

**TITLE:** ACYL HOMOSERINE LACTONE CHANGES THE PROFILE OF CELLULAR FATTY ACIDS OF *Salmonella* Enteritidis

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**ABSTRACT:**

The quorum sensing (QS) is a mechanism of communication between cells which lead to differential expression of genes in response to changes to the cell population density. Studies have shown that QS regulates a variety of phenotypes, including the biofilm formation and expression of virulence genes. N-acyl homoserine lactones (AHLs) are class 1 of autoinducers (AI-1) and, are used by gram-negative bacteria for communication. Some bacteria, such as *Salmonella*, do not produce AHLs, but are able to detect and respond to AHLs produced by other bacterial species or even synthetic AHLs. Another class of QS signals in gram-negative bacteria produced by *Burkholderia* spp. and *Stenotrophomonas maltophilia* is the diffusible signal factor (DSF) which are *cis*-2-unsaturated fatty acids. In addition, a cellular fatty acid composition changes according to cultivation conditions of bacteria. The aim of this work was to evaluate the influence of AI-1 on the profile of cellular fatty acids of *Salmonella* Enteritidis PT4 578 throughout growth in anaerobic condition using the gas chromatography based Sherlock™ Microbial Identification System (MIS). The N-dodecyl-homoserine lactone (C12-HSL) added to the broth interfered in the level of some fatty acids after 4, 6, 7 and 12 h of incubation when compared to the control. However, this profile was not observed at 24 and 36 h. *Salmonella* growing in the presence of C12-HSL for 4 h showed less 17:0 cyclo and higher of two mixtures of monounsaturated fatty acids 16:1  $\omega$ 6c/16:1  $\omega$ 7c and 18:1  $\omega$ 6c/18:1  $\omega$ 7c. The saturated fatty acids 16:00 and 18:00 (palmitic and stearic acids) were reduced in the presence of AI at 6 and 7 h of incubation, respectively, also a reduction of 17:1  $\omega$ 7c was observed at 6 h. On the other hand, after 12 h of incubation an unresolved mixture of 14:0 3 OH and 16:1 iso I, was higher in the presence of C12-HSL. However, the level of most of the cellular fatty acids changed during the same treatment throughout the growth of *Salmonella* Enteritidis, except for the fatty acids 18:00 and 20:2  $\omega$ 6,9c (stearic and eicosadienoic acids) in the control treatment. Further studies are needed in order to determine the specific role of the differentially abundant fatty acids of *Salmonella* in the presence of QS signaling molecules in the different times of cultivation.

**Keywords:** Autoinducer, monounsaturated, pathogen, quorum sensing, saturated.

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