

The use of larvae meal in the feeding of broiler chickens

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Abstract

In raising broiler chickens, the biggest part of the expenses is the feed, especially the protein source. From this consideration, non-traditional sources of protein can become an alternative source of protein food for their growth, without decreasing their genetic potential.

Europe is leading the way in terms of start-ups focused on raising insects, having included insects on the list of sustainable foods. European authorities have allocated funds for research and production facilities, and the EU block already allows the use of insects for feeding fish, dogs and cats.

Biodegradable waste processing provides systems for insect reproduction. Worm-shaped worm does not look appetizing. But insect larvae must taste good only to fish, chickens or pigs. Their larvae are high in protein and are intended to replace fishmeal and soybeans as animal feed. Both protein sources are not only becoming more expensive, which is a financial burden for farmers and ranchers.

Insects transform waste into protein and reduce total nitrogen excretion, odors and methane emissions, thus contributing to environmental protection. The black soldier fly (BSF, *Hermetia illucens*) is one of the main species considered for large-scale insect farming, given their ability to convert low-value agro-industrial by-products into protein-rich biomass.

Insects could be used without negative effects on animal performance, health or quality of animal products. Since, at present, the increase of antibiotic resistance is of great concern, there is interest in the use of black soldier fly larvae (BSFL) (*Hermetia illucens*) as an antimicrobial product. They have the potential to control pathogens due to their naturally occurring antimicrobial properties. Also, the addition of BSFL meal to animal feed can modify the intestinal microbiota, improving animal productivity and meat quality.

The defatted insect meal can be incorporated in a proportion of 5% in the combined feed intended for birds and pigs, being able to partially replace the soybean meal and partially or totally the fish meal, as the case may be.

BSFL is found to be high in relevant macroelements (Ca, P, K, Mg) and microelements (Mn, Fe, Zn), with a Ca/P ratio of 4.2. The level of Ca, the major mineral of BSFL, is substrate dependent and tends to increase in the pre-pupa and pupa stages.

Larvae eat almost everything, are a bit picky and robust. In addition to its high protein content on the one hand, it has proven a natural antibiotic effect, which protects animals fed with it. On the other hand, the larvae meal corresponds to the natural feed intake of the birds. This also reduces behavioral disorders such as tail biting in pigs or feather plucking in chickens.

Finally, we need to get rid of fishmeal as animal feed. Across the EU, there are 40 million tonnes of cereal waste every year. The circular economy is advantageous from an ecological and bioeconomy point of view.

Conclusions: Larvae meal can be used as a protein source in the diet of broiler chickens, without diminishing their genetic potential.

Keywords: Larvae meal, Feeding, Broiler chickens.