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Survival of *Salmonella* in plant-based meat products and impact on the microbiome

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Abstract

Salmonella is one of the leading causes of foodborne illnesses in the United States, and *Salmonella* Typhimurium is one of the top three serovars associated with human disease worldwide. *S. Typhimurium* infections are typically associated with the consumption of contaminated meats or meat products. However, a potentially new source of *S. Typhimurium* are plant-based meats (PBM) which may be contaminated along the food production chain. There is a rising popularity of PBM by consumers who are moving away from animal-based products. Animal-based products are highly regulated for pathogens while there is very little known about pathogen survivability within PBM, therefore the goal of this study was to determine the survivability of *S. Typhimurium* in PBM and the impact it has on the overall microbiome of the products. In addition, the study is the first to examine the overall microbiome of different PBM and how it compares to the microbiome of ground beef. Three different types of PBM products were inoculated with different amounts of *Salmonella* Typhimurium, while ground beef served as the positive control. Inoculated samples were stored at 4°C for two weeks, and plated for *S. Typhimurium* at 1, 3, 10 and 14 days to determine if *S. Typhimurium* could survive at least two weeks in the PBM. The study found that the *S. Typhimurium* survived throughout the 14 day period in all PBM products and ground beef. Microbiome analysis is currently ongoing, but initial results suggest that the presence of *S. Typhimurium* results in at least some change in the microbiome of PBM products and ground beef. This study provides new insight into the food safety risks associated with PBM products, which due to its rising popularity, is more important than ever to understand to protect the populace in being safe eating their preferred protein source.