Modeling the Growth of Listeria monocytogenes in Soft Blue-White Cheese

The aim of this study was to develop a predictive model simulating growth over time of the pathogenic bacterium Listeria monocytogenes in a soft blue-white cheese. The physicochemical properties in a matrix such as cheese are essential controlling factors influencing the growth of L. monocytogenes. We developed a predictive tertiary model of the bacterial growth of L. monocytogenes as a function of temperature, pH, NaCl, and lactic acid. We measured the variations over time of the physicochemical properties in the cheese. Our predictive model was developed based on broth data produced in previous studies. New growth data sets were produced to independently calibrate and validate the developed model. A characteristic of this tertiary model is that it handles dynamic growth conditions described in time series of temperature, pH, NaCl, and lactic acid. Supplying the model with realistic production and retail conditions showed that the number of L. monocytogenes cells increases 3 to 3.5 log within the shelf life of the cheese.

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