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

Items published between 01 october 2023 and 30 november 2023

This newsletter is produced by a research team on entomoconversion and the “Direction pour la Science Ouverte” (DipSO). It is the result of multi- source monitoring (media, articles, ...).

Scope :

- **Europe/France**
- **Thematics axes** : insects (Tenebrio molitor et Hermetia Illucens) , substrates (organic waste, by-products, ...), industrials applications and products (frass, fertilizer, ...)
- **Sources** : articles, information on ongoing and completed projects, regulatory documents, calls for expressions of interest, private sector activities.

Note : Items in this newsletter do not represent INRAE's position.

Call for proposals, call for tenders,

o Aquafeed.com | Insects to Feed the World

Substrate - media

o Insect-powered food waste management solution for hospitality industry

o Hungry insect army to chomp through food waste at Howard Smith ... - Brisbane Times

o ‘It has the potential to improve sustainability across the supply chain’: UK mulls regulatory changes to allow insects to eat your food waste

Substrate - articles

- Fresh aquaculture sludge management with black soldier fly (Hermetia illucens L.) larvae: investigation on bioconversion performances
- Utilization of Spent Coffee Grounds as a Feed Additive for Enhancing the Nutritional Value of Tenebrio molitor Larvae
- A Metanalysis to Evaluate the Effects of Substrate Sources on the Nutritional Performance of Black Soldier Fly Larvae: Implications for Sustainable Poultry Feed
- Nursery diet exclusion during the development of Hermetia illucens L. (Diptera: Stratiomyidae) in restaurant food waste
- Ability of black soldier fly larvae to bioaccumulate tocopherols from different substrates and measurement of larval tocopherol bioavailability in vitro
- Safety of black soldier fly (Hermetia illucens) larvae reared on waste streams of animal and vegetal origin and manure
- Future Proteins: Sustainable Diets for Tenebrio molitor Rearing Composed of Food By-Products
- Integrating insects into the agri-food system of northern Italy as a circular economy strategy
- Standardisation of fermented pellet feed of Tenebrio molitor larvae for use as a biodiesel raw material
- Co-digestion of chicken manure and sewage sludge in black soldier fly larvae bioconversion system: bacterial biodiversity and nutrients quality of residues for biofertilizer application
- Black soldier fly (Diptera: Stratiomyidae) reduction of different sludges, subsequent safety, and research gaps
- Rethinking food waste: Exploring a black soldier fly larvae-based upcycling strategy for sustainable poultry production
- Alleviation of Selected Environmental Waste through Biodegradation by Black Soldier Fly (Hermetia illucens) Larvae: A Meta-Analysis
- Growth performance and dynamic copper accumulation in tissues of black soldier fly (Hermetia illucens) larvae under copper exposure
- Growth Performance, Diet Digestibility, and Chemical Composition of Mealworm (Tenebrio molitor L.) Fed Agricultural By-Products
- Insects, Vol. 14, Pages 821: Rapid Evolutionary Adaptation to Diet Composition in the Black Soldier Fly (Hermetia illucens)
- Sesame cake diet enhances the nutritional value of Tenebrio molitor (mealworm)
- Improvement of Tenebrio molitor Larvae Farming and Fatty Acid Composition by Supplementation with Vegetable Waste
- Black soldier fly larvae recruit functional microbiota into the intestines and residues to promote lignocellulosic degradation in domestic biodegradable waste
- Cellulose-degrading bacteria improve conversion efficiency in the co-digestion of dairy and chicken manure by black soldier fly larvae
- Steam pre-treatment of sugarcane bagasse and wheat straw as a cleaner feedstock for black soldier fly larvae rearing
- The fatty acid composition of black soldier fly larvae: the influence of feed substrate and applications in the feed industry in: Journal of Insects as Food and Feed
- Performance of black soldier fly larvae (Hermetia illucens, l.) on different feed substrates
- Laboratory-adapted and wild-type black soldier flies express differential plasticity in bioconversion and nutrition when reared on urban food waste streams - Zhang - Journal of the Science of Food and Agriculture
- Revealing the effects of fermented food waste on the growth and intestinal microorganisms of black soldier fly (Hermetia illucens) larvae

