

Survival of Shiga toxin-producing and generic *Escherichia coli* during ripening of semi-hard raw milk cheese

Silvio Peng¹, Wolfgang Hoffmann², Wilhelm Bockelmann³, Jörg Hummerjohann⁴, Roger Stephan¹ and Philipp Hammer²

¹ Institute for Food Safety and Hygiene, University of Zurich, Zurich, Switzerland and Research Station Agroscope Liebefeld-Posieux, Bern, Switzerland

² Department of Safety and Quality of Milk and Fish Products, Max Rubner-Institut, Kiel, Germany

³ Department of Microbiology and Biotechnology, Max Rubner-Institut, Kiel, Germany

⁴ Research Station Agroscope Liebefeld-Posieux, Bern, Switzerland

Prevalence of Shiga toxin-producing *Escherichia coli* (STEC) among raw milk cheeses at retail level has been reported by several studies. Investigations on survival of STEC during production and ripening of raw milk cheeses may assist the development of control measurements. In this study five different *E. coli* strains, including three STEC strains, were analysed for their behaviour during production and ripening of artificially contaminated semi-hard raw milk cheese. The strains used were previously isolated from raw milk cheese and selected based on phenotypic traits and stress response abilities. Prior to the cheese production process the strains were inoculated into raw milk at two different contamination levels (10^1 and 10^3 CFU/g). Raw milk cheeses were produced according to semi-hard raw milk cheese recipe while using two different cooking temperatures (40°C and 46°C). Artificially inoculated *E. coli* strains were monitored separately during production and 16 weeks ripening period. An increase in bacterial loads of about 3.5 log from raw milk to fresh cheese occurred during the manufacture before counts were decreasing over the ripening period. At both contamination levels significant differences in the behaviour of the strains were found. The two generic *E. coli* strains were able to survive in higher numbers than the STEC strains. However, at the end of the ripening period in 6 of 16 cheeses made at lower contamination level STEC were still present at more than 10 CFU/g while detection of STEC after enrichment was possible in almost all cheeses.