

# Newsletter on Insects for feed, food and bioconversion of organic substrates

Articles parus entre le 01/03/22 au 13/06/22

Cette newsletter est le fruit d'une veille réalisée en partenariat entre la Direction pour la Science Ouverte (DipSO) et le collectif de recherche sur l'entomologie.

## Le périmètre visé :

- **Europe/France**
- **Axes thématiques** : Focus sur 2 insectes (Tenebrio molitor et Hermetia Illucens) , les substrats (biodéchets organiques et coproduits agricoles), les usages industriels et les produits (farine de protéine et fumier d'insecte)
- **Types d'informations** : articles scientifiques, informations sur projets en cours et terminées, documents réglementaires, Appels à manifestation d'intérêts, infos sur le secteur privé.

A noter: les informations sélectionnées ne présentent pas la production INRAE ni sa position officielle.

## Informations non scientifiques

Types de sources : presse généralistes, spécialisées, réglementations, infos institutionnelles, ...



### L'Université Laval lance une chaire d'enseignement sur les insectes comestibles

Une professeure de l'Université Laval travaille à positionner l'élevage d'insectes comestibles comme une production animale à part entière, pouvant ...

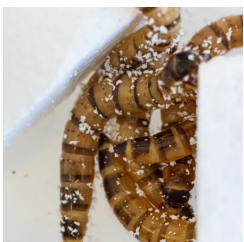
[www.enbeauce.com](http://www.enbeauce.com)



### Weekend podcast: Insects key to reducing food waste

FARMER'S INSIDE TRACK: An expert reckons that insects might free up an additional 325 tonnes of wasted food. This is pretty impressive given ...

[www.foodformzansi.co.za](http://www.foodformzansi.co.za)



### Insects called "superworms" that can eat through polystyrene plastic waste

... be used in processing and recycling plastic. "Insect larvae have ... "Superworms are like mini recycling plants, shredding the ...

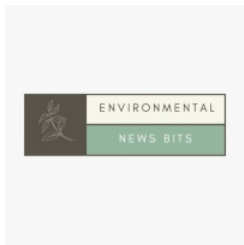
[wastemanagement.einnews.com](http://wastemanagement.einnews.com)



### Insect protein: Hype or hope for pet food's future?

Insect protein for pet food, human food and animal feed is getting a lot of attention, investment, research and media coverage. Is that warra...

[www.petfoodindustry.com](http://www.petfoodindustry.com)



## Alt fat from insects: Exploring the circular economy potential of larvae fat for feed and food

Read the full story at Food Navigator. Could insect-derived fatty acids, fuelled by mixed food waste, replace conventional dietary fat in feed ...

[envnewsbits.info](http://envnewsbits.info)



## Welsh Schools to Feed Primary Students Insects to Determine Their Appetite for "Alternative Protein"

Are you ready for the McGrub sandwich? Or the locust's stir-fry? The silkworm and beetle combo plate? Cows will not be the demise of the earth. ...

[acrookedpath.com](http://acrookedpath.com)



## Virginia Tech faculty researching and testing insect protein

Faculty at Virginia Tech's Seafood Agricultural Research and Extension Center are working to develop alternative and sustainable food sources ...

[url4ever.com](http://url4ever.com)

## Insect protein partnership

A consortium of Dutch actors in the poultry chain is joining forces in a public-private partnership. The aim is to investigate insects as a protein ...

[www.agrarzeitung.de](http://www.agrarzeitung.de)



## Key Dutch players join forces to evaluate insect-derived feed ingredients

Protix, ForFarmers, PHW Group's Dutch entity Esbro, Venik and Wageningen Livestock Research joined their forces to investigate how insect-derived ...

[www.feedandadditive.com](http://www.feedandadditive.com)



## Four UK primary schools to feed youngsters insects

Free West Media | June 1, 2022  
Insects are supposed to be nutritious and have a lower carbon footprint than regular meat, scientists have claimed. ...

