

Effects of an in-feed antibiotic on the morphology and mitotic index of the porcine small intestine.

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The objective of the current experiment was to assess the effect of the antibiotic (carbadox) on the intestinal morphology. A total of 25 weanling piglets (DH x LYD) were used in the experiment. Pigs were weaned at 21 d and allotted to one of two treatment groups. A phase 1 diet was fed to appetite to the pigs during the entire experimental period. Pigs on treatment group 1 received this diet without any in-feed antibiotic. Pigs on treatment group 2 received the diet with an antibiotic growth promoter (carbadox) included at 50 ppm. Small intestinal morphology and enterocyte mitotic index was assessed on the d of weaning (d 0), and on d 5 and d 10 of the experiment. Samples taken from the pigs included intestinal tissue obtained from 33%, 66%, and 100% of the length of the small intestine measured from the pyloric sphincter.

Computerized morphometry and enterocyte mitotic index was performed on the intestinal sections. Results were analyzed using a three-way factorial analysis. For d 0, the mean villus height (VH) values were higher ($P < 0.05$) than for d 5 or d 10 regardless of the diet being fed post-weaning. Regardless of the site of sampling there was no effect of diet on VH ($P > 0.05$). Within each diet, there was no difference ($P > 0.05$) between mean VH at site 33% and 66%. However, for both diets, VH at both these sites were higher ($P > 0.05$) than at site 100%. On d 0, site 100% had greater crypt depths (CD) than sites 33% and 66% ($P < 0.05$). For diet 1, the CD for site 66% at d 5 were greater than for the other two sites ($P < 0.05$). However, on d 10 site 100% had greater CD than

site 66% ($P < 0.05$). For diet 2, CD were greater on d 10 regardless of sampling site. On d 5, pigs fed diet 1 had greater ($P < 0.05$) mean CD values at site 66% than pigs fed diet 2 ($P < 0.05$), but on d 10, pigs fed diet 2 had greater ($P < 0.05$) CD values than pigs fed diet 1. No effects of time, diet, or site were found for the mitotic index. Overall, the results of this experiment demonstrated that VH decreases after weaning while CD increases. An in-feed antibiotic such as carbadox can contribute to an amelioration of the increase in CD.

Key Words: Piglets, Villus height, Crypt depth, Morphometry, Mitotic index.