

Analysis of Eicosanoids in Fish Liver by LC-MS/MS

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The eicosanoids Leukotriene B₄ (LTB4) and Prostaglandin E₂ (PGE2) are molecules with various physiological properties and pathological effects, both in humans and animals. These molecules are linked to pain and inflammation, and as such, present a welfare and growth issue in farmed fish¹. The current method for quantifying and extracting these molecules, ELISA, is flawed, and as such new methods need to be developed. We used Liquid chromatography mass spectrometry and studied its performance.

1 Fish were fed one of two diets, one with a high amount of EPA and one with a low amount of EPA Liver samples were suspended in acetonitrile and chloroform 3 The solution was dried



The analysis showed an increase in PGE2 as the EPA-content increased. LTB4 content remained similar. This is consistent with previous studies². The higher amount of LTB4 than PGE2 could be explained by the higher energy cost of producing PGE2 than LTB4. Future studies should consider antiinflammatory molecules in this context.



Figure 1: Measured prostaglandin E₂ (PGE2) and leukotriene B₄ (LTB4) contents in fish liver samples by using LC-MS/MS analysis. The fish were fed two different diets, one low in EPA content and one high in EPA content. The concentration was measured in ng/mL. The error bars represent standard error.

Acknowledgments: Sarah Iqbal and Pedro Araujo for LCMS training and scientific input, respectively.

References: 1.Martins DA, Rocha F, Martínez-Rodríguez G, et al. Teleost fish larvae adapt to dietary arachidonic acid supply through modulation of the expression of lipid metabolism and stress response genes. *Br J Nutr*. 2012;108(5):864-874. doi:10.1017/S0007114511006143 2. Hundal BK, Liland NS, Rosenlund G, et al. Increasing the dietary n-6/n-3 ratio alters the hepatic eicosanoid production after acute stress in Atlantic salmon (Salmo salar). *Aquaculture*. 2021;534:736272. doi:10.1016/j.aquaculture.2020.736272 Illustrations: Created with BioRender.com

