Accepted Manuscript

Effect of fishmeal and fish oil replacement by vegetable meals and oils on gut health of European sea bass *(Dicentrarchus labrax)*

S. Torrecillas, D. Mompel, M.J. Caballero, D. Montero, D. Merrifield, A. Rodiles, L. Robaina, M.J. Zamorano, V. Karalazos, S. Kaushik, M. Izquierdo

PII: S0044-8486(16)30886-9
DOI: doi: 10.1016/j.aquaculture.2016.11.005
Reference: AQUA 632402

To appear in: *Aquaculture*

Received date: 30 August 2016
Revised date: 3 November 2016
Accepted date: 4 November 2016

Please cite this article as: Torrecillas, S., Mompel, D., Caballero, M.J., Montero, D., Merrifield, D., Rodiles, A., Robaina, L., Zamorano, M.J., Karalazos, V., Kaushik, S., Izquierdo, M., Effect of fishmeal and fish oil replacement by vegetable meals and oils on gut health of European sea bass *(Dicentrarchus labrax)*, *Aquaculture* (2016), doi: 10.1016/j.aquaculture.2016.11.005

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Effect of fishmeal and fish oil replacement by vegetable meals and oils on gut health of European sea bass *(Dicentrarchus labrax)*

S. Torrecillas[1*], D. Mompel[1], M.J. Caballero[1], D. Montero[1], D. Merrifield[2], A. Rodiles[2], L. Robaina[1], M.J. Zamorano[1], V. Karalazos[3], S. Kaushik[1] and M. Izquierdo[1]

[1]Grupo de Investigación en Acuicultura (GIA), IU-ECOAQUA, Universidad de Las Palmas de Gran Canaria, Crta. Taliarte s/n, 35214 Telde, Spain
[2]Aquaculture and Fish Nutrition Research Group, School of Biological Sciences, Plymouth University, Plymouth, Devon, PL4 8AA, UK
[3]Biomar UK, North Shore Road, Grangemouth FK3 8UL, Scotland

* silvia.torrecillas@giaqua.org; Phone #: 0034 626715903

Abstract

The main objective of this study was to assess the effects of graded levels of replacement of fishmeal (FM) and fish oil (FO) by terrestrial meals (TM) and vegetable oils (VO) on gut health of European sea bass (*Dicentrarchus labrax*) based on gut morphology, gut-associated immune system (GALT) and gut microbiota composition. Reducing the dietary FM and FO levels down to 10 and 3%, respectively did not affect the growth of European sea bass. Increase in TM and VO markedly affected anterior and posterior gut morphology and fatty acid composition, which mirrored the dietary fatty acid profile. FO replacement by VO increased lipid deposition in anterior gut *lamina propria*, denoting an effect in lipid metabolism and lipoprotein synthesis. In posterior gut, FM replacements by TM induced an engrossment of the submucosa, an up-regulation of the proinflammatory cytokines IL-1β and TNFα genes, a relatively high mucus production and changes in mucosal microbiota profiles. Finally, supplementation of 0%FM-0%FO diets with LC-PUFA contributed to maintain gut homeostasis in terms of GALT response and microbiota profiles alterations.

Keywords: European sea bass, alternative feed ingredients, terrestrial meals, vegetable oils, gut health, GALT, microbiota

Download English Version:

https://daneshyari.com/en/article/5539472

Download Persian Version:

https://daneshyari.com/article/5539472

Daneshyari.com