Product - media

- Australian pet food company gives dogs the juicy and fibrous meaty mouthfeel they crave...without meat, in the launch of Australia's freshest entovegan pet food, using circular economy food ingredients including plant and insect protein.
- Eating insects: absurd or the future?
- Turning insect waste into biodegradable plastics • Earth.com
- Kovai BSF finds commercial success in insect meal venture
- New fraction from insect meal tested in feed

Product - articles

- Innovative Applications of Tenebrio molitor Larvae in Food Product Development: A Comprehensive Review
- Physicochemical, functional, and antioxidant properties of black soldier fly larvae protein
- Valorization of biological waste from insect-based food industry: Assessment of chitin and chitosan potential
- Agronomy, Vol. 13, Pages 2827: Can Soil Improvers (Biochar, Compost, Insect Frass, Lime, and Zeolite) Achieve Phytostabilization of Potentially Toxic Elements in Heavily Contaminated Soil with the Use of Purslane (Portulaca oleracea)?
- Salt-soluble protein extracts from Hermetia illucens and Bombyx mori for high protein pasta production
- A systematic review on the occurrence of Salmonella in farmed Tenebrio molitor and Acheta domesticus or their derived products
- Evaluation of the interrelated effects of slaughtering, drying, and defatting methods on the composition and properties of black soldier fly (Hermetia illucens) larvae fat
- Effect of ethanol treatment on the structural, techno-functional, and antioxidant properties of edible insect protein obtained from Tenebrio molitor larvae
- Insect residues as an alternative and promising source for the extraction of chitin and chitosan
- Nutritional content, amino acid profile, and protein properties of edible insects (Tenebrio molitor and Gryllus assimilis) powders at different stages of development
- Black soldier fly larvae (Hermetia illucens) as a sustainable and concentrated source of bioavailable lutein for feed
- Allergenicity of tropomyosin variants identified in the edible insect Hermetia illucens (black soldier fly)
- Characterization of wheat dough and Chinese steamed bread using mealworm powder formulated with medium-gluten and whole wheat flour
- Changes in nutrient composition and gene expression in growing mealworms (Tenebrio molitor)
- A study of the purchase intention of insect protein food as alternative foods for fitness proteins
- Influence of mealworms (Tenebrio molitor larvae) and their protein derivatives on the structural and rheological properties of tofu
- Exploring the Antimicrobial Potential and Stability of Black Soldier Fly (Hermentia illucens) Larvae Fat for Enhanced Food Shelf-Life

Industrials applications - media

- Insect meal in commercial Skretting feed
- Entobel Sets Industry Record with Opening of the Largest Insect Protein Production Plant in Asia
- Grubbly Farms raises Series A funding round to transform the pet food industry with sustainable insect protein from black soldier fly grubs
- Startup sees demand for insect protein creep up
- Full Circle Biotechnology to supply HydroNeo with insect-based shrimp feed additive
- Maggots instead of soy: insects as a substitute for animal feed? Companies see great potential
- Can insects be nutritionally enhanced for poultry feed?

- How insects can help feed the world
- Germany’s FarmInsect gobbles €8M to produce protein-rich, insect-based animal feed
- Veolia starts to export insect meal and oil to Europe
- Tyson Foods enters insect protein industry with Protix black soldier fly investment
- Edinburgh-based Beta Bugs raises €1.46M to scale up sustainable insect farming for animal feed production
- Second Bioflytech facility to produce insect ingredients for animal feed - World Grain

