

# **EFFECTS OF ELEVATED DIETARY CU AND CD CONCENTRATIONS ON OXIDATIVE STRESS, CELL PROLIFERATION, AND APOPTOSIS IN ATLANTIC SALMON (SALMON SALAR L.) PARR**

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Elevated dietary Cu and Cd can cause peroxidation of lipids. Toxic consequences of membrane lipid oxidation may result in loss of membrane integrity and subsequent apoptosis and/or necrosis. Salmonid tissues, which are characterised by high concentrations of polyunsaturated fatty acids, are especially susceptible to pro-oxidants. Both Cu and Cd can occur in elevated concentrations in commercial fish feed. This can be due to either contamination (Cd) or supplementation of trace elements to the feed (Cu).

The present study (one month exposure) was conducted to assess the effects of dietary Cu (control, 35 or 700mg/kg) and Cd (control, 0.5 or 250mg/kg) on tissue oxidative stress and intestinal cell turn over. Both Cu and Cd accumulated in intestine > kidney > liver of exposed fish. Dietary Cd had an inhibiting effect on selenium dependent glutathione peroxidase activity in the intestine. The intestine showed highest lipid peroxidation, measured as TBARS. Rates of intestinal and cell proliferation increased following exposure to dietary Cu and Cd, no necrosis was observed.

Results from this study indicate oxidative stress in elevated dietary Cd and Cu exposed Atlantic salmon, resulting in regulated cell death.