

Growth of food-borne pathogens *Listeria* and *Salmonella* and spore-forming *Paenibacillus* and *Bacillus* in commercial plant-based milk alternatives

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An increase in vegan diet preference, lactose intolerance, calorie concern and environmental awareness has led to a rise in the popularity of plant-based alternatives to bovine milk. However, there are still gaps in understanding how known bacterial food contaminants behave in plant-based beverages. The present study is the first to compare the growth of food-pathogens *Listeria monocytogenes* and *Salmonella enterica*, food spoilage *Bacillus subtilis* and an industrial milk product isolate, spore-forming *Paenibacillus* in commercially available ultrahigh temperature processed bovine milk and plant-based milk alternatives (coconut, almond, cashew). Beverage samples were inoculated with a strain cocktail or individual strains of either *Listeria*, *Salmonella*, *Bacillus* or *Paenibacillus*, respectively (approximately 1×10^3 CFU/mL) and stored at chilled and ambient temperatures (4°C, 8°C or 20°C). Bacterial strains used in the study were capable of proliferating in plant-based beverages at higher rates than in bovine milk at 8 °C and 20 °C for *Listeria* and 20 °C for *Salmonella* and *Paenibacillus*, respectively. *Bacillus subtilis* grew equally fast in bovine milk and plant-based milk at 20 °C. No statistically significant difference ($p > 0.05$) in growth rates between different types of tested beverages was observed at 4°C and 8°C for *Listeria* and *Salmonella* cocktails, respectively. These data suggest that plant-based beverages may present a significant risk for listeriosis and salmonellosis, and post-opening recommendations should be carefully considered.