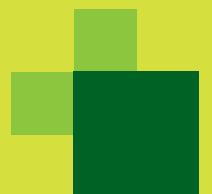


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Evaluation of *Zophobas morio* larvae meal as fishmeal replacer for gilthead seabream diet

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The dietary inclusion levels of fishmeal as a major protein source in aquafeeds are decreasing due to its stagnant availability in the global market, its rising price and the environmental concerns that are linked to its production. Moreover, as aquaculture further develops and intensifies, the need for alternative protein sources in aquafeeds becomes more intense. The use of insect meals for the replacement of fishmeal in aquafeeds has attracted the research interest, especially after their recent approval in the European aquafeed chain. Among the insect species used so far, most studies have been conducted with *Tenebrio molitor* and *Hermetia illucens*. However, other species that have not yet been studied extensively could also be proved suitable for fishmeal replacements. The giant mealworm, *Zophobas morio*, is a large tenebrionid beetle species, with high nutritive value, which is commonly reared as feed for birds and reptiles. In the present study, we examined the suitability of *Z. morio* as fishmeal replacer in gilthead seabream (*Sparus aurata*) diet. Seabream is amongst the most important marine fish species reared in Europe with an annual world production of around 160,000 mt. *Z. morio* larvae were raised in a mixture of wheat bran (90%) and egg layer hens feed (10%). Late-instar larvae were collected, dried and milled, in order to produce the *Z. morio* larvae meal (12% moisture, 41% crude protein, 39% crude lipid) used in the feeding trial. A total number of 270 *S. aurata* juveniles of 3.4 g initial mean weight were allocated into 9 glass tanks (125 l) within a closed recirculation seawater system and divided into 3 dietary groups in triplicates, each feeding on a different diet. Three isonitrogenous (52%) and isoenergetic (20 MJ/kg) diets were formulated at which the fishmeal protein of the control diet was replaced by the *Z. morio* meal at 5 and 10%. Fish were fed to satiation twice a day, 6 days per week for 100 days in total. High survival rates, reaching 99%, were recorded in all groups. In addition, no significant differences were noted among all fish groups for feed intake, final weights, specific growth rates and FCR. These findings suggest that *Z. morio* is an attractive feedstuff that could successfully replace fishmeal protein in seabream's diet at 10%. The study was funded by 'Operational Programme Competitiveness, Entrepreneurship and Innovation 2014-2020 (EPAnEK)' of Hellenic Republic, MIS 5045804.

Effect of soybean oil replacement by *Hermetia illucens* fat on broiler chicken performance and nutrients digestibility

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The aim of the study was to investigate the effect of partial or full replacement of soybean oil by *Hermetia illucens* fat (HI) obtained via super-critical CO₂ extraction on the growth performance and nutrients digestibility of broiler chickens. In an experiment, lasted 35 d 1-day-old male broilers (Ross 308) were used. The birds were assigned to 5 groups per 10 replicates (16 birds per rep). Food and water were supplied *ad libitum*. The following design of the experiment was used: SO; control treatment with 100% soybean oil; HI25, 50, 75, 100; experimental treatments with partial, i.e. 25, 50, 75 or full 100 replacement of soybean oil by HI fat. TiO₂ (0.3%) as an internal marker was used. The growth performance parameters, i.e. body weight gain (BWG), feed intake (FI) were measured and feed conversion ratio (FCR) was calculated at 14, 21, 28, and 35 d, as well as coefficients of apparent ileal digestibility of nutrients, were calculated at 35 d of age. In general, there were no statistically significant differences ($P > 0.05$) between control SO and experimental groups in terms of BWG, FI, as well as FCR. Only in the first two weeks (1-14 d) HI oil positively decreased FI ($P < 0.001$), and FCR ($P = 0.031$) values in comparison to SO control group. However, in the case of FCR the most efficient were groups with 75 or 100% of *H. illucens* fat in the broiler diets. The results of digestibility calculation at 35 d were not affected by *H. illucens* fat, in terms of crude protein ($P = 0.854$), ether extract ($P = 0.203$), as well as AMEN ($P = 0.810$). Whereas, the weights of selected gastrointestinal tract segments were reduced, i.e. jejunum ($P < 0.001$), ileum ($P < 0.001$) by *H. illucens* fat addition to the broiler diets. Present data suggest that soybean oil may be replaced by *H. illucens* without negative effects on the growth performance during 35 d rearing. This work was financed by the National Centre for Research and Development within the LIDER VII Programme No. LIDER/5/0148/L-7/15/NCBR/2016, titled 'IN OIL project: An innovative method for bio-conversion of byproducts from food processing industry'.