N-3 long-chain PUFA supplementation prevents high fat diet induced mouse liver steatosis and inflammation in relation to PPAR-? upregulation and NF-?B DNA binding abrogation

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Scope: Dietary n-3 long-chain PUFAs (n-3 LCPUFAs) supplementation was studied in an HFD-induced (HFD is high-fat diet) steatosis and inflammation in relation to peroxisome proliferator-activated receptor alpha (PPAR-?) and nuclear factor ?B (NF-?B) signaling. Methods and results: Male C57BL/6J mice received (i) control diet (10% fat, 20% protein, 70% carbohydrate), (ii) control diet plus n-3 LCPUFAs (daily doses of 108 mg/kg body weight of eicosapentaenoic acid plus 92 mg/kg body weight of docosahexaenoic acid), (iii) HFD (60% fat, 20% protein, 20% carbohydrate), or (iv) HFD plus n-3 LCPUFAs for 12 wk. PPAR-?, tumor necrosis factor alpha (TNF-?), and IL-1? mRNA expression, acyl-CoA oxidase 1 (ACOX1), and carnitine-acyl-CoA transferase 1 (CAT-I) protein contents, and NF-?B DNA binding activity were measured. HFD significantly decreased liver PPAR-?, ACOX1, and CAT-I levels with NF-?B activation, higher TNF-? and IL-1? expression, and steatosis development. These changes were either redu