Industrials applications - articles

- Dietary replacement of soybean meal with black soldier fly larvae meal in juvenile Labeo rohita and Catla catla: Effects on growth, nutritional quality, oxidative stress biomarkers and disease resistance
- Use of black soldier fly (Hermetia illucens) larvae meal in diets for gilthead seabream juveniles: Effects on growth-related gene expression, intermediary metabolism, digestive enzymes, and gut microbiota modulation
- Effects of partial replacement of fish meal with black soldier fly (Hermetia illucens) larvae meal on growth performance, lipid metabolism and hepatointestinal health of juvenile golden pompano (Trachinotus ovatus)
- Effects of partially defatted larvae meal of Black Soldier Fly (Hermetia illucens) on caecal microbiota and volatile compounds of Muscovy ducks (Cairina moschata domestica)
- Soil amendment with insect frass and exuviae affects rhizosphere bacterial community, shoot growth and carbon/nitrogen ratio of a brassicaceous plant
- Effects of black soldier fly (Hermetia illucens) larvae oil on fillet quality and nutritional traits of gilthead seabream
- Black soldier fly pulp in the diet of golden pompano: Effect on growth performance, liver antioxidant and intestinal health
- Insights into the reduction of antibiotic-resistant bacteria and mobile antibiotic resistance genes by black soldier fly larvae in chicken manure
- Black soldier fly larvae (Hermetia illucens) meal is a viable protein source for Atlantic salmon (Salmo salar) during a large-scale controlled field trial under commercial-like conditions
- [hal-04228910] Environmental impact potential of insect production chains for food and feed in Europe

18/10/2023

Aquafeed.com | Insects to Feed the World

The Insects to Feed the World (IFW) conference is the premier conference for the Insects as Feed and Food sector.

www.aquafeed.com

Substrate - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

09/11/2023

Insect-powered food waste management solution for hospitality industry

Howard Smith Wharves and Goterra have unveiled a food waste management initiative with the deployment of Goterra's technology onsite at the precinct. The solution, powered by insect technology, is designed to help provide sustainable food waste ...

www.sustainabilitymatters.net.au

black soldier fly

25/10/2023

'It has the potential to improve sustainability across the supply chain': UK mulls regulatory changes to allow ...

Food companies can potentially cut their volumes of waste up to 75% using insect bioconversion, whilst at the same time creating valuable new ...

www.foodnavigator.com

black soldier fly

07/11/2023

Hungry insect army to chomp through food waste at Howard Smith ... - Brisbane Times

Hungry insect army to chomp through food waste at Howard Smith ... Brisbane Times

www.brisbanetimes.com.au

Substrate - articles

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

28/11/2023

Fresh aquaculture sludge management with black soldier fly (Hermetia illucens L.) larvae: investigation on bioconversion performances

Aquaculture solid waste (ASW) is a nutrient rich material that can pose a significant environment challenge if not properly managed. This study investigated the potential of black soldier fly (BSF) larvae in converting this waste into biomass. ...

www.nature.com

hermetia illucens | black soldier fly

23/11/2023

Utilization of Spent Coffee Grounds as a Feed Additive for Enhancing the Nutritional Value of Tenebrio molitor Larvae

Increasing demand for sustainable protein sources has spurred interest in the exploration of alternative protein sources with a reduced environmental impact. This study investigates the use of spent coffee grounds (SCG), a widely available b...

www.mdpi.com

tenebrio molitor

18/11/2023

A Metanalysis to Evaluate the Effects of Substrate Sources on the Nutritional Performance of Black Soldier Fly Larvae: Implications for Sustainable Poultry Feed

This meta-analysis presents an evaluation of substrate sources and their impact on the growth performance of black soldier fly (BSF) larva. The database, compiled from Google Scholar, PubMed, and Science Direct, focuses on data concerning substrate ...

www.sciencedirect.com

black soldier fly

14/11/2023

Nursery diet exclusion during the development of Hermetia illucens L. (Diptera: Stratiomyidae) in restaurant food waste

Abstract The black soldier fly (BSF) (Hermetia illucens) (Diptera: Stratiomyidae) is a valuable commercial insect for its nutritional and productive aspects, ability to cycle organic waste, and use as protein in animal feed. Its rearing is done ...

brill.com

hermetia illucens | black soldier fly

14/11/2023

Ability of black soldier fly larvae to bioaccumulate tocopherols from different substrates and measurement of larval tocopherol bioavailability in vitro

Edible insects are an emerging approach to provide sustainable proteins in feed. Black soldier fly larvae (BSFL) can also bioaccumulate micronutrients from various substrates. The purpose of this study was to assess whether BSFL can bioaccumulate ...

brill.com

black soldier fly

13/11/2023

Safety of black soldier fly (Hermetia illucens) larvae reared on waste streams of animal and vegetal origin and manure

In Europe, commercial and scientific interest in black soldier fly larvae (BSFL, Hermetia illucens) as a new feed source has grown substantially, primarily because this species can be reared on waste-streams which are otherwise unsuitable. However, ...

