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Control of *Salmonella* and other bacteria harbouring resistance to multiple antimicrobial agents in animal production in developed and emerging countries; different situations, same approach

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Food borne infections by *Salmonella* are very common in all countries. Although food animal production systems vary from a country to another, the control of this bacterium in meat products remains a challenge for various reasons.

In high density closed facilities, often observed in developed countries, animals are relatively well protected against new infection sources from outside but when introduced, infection can be propagated easily among animals. Despite high biosecurity measures to reduce infection pressure, use of antimicrobial agents is very common in these types of farm in order to control infections.

In opened, low density premises, often found in emerging countries, infection sources from outside are numerous and difficult to manage. Although the animal density is reduced, lower hygienic practices and difficulties to carry out adequate disinfection make it difficult to avoid regular use of antimicrobial agents (AMs).

In both cases, regular use of AMs have generated, over the year, multiple resistance in *Salmonella* and other important pathogenic bacteria that compromise the control of many diseases as well of zoonotic microbes, underlining the need to find alternatives to antimicrobial agents to control these pathogens in animals. Since AMs are often used at higher concentration in order to try to overcome the bacterial resistance, significant concentrations can be recovered from slurry and manure and can contaminate environment.

We have therefore developed a research program that aim to better understand the epidemiology of *Salmonella* and assess the efficacy of alternatives to AMs such as protected organic acids, prebiotics and probiotics. In this paper, we will review the most recent data on the various risk factors to reduce *Salmonella* in animal production and we will present most promising alternatives to AMs, including some data on the efficacy of these alternatives.