[alethonews.com](http://alethonews.com)



## Bühler opens Insect Technology Center to support customers in the food and animal feed industries

SWITZERLAND — Bühler Group, a Swiss multinational plant equipment manufacturer, has opened a world-class Insect Technology Center (ITC) in Uzwil, ...

...

[www.foodbusinessafrica.com](http://www.foodbusinessafrica.com)



## The UAE hosts the first project in the region that uses insects to produce feed from organic waste

The Minister of Climate Change and Environment, Maryam bint Mohammed Al Muhairi, launched the first project in the region to recycle organic ...

[pledgetimes.com](http://pledgetimes.com)

## Lillian and Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, or Molecular Biology ...

This award encourages graduate students working with insects or other arthropods in the broad areas of physiology, biochemistry, and molecular ...

[entsoc.org](http://entsoc.org)



## Insects As Feed EU Legislation – Aquaculture, Poultry & Pig Species

IPIFF believes that insects as feed will soon constitute a reliable alternative or addition to fishmeal for aquaculture, poultry and pig spec...

[ipiff.org](http://ipiff.org)



## Promoting Insects for Human Consumption & Animal Feed – IPIFF

IPIFF is an EU non-profit organisation. We promote the use of insects for human consumption and insect derived products as a food source for ...

[ipiff.org](http://ipiff.org)



## Insect feed more popular with investors and farmers stung by record food prices and war | Fortune

Food commodity prices have skyrocketed in the past 18 months, even more so since Russia invaded Ukraine in February. That's forcing agriculture ...

[fortune.com](http://fortune.com)

## VIV Europe 2022: Evonik focuses on the digital future of poultry production Evonik strengthens support for U.S. milk and dairy industry Evonik published first edition of the MetAMINO® ATLAS Evonik ...

Evonik will focus on its Precision Livestock Farming program and the ways it can support poultry production – one of the main pillars of the agricultural sector - at VIV Europe 2022 in Utrecht (The Netherlands). ... MORE Evonik has resumed operations ...

[animal-nutrition.evonik.com](http://animal-nutrition.evonik.com)

## Insect meal can give chicken extra protein, says trade group

(Bernama pic) PETALING JAYA: Insect meal, particularly those derived from black soldier fly (BSF) larvae, can be used as a supplement for chicken feed, says an adviser to a livestock association.

[www.freemalaysiatoday.com](http://www.freemalaysiatoday.com)

## INSEACT launches insect protein facilities in Singapore

Singapore-based alternative protein company INSEACT officially opened the doors to its facility in Singapore today, in a ceremony attended by government representatives alongside investors and industry partners

[fareasternaquaculture.com](http://fareasternaquaculture.com)



## VIDEO: When will insect protein reach its full potential?

Beta Bug's Graeme Dear provides an insect farming outlook, offering his thoughts on when insect proteins will become [...] The post VIDEO: When ...

[www.feedstrategy.com](http://www.feedstrategy.com)

## Adisseo & Entobel cooperate on alternative insect protein development

Adisseo & Entobel have agreed to initiate a R&D collaboration to better understand and enhance insect rearing performance and the nutritional requirement of insects, specifically, the black soldier fly.

[www.efeedlink.com](http://www.efeedlink.com)



## IPIFF looks to expand knowledge around safe use of new substrates as feed for insects

Exploring new feeding substrates for farmed insects, the contribution of insect frass as fertilizer and the health benefits of insects in food ...

[www.feednavigator.com](http://www.feednavigator.com)



## Inodore et sans insectes, ce composteur "fontaine" pourrait révolutionner le tri de nos déchets

C'est curieusement dans un garage que cette histoire commence. Celui d'Arthur Jourdan, un ingénieur passionné qui réfléchit depuis une dizaine

...

[www.18h39.fr](http://www.18h39.fr)



## InnovaFeed on track to open commercial insect protein production in Decatur by 2024

May 11, 2022 - French firm, InnovaFeed, says it is on track to open commercial production by 2024, making its Decatur plant the world's largest ...