brill.com

hermetia illucens | black soldier fly

11/11/2023

Future Proteins: Sustainable Diets for Tenebrio molitor Rearing Composed of Food By-Products

Since the human population is continuously growing, sufficient food with low environmental impact is required. Especially, the challenge of providing proteins will deepen and insects can contribute to a more sustainable and efficient source ...

www.mdpi.com

tenebrio molitor

10/11/2023

Integrating insects into the agri-food system of northern Italy as a circular economy strategy

In response to the challenges posed by linear production processes and increasing waste generation, adopting sustainable circular economy strategies is paramount to mitigate environmental impacts. Among these strategies, the valorization of ...

www.sciencedirect.com

hermetia illucens | black soldier fly

09/11/2023

Standardisation of fermented pellet feed of Tenebrio molitor larvae for use as a biodiesel raw material

To use mealworm (Tenebrio molitor larva) as a raw material for biodiesel production, after selecting three raw materials (wheat bran, mealworm frass, food waste) among 10 raw materials, WB50-FW50 (wheat bran:food waste = 50:50), which had the ...

brill.com

mealworm | tenebrio molitor

06/11/2023

Co-digestion of chicken manure and sewage sludge in black soldier fly larvae bioconversion system: bacterial biodiversity and nutrients quality of residues for biofertilizer application

Black soldier fly larvae (BSFL) bioconversion system is emerging as an effective approach for organic waste pollution treatment. Co-digestion of different organic matters with BSFL can be an effective way to realize the innovative biowaste circular ...

link.springer.com

black soldier fly

29/10/2023

Black soldier fly (Diptera: Stratiomyidae) reduction of different sludges, subsequent safety, and research gaps

One of the many waste components that end up in landfills is sludge, an organic waste that Black Soldier Flies (BSF) may be capable of reducing or removing along with potential pathogens from the environment. Throughout this review, knowledge ...

www.sciencedirect.com

black soldier fly

25/10/2023

Rethinking food waste: Exploring a black soldier fly larvae-based upcycling strategy for sustainable poultry production

Food waste (FW) contributes to greenhouse gas emissions, burdens waste management systems, worsens food insecurity, and reduces biodiversity. Consequently, upcycling strategies must be refined to efficiently convert FW into valuable products. ...

www.sciencedirect.com

black soldier fly

24/10/2023

Alleviation of Selected Environmental Waste through Biodegradation by Black Soldier Fly (Hermetia illucens) Larvae: A Meta-Analysis

Alleviation of environmental waste is a significant challenge, contributing to greenhouse gas emissions and wasting valuable resources. To address this issue sustainably, valorization techniques are being explored to convert environmental waste ...

www.mdpi.com

hermetia illucens | black soldier fly

24/10/2023

Growth performance and dynamic copper accumulation in tissues of black soldier fly (Hermetia illucens) larvae under copper exposure

To figure out the copper metabolism features in vivo and evaluate the potential risk of copper residue in tissues of black soldier fly larvae (BSFL) and their by-products, the effects of oral copper exposure of 0, 50, 500 and 1000 mg/kg (Control, ...

brill.com

hermetia illucens | black soldier fly

20/10/2023

Growth Performance, Diet Digestibility, and Chemical Composition of Mealworm (Tenebrio molitor L.) Fed Agricultural By-Products

Humanity’s growing demand for animal protein exceeds the capacity of traditional protein sources to support growing livestock production. Insects offer promising partial substitutes, converting low-nutritional quality materials into high-value ...

www.mdpi.com

mealworm | tenebrio molitor

18/10/2023

Insects, Vol. 14, Pages 821: Rapid Evolutionary Adaptation to Diet Composition in the Black Soldier Fly (Hermetia illucens)

Genetic adaptation of Hermetia illucens (BSF) to suboptimal single sourced waste streams can open new perspectives for insect production. Here, four BSF lines were maintained on a single sourced, low-quality wheat bran diet (WB) or on a high-quality ...

www.mdpi.com

hermetia illucens | black soldier fly

16/10/2023

Sesame cake diet enhances the nutritional value of Tenebrio molitor (mealworm)

