



## Heat tolerance of dairy lactococcal c2 phages

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Lactococcal phages constitute a problem in the dairy industry since they may interfere with the fermentations. In spite of this, there is relatively little detailed knowledge on the heat tolerance of different phages. Nine *Lactococcus lactis* c2 phages propagated on different hosts were screened for thermal resistance in skimmed milk. Pronounced variations in thermal resistance were found. Three phages displayed high sensitivity towards heat resulting in > 8 log reductions after 70°C for 5 min, while the most thermal resistant phages required 80°C for 5 min to obtain the same reduction. Inactivation kinetics were determined for a thermo-sensitive and a thermo-resistant phage at 60°C-70°C and 65°C-78°C, respectively, using a submerged coil system with extremely short heating-up times. Inactivation of phages followed first order kinetics with correlation coefficients of 0.96-0.99. D<sub>70</sub>-values of 12 sec and 16.6 min were calculated for the most sensitive and for the resistant phage, respectively. Release of phage DNA from capsids, and disintegration of phage heads and tails were the first morphological changes observed for moderately thermal inactivated lysates (15% phage inactivation) of the heat tolerant phage P635.