[nowdecatour.com](http://nowdecatour.com)



## Vietnam-based insect protein firm Entobel raised US\$30 million from Mekong Capital and Dragon Capital

@ Vietnam Insider Entobel is a biotech company producing insect-based ingredients from Black Soldier Flies for various industries including the ...

[vietreader.com](http://vietreader.com)



## Insect protein in Nestlé Purina pet food

Nestlé's Purina brand is launching a pet food range with products made using insects, as the food group is testing more environmentally sustainable ...

[trademagazin.hu](http://trademagazin.hu)



## We can turn organic waste into high value nutrients with the power of insects: Chapul Farms CEO - BNN

We can turn organic waste into high value nutrients with the power of insects: Chapul Farms CEO BNN

[www.bnnbloomberg.ca](http://www.bnnbloomberg.ca)

## UK lags behind on insects as feed

With the industry looking for alternatives to soya in animal feed, Cedric Porter takes a look at the potential for insects as feed and food in the UK

[www.fginsight.com](http://www.fginsight.com)



## **Insects As Food & Feed – General Information – IPIFF**

Our planet faces huge challenges because of the growing population and increasing competition for scarce resources. IPIFF and its Members believe ...

[ipiff.org](http://ipiff.org)

## **The Worldwide Insect Protein Industry is Expected to Reach \$1.74 Billion by 2028**

It includes insects such as grasshoppers, locusts, and crickets. Crickets are more efficient as a poultry feed as well as a good source of protein ...

[uk.news.yahoo.com](http://uk.news.yahoo.com)

## **Insects' key role as food and feed**

Speaking at a major two-day conference on the role of insects as food and feed held this week at the Natural History Museum, lawyer Rachel O'Connor, ...

[www.scotsman.com](http://www.scotsman.com)



## **Insect protein a climate friendly alternative to meat, researchers say**

New research out of the University of Helsinki has found substituting animal products for insect protein could reduce global warming.

[www.rnz.co.nz](http://www.rnz.co.nz)



## **Canada: Insect protein startup to build new facility as investors provide US\$52m**

Canadian insect protein ingredient company, Entosystem Inc, has raised CAD\$66m (US\$52m), from both public and private investors, to start building ...

[www.feednavigator.com](http://www.feednavigator.com)



## **Yeast probiotic Actisaf SC47 improves yellow mealworm larvae yield**

A recent study conducted in Spain, has confirmed positive results with Actisaf® Sc47, a yeast probiotic developed by Phileo by Lesaffre, on yellow ...

[www.feedandadditive.com](http://www.feedandadditive.com)

## **Canada invests in black soldier fly facility for animal feed**

Entosystem will receive up to \$6 million in funding

[www.theBeefsite.com](http://www.theBeefsite.com)



## **Insect protein start-up makes investment history**

Inseco, a Cape Town-based company, has raised \$5.3 million with its plans to turn insects into a widely available source of sustainable protein. ...

[www.foodformzansi.co.za](http://www.foodformzansi.co.za)

## **Biggest insect protein plant in southern hemisphere raises seed funding**

\$5.3m raised in South Africa's biggest ever startup seed funding round.

[www.moneyweb.co.za](http://www.moneyweb.co.za)



## **Will insects be the new ingredient in your animal feed? - Successful Farming**

Will insects be the new ingredient in your animal feed? Successful Farming

[www.agriculture.com](http://www.agriculture.com)

## **Insect protein has big role to play in feed industry**

Insect protein will play a bigger role in the feed industry than in the food industry. Many cultures in Asia remain unfamiliar with or still ...

[www.asian-agribiz.com](http://www.asian-agribiz.com)



## **Black Soldier Fly Larvae To Be Used To Treat Organic Waste In Landfills**

Environment and water minister Tuan Ibrahim Tuan Man looking at the fly larvae used to treat organic waste TANAH MERAH The sustainable waste ...

