III Encontro Científico de Produção Animal Sustentável
05 de outubro de 2012
Instituto de Zootecnia, Nova Odessa, SP
ISSN 1981-4100 (On-line)

DIETARY LEVELS OF MANNANOLIGOSCCHARIDES (MOS) FOR NILE-TILAPIA (*Oreochromis niloticus*): INTESTINAL MORPHOLOGY[1]

NÍVEIS DE MANANOLIGOSSACARÍDEOS (MOS) NA DIETA DE TILÁPIAS-DO-NILO (*Oreochromis niloticus*): *MORFOLOGIA INTESTINAL*

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Intensification of aquaculture production systems exposes fish to numerous stressors, which may negatively affect their growth and limit profitability of aquaculture systems. In addition, fish farmers are now obliged to conform to Best Management Practices (BPMs) regulations. This current setup favors the use of dietary prebiotics for management of farmed fish as environmentally friendly practice. Mannanoligosaccharides (MOS) are complex carbohydrates derived from yeast (*Saccharomyces cerevisiae*) cell walls. This study was set out to evaluate the effects of increasing levels of dietary MOS on intestinal morphology of Nile-tilapia. *Fish (12.62 ± 0.38*) were randomly distributed into 16 cages (0.25m^3 polyvinyl chloride; 20 fish per cage), inside four 5m^3 net-cage at Salto Caxias Hydroeletric water reservoir (Boa Vista da Aparecida, PR) and fed diets containing increasing levels of MOS (0.0; 0.2; 0.4 and 0.8%) during 30 days (n=4). The proximal intestine fragment of two specimens from each replicate was taken for histological observations. The histological sections (5 µm) were stained with haematoxylin and eosin (H & E) and documented photographically with a digital camera (DCM 130E digital camera for microscope 1.3 pixels, CMOS chip Software Scopephoto) connected to a light microscope (EDUTEC 502 AC). The images were analyzed by using (BEL Eurisko) software for intestinal villi measures. Water quality parameters (temperature, pH and dissolved oxygen) were monitored during trial. It was observed influence ($p<0.05$) of MOS supplementation on Nile tilapia intestinal morphology. Fish fed diet containing 0.4% MOS supplementation showed increased ($p<0.05$) villi height (436.98±66.81 µm) when compared to fish fed unsupplemented control diet (401.01±70.73 µm), 0.2% (364.59±61.68 µm) and 0.8% (404.08±61.62 µm). Mannanoligosaccharides (MOS) are complex carbohydrates derived from yeast (*Saccharomyces cerevisiae*) cell walls and present mannose as primary carbohydrate, providing substrate for selective attachment of pathogenic intestinal bacteria, impairing bacterial adhesion to entherocytes, thus preventing infection of host cells. Thereby, the inhibition of bacteria adhesion to enterocytes prevents formation of mixed colonies, the entrapment of nutrients for bacterial growth and infection of host cells, leading to better gut health by increasing regularity, height and integrity of the gut villi and consequent better utilization and absorption of nutrients. In conclusion, dietary MOS at 0.4% supplementation for 30 days presented prebiotic effects for juvenile Nile-tilapia.

Key words: prebiotic, O. *niloticu* **,** mannanoligosaccharide, intestinal morphology.