

Effects of bacitracin, nosiheptide and oxytetracycline on intestinal epithelial permeability, intestinal flora and bacterial translocation in broilers ⁽¹⁾

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Received: Jul. 13, 2022; Accepted: Oct. 20, 2022

Abstract

This study aimed to investigate the effect of adding supplemental antibiotics to intestinal bacterial composition, bacterial translocation to organs and intestinal permeability. One hundred and ninety-two broilers were randomly allocated to 4 treatments with 4 replicates of 12 birds each. The 4 treatments were: control (CON), dietary supplementation with bacitracin (55 ppm), nosiheptide (2.5 ppm), and oxytetracycline (55 ppm). The intestinal bacterial composition, bacterial translocation to organs, and intestinal permeability were measured at 3-wks and 6-wks of age. Results showed that adding the three antibiotics did not affect the potential difference (PD), short-circuit current (I_{sc}) and conductance of intestines, not did it have any significant impact on the bacterial composition in Coliform, *Enterococcus*, and Lactobacilli. However, all supplemental antibiotics decreased total bacteria count in the liver of birds at age of 3 wks ($P < 0.05$), while nosiheptide had the best bacteriostatic effect. In the control group, the total bacteria transferred to the liver at 0 and 3 wks was higher than that at 6 wks ($P = 0.13, 0.08$), suggesting that intestinal barrier function was vulnerable in broilers during younger ages. Our findings indicated that supplementation of the 3 different types of antibiotics reduced the incidence of bacterial invasion and translocation into the liver to a great extent due to their beneficial effects on the improvement of intestinal barrier integrity. Because these three growth-promoting antibiotics have been banned after this study, feed additives with similar antibacterial functions should be developed to replace antibiotics.

Key words: Antibiotics, Intestinal epithelial permeability, Intestinal flora, Bacterial translocation, Broilers.

(1) Contribution No. 2719 from Livestock Research Institute, Council of Agriculture, Executive Yuan.

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