

CHAPTER 3: RESEARCH

Research chapter is presented in the format of article submitted to Food Microbiology.

The objective of this study was to determine the effect of gamma irradiation at a target dose of 9 kGy on the general bacterial quality and *Clostridium perfringens* ATCC 13124 spores inoculated on RTE bovine tripe, and to determine the shelf life of RTE tripe stored at 5 and 15 °C for 14 days. The initial intention was to inoculate RTE bovine tripe and process it as a *sous-vide* product in an anaerobic environment (vacuum packaged). This is shown in the experimental design for Phase 1 in Fig. 3.1.

However, *C. perfringens* was not detected in inoculated samples after boiling and throughout storage. Gas analysis of RTE bovine tripe with Gaspac2 (Oxfordshire, UK) indicated the presence of oxygen in the packs. Although *C. perfringens* is generally considered anaerobic/ microaerophilic, experience with *C. perfringens* in this research showed that *C. perfringens* ATCC 13124 is an obligate anaerobe. Since *C. perfringens* ATCC 13124 is an obligate anaerobe, it was inhibited in the *sous-vide* RTE bovine tripe because the package was aerobic.

Consequently, the processing of RTE tripe was changed in Phase 2, where raw tripe was boiled in a pot, rapidly chilled and inoculated, prior to vacuum packaging, and heat shrinking of the vacuum packs. The experimental design for Phase 2 is shown in Fig. 3.2. This change in processing of RTE bovine tripe was done to eliminate the presence of oxygen in the vacuum packs so as to create an anaerobic environment, to study the effect of gamma irradiation on *C. perfringens* inoculated on boiled tripe. Consequently, the contribution of boiling was not studied in Phase 2. Since a shelf life study (14days) was conducted in Phase 1, the shelf life study in Phase 2 was shortened to 7 days because it was not the main focus area of Phase 2 study.