[babab.net](http://babab.net)



## **Tuan Ibrahim: Ministry to use black soldier fly larvae in sustainable waste treatment**

... 17 — The Sustainable Waste Management Project using the Black Soldier ... the management of daily organic waste, including at landfills in ... ..

[wastemanagement.einnews.com](http://wastemanagement.einnews.com)



## **Better Origin raises \$16 million to take food chain back to its sustainable roots with its AI-powered insect ...**

Better Origin takes local food waste and converts it into high-quality, sustainable animal feed on AI-powered insect mini-farms, recreating the ...

[metavallon.vc](http://metavallon.vc)

## **Insects and algae are slowly changing salmon feed**

Salmon feed is slowly changing, according to a report on raw materials for salmon and trout. Continue reading

[salmonbusiness.com](http://salmonbusiness.com)

## **Malaysia to use black soldier fly larvae in organic waste treatment**

Malaysia to use black soldier fly larvae in organic waste treatment Reference More The post Malaysia to use black soldier fly larvae in organic waste treatment appeared first on NewsDay24.com.

[www.newsday24.com](http://www.newsday24.com)



## **Ministry to use Black Soldier Fly larvae for waste treatment**

THE Sustainable Waste Management Project using Black Soldier Fly (BSF) larvae will be able to resolve the management of daily organic waste, ...

[www.themalaysianinsight.com](http://www.themalaysianinsight.com)

## **Black soldier fly to be used as protein filler in future feed**

Black soldier fly has been found to be an efficient source of protein for animal feed of the future according to WEDA Dammann and Westerkamp ...

[www.thescottishfarmer.co.uk](http://www.thescottishfarmer.co.uk)



### **Insect oil: A sustainable alternative for poultry feed**

Insect oils can boost poultry welfare, growth and performance while also lowering the overall environmental impact of feed production.

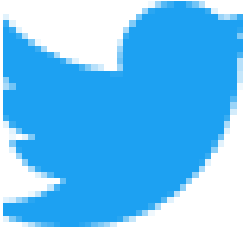
[www.wattagnet.com](http://www.wattagnet.com)



### **Australia: Ensuring feed-insects are free of animal materials**

Production of insects for livestock feed is expanding in countries around the world. But what's fed – or might be fed in the future – to these ...

[www.allaboutfeed.net](http://www.allaboutfeed.net)



### **#French provider of edible #insects for animal and human feed...**

#French provider of edible #insects for animal and human feed @Ynsect has purchased US #mealworm producer Jord Prod... <https://t.co/H3vgnWM2KB>  
[twitter.com](https://twitter.com)



### **The potential of frass derived from the rearing of Tenebrio molitor as a fertilizer for organic horticulture**

Farag, Dalia Hosameldin Mahmoud Ahmed - Italie

[www.secheresse.info](http://www.secheresse.info)

## **Publications scientifiques**

Sources : HAL, Pubmed, BASE, MDPI, F100Research, Journal of Insects as Food and Feed, ...



### **Total fishmeal replacement by defatted *Hermetia illucens* larvae meal in diets for gilthead seabream ( *Sparus* ...**

This work aimed to evaluate the digestibility of defatted *Hermetia illucens* larvae meal (HM), and its effects as fishmeal (FM) replacement on ...

[dx.doi.org](https://dx.doi.org)

### **Black soldier fly larvae frass increases the soil's residual nutrient content and enzymatic activity – a lettuce production trial**

The aim of this study was to evaluate the potential agronomic value of black soldier fly larvae frass (BSFF) as an organic fertiliser in short-cycle crops, using lettuce as the test plant. Treatments consisted in applying different fertilisers ...

[dx.doi.org](https://dx.doi.org)



### **Economic and ecological values of frass fertiliser from black soldier fly agro-industrial waste processing**

The sustainable utilisation of black soldier fly (BSF) for recycling organic waste into high-quality protein feed and organic fertiliser with ...

