

Fermentation failures and flavour deficiencies caused by heat-resistant bacteriophages attacking *Leuconostoc* starter cultures

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Bacteriophages of lactic acid bacteria are still the primary cause for fermentation failures in the dairy industry. They can cause loss of viability and affect both – acidification cultures as well as aroma cultures. *Leuconostoc* strains are important for the production of flavour compounds like diacetyl in several dairy products. They have also other essential functions, e.g. production of gas resulting in hole-formation in cheese. Contamination with *Leuconostoc* bacteriophages in dairies is due to the presence of *Leuconostoc* strains in raw milk. Some heat resistant bacteriophages may survive pasteurization and then be present on dairy products. The aim of this study was to test *Leuconostoc* phages for their heat resistance and to select a thermo-resistant *Leuconostoc* phage in order to provide data for designing heating processes of milk and whey. The test phage was also used to assess phage-derived influences on the organoleptic properties of cream cheese.

A total number of 77 dairy *Leuconostoc* phages, either isolated from milk products provided by dairies or obtained from starter culture manufactures, were tested for their heat resistance^[1]. Heat inactivation experiments showed that 15% of the phages were still active after a heat treatment of 85 °C for 1 min. For one of the most thermostable phages (i.e. *Leuconostoc pseudomesenteroides* phage P793), kinetic parameters of inactivation were determined. Results showed that pasteurization was not sufficient for a 3-log inactivation of phage P793. In addition cream cheese was produced using milk either contaminated with *Leuconostoc* phages or without contamination. The products were evaluated by a triangle test method. A significant difference of the cream cheese samples was observed. In the presence of *Leuconostoc* phages, a reduction of flavour compounds was noted in the samples.

[1] Atamer, Z., Ali, Y., Neve, H., Heller, K.J. and Hinrichs, J. (2011) Thermal resistance of bacteriophages attacking flavour-producing dairy *Leuconostoc* starter cultures. International Dairy Journal 21 (5): 327-334.