Mealworms (MWs) are a potentially environment-friendly, nutrient-rich, alternative food source. MWs can be fed various food by-products, including sesame cakes, a by-product of sesame oil. We studied the impact of a sesame cake diet on the n...

brill.com

mealworm | tenebrio molitor

14/10/2023

Improvement of Tenebrio molitor Larvae Farming and Fatty Acid Composition by Supplementation with Vegetable Waste

T. molitor larvae were fed with wheat bran (W) and supplemented (1:1) with cucumber (C + W) or tomato (T + W) agricultural wastes, from conventional or ecological farming, for 6 weeks. Weekly and fortnightly measurements of larvae weight/tray ...

www.mdpi.com

tenebrio molitor

13/10/2023

Black soldier fly larvae recruit functional microbiota into the intestines and residues to promote lignocellulosic degradation in domestic biodegradable waste

Lignocellulose is an important component of domestic biodegradable waste (DBW), and its complex structure makes it an obstacle in the biological treatment of DBW. Here, we identify black soldier fly larvae (Hermetia illucens L., BSFL) as a bioreactor ...

www.sciencedirect.com

hermetia illucens | black soldier fly

12/10/2023

Cellulose-degrading bacteria improve conversion efficiency in the co-digestion of dairy and chicken manure by black soldier fly larvae

Black soldier fly larvae (BSFL) have potential utility in converting livestock manure into larval biomass as a protein source for livestock feed. However, BSFL have limited ability to convert dairy manure (DM) rich in lignocellulose. Our previous ...

www.sciencedirect.com

black soldier fly

12/10/2023

Steam pre-treatment of sugarcane bagasse and wheat straw as a cleaner feedstock for black soldier fly larvae rearing

With the pressing need for alternative waste management strategies that are friendly to the environment, black soldier fly larvae (BSFL) are being cultivated as exceptional insects for the bioconversion of organic waste into larval biomass rich ...

brill.com

black soldier fly

12/10/2023

The fatty acid composition of black soldier fly larvae: the influence of feed substrate and applications in the feed industry in: Journal of Insects as Food and Feed

The need to reduce, reuse and recycle materials by applying new strategies of circular economy instead of linear systems of disposal is becoming increasingly urgent. The black soldier fly (BSF), Hermetia illucens (L.) (Diptera: Stratiomyidae), ...

brill.com

hermetia illucens black soldier fly

12/10/2023

Performance of black soldier fly larvae (Hermetia illucens, l.) on different feed substrates

The study assessed the nutrient composition of Sesbania grandiflora (SG) and Moringa oleifera (MO) leaves, and agro-industrial by-products, including soybean waste (SBW), wheat pollard (WP), rice bran (RB), and milk-extracted coconut meat (MECM) ...

brill.com

hermetia illucens black soldier fly

11/10/2023

Laboratory-adapted and wild-type black soldier flies express differential plasticity in bioconversion and nutrition when reared on urban food waste streams - Zhang - Journal of the Science of ...

The black soldier fly (BSF) offers a potential solution to address shortages of feed and food sources; however, selecting effective rearing substrates remains a major hurdle in BSF farming. In an urban area like Singapore, current practice is ...

onlinelibrary.wiley.com

hermetia illucens black soldier fly

09/10/2023

Revealing the effects of fermented food waste on the growth and intestinal microorganisms of black soldier fly (Hermetia illucens) larvae

The escalating global food waste (FW) issues necessitate sustainable management strategies. Black soldier fly larvae (BSFL) offer a promising solution for FW management by converting organic matter into insect protein. However, the fermentation ...

www.sciencedirect.com

hermetia illucens black soldier fly

Product - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

17/11/2023

Australian pet food company gives dogs the juicy and fibrous meaty mouthfeel they crave... without meat, in the ...

Many pet parents are adopting one of pet food's hottest trends: raw, fresh and high meat diets. However, high meat diets typically have a high ...

prwire.com.au

black soldier fly

26/10/2023

Eating insects: absurd or the future?

