**FORTIFICATION OF SEABREAM WITH VITAMIN D3 AND 25-HYDROXYVITAMIN D ENHANCES THE NUTRITIONAL VALUE OF FARMED FISH**

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**INTRODUCTION:** There is a need for sustainable food-based strategies to bridge the gap between current and recommended intakes of vitamin D to minimise the prevalence of low serum 25(OH)D status, without increasing the risk of excessive dosing. Oily fish are regarded as one of richest dietary sources of vitamin D being mainly available in the form of cholecalciferol (vitamin D3). Recent studies have shown that vitamin D3 is more effective at raising serum 25(OH)D concentrations than vitamin D2. Under farming conditions, fish quality traits such as fatty acid profile and concentration of several trace nutrients like minerals and vitamins are known to be influenced by diet composition. Exogenous feeding opens the possibility to tailor fish composition in terms of its content of valuable nutrients.

**AIMS:** A trial was performed with gilthead seabream to assess the effect of a dietary supplementation on vitamin D3 (as cholecalciferol) and 25-hydroxyvitamin D on the growth performance, vitamin D3 deposition in fillets and sensory quality traits.

**METHODOLOGY:** Three diets were formulated to be isonitrogenous, isolipidic and isoenergetic. A control diet (CTRL), mimicking a commercial formulation contained vitamin D3 supplied as cholecalciferol, at levels of 31 µg·kg-1. Based on this control formulation, two other diets were manufactured to a target level of 75 µg·kg-1 of vitamin D3, supplied either as cholecalciferol (diet D3) or as 25-hydroxyvitamin D (diet HyD). The upper limit of vitamin D3 supplementation was set at 75 µg vitamin D3 per kg feed (3000 IU∙kg-1), to comply with the current maximum legal limit in the EU market.

Each experimental treatment was tested in duplicate tanks over 84 days.

**RESULTS: T**he overall growth performance criteria (weight gain, feed intake) and the composition of whole fish at the end of the trial were not significantly affected by the various dietary treatments (P>0.05). Similarly, the fillet content on vitamins (A and D3) and minerals (iodine, selenium, iron, zinc, potassium, magnesium) was not affected by dietary treatments (P>0.05). Fillets from seabream fed the CTRL diet contributed to 46% of vitamin D3 DRV, while those fed the D3 and HyD diets represented 60 and 55%, respectively. On a relative basis, this variation represented a 31% (D3) and 21% (HyD) increase of the nutritional contribution of fortified seabream fillets.

**CONCLUSIONS:** The vitamin D3 supplementation, kept within the maximum authorized limit (3000 IU/kg feed) in the EU market, enhances the contribution of gilthead seabream to the Dietary Reference Value. This biofortification of farmed fish is an efficient strategy to enhance the vitamin D3 intake in general populations.

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