Histopathological study of proximal intestine of newly weaned rainbow trout (*Oncorhynchus mykiss*) fries fed with various dietary HUFA and PUFA (C_{18}) levels

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Abstract

Imbalanced dietary fatty acid profile could influence the performance of larvae. In the present study the effect of various dietary levels of HUFA and PUFA (C_{18}) on histoarchitecture of newly weaned rainbow trout (*Oncorhynchus mykiss*) larvae were investigated. To this end, various dietary HUFA levels (0, 0.5, 1 and 2 percent) at a fixed dietary PUFA of 20 percent (the first experiment) and various dietary PUFA levels (10, 20, 30 and 40 percent) at fixed dietary HUFA of 8 percent (the second experiment) were created and fed to larvae. The experiments were lasted for six weeks. At the end of the experiments, six fish were randomly taken and the proximal intestine was dissected out and fixed for histological studies. According to lipid epithelial disorganization and cell lifting along with frequency of enterocyte fat stores of proximal intestine of fries, it could be stated when dietary PUFA was fixed at 20 percent (mainly due to replacing dietary fish oil with plant sources), there is no way to prevent such deteriorative histological alterations except increasing dietary HUFA levels up to 2 percent of dietary lipid content. In the second experiment, increasing dietary PUFA to 40 percent of dietary lipid content improved proximal intestine integrity. Furthermore, the lowest goblet cells counts and consequently the highest number of enterocytes, or intestinal absorptive cells, were recorded in treatment 3 and 6. Concludingly, in those groups feeding on diet containing 20 percent PUFA with 2 percent HUFA or 40 percent PUFA with 8 percent HUFA lower lipid vacuoles were present and normal intestinal epithelia were observed.

Keywords: Proximal intestine, HUFA, PUFA (C_{18}), Newly weaned fries, *Oncorhynchus mykiss*

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