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Bjerrum-Bohr, Ida Jannike; Thorsen, Line; Christiansen, Lasse Engbo; Jespersen, Lene

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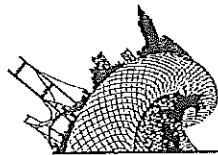
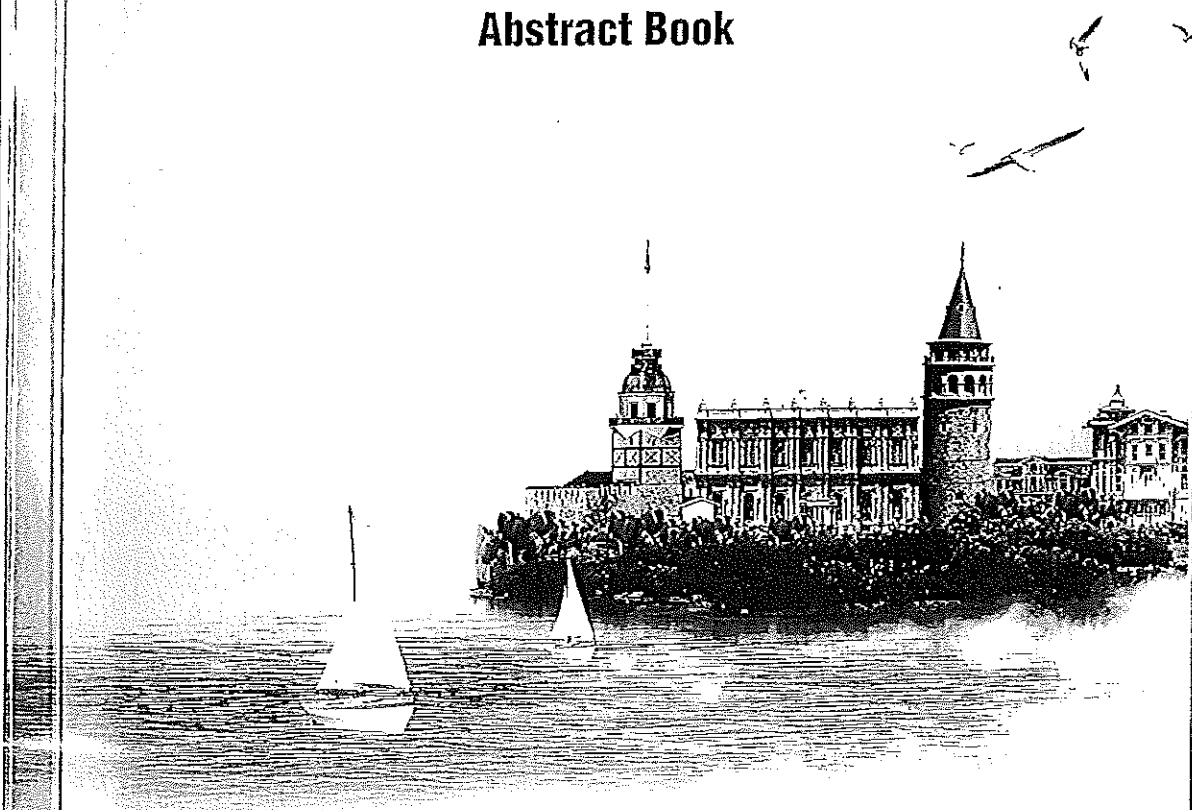


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Foodborne pathogens

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Tolerance of dairy-related *Listeria monocytogenes* strains to lactic acid stress

Ida J. BJERRUM-BOHR¹, Line THORSEN¹, Lasse Engbo CHRISTIANSEN², Lene JESPERSEN¹

1:Department of Food Science, University of Copenhagen, Copenhagen, DENMARK
2:Department of Informatics and Mathematical Modelling, Technical University of Denmark, Lyngby, DENMARK
Corresponding author: lith@life.ku.dk

Lactic acid is found in high concentrations in cheese due to formation by lactic acid bacteria. It has an inhibiting effect of the growth on bacteria and in particular the *Listeria monocytogenes*. *L. monocytogenes* can cause listeriosis in risk groups, such as pregnant women, neonates, older and immunocompromised people and listeriosis has a high mortality rate i.e. up to 20-30%. *L. monocytogenes* may be present in dairy products, ready-to-eat meat products and seafood. Some of the strains of *L. monocytogenes* may be better in adapting to higher concentrations of lactic acid than others. However, the strain depended tolerance towards lactic acid has never been thoroughly investigated of dairy-related strains of *L. monocytogenes*. The aim of the present study was therefore to investigate which effects different concentrations of lactic acid have on growth and gene expression of different strains of *L. monocytogenes*. Six different dairy-related *L. monocytogenes* strains were grown with 0 mM, 10 mM, 15 mM and 20 mM lactic acid in BHI broth at 37°C. The growth rate ($[mic]_{max}$) and lag time ($[lbd]$) was calculated using a mathematical growth model with linear regression of the absorbance detection times of 10-folds serially diluted cultures. With increasing concentration of lactic acid we observed a larger variation in the growth rate. The lag time of the six strains was significantly increased at 20 mM compared to 0 mM and the differences between the strains were more distinct. Two strains (15675 and 51779) originally isolated from cheese and with distinct differences in lactic acid tolerance were selected for further investigation by gene expression studies. Results on gene expression of the two strains investigated by quantitative real time polymerase chain reaction (qRT-PCR) will be presented. The study has given us increased knowledge on *L. monocytogenes* strain related differences in lactic acid tolerance. This will lead to further understanding on how the virulence potential of *L. monocytogenes* strains could vary within different strains - an important aspect to consider when discussing food safety.

Foodborne pathogens

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Virulence genes in raw milk

Suvi JOUTSEN, San LINDSTRÖM, Maria F University of Helsinki, Helsinki, Finland
Hygiene and Environmental
Corresponding author: suvi

Enteropathogenic *Yersinia pseudotuberculosis* are among most numerous reported zoonotic pathogens. *Y. pseudotuberculosis* 1B and 2-5 are known pathogenic due to the lactic acid virulence genes. However, biologically apathogenic due to the lack of virulence genes. In this study we investigated the presence of virulence genes in 11 Finnish raw milk samples. Wauters scheme using pyrazinamide production, and salicin, xylose reaction (PCR) based on SY1 and hreP virulence genes located on a plasmid. Most of the *Y. enterocolitica* remaining four isolates from these isolates were tween negative for ystA, ystB or hreP. The remaining 23 isolates (68%) were both ystB- and hreP- positive, others lacked all virulence genes or yadA-positive. Raw milk is an emerging food trend. As temperatures increase, its presence in raw milk strains isolated from raw milk is considered to be apathogenic. Isolates from raw milk with virulence genes are *Y. enterocolitica* strains.