International Association for Food Protection

T8-12: Quantitative Risk Assessment of Listeriosis from Traditional Brazilian Minas Artisanal Semi-hard and Fresh Soft Cheeses

Tuesday, July 10, 2018
04:45 PM - 05:00 PM
Salt Palace Convention Center - Room 151 D-F

Introduction: Traditional Minas cheeses are very popular in Brazil. These cheeses are of two types: artisanal ripened semi-hard cheeses (HC) produced with raw milk and refrigerated fresh soft cheeses (SC) generally produced with pasteurized milk.

Purpose: This study estimates the risk of listeriosis due to HC and SC consumption using quantitative microbial risk assessment (QMRA).

Methods: QMRAs were developed for both cheese types. The HC model contained a module for predicting *Listeria monocytogenes* decline during ripening. The SC model contained a refrigerated storage module for predicting *L. monocytogenes* growth during storage. HC modeling scenarios varied *L. monocytogenes* starting concentration over -2.4 to 6 log CFU/ml in raw milk and three ripening times (4, 22, and 60 days). SC modeling scenarios varied *L. monocytogenes* starting concentration (-2.4 to 4 log CFU/ml in milk). Inclusion of antilisterial lactic acid bacteria (LAB) was also examined. Simulations (100,000 iterations per scenario) were carried out using the @Risk add-in for Excel.

Results: Aging HC reduced risk, and risk was influenced by *L. monocytogenes* starting concentration. Aging 22 days with inhibitory LAB reduced risk more than 4 million-fold when *L. monocytogenes* was assumed to be 6 log CFU/ml in raw milk, and was lower risk than HC made without LAB and with a starting concentration of 1 log CFU/ml in raw milk. Inclusion of inhibitory LAB reduced risk of listeriosis from SC, but not as dramatically as for HC. Relative risk to vulnerable populations reduced 4.4 and 3.4-fold when *L. monocytogenes* starting concentrations were 1 log and 4 log CFU/ml in milk, respectively.

Significance: The results of the QMRA predict that consumption of contaminated Minas cheeses can present a high risk of listeriosis, especially for vulnerable populations. Scenario analyses indicate that aging of HC and inclusion of LAB in HC and SC are effective risk mitigation measures.

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