D-48: Effect of heat-shock on the thermoresistance of *Vibrio parahaemolyticus*

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The survival of stationary phase cells (grown at 37°C) of *Vibrio parahaemolyticus* (NCTC strain 10885), held at 40° for 15 minutes (heat-shocked), 1, 2 and 3 h prior to a secondary heat treatment at 48°C for 15 min. was investigated.

The thermoresistance of *Vibrio parahaemolyticus* heated at 48°C in prawn homogenate increased when the cells were heat-shocked 40°C for 15 min. before heating at the higher temperature. The counts on tryptic soy broth with 3% NaCl (TSB3SA) with added sodium pyruvate (0.1%) demonstrated an increase of 0.98 and 1.06 log cycles in heat-shocked cells at the end of heating for 10 and 15 minutes, respectively, compared to un-shocked cells. The time taken for un-shocked cells to reduce 1 log cycle (D value) was 7.8 minutes and the corresponding time for heat shocked cells was 13.3, which was a 1.7 fold increase. Higher counts were also observed on TSB3SA indicating acquired resistance to hydrogen peroxide toxicity, as well. Prolonged holding for 1.2 and 3 h at 40°C

prior to secondary heat treatment resulted in significant increase in thermotolerance. The percentage surviving fraction increased from 0.11% in un-shocked cells to 18% (heat-shock, 1 h) and 69% (heat-shock, 3 h).

The heat shock phenomenon, therefore has implications for the safety of foods given marginal heat treatment. Increased D values indicate the possibility that microbial heat resistance many increase during the cooking process of foods. This should be taken into account when establishing safer heat treatment.