[dx.doi.org](https://dx.doi.org)

### **Effect of Feeding Rate on Growth Performance and Waste Reduction Efficiency of Black Soldier Fly Larvae (Diptera: Stratiomyidae)**

Malaysia like many other developing countries is facing the challenge of poor waste management. This research was conducted to determine the effect of black soldier fly (BSF) larvae in decomposing food waste, palm oil waste, fish waste and yard ...

[pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov)

## Characterization of lipid extracts from the *Hermetia illucens* larvae and their bioactivities for potential use as pharmaceutical and cosmetic ingredients

There is an increasingly growing demand for the use of natural and sustainable bioactives in the field of the pharmaceutical and cosmetic industries. The biomass from black soldier fly larvae (*Hermetia illucens*) can be viewed as an innovative ...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)

## Comparison of Nutritional Profiles of Super Worm (*Zophobas morio*) and Yellow Mealworm (*Tenebrio molitor*) as Alternative Feeds Used in Animal Husbandry: Is Super Worm Superior?

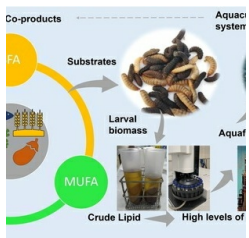
Edible insects are acknowledged as a valuable nutritional source and promising alternative to traditional feed ingredients, while the optimization of rearing conditions is required for their wider utilization in the animal feed industry. The ...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)

## Use of black soldier fly (*Hermetia illucens*) prepupae reared on organic waste as feed or as an ingredient in a pellet-feed formulation for Nile tilapia (*Oreochromis niloticus*)

The growth and sustainability of freshwater aquaculture are highly dependent on economic feed which is the major running cost. Fish feed industries depend on the high-priced fish meal (FM) as protein source in feed formulations. In this context, ...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)



## Sustainability, Vol. 14, Pages 6472: Improving the Lipid Profile of Black Soldier Fly (*Hermetia illucens*) ...

The replacement of fish meal and fish oil by insect-based ingredients in the formulation of marine aquafeeds can be an important step towards ...

[www.mdpi.com](http://www.mdpi.com)

## Dietary Fish Meal Replacement with *Hermetia illucens* and *Tenebrio molitor* Larval Meals Improves the Growth Performance and Nutriphysiological Status of Ide (*Leuciscus idus*) Juveniles

The ide (*Leuciscus idus*) is a native European species of rheophilic cyprinid fish whose wild population status is dependent on conservation efforts, particularly regular restocking. This study aimed to evaluate the effects of including insect ...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)

## Impact and Persistence of *Serratia marcescens* in *Tenebrio molitor* Larvae and Feed under Optimal and Stressed Mass Rearing Conditions

Industrial insect mass rearing aims to produce quality insects under safe sanitary conditions which can be compromised by pathogens and abiotic stressors. Therefore, knowledge on pathogen persistence, virulence and means of detection is of i...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)

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[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)

## Dynamic changes in molecular composition of black soldier fly prepupae and derived biomasses with microbial fermentation

Black soldier fly (BSF) is being increasingly used for agro-food by-products valorisation. Adult flies, puparia, and excess of prepupae are the by-products of this process, which could be further valorised. Lactic fermentation of BSF biomasses ...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)



## Low dietary inclusion levels of *Tenebrio molitor* larva meal slightly modify growth performance, carcass and meat traits of Japanese quail (*Coturnix japonica*)

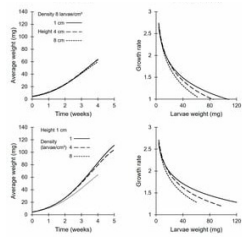
CONCLUSION: TM meal inclusion at higher levels than 1.65% slightly impaired the growth performance of Japanese quails. Negligible effects on physical properties such as colour, texture, cooking loss and also on the fatty acid profile of the ...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)

## Degradation and excretion of the *Fusarium* toxin deoxynivalenol by an edible insect, the Yellow mealworm (*Tenebrio molitor* L.)

