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BOOK OF ABSTRACTS

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I10. Industrial and Food Microbiology and Biotechnology

P392. Assess of acid tolerance of non-typhoidal *Salmonella* and *Enterococcus faecium* from different epidemiological and genetic backgrounds

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Acid stress is one of the most frequently encountered hostile conditions that bacteria have to face (e.g. food-production-chain/feed/disinfectants/human and animal hosts). Nevertheless, acid tolerance profile of bacteria from diverse epidemiological and genetic backgrounds, including multidrug- resistant (MDR), is still poorly explored.

The aim of this study was to assess the susceptibility to acidic-pH of non-typhoidal *Salmonella* and *Enterococcus faecium* (Efm) from diverse origins. We included *Salmonella* (n=66; 23 serotypes) and Efm (n=74; clades A1/A2/B) recovered from human-n=54, food-animal production setting-n=20, food- n=56) and environment-n=10 (1997-2018; 6-countries). The minimum-growth-pH (growth-pHmin) was assessed by broth-microdilution using Mueller-Hinton-II adjusted with HCl (pH=2.0-6.5/16h-20h ±2h/37ºC) and the minimum-survival-pH (survival-pHmin) by plating the microdilution wells without visible growth in Brain-Heart-Infusion-agar (BHI) (24h-48h±2h/37ºC). An Acid-Tolerance-Response (ATR) assay was performed in 3 isolates of each genera (different growth/survival-pHmin), exposing bacteria in log-phase to an acid-shock-challenge (pH=3.0/15'-*Salmonella*/60'-Efm) or to a pre- adaptation to acidic-pH (pH=4.5/60' - for both bacteria) followed by an acid-shock-challenge (pH=3.0/15'-*Salmonella*/60'-Efm). After that a growth-pHmin and survival-pHmin assays were performed.

Most *Salmonella* showed a growth-pHmin of 4.0 (98%- n=65/66) and a survival-pHmin between 4.0 (52%-n=34/66) and 3.5 (48%-n=32/66). In Efm, the growth-pHmin ranged between 4.5 (65%-n=48/74) and 5.0 (35%-n=26/74) and the survival-pHmin between 3.0 (15%-n=11/74), 3.5 (43%- n=32/74) and 4.0 (42%-n=31/74). Only Efm isolates from food (39%-n=11/28), mostly from a poultry-processing-plant using peracetic acid as disinfectant (73%-n=8/11), presented the lowest survival-pHmin 3.0 (73%- MDR/82%-clade A2). Similar survival-pHmin=3.5-4.0 were observed for different Salmonella serotypes and Efm clades. However, a higher percentage of MDR-*Salmonella* (61%-n=27/44) were able to survive at pH=3.5 contrasting with non-MDR-*Salmonella* (23%-n=5/22) ($p<0,05$; Fisher-exact test). The ATR-assay (pre-adaptation acidic pH+acid shock challenge) enhanced survival-pHmin from 3 to 2.5 in 1-Efm (clade A2/MDR/from a poultry processing plant) and from 4 to 3.5 in 1-S. 4,[5],12:i:- (MDR/with mcr-1 gene/from pork meat).

Our data suggest that MDR-*Salmonella* and Efm with diverse epidemiological and genetic backgrounds can survive to low-pH values, although differences among clades/serotypes were not detected. MDR- *Salmonella* showed a better ability to survive to more acidic pH than non-MDR isolates. ATR-assays revealed strain-specific ability to survive under more acidic-pH after a pre-adaptation to middle acidic- pH.