

How much is too much? Feeding live black soldier fly larvae to laying hens.

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The use of insects in animal feed has the potential to reduce the demand for soybean production and reduce the deforestation and loss of natural resources. In particular, black soldier fly (BSF, *Hermetia illucens*) larvae have received attention due to their ability to convert organic waste into high-value biomass. Several studies have investigated the effects of providing BSF larvae to both broilers and laying hens. However, knowledge gaps regarding hens' voluntary intake of live larvae and the effects of larvae consumption on egg production still remain. Therefore, the aim of the present study was to determine the effects of the provision of four different amounts of live BSF larvae on laying hen feed consumption, hen health and fearfulness, and egg production and quality. To this end, 40 Bovans White laying hens were housed individually and provided with 0%, 10%, 20% or *ad libitum* daily portions of live larvae (relative to expected dry matter intake) plus a complementary concentrated pelleted feed from 18 to 30 weeks of age. Larvae consumption and concentrate consumption, hen weight, egg production and egg quality were monitored. Overall, differences were found between the hens given *ad libitum* access to larvae compared to the other treatments. *Ad libitum* hens, consumed 163 ± 41 g larvae/hen/day, consumed less concentrates ($P = 0.03$) and gained more weight ($P = 0.0002$) than all other treatments. They also had an overall higher consumption of protein, fat and energy ($P < 0.03$). There was no effect of larvae provision on egg production, egg weight, shell thickness, shell breaking strength, or Haugh unit ($P > 0.05$). Furthermore, there was no effect on hen behaviour towards a novel object or in an open field test. This study shows that *ad libitum* feeding of live BSF larvae had no strong effects on egg production or egg quality, but did reduce feed consumption and increased hen weight, which can have health consequences in the long term. Nevertheless, including BSF larvae in the diet of hens could be an interesting option for the future.