TITLE: EVALUATION OF ACID AND OXIDATIVE STRESS IN *SALMONELLA* TYPHIMURIUM STRAINS ISOLATED FROM HUMANS AND FOOD IN BRAZIL

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ABSTRACT:

Salmonella enterica subsp. *enterica* serovar Typhimurium (*S.* Typhimurium) is an important cause of gastroenteritis worldwide and the main bacterial genus isolated from foodborne outbreaks in Brazil. The gastroenteritis is usually self-limiting, mainly causing diarrhea and inflammation of the intestinal epithelium. However, systemic infections by *S.* Typhimurium can occur in children and immunocompromised patients. The adaptation of this bacterium is related to several factors, including its ability to survive to the acidic pH of the stomach and to the alkaline pH of the intestine. Therefore, the aim of this work was to assess the survival capability to acid and oxidative stresses of *S.* Typhimurium strains isolated from humans and food in Brazil during 30 years. A total of 40 *S.* Typhimurium strains isolated from humans (20) and food (20) between 1983 to 2013 in different States in Brazil were studied. For the assays, cultures of *S.* Typhimurium in Luria Bertani (LB) were adjusted to the optical density of $O.D._{600nm}$ 0.2 (approximately $1x10^8$ CFU/mL). For the acid stress tolerance assay, the pellets were resuspended in 1 mL of sodium citrate buffer 100 mM pH 7.0 (control) and sodium citrate buffer 100 mM pH 4.5 (stress). For the oxidative stress tolerance assay, the pellets were resuspended in 1 mL of saline 0.8% (v/v) (control) and saline 0.8% (v/v) supplemented with H_2O_2 15mM (stress). Control and stress aliquots were taken after 10 min and 1 hour. Three experiments were conducted on different days. All the 40 *Salmonella* Typhimurium strains isolated from humans (20) and food (20) survived to acid stress after 10 minutes and 1 hour with a survival rate of 34 to 100%. Thirty six *S.* Typhimurium strains isolated from humans (17) and food (19) survived to oxidative stress after 10 minutes and 1 hour with a survival rate of 1 to 73%. In conclusion, the survival rates of the majority of the *Salmonella* Typhimurium strains isolated from humans and food studied under acid and oxidative stress reinforce the ability of this pathogen to tolerate unfavorable conditions and suggest that more rigorous control measures may be needed, given the importance of contaminated food with *Salmonella* Typhimurium.

Keywords: *Salmonella* Typhimurium, acid stress, oxidative stress, humans and food strains

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