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The influence of different levels of soybean meal in diets for on-growing gilthead sea bream (*Sparus aurata*) and European sea bass (*Dicentrarchus labrax*)

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ABSTRACT

The present study was undertaken to determine the effect of soybean meal (SBM, crude protein: 48.7%) on growth performance, nutrient utilization and gut histology of gilthead sea bream *Sparus aurata* and European sea bass *Dicentrarchus labrax*. Three isonitrogenous and isolipidic extruded diets (crude protein, 47%, crude fat, 20%) were formulated containing 0 (diet 1), 18 (diet 2) and 30% SBM (diet 3) and tested on both species in two separate experiments. Fish were randomly allocated into 800 L squared tanks provided with natural seawater, aeration and connected to a closed recirculating system. In the first experiment, 110 sea bream (IBW=17.9±0.2g) per tank were used, while in the second experiment 120 sea bass (IBW=18.7±0.2g). The two trials lasted 80 and 89 days, respectively. Animals were hand-fed to apparent satiation twice a day from Monday to Saturday and once on Sundays. Fish were weighed in bulk at the beginning of the experiments, at day 35 and the end of the trials. Diets were tested in duplicate for each species. Fish samples were taken for nutrient retention determination and gut histology examination. One-way ANOVA with Newmann - Keuls' post test were used for statistics (P≤0.05). No differences in terms of palatability were observed. In the first experiment, at day 80, sea bream fed diet 1, 2 and 3 reached weight of 95.0±0.2g, 96.0±1.1g and 92.2±1.8g. In the second experiment, sea bass fed the same diets reached weights of 90.1±2.4g, 90.4±0.5g and 91.5±1.2g. No differences in performances (sea bream Specific Growth Rate - SGR: 0-35/36-80 days: 2.50±0.01/1.75±0.04, 2.51±0.00/1.77±0.01, 2.46±0.03/1.78±0.00, for diet 1, 2 and 3, respectively; sea bass Specific Growth Rate - SGR: 0-35/36-89 days: 2.39±0.02/1.34±0.05, 2.45±0.00/1.28±0.07, 2.43±0.06/1.32±0.01, for diet 1, 2 and 3, respectively) or nutrient retention (sea bream Protein Efficiency Ratio - PER: 1.90±0.02, 1.88±0.03, 1.88±0.04 for diet 1, 2 and 3, respectively; sea bass Protein Efficiency Ratio - PER: 1.93±0.10, 1.91±0.01, 1.85±0.06 for diet 1, 2 and 3, respectively) were found in both the trial. In sea bass, no soy specific histopathological changes were observed in the intestine. In sea bream intestine, *lamina propria* was moderately and diffusely expanded in some fish due to an increase of cell infiltration represented by mononuclear cells, this finding being more frequent in sea bream fed diet 3. The findings of this study indicate that SBM can be successfully incorporated up to a level of 30% without any deleterious effects on feed intake, growth and protein utilization of sea bream and sea bass juveniles. At this inclusion rate, no changes in gut histology have been observed in sea bass after 89 days of feeding. In sea bream intestine, some more minor changes were found in animals fed the diet with the highest SBM inclusion but this may need further investigations.