

Title *Alteration in dimensions of different mucosal components of small intestine of rock pigeon (Columba livia domestica) caused by dietary mannan oligosaccharide*

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Abstract:

Investigation on the intestinal histology in various species of birds and the effects of variety of dietary inclusions on this histology is the continuous interest of poultry industry. Conducting research on the possible ways to improve the ingredients in the bird diet to ensure the intestinal health of poultry is an ongoing process.

Prebiotics, being one of the non-pharmaceutical substitutes to low dose antibiotic growth promoters, are a constant subject of studies so that these may be tested further for their potential with different concentrations in different birds. These are non-digestible food ingredients which promote intestinal health by favorably modifying the microenvironment at mucosal surface.

The present study used Mannan oligosaccharide (MOS), a prebiotic, in a feeding trial and the subject of this study was Rock pigeon (*Columba livia domestica*).

The study was aimed to see the effect of MOS supplementation in different concentrations (0%, 0.1%, 0.2% and 0.5%) on dimensions of mucosal components (Villus height, Villus width, Crypt depth, Thickness of lamina propria, Thickness of Muscularis mucosa, Villus surface area, Mucosal surface area and Villus height to Crypt depth ratio) of small intestine of Rock pigeons.

Forty maternally isolated pigeons (n = 40) were randomly divided into four groups (A, B, C & D) based on 4 levels of MOS in the Corn based basal diet (0%, 0.1%, 0.2% and 0.5%). The trial lasted for 35 days. Thereafter, eight birds per group were randomly selected and slaughtered. Tissue samples for histology were obtained from duodenum, jejunum and ileum of pigeons.

The Samples were processed by paraffin embedding technique and staining was done by Haematoxyline & Eosin technique. Histomorphometry was done using the software (ProgRes® CapturePro - Jenoptik AG). Differences between groups were considered significant at $P < 0.05$.

The MOS did not produce any beneficial effect on the pigeon intestine except for decreasing the crypt depth of jejunum with 1% MOS supplement and thinning of Muscularis mucosa of duodenum and ileum with 0.2% and 0.5% MOS supplemented diets. In all other cases it either affected the mucosa adversely compared to the control group or did not bring about any change.

Conclusion:

The study concluded that MOS did not have any significant beneficial effect on the pigeon intestine in entirety.
