
Inhibition of Growth of Salmonella by Native Flora of Broiler Chickens

Arthur Hinton Jr (I)

(I) ARS, USDA - Russell Research Center (950 College Station Road, Athens, GA, 30605)

Resumo

Introduction. Some bacteria in the cecal microflora of broilers can inhibit colonization of chicks by *Salmonella*. Beneficial cecal bacteria may reduce *Salmonella* colonization by competing for nutrients and attachment sites or by producing metabolites that inhibit *Salmonella* growth. The purpose of this study was to determine if cecal bacteria cultured in media supplemented with lactate and succinate produced metabolites that inhibit *Salmonella* growth in vitro. **Materials and Methods.** Cecal cultures were prepared by inoculating broth media with cecal contents of processed broilers and anaerobic incubation at 37°C for 48 h. Media supplemented with 0, 50, 100, or 150 mM of sodium lactate and sodium succinate were inoculated with the cecal culture, only; *Salmonella* Typhimurium, only; or the cecal culture and *Salmonella* Typhimurium. Inoculated media was incubated anaerobically at 37°C, and samples were removed after 7, 14, and 21 days for microbial and chemical analysis. Cecal bacteria and *Salmonella* Typhimurium were enumerated, and concentrations of formic, acetic, propionic, butyric, lactic, and succinic acids were measured. Cecal bacteria were selected from agar and identified using the Biolog Microbial Identification System. Three trials of the experiment were conducted, and statistical analysis was performed using GraphPad InStat. **Results.** After 21 days of incubation, significantly ($p < 0.05$) fewer *Salmonella* were recovered from mixed cultures of cecal bacteria and *Salmonella* incubated in media supplemented with 50, 100, or 150 mM lactate and succinate than from non-supplemented media. Significantly higher concentrations of propionate were produced in media supplemented with lactate and succinate and inoculated with cecal bacteria only or cecal bacteria and

Referência:

Arthur Hinton Jr. Inhibition of Growth of *Salmonella* by Native Flora of Broiler Chickens. In: **Anais do 12º Congresso Latinoamericano de Microbiologia e Higiene de Alimentos - MICROAL 2014** [= Blucher Food Science Proceedings, num.1, vol.1]. São Paulo: Editora Blucher, 2014.
DOI 10.5151/foodsci-microal-304

Salmonella, but not in media inoculated with Salmonella only. Cecal isolates were included Abiotrophia, Arcanobacterium, Atopobium, Bacteroides, Clostridium, Enterococcus, Eubacterium, Gemella, Lactobacillus, Lactococcus, Peptostreptococcus, Proteus, Propionibacterium, and Weissella. Conclusion. Propionate produced by the metabolism of lactate and succinate may play a role in the inhibition of the Salmonella by cecal bacteria. Understanding the anti-Salmonella activity of these bacteria may assist in defining the inhibitory mechanisms of competitive inhibition and identifying bacteria that should be included in effective probiotics.

Palavras-Chave: poultry, Salmonella, competitive exclusion, lactate, succinate

Agência de Fomento: Russell Research Center