weight loss of SV100 resulted significantly lower compared to SV75. Texture analysis (Warner Bratzler and TPA) confirmed the lower hardness of LTLT cooked meat muscles, with HTST samples very similar to traditionally boiled ones. In addition, vitamin B3 retention was very similar for both sous vide methods, while LTLT allowed a higher retention of B12. Finally, volatile compounds of beef muscles cooked by means of LTLT and HTST sous vide conditions showed lower accumulation of off-flavour such as hexanal or 3-octanone in comparison to traditional boiling technique and better preserved the volatile profile of raw meat.