A WAX MATRIX IS AN EFFICIENT BUTYRATE CARRIER THAT CAN BE USED AS A FEED ADDITIVE TO REDUCE SALMONELLA COLONIZATION

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Butyrate has been used extensively as a feed additive to decrease *Salmonella* colonization in poultry with inconsistent results, which could be due to butyrate release location effects. In this study, newly developed butyrate formulations were evaluated for their effect on shedding and colonization of broiler’s digestive and immune tissues by *Salmonella* Enteritidis. Broilers were randomly allocated to six dietary treatment groups: control without butyrate, novel wax-matrix, novel wax-and-starch-matrix, polyhydroxybutyrate (PHB), pH-sensitive-polymer-coated butyrate (SPH), and commercially available fat-coated product. The formulations were based on different approaches to modify butyrate release profile. Microcrystalline-wax matrix is based on diffusion/erosion and is nearly pH independent, inducing a sustained release. PHB is hypothesized to be enzymatically degradable to release 3-hydroxy-butyric acid throughout the GIT. The SPH formulation supposedly release butyrate around pH7 in the colon. The fat-coated butyrate was included as a comparator, because of its known effect on reduction of *Salmonella* colonization. Each chicken was orally inoculated with 105 cfu/mL of S. Enteritidis at day 17 post-hatch. Four days after inoculation the number of cfu *Salmonella* per g cecal content and spleen were determined. Wax-matrix without starch resulted in a more than 10-fold reduction of *Salmonella* colonization in cecal contents. A trend in reduction of cfu/g *S*. Enteritidis was observed for the fat-coated butyrate in cecal content (0,9 log). Increases in butyrate concentration measured in the caeca correlated with reductions in *Salmonella* colonization. In conclusion, new formulations of butyrate that increase its release in the ceca seem promising to protect against *S*. Enteritidis colonization.