Eating caterpillars or insects in front of a camera is a demonstration of how nutritious these things can be, but the modern, ordinary person ...

all-andorra.com

01/11/0003

Turning insect waste into biodegradable plastics • Earth.com

In a new study, scientists have unlocked the potential of using insect waste, particularly the discarded carcasses of adult black soldier

www.earth.com

black soldier fly

15/10/2023

Kovai BSF finds commercial success in insect meal venture

Kovai BSF is seeing greater acceptance of its insect meal (black soldier fly) products in animal feed, especially in the pet food and aquafeed markets. Company founder Anupa Velusamy told Asian Agribiz that Kovai BSF has worked to perfect the ...

www.asian-agribiz.com

black soldier fly

04/10/2023

New fraction from insect meal tested in feed

Insects are towards the bottom of the food chain and require little area to thrive, ... Les videre «New fraction from insect meal tested in feed» Source

nofima.com

black soldier fly

Product - articles

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

22/11/2023

Innovative Applications of Tenebrio molitor Larvae in Food Product Development: A Comprehensive Review

The utilization of alternative and sustainable food sources has garnered significant interest as a means to address the challenges of food security and environmental sustainability. Tenebrio molitor larvae, commonly known as mealworms, have ...

www.mdpi.com

mealworm | tenebrio molitor

20/11/2023

Physicochemical, functional, and antioxidant properties of black soldier fly larvae protein

This study explores the multifaceted attributes of black soldier fly larvae protein (BSFLP), focusing on its physicochemical, functional, and antioxidant properties. BSFLP is characterized by 16 amino acids, with a predominant random coil secondary ...

ift.onlinelibrary.wiley.com

black soldier fly

20/11/2023

Valorization of biological waste from insect-based food industry: Assessment of chitin and chitosan potential

Edible mealworms can be farmed to produce high-quality nutrients and proteins, useful as ingredients in human and animal foods. During this process biological waste is produced. This work explores the usage of the biological waste as source ...

pubmed.ncbi.nlm.nih.gov

tenebrio molitor

16/11/2023

Agronomy, Vol. 13, Pages 2827: Can Soil Improvers (Biochar, Compost, Insect Frass, Lime, and Zeolite) Achieve Phytostabilization of Potentially Toxic Elements in Heavily Contaminated Soil w... ... ...

In soil with extremely high contents of Cd (101.87), Pb (26,526.44), and Zn (17,652.63 mg kg−1), we aimed to test the phytostabilization capacity of purslane (Portulaca oleracea) with the use of various soil improvers, both organic ...

www.mdpi.com

11/11/2023

Salt-soluble protein extracts from Hermetia illucens and Bombyx mori for high protein pasta production

Black soldier fly (Hermetia illucens, HI) and silkworm (Bombyx mori, BM) are two promising insect species for possible novel food applications, currently undergoing safety evaluation by European Food Safety Authority (EFSA). Aim of this research ...

www.sciencedirect.com

black soldier fly | hermetia illucens

09/11/2023

A systematic review on the occurrence of Salmonella in farmed Tenebrio molitor and Acheta domesticus or their derived products

Insects represent a sustainable and protein-rich food source. This new supply chain requires the study and monitoring of pathogens' presence and impact, as for other farmed animals. Among pathogens, Salmonella is of interest due to the well-...

www.sciencedirect.com

mealworm | tenebrio molitor

08/11/2023

Evaluation of the interrelated effects of slaughtering, drying, and defatting methods on the composition and properties of black soldier fly (Hermetia illucens) larvae fat

The interrelated effect of different slaughtering, drying and defatting methods of black soldier fly larvae (BSFL) on the lipid composition and properties of the fat was studied. Blanching and freezing were compared as slaughtering methods, ...

www.sciencedirect.com

black soldier fly

03/11/2023

Effect of ethanol treatment on the structural, techno-functional, and antioxidant properties of edible insect protein obtained from Tenebrio molitor larvae

Edible insect-derived proteins have attracted considerable attention in the food industry owing to their excellent nutritional and bio-functional activities. Herein, ethanol (20, 40, 60, and 80 %)-treated Tenebrio molitor protein (ETMP) was ...

pubmed.ncbi.nlm.nih.gov

tenebrio molitor

03/11/2023

Insect residues as an alternative and promising source for the extraction of chitin and chitosan

