TITLE: TECHNOLOGICAL STRATEGIES FOR ADMINISTRATION OF AN ANTIVIRULENCE COMPOUND AGAINST SALMONELLOSIS IN FARM ANIMALS

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ABSTRACT:

According to the Brazilian Ministry of Health, *Salmonella* and *Escherichia coli* are the etiological agents further identified in foodborne illnesses. These bacteria are also involved in enteric disturbances in pigs and birds affecting meat production due to low animal yield. The genus *Salmonella* consists of several species and several different serovars; some of which are zoonotic and can infect humans and animals a problem of public health. Antibiotics are used in the animals' feed as prevention of bacterial infections and as growth promoters. However, the excessive and inappropriate use of antibiotics has been promoted to the emergence of resistance to several antibiotics in both clinical and environmental isolates. Therefore, it is a worldwide matter and a critical requirement to develop new therapeutic or defensive alternatives against infectious diseases. An alternative is the use of antivirulence compounds that are able to disarm the pathogen inhibiting its virulence factors and consequently interrupting the disease progression. The LED209 was characterized as an antivirulence molecule, being able to inhibit the QseC signaling cascade, a histidine kinase found in many pathogenic bacteria, such as *Salmonella*. QseC senses autoinducer 3 produced by bacteria, and the hormones epinephrine/norepinephrine produced by the host and is responsible for initiating a regulatory cascade of several virulence genes. Our objective is to evaluate technological strategies for the administration of this antivirulence compound in the fight against Salmonellosis in farm animals. However, LED209 has low aqueous solubility, thus was obtained a nanoemulsion contain LED209, followed by microencapsulation with pH-dependent polymers. This new vehicle containing the LED209* should release in the intestines of animals. A pilot assay was performed with some mice as follows: group one negative control alone PBS; group two were defiance with *Salmonella* by gavage; group three were pretreated with LED209* and were defiance with *Salmonella enterica* serovar Typhimurium. After the times of 24, 48 and 72 hours were collected the fresh feces to perform the survival assay. The result showed a large reduction in the number of colonies (CFU) only in the group pretreated with LED209* after 48 hours of the defiance with *Salmonella*. Until this moment, this result with LED209* in the novel vehicle, despite being a pilot assay showed a large reduction of *Salmonella* infection in mice.

Keywords: Nanoemulsion, Salmonellosis, Microencapsulation, LED209, Antivirulence

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