Insects could provide an alternative and more sustainable source of animal protein compared to conventional livestock. Yellow mealworms (*Tenebrio molitor* L.) can be grown on diets composed of organic by-products. However, these diets could be ...

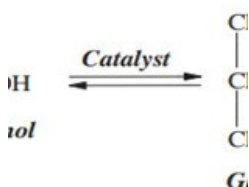
[dx.doi.org](http://dx.doi.org)



## Sustainability, Vol. 14, Pages 6234: The Effects of Density on the Growth and Temperature Production of *Tenebrio* ...

*Tenebrio molitor* larvae live, at least partially, inside their feed. Hence, they do not live on a 2D plane but in a 3D environment. However, ...

[www.mdpi.com](http://www.mdpi.com)



## Fuels, Vol. 3, Pages 295-315: Performance of Citric Acid as a Catalyst and Support Catalyst When Synthesized ...

Current research and development to lower the production cost of biodiesel by utilizing feedstock derived from waste motivates the quest for ...

[www.mdpi.com](http://www.mdpi.com)

## Impact of age, size, and sex on adult black soldier fly [*Hermetia illucens* L. (Diptera: Stratiomyidae)] thermal preference

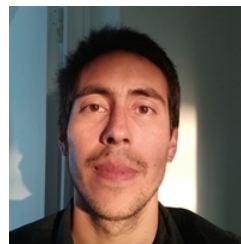
Population growth and rapid urbanisation have increased the global demand for animal feed and protein sources. Therefore, traditional animal feed production should be increased through the use of alternative nutrient sources. Insects as feed ...

[dx.doi.org](http://dx.doi.org)

## Live black soldier fly larvae (*Hermetia illucens*) for turkey poults

Black soldier fly larvae (BSFL; *Hermetia illucens*) are a suitable protein source for poultry. However the effect of live BSFL supplementation on growth performance and behaviour has never been demonstrated and quantified in turkeys. Wild turkeys ...

[dx.doi.org](http://dx.doi.org)



## Data and R code for the paper Black soldier fly reared on pig manure: bioconversion efficiencies, nutrients ...

The study consisted on quantifying and comparing nutrient balances, nutrient levels in residual materials and emissions of greenhouse gases and ...

[library.wur.nl](http://library.wur.nl)

## Nutritive Value of Wheat Bran Diets Supplemented With Fresh Carrots and Wet Brewers' Grains in Yellow Mealworm

We evaluated the effect of supplementation of a wheat bran (WB) diet with fresh carrots (FC) or wet brewer's grains (WBG) on the growth performance and chemical composition of *Tenebrio molitor* larvae. Additionally, a digestibility trial was ...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)

## **Enriched sewage sludge from anaerobic pre-treatment in spurring valorization potential of black soldier fly larvae**

The valorization of sewage sludge by black soldier fly larvae (BSFL) has gained attentions for sewage sludge management since the sludge can be reduced securely as well as larval biomass can be used for biorefineries application. Nevertheless, ...

[pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov)

## **Black soldier fly (Hermetia illucens) larvae oil as an alternative fat ingredient to soybean oil in laying hen diets**

CONCLUSION: We considered that HILO could be an alternative dietary fat to SBO for laying hens with maintained productive performance and good egg quality..

[pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov)

## **Suitability of Hermetia illucens larvae meal and fat in broiler diets: effects on animal performance, apparent ileal digestibility, gut histology, and microbial metabolites**

CONCLUSIONS: A partial replacement of SBM with HI larvae meal and soybean oil with HI larvae fat in broiler diets without impairing animal performance or gut health seems possible. Feeding HI larvae meal affected broiler performance positively ...

[pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov)

## **Marketing and social effects of industrial scale insect value chains in Europe: case of mealworm for feed in France**

Insects are becoming part of the human diet in many regions of the world, either directly or indirectly, as livestock feed. Insects could become a significant feed ingredient if produced at industrial scale, but it is a challenge. Such an emerging ...

[dx.doi.org](https://dx.doi.org)

## **Multipurpose monitoring system for edible insect breeding based on machine learning**

The *Tenebrio molitor* has become the first insect added to the catalogue of novel foods by the European Food Safety Authority due to its rich nutritional value and the low carbon footprint produced during its breeding. The large scale of *Tenebrio* ...

[pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov)

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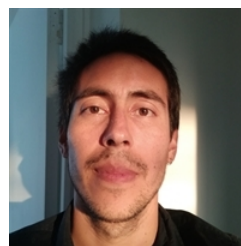
CONCLUSION: We considered that HILO could be an alternative dietary fat to SBO for laying hens with maintained productive performance and good egg quality..

[pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov)

## **Growth performance of common catfish (Ameiurus melas Raf.) fingerlings fed mealworm (Tenebrio molitor) diet**

A pre-fattening trial was performed to evaluate the effect of replacement of fishmeal (FM) with insect meal (IM; *Tenebrio molitor*) on growth performance and survival rate of common catfish (*Ameiurus melas*). Fingerlings of *A. melas* (mean body ...

[dx.doi.org](https://dx.doi.org)



## **Black soldier fly larvae show a stronger preference for manure than for a mass-rearing diet**

The attention for black soldier fly larvae (BSFL) as an alternative ingredient for food and feed products is on the rise. While many studies ...

[library.wur.nl](https://library.wur.nl)



### Standardisation of quantitative resource conversion studies with black soldier fly larvae

Using larvae of the black soldier fly (*Hermetia illucens*; BSF) to convert low-value residual organic resources into high-value products like ...

[library.wur.nl](http://library.wur.nl)



### Assessing the Effectiveness of Providing Live Black Soldier Fly Larvae (*Hermetia illucens*) to Ease the Weaning ...

Weaning is a stressful event for piglets, involving substantial changes to their nutritional and social environment. Providing edible enrichment ...

[library.wur.nl](http://library.wur.nl)

### Agricultural by-products from Greece as feed for yellow mealworm larvae: circular economy at a local level

Organic side-streams and agricultural wastes represent a big pool of untapped and underrated resources which could be efficiently exploited for ...

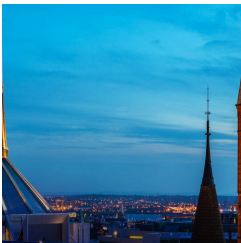
...

[library.wur.nl](http://library.wur.nl)

### Black soldier fly (*Hermetia illucens* L.) as a high-potential agent for bioconversion of municipal primary sewage sludge

The treatment of municipal wastewater produces clean water and sewage sludge (MSS), the management of which has become a serious problem in Europe. The typical destination of MSS is to spread it on land, but the presence of heavy metals and ...

[pubmed.ncbi.nlm.nih.gov](http://pubmed.ncbi.nlm.nih.gov)



### Valorisation of Organic Waste By-Products Using Black Soldier Fly (*Hermetia illucens*) as a Bio-Converter

One third of food produced globally is wasted. Disposal of this waste is costly and is an example of poor resource management in the face of ...

[livrepository.liverpool.ac.uk](http://livrepository.liverpool.ac.uk)



### Sustainability, Vol. 14, Pages 4565: A Review of Organic Waste Treatment Using Black Soldier Fly (*Hermetia* ...

The increase in solid waste generation is caused primarily by the global population growth that resulted in urban sprawl, economic development, ...

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### Black soldier fly larvae (BSFL) and their affinity for organic waste processing

There are two major problems that we are facing currently. Firstly, a growing human population continues to contribute to the increased food demand. Secondly, the volume of organic waste produced will threaten human health and the quality of ...

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