

## Transcriptomic and Translational Regulation of Peroxisome Proliferator-Activated Receptors after Different Feedings in Salmon

**Authors :** Mahsa Jalili, Essa Ehsan Khan, Signe Dille Lovmo, Augustine Akruwe, Egil Lien, Rolf Erik Olsen, Trygve Sigholt, Atle Magnus Bones

**Abstract :** Data from the Norwegian Directorate of Fisheries reported that >1.2 million tons of Atlantic salmon were produced in Norway aquaculture industry in 2016. Peroxisome proliferator-activated receptors (PPARs) are one of the key transcription factor families that respond to nutritional ligands. Recent studies have shown the connection between PPARs with lipid and carbohydrate metabolism in aquaculture. To our knowledge, there is no published data about the effects of krill meal, soybean meal, Bactocell® and butyrate feedings compared to control group on PPARs gene and protein expressions in Atlantic salmon. Fish, 1year +postsmolt, average weight 250 gram were cultured for 12 weeks after acclimatization by control commercial feeding in 2 weeks after hatchery. Water oxygen rate, salinity, and temperature were monitored every second day. At the end of the trial, fish were taken from tanks randomly, and four replicates per group were collected and stored in -80 freezers until analysis. Total RNA extracted from posterior part of dorsal fin muscle tissues and Nanodrop and Bioanalyzer was used to check the quality of RNA. Gene expression of PPAR  $\alpha$ ,  $\beta$  and  $\gamma$  were determined by RT-PCR. The expression of genes of interest was measured relative to control group after normalization to three reference genes. Total protein concentration was calculated by Bradford method, and protein expression was determined with primary PPAR $\gamma$  antibody by western blot. All data were analyzed by ANOVA followed by Benjamini-Hochberg and Bonferroni tests. Probability values <0.05 considered significant. Bactocell® and butyrate groups showed significantly lower PPAR $\alpha$  expression. PPAR $\beta$  and  $\gamma$  were not significantly different among groups. PPAR $\gamma$  mRNA expression was approximately consistent with protein expression pattern, except than butyrate group showed lower mRNA level. The order of PPAR $\gamma$  expression was Bactocell® > soy meal > butyrate > krill meal > control respectively. PPAR $\beta$  gene expression decreased more in soy meal > butyrate > krill meal > Bactocell® > control groups respectively. In conclusion, the increased expression of PPAR $\gamma$  and  $\alpha$  is proposed to represent a reduction tendency of lipid storage in fish fed by Bactocell®, butyrate, soy and krill meal.

**Keywords :** aquaculture, blotting western, gene expression, krill protein extract, prebiotics, probiotics, *Salmo salar*

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