

## **A standard quantitative method to measure acid tolerance of probiotic cells**

### **Abstract**

The aim of this work was to develop a standard quantitative method to measure the acid tolerance of probiotic cells when exposed to a simulated gastric fluid. Three model strains of different cell concentrations were exposed to a standard simulated gastric fluid of fixed volume. The fluid pH ranged from pH 1.5 to 2.5. In general, the death kinetics followed an exponential trend. The overall death constant,  $k_d$ , for all strains was found to be in a power relationship with the pH value and the initial cell concentration, and it can be expressed as  $k_d = k_{AII}(\text{pH} - 9.0)N_0^{-0.19}$  where  $k_{AII}$  is defined as the acid intolerance indicator and  $N_0$  is the initial cell concentration (CFU/ml). This equation was validated with the experimental data with an average  $R^2$  of 0.98. The acid intolerance of cells can be quantitatively expressed by the  $k_{AII}$  values, where higher value indicates higher intolerance. In conclusion, a standard quantitative method has been developed to measure the acid tolerance of probiotic cells. This could facilitate the selection of probiotic strains and processing technologies.

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