Alternative growth promoters for poultry that can mitigate the antibiotic resistance of zoonotic pathogens

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The development of antibiotic resistance by multiple bacterial pathogens has resulted in a troubling loss of effective antibiotic options for human. The emergence of multi-drug-resistant pathogens has necessitated higher dosages and combinations of multiple antibiotics, further exacerbating the problem of antibiotic resistance. Zoonotic bacterial pathogens, such as *Salmonella*, *Campylobacter*, Shiga toxin-producing *Escherichia coli*, and *Listeria* are the most common and predominant foodborne enteric infectious agents. It was observed that these pathogens gained/developed their ability to survive in the presence of antibiotics either in farm animal gut or farm environment and researchers believe that therapeutic and sub-therapeutic antibiotic use in farm animal production might play an important role in it. The mechanism of action of antimicrobial components used in farm animal production in genomic interplay in the gut and farm environment, has not been fully characterized. Even the risk of promoting the exchange of mobile genetic elements between microbes specifically pathogens needs to be evaluated in depth, to ensure sustainable farm animal production, safety of our food and mitigate/limit the enteric infection with multiple antibiotic resistant bacterial pathogens.

Due to the consumer's demand and considering the current emerging situation, many countries are in process to withdraw antibiotic use in farm animal production. Before withdraw the sub-therapeutic antibiotic or restrict the use of therapeutic antibiotics in farm animal production, it is essential to find alternative natural antimicrobials for promoting growth of farm animal and/or treating animal diseases. Further, it is also necessary to consider whether that compound(s) has the potential to trigger the acquisition or loss of genetic materials in zoonotic and any other bacterial pathogens. Development of alternative therapeutic and sub-therapeutic antimicrobials for farm animal production and food processing and preservation and their effective implementation for sustainable strategies for farm animal production as well as the possible risk for horizontal gene transfer in major enteric pathogens will be focus in the presentation.