This work aimed to obtain and characterize chitin and chitosan extracted from the rearing residues of Tenebrio molitor, Zophobas morio, and Blaptica dubia insects in different growth stages in the same rearing cycles chitin and chitosan yielded ...

www.sciencedirect.com

tenebrio molitor

02/11/2023

Nutritional content, amino acid profile, and protein properties of edible insects (Tenebrio molitor and Gryllus assimilis) powders at different stages of development

Insects have great potential as ingredients for industrial purposes, providing good technological properties. This study aimed to characterize powders of Tenebrio molitor and Gryllus assimilis at two developmental stages for potential use in ...

www.sciencedirect.com

yellow mealworm

tenebrio molitor

01/11/2023

Black soldier fly larvae (Hermetia illucens) as a sustainable and concentrated source of bioavailable lutein for feed

Black soldier fly larvae (BSFL) are increasingly used to recycle and convert food waste into feed. We attempted to assess whether they can bioaccumulate lutein, a xanthophyll used as a food coloring, and whether it is then sufficiently bioavailable ...

brill.com

black soldier fly

hermetia illucens

24/10/2023

Allergenicity of tropomyosin variants identified in the edible insect Hermetia illucens (black soldier fly)

Insect consumption could address the increasing protein demand in compliance with environmental sustainability. Hermetia illucens (black soldier fly, BSF) is a promising insect for human diet and it is essential to assess the related allergenic ...

www.sciencedirect.com

black soldier fly

hermetia illucens

18/10/2023

Characterization of wheat dough and Chinese steamed bread using mealworm powder formulated with medium-gluten and whole wheat flour

BACKGROUND Mealworm (Tenebrio molitor) larvae are nutritious edible insects and exhibit the potential to act as protein substitutes in food products. In this study, we added mealworm powder as a substitute to medium-gluten wheat and whole wheat ...

onlinelibrary.wiley.com

mealworm | tenebrio molitor

13/10/2023

Changes in nutrient composition and gene expression in growing mealworms (Tenebrio molitor)

Insects are of high interest as a sustainable source of nutrients to be included in the food production system. The larvae of Tenebrio molitor, commonly known as yellow mealworms (MW), have a high protein content, which means potential applications ...

brill.com

yellow mealworm | tenebrio molitor

09/10/2023

A study of the purchase intention of insect protein food as alternative foods for fitness proteins

The purpose of this study is to investigate the influencing factors for fitness enthusiasts' willingness to purchase insect protein foods as fitness protein replacements. Using structural equation modeling, a model was developed to understand ...

pubmed.ncbi.nlm.nih.gov

09/10/2023

Influence of mealworms (Tenebrio molitor larvae) and their protein derivatives on the structural and rheological properties of tofu

This study investigates the effects of incorporating mealworms into tofu, regarding its structural and rheological properties. Tofu samples were prepared using only soybean flour (S), or by replacing soybean flour with mealworms (M), mealworm ...

www.sciencedirect.com

mealworm | tenebrio molitor

02/10/2023

Exploring the Antimicrobial Potential and Stability of Black Soldier Fly (Hermentia illucens) Larvae Fat for Enhanced Food Shelf-Life

The larvae of the Black Soldier Fly (BSF, Hermetia illucens) have been introduced as one of the tools to create a circular economy model, which will be used in areas such as waste management and the treatment of industrial by-products to produce ...

www.mdpi.com

black soldier fly | hermetia illucens | yellow mealworm | tenebrio molitor

Industrials applications - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

30/11/2023

Insect meal in commercial Skretting feed

November 30, 2023 - The challenge of incorporating an expensive novel ingredient into a fish or shrimp diet, despite it having positive sustainability ...

theaquaculturists.blogspot.com

black soldier fly

23/11/2023

Entobel Sets Industry Record with Opening of the Largest Insect Protein Production Plant in Asia

VUNG TAU, Vietnam, Nov. 23, 2023 /PRNewswire/ -- Entobel, a global leader in the production of functional insect protein for animal and plant ...

www.aap.com.au

black soldier fly

17/11/2023

Grubbly Farms raises Series A funding round to transform the pet food industry with sustainable insect protein from black soldier fly grubs

Funding will support efficient scaling & customer acquisition in the pet chicken market. ATLANTA, Nov. 17, 2023 /PRNewswire/ -- Grubbly Farms, a specialty pet food company using black soldier fly grub protein as a healthier and more sustainable ...

www.prnewswire.com

black soldier fly

08/11/2023

Startup sees demand for insect protein creep up

Divaks, the insect ingredients start-up, is scuttling to meet fast-growing consumer demand for alternative protein sources with its mealworm ...

www.nutraingredients.com

yellow mealworm

tenebrio molitor

07/11/2023

Full Circle Biotechnology to supply HydroNeo with insect-based shrimp feed additive

Through a new partnership, Bangkok, Thailand-based nutrient recapture startup Full Circle Biotechnology will supply Thai aquaculture technology ...

www.seafoodsource.com

black soldier fly

04/11/2023

Maggots instead of soy: insects as a substitute for animal feed? Companies see great potential

...since attracted the attention of the European Union. "In the EU, eight insect species are now approved as farm animals... 1100 tons of dried ...

newsrnd.com

mealworm

tenebrio molitor

03/11/2023

Can insects be nutritionally enhanced for poultry feed?

Can insects be nutritionally enhanced for poultry feed? 09:00 | Nutrition | News Researchers aim to develop a nano-enhanced substrate ...

www.poultryworld.net

black soldier fly

25/10/2023

How insects can help feed the world

Proteins and fats can come from many sources, but perhaps one of the most novel is that found in insects. Insect protein can be produced using a fraction of the land, water, and resources required – thus helping our customers meet their sust...

www.feedandadditive.com

black soldier fly

23/10/2023

Germany's FarmInsect gobbles €8M to produce protein-rich, insect-based animal feed

Munich-based tech startup FarmInsect has netted €8 million in Series A funding. The round was led by Sandwater... The post Germany's FarmInsect ...

techfundingnews.com

black soldier fly

19/10/2023

Veolia starts to export insect meal and oil to Europe

Veolia Bioconversion Malaysia, part of the Veolia Group, which aims to become the benchmark company for ecological transformation, announced ...

www.feedandadditive.com

black soldier fly

18/10/2023

Tyson Foods enters insect protein industry with Protix black ...

--- Tyson Foods has entered a two-fold investment with Netherlands-based insect ingredient formulator Protix to upcycle its by-products such ...

www.nutritioninsight.com

black soldier fly

yellow mealworm

17/10/2023

Edinburgh-based Beta Bugs raises €1.46M to scale up sustainable insect farming for animal feed production

Scotland-based Beta Bugs raises €1.46M to scale up sustainable insect farming for animal feed production.

siliconcanals.com

black soldier fly

10/10/2023

Second Bioflytech facility to produce insect ingredients for animal feed - World Grain

Second Bioflytech facility to produce insect ingredients for animal feed World Grain

www.world-grain.com

black soldier fly

20/11/2023

Dietary replacement of soybean meal with black soldier fly larvae meal in juvenile Labeo rohita and Catla catla: Effects on growth, nutritional quality, oxidative stress biomarkers and disease ...

This experiment aimed to investigate the effects of partial substitution of crude protein from soybean meal (SBM) with black soldier fly (Hermetia illucens) larvae meal (BSFLM) in juvenile rohu (Labeo rohita) and catla (Catla catla). Four is...

journals.plos.org

black soldier fly | hermetia illucens

14/11/2023

Use of black soldier fly (Hermetia illucens) larvae meal in diets for gilthead seabream juveniles: Effects on growth-related gene expression, intermediary metabolism, digestive enzymes, and gut ...

A study was conducted to evaluate the effects of dietary inclusion of defatted Hermetia illucens larvae meal (HM) on the expression of growth-related genes, plasma metabolites, activity of intermediary metabolism enzymes, and gut microbiota ...

www.sciencedirect.com

black soldier fly | hermetia illucens

06/11/2023

Effects of partial replacement of fish meal with black soldier fly (Hermetia illucens) larvae meal on growth performance, lipid metabolism and hepatointestinal health of juvenile golden pompano ...

This experiment was conducted to investigate the effects of partial replacement of fish meal with black soldier fly larvae (BSFL) meal on growth performance, body and muscle nutrients, lipid metabolism, