

Listeria monocytogenes in biofilms under conditions simulating the meat processing environment

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Listeria monocytogenes (Lm) is a foodborne pathogen of major concern for public health and the food industry. It can persist in processing environments, leading to recurring cross-contamination of food products. The biofilm lifestyle is considered to protect Lm, facilitating their survival even under harsh conditions. Various environmental stress factors influencing the biofilm forming ability (BFA) of Lm have been investigated, but the adaptation of biofilm models to conditions prevailing in food processing facilities is often neglected.

Our aim is a step-by-step approximation to conditions of the meat processing environment. Starting with a static model, 33 field isolates, sampled in official controls in Germany and mainly associated with meat production, were tested for their capability to form biofilms at 21°C. The selected isolates covered a high diversity including various MLST CCs, serogroups and genetic lineages, as well as infection- and food-related, proven persistent and atypical (low motility) Lm. We observed isolate-specific differences in the formed biofilm biomass. The majority of isolates were weak biofilm formers (20). Only 9 Lm showed a moderate BFA, but without similarities regarding the mentioned properties. Non-motile isolates displayed no BFA. Lowering the model temperature to 12°C (meat processing temperature) decreased the total biofilm biomass and delayed biofilm formation. Temperature pre-conditioning also had a negative effect on the BFA.

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Listeria monocytogenes, biofilm, persistence

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Junior Scientist Status

Yes, I am a Junior Scientist.

Primary authors: PREUSS, Thalia (German Federal Institute for Risk Assessment, Berlin, Germany); Dr LÜTH, Stefanie (German Federal Institute for Risk Assessment, Berlin, Germany); Prof. ALTER, Thomas (Freie Universität Berlin, Berlin, Germany); Dr KLETA, Sylvia (German Federal Institute for Risk Assessment, Berlin, Germany); Dr DIECKMANN, Ralf (German Federal Institute for Risk Assessment, Berlin, Germany); Dr NEUHAUS, Szilvia (German Federal Institute for Risk Assessment, Berlin, Germany); Prof. AL DAHOUK, Sascha (German Environment Agency, Berlin, Germany)

Presenter: PREUSS, Thalia (German Federal Institute for Risk Assessment, Berlin, Germany)

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