

RECOVERY OF HEAT-INJURED *LISTERIA INNOCUA*

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Some treatments used in food processing are often not severe enough to kill all microorganisms, leading to the presence of physiologically injured bacteria that might have a dangerous potential to recover. While there has been an increase in the number of thermal inactivation studies on *Listeria monocytogenes*, research on its susceptibility to heat injury is limited. The objectives of the present study were to determine the incidence of injured cells after thermal inactivation and to observe the ability of two different selective media in the detection of thermally injured *L. innocua*. In the current work, *L. innocua* was used instead of *L. monocytogenes*, because it is a non-pathogenic specie and it had been proven to be a biological indicator of *L. monocytogenes* in thermal inactivation treatments (1). Stationary phase cultures of *L. innocua* NCTC 10528 were heated in liquid medium, in an agitated water bath, at various temperatures: 52.5, 55.0, 57.5, 60.0, 62.5 and 65.0°C. After different time intervals, samples were removed and placed in a mixture of ice-water. Samples were serially diluted and plated onto duplicate TSA supplemented with 0.6% yeast extract (TSA + 0.6%YE), TSA + 0.6%YE plus 5% NaCl and Palcam agar plus selective supplement. Plates were incubated at 30°C and counted every 24 hours, until the number of colony formation unities no longer increased. The detection of injured microorganisms was based on the use of the selective media. While TSA + 0.6%YE medium allows the estimation of the total number of *Listeria* cells present (i.e. uninjured plus injured cells), TSA + 0.6%YE + 5% NaCl and Palcam agar media provide only an estimate of the number of uninjured *Listeria* cells. This happens because in non-selective agar media, injured cells can repair the damage induced by the stress. However, on selective agars, containing NaCl or antibiotics, injured cells suffer additional stresses and may fail to repair the initial damage. Based on the experimental results, D-values were calculated for each media at all temperatures studied. The D-values observed using non-selective recovery procedures were much higher than the ones obtained for the two selective media. When comparing the selective media, it can be concluded that the Palcam agar allowed the repair and growth of some thermally injured cells. The results of this work demonstrated that most of the media used as selective for *L. monocytogenes* might not be suitable for the recovery of heat-injured cells, which can dangerously underestimate the foodborne pathogen.

Key words: injury, *L. innocua*, thermal inactivation

1. Kamat, A. S. and Nair, P. M.. Identification of *Listeria innocua* as a biological indicator for inactivation of *L. monocytogenes* by some meat processing treatments. *Lebensm.-Wiss. u.-Technol.*, 1996, vol. 29, p. 714-720.