Alternative ingredient: use of insects in fish feed

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Abstract

Statement of the Problem: Most of the commercial fish feed formulations includes fishmeal and fish oil obtained by processing species captured by predatory fishing, a practice characterized by unsustainability, since it consumes the environment beyond replenishment capacity, affecting aquatic populations and plants. This unbridled practice contributes to animal extinction, ecological imbalances and the collapse of fish stocks. The dependence on unsustainable capture motivates the investigation of alternatives. The purpose of the present work aimed, from theoretical-empirical studies, to identify and analyze how and under what conditions the use of insects in fish diets was recommended. Methodology & Theoretical Orientation: The method adopted was a bibliographical research, based on the electronic search of scientific articles in Scielo database, Google Academics and *Portal de periódicos* CAPES. Findings: The review has pointed out that some types of insects have already been used in fish feeding, such as: black soldier fly larvae (*Hermetia illucens*); common housefly (*Musca domestica*); yellow mealworms (*Tenebrio molitor*); silkworm's pupa (*Bombyx mori*); variegated grasshopper (*Zonocerus variegatus*) and migratory locust (*Locusta migratoria*). As the use of these depends on the analysis of both the composition of the body of the insect and the nutritional requirements of the aquatic species to be fed, studies recommend further investigation of functional properties and levels of inclusion of these ingredients in fish diet. Even though they are rich in essential nutrients, insects have highly variable protein, lipid and mineral composition according to the growth phase, species and substrate used to feed them. Conclusion & Significance: It was concluded that ensuring proper formulation, insects can compose fish diets. Despite the lack of scientific studies on the use of insects as feedstock for feed production, they demonstrated itself rich in sustainable protein, guaranteeing new perspectives in animal feed with lower environmental impacts.

Image



Figure 1 – Growth stages of black soldier fly (*Hermetia Illucens*): from larva to pupa. Photo by Jonathan Tan

Recent Publications

1. Henry M, Gasco L, Piccolo G, Fountoulaki E (2015) Review on the use of insects in the diet of farmed fish: past and future. Animal feed science and technology 203:1-22.
2. Makkar H, Tran G, Heuze V, Ankers P (2014) State-of-the art on use of insects in animal feed. Animal Feed Science and Technology, 197, 1 33.
3. Sanchez-Muros M, Barroso F, Manzano-Agugliaro F (2014) Insect meal as renewable source of food for animal feeding: A review. Jornal of Cleaner Production 65: 16-27.
4. Stamer A, (2015) Insect proteins: a new source for animal feed. EMBO Reports 16(6): 676–680.
5. Tran G, Heuzé V, Makkar H (2015) Insects in fish diets. Animal Frontiers 5, 37–44.



Biography

The author born in Campinas, state of São Paulo, is completing his undergraduate degree in Animal Science at the Federal University of Minas Gerais, located in the city of Montes Claros. Has professional experience in aquaculture with emphasis on ornamental fish. It intends to follow the academic career with graduation project related to the use of insects in the feeding of aquatic organisms.

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