Growth performance and intestinal morphology of African catfish (Clarias gariepinus , Burchell, 1822) larvae fed on live and dry feeds

Patricia Muendo, Callen Nyang'ateOnura, Wim Van Den Broeck, Nancy Nevejan, Gilbert Van Stappena (2018)

Abstract

Effects of live and dry feeds on intestinal morphology and growth of African catfish, Clarias gariepinus, larvae (Burchell, 1822) were investigated from 2 days post hatching (dph) to 6 dph and 11 dph, respectively. Feeding trials were carried out at Fleuren and Nooijen hatchery, Netherlands, in glass tanks connected to a RAS system. Five test diets (Artemia nauplii combined with dry feed (A), decapsulated Artemia cysts combined with dry feed (B), Artemia nauplii only (C), decapsulated Artemia cysts only (D) and commercial dry feed (E)) were assigned randomly in triplicate. The proportion of live feed in the combined diets was gradually reduced until 6 dph. Thereafter, all treatments were fed on the dry feed. Histological parameters were analysed in the proximal, middle and distal part of the intestine using standard H and E staining methods. At the end of the experiment, final wet weight (17.90 ± 0.38 mg) and specific growth rate (SGR) (24.12 ± 0.35%/day) were significantly higher ($P < 0.05$) in larvae fed nauplii combined with dry feed. A diet of decapsulated Artemia cysts resulted in the lowest values for these parameters (8.90 ± 0.44 mg and 17.18 ± 0.28%/day, respectively). FCR was best in the diets using nauplii only (0.53 ± 0.12) or nauplii combined with dry diet (0.70 ± 0.30). Feeding decapsulated Artemia cysts or its combination with dry feed resulted in the poorest (1.62–1.66) FCR values. Microscopic observation of the intestinal morphology demonstrated a decrease of mucosal folds, mucosal fold height, perimeter ratio (inner/outer perimeter) and wall thickness from the proximal to the distal intestine at 6 dph. Generally mucosal morphometric parameters were significantly ($P < 0.05$) higher when feeding nauplii combined with dry feed, than when feeding other diets. Goblet cells counts relative to PAS staining decreased from the proximal to the distal intestine. Nauplii and its combination with dry feed resulted into significantly ($P < 0.05$) higher counts of goblet cells in all intestinal parts. The highest goblet cell count was on 4 dph (range 57–254) before decreasing by 6 dph (32–54) in all diets. A gradual reduction of nauplii daily ration in its combination

with dry feed stimulated morphological development that resulted in improved growth performance. Different starter feeds thus had an impact on intestinal morphological development and on growth in the larval phase, but could also affect further rearing results.