Effects of black soldier fly meal in poultry and fish diets on performance and product quality

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Insect-based protein meals are in discussion as sustainable components in livestock and fish diets, with a potential to recycle wasted food materials and to replace partly feeds from arable land. Black soldier fly (BSF; *Hermetia Illucens*) is of particular interest in this context. Since insect production for animal feed appears as an additional trophic level in the food chain, it should either base on substrates, which are not directly edible for livestock and fish, or significantly improve feed efficiency or product quality to justify its application. Feed efficiency and product quality after replacing conventional protein sources by BSF meal were therefore tested in recent experiments with layers, broilers and trout. In a layer experiment, respectively four groups of 10 hens were fed either a control diet, a diet containing 12 g/100 g or a diet with 24 g/100 g defatted Hermetia meal for four weeks. Neither laying performance nor feed efficiency (g/g egg weight) nor egg composition differed by diet. In a fattening experiment with 15 broilers per group the partial replacement of soybean meal by mixtures of either alfalfa or peas with Hermetia meal (7.8 g/100 g Hermetia) did neither affect weight gains nor carcass weights compared to a control diet. Compared on a group level, neither feed intake nor feed efficiency differed with the diets. Also weights of meat cuts, shear force and meat colour were not affected by diet. Only cooking loss increased in meat from broilers provided with the Hermetia-pea mixture ($P>0.001$). In a further feeding trial, young rainbow trout (body weight 67 to 125 g) were fed for 7 weeks with either a usual control diet or a feed, where 46% of the fishmeal was replaced by Hermetia meal. Initial and final body mass were equal with both diets and no differences were found for growth rate, weight gain. Chemical fish composition was not affected. A degustation panel did not reveal differences in taste, odour or texture of the trout filets. If also in future no advantageous effects of feeding Hermetia meal on performance, feed efficiency or product quality would be found, production of BSF should prove sustainability in itself to justify its use as animal feed component.

Evaluation of reusable hiding units for rearing house crickets (*Acheta domesticus*)

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In order to improve hygiene and to reduce the material waste in production of house crickets (*Acheta domesticus*), two housing methods were evaluated that could substitute non-cleanable cardboard materials often used in cricket rearing. Hiding units were prepared out of tubes of approx. 6 cm long black PEM pipe (∅ 25 mm) or transparent silicone water pipe (∅ 25 mm), horizontally stacked to 5 layers (floors) high with silicone. Both units were placed inside a 20 l plastic box containing 30 adult crickets bought from a local pet store. Feed and water were placed close to both units. Twice a day on days 3-6 and days 29-31 of the observation period the number of crickets inside and on the hiding units was counted. None of the crickets died during the observation period. Overall the crickets preferred to use the black hiding unit more than the transparent one ($P<0.01$). In fact only 2 times it was observed crickets using the transparent unit. The floor had significant effect ($P<0.001$) as floor 1 and 3 were used 41 and 25% of the time, respectively, whereas the 5th floor was used only 3% of the time. There were no significant differences between climbing on the hiding unit and being inside the unit, except for the 1st floor where crickets preferred to spend 74% of the time inside. This however can also be due to lower available outer surface of the lowest floor. It can be concluded that house crickets prefer dark hiding places to either shade them from excess light or due to natural hiding behaviour from predators. Reusable and cleanable black water piping or similar dark materials can provide long term solutions for providing extra floor space in cricket rearing facilities for safe food production.

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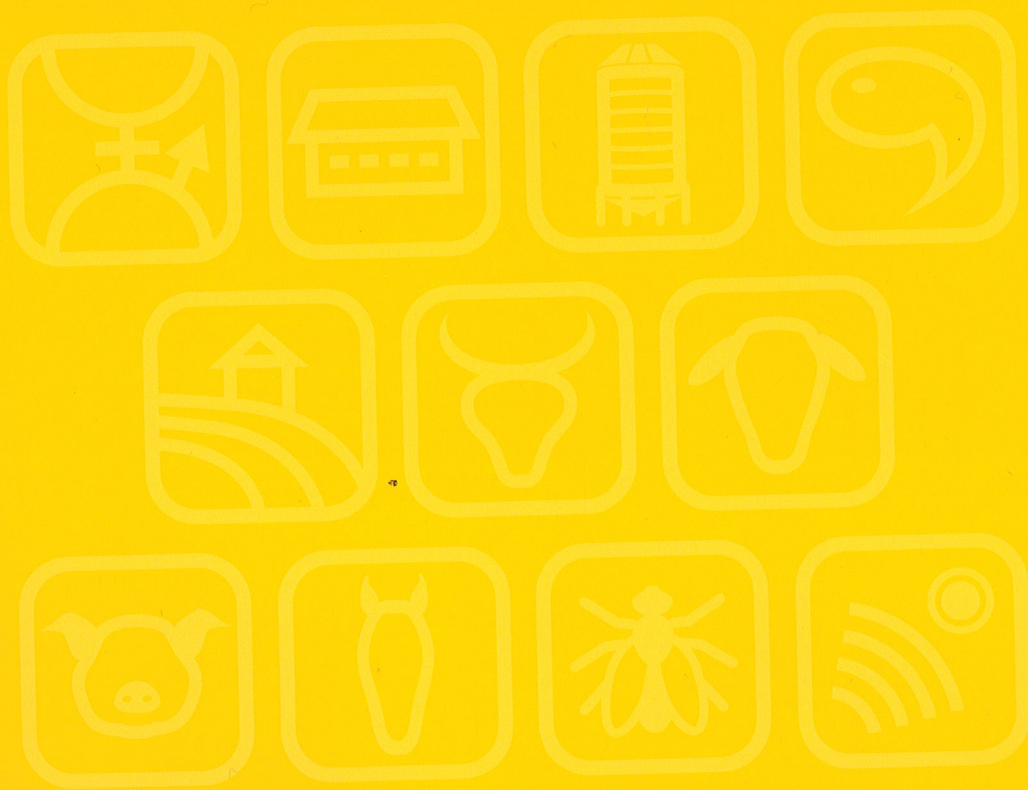

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