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ABSTRACT BOOK

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CONSUMERS APPRECIATE EUROPEAN SEABASS WHEN FED INNOVATIVE DIETS COMMITTED TO A CIRCULAR ECONOMY

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Poultry by-product meal (PM), defatted Hermetia illucens meal (HM), the invasive crayfish Procambarus clarkii meal (CM) and dried microalgae biomass (MA) are examples of nutritious and sustainable aquafeed ingredients1,2. Ten diets were tested on the European seabass Dicentrarchus labrax: a vegetable-based diet (CV); a fishmeal-based diet (CF); eight diets prepared by replacing 10, 20 or 40% of the plant proteins in CV with HM or PM singly or together (HP), with CM, or with MA. Firstly, fillet quality of fish and fillets were fully characterised, then, fish underwent a blind consumer test.
MA diet efficiently increased the yellowness index of fish skin ($p<.05$), similarly to what found in Sparus aurata2, while no effect on fillet colour emerged ($p>.05$). Dietary HM and PM increased fillet texture (52.8, 78.3, 91.9 and 80.0 N in CV, HM40, PM40 and HP; $p<.01$). Fillet fatty acid profiles reflected the dietary ones, in line with the literature3, except for docosahexaenoic acid, whose content did not vary in fillets belonging to different groups (5.8g/100g total fatty acid).
Consumers' liking for odour, flavour and texture was high in HM, PM, and HP fillets, as found in Salmo salar and Oncorhynchus mykiss fed HM or PM3,4. Besides, the highest intention of re-consumption was expressed for HP fish (89%), while the other groups ranged between 78 and 84%.
In conclusion, a possible functional effect of MA emerged, while HP seemed a feasible and promising combination for D. labrax nutrition. However, an insight into the metabolic mechanism behind these positive results is necessary for a comprehensive knowledge of fish qualitative aspects.
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IS IT SAFE TO CONSUME GSB AND ESB FROM AQUACULTURE? A MERCURY LEVEL ASSESSMENT.

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Mercury (Hg), in the form of methylmercury, is one of the most concerning heavy metals in seafood, for its toxic properties and lack of biological function. It is released into the environment from natural and anthropogenic sources, the highest levels being found in fish of high trophic levels, as a result of a bioaccumulation process along the food chain. Aquaculture fish are mostly exposed to Hg through fish feed, with fish meals (FM) assuming here an important role. Fish trimmings can be riskier than FM from whole fish as they result mainly from viscera (where Hg mostly accumulates) of high trophic level species, whereas FM from whole fish is typically composed of low trophic level species. There is, thus, a tight regulation by the European Commission for Hg, displaying maximum values for the edible fish portion (0,5 mg/kg for most species), complete aquafeeds (0,2 mg/kg) and feed materials (0,1 mg/kg, except for those deriving from fish processing – 0,5 mg/kg) (Commission Regulation No. 1881/2006 and No. 2019/1869).
This work aimed at understanding the relationship between fish formulations containing 20-25% of fish trimmings and the Hg levels in fish muscle, based on assessed Hg concentration for fish trimmings of 0,20-0,30 mg Hg/kg and for the complete feed of 0,10-0,15 mg Hg/kg. Fish from 14 and 10 groups of gilthead seabream and European seabass, respectively, with a known feed history, were collected from Iberian farms (cages and ponds), weighted and filleted. Composite samples were further analyzed for Hg (Merieux NutriSciences).
Results showed a positive and significant correlation between fish body weight and Hg concentration in the fillet ($R2=0,56$; $p<0,05$). A logarithmic response was observed, meaning a more pronounced accumulation of Hg in juvenile stages that tends to stabilize as fish grows, though on a level very significantly below the maximum legal value (~0,3 mg/kg).
Concluding, when it comes to Hg risk exposure, the collected data reinforces farmed bream and bass as safe for the final consumer. Moreover, the use of fish trimmings in aquafeeds, once well monitored for Hg levels, is encouraged, with these results further supporting its wider use, besides being an environmental and economically sustainable raw material.

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