

**Title:** Survival of *Listeria monocytogenes* on pistachios, corn flakes and chocolate liquor stored at 4°C and 23°C

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**Abstract:** Low-moisture foods (LMFs) such as dried fruits, cereals and confections, are characterized by a water activity ( $a_w$ ) below 0.85 and have been recognized as vehicles for foodborne illness. Although the growth of bacterial pathogens such as *Listeria monocytogenes* is inhibited by low  $a_w$ , long-term survival has been demonstrated in some LMFs.

This long-term survival can present a public health concern, especially when LMFs are consumed without undergoing any microbial inactivation steps. The presence of any *L. monocytogenes* on ready-to-eat foods can lead to food recalls, thus research regarding foodborne pathogens on LMFs is essential to understand the environmental mechanisms underlying pathogen survival and has great relevance for predictive modeling used in microbial health risk assessments.

The main purpose of this study is to assess the survival of *L. monocytogenes* on artificially-inoculated LMFs (dry-roasted shelled pistachios, chocolate liquor and corn flakes).

LMFs were inoculated with a 4-strain cocktail of *L. monocytogenes* at an initial concentration of 8 log CFU/g by wet-inoculation (pistachios) or misting (chocolate liquor and corn flakes). They were then dried at 30°C, and stored at both 23°C, 30-35% relative humidity (RH) and 4°C, 29-75% RH. Bacterial enumerations were done on tryptic soy agar with 0.6% (w/v) yeast extract, with the exception of pistachios, for which Oxford agar was used due to interfering background microbiota. Analysis of significant differences in population levels was determined using a two-way repeated measures ANOVA.

Populations of *L. monocytogenes* declined significantly ( $P \leq 0.05$ ), i.e., by 3.95, 1.37, and 2.26 log CFU/g on corn flakes (month 6), dry-roasted pistachios (month 5), and chocolate liquor (month 3) stored at 23°C, respectively. In contrast, the levels of *L. monocytogenes* remained stable on all LMFs stored at 4°C for 3-6 months ( $P > 0.05$ ). Monthly sampling of LMFs will continue for up to a year. Future studies will include examining the microbiome of the LMFs and investigating any potential changes in virulence of *L. monocytogenes* during storage on the LMFs.