

Title Effect of Fluctuating Temperature on Adhesion of Bacteria Related to Fresh Produce
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Abstract

The adherent characteristics of bacteria isolated from cabbage and cucumber fruits on the inner surface of polystyrene test tube were investigated under fluctuating temperature conditions. Fluctuation cycles set at 5 °C for 24 hrs and 30 °C for 24 hrs were repeated until the fifth day. Two levels of nutrient (trypticase soy broth: fresh broth and 5% of fresh broth) conditions were prepared. Bacterial adhesions were evaluated by the OD₅₀₀ value of bacterial cells stained with 0.1% (w/v) of crystal violet solution. The adhesions of the isolated bacterial group of cucumber fruits gradually increased with incubating days under fluctuating temperature. Approximately two times of OD₅₀₀ value was observed in the 5% of trypticase soy broth condition compared with that in rich nutrition. The rate of bacterial adhesion under poor nutrient condition for 5 days was almost same as that observed under steady temperature conditions of 15 and 30 °C. Remarkable bacterial adhesions were observed under fluctuating temperature condition for three days. However, the gradual increases in the OD₅₀₀ value obtained under steady temperature condition for 5 days incubation in case of isolates from cabbage. The adherent potentials of many kinds of bacteria isolated from fresh produces might be stimulated by the temperature fluctuation during incubation. These results indicated that exposure of produce to high temperature during distribution could influence the bacterial adhesions, and lead to biofilm formations on the surface of fresh produces.