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Note: This research study analyzed one particular pickling procedure that started with partially fermenting cucumbers at room temperature and then storing them in the refrigerator with no further treatment or processing. It does not represent findings or advice for any other type of refrigerator pickles.

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Listeria monocytogenes survival in refrigerator dill pickles

J. KIM[1], E. M. D'Sa[2], M. A. Harrison[1], J. A. Harrison[2], and E. L. Andress[2]. (1) Dept. of Food Science & Technology, Univ. of Georgia, Food Science Bldg., Athens, GA 30602, (2) Dept. of Foods & Nutrition Extension, Univ. of Georgia, 208 Hoke Smith Annex, Athens, GA 30602.

Listeria monocytogenes can survive and grow in refrigerated foods with pH levels of approx. 4.0-5.0 and salt concentrations of 3-4%. Home-fermented refrigerator dill pickles fit this description. Contamination of this product with *L. monocytogenes* could cause serious problems since these items are not heated prior to consumption.

This study determined *L. monocytogenes* survival and growth patterns in refrigerator dill pickles at three salt levels (1.3, 3.8 and 7.6%).

Pickling cucumbers were inoculated with *L. monocytogenes*, brine mixtures were added and the cucumbers were held at room temperature for one week and then refrigerated for up to 3 months. The pH, percent NaCl, percent titratable acidity and total aerobic, psychrotrophic, lactic acid bacteria and *Listeria* counts were measured at the addition of brine, at 2, 4, and 7 days during storage at room temperature and then at weekly intervals during refrigerated storage.

There was a rapid decrease in pickle pH after four days at room temperature (from 6.2-6.3 to 4.4-4.8) followed by a gradual decrease. The percent NaCl in the pickles increased only slightly while held at room temperature from 0 to 0.101, 0.234 and 0.448% in 1.3, 3.8 and 7.6% salt mixtures, respectively. The initial *Listeria* population was 6-7 log cfu/in^2 on the surface and 4-5 log cfu/g internally. There was approximately a 1-log increase during fermentation at room temperature followed by a population decline during refrigerator storage, with a greater decrease in the pickles with the highest NaCl content. Populations of total aerobes and lactic acid bacteria increased.

Based on old recommendations, consumption of refrigerator dill pickles could typically be anytime after 3 days of refrigerated storage. Since *L. monocytogenes* may still be viable well after this point, there is a food safety risk and no recommendations to prepare this product in the home should be distributed.