

Effects of antibiotics addition on intestinal morphology and disaccharidase activity in broilers ⁽¹⁾

Ching-Chi Hung ⁽²⁾ Bao-Ji Chen ⁽³⁾ Ching-Yi Chen ⁽³⁾ Ying-An Chu ⁽³⁾
I-Nung Huang ⁽³⁾ and Yih-Fwu Lin ⁽²⁾⁽⁴⁾

Received: Jun. 7, 2021; Accepted: Oct. 8, 2021

Abstract

The study emphasizes on the potential effects of antibiotics on intestinal digestion and integrity in broilers with respect to histological morphology and disaccharidase activity. A total of 192 one-day-old Arbor Acres birds were randomly allocated to one of the following four treatments for 42 days including control, bacitracin (55 mg/kg), nisin (2.5 mg/kg), and oxytetracycline (OTC, 55 mg/kg) groups. The addition of bacitracin and nisin caused an increase in body weight gain at 3 wk and 6 wk of age and OTC addition only promoted weight gain at 3 wk of age ($P < 0.05$). The addition of bacitracin and nisin had a marginal effect on disaccharidase activity in the jejunum and ileum at 3 wk of age ($P < 0.1$). The addition of bacitracin significantly increased the villus area length of ileum, and the ratio of villus to crypt cell of jejunum and ileum at 6 wk of age when compared with the control group ($P < 0.05$). The addition of nisin reduced the thickness of the ileum mucosae at 3 wk of age and decreased the depth of crypt in the jejunum at 6 wk of age ($P < 0.05$). On contrary, OTC thickened the muscularis mucosae and the depth of crypt in the jejunum at 3 wk of age ($P < 0.05$). In sum, bacitracin and nisin exhibit a beneficial effect on intestinal integrity by improving gut morphology.

Key words: Broilers, Antibiotics, Disaccharidase activities, Intestinal morphology.

(1) Contribution No. 2682 from Livestock Research Institute, Council of Agriculture, Executive Yuan.

(2) Nutrition Division, COA-LRI, Tainan 71246, Taiwan, R. O. C.

(3) Department of Animal Science and Technology, National Taiwan University, Taipei 10617, Taiwan, R.O.C.

(4) Corresponding author, E-mail: yflin@mail.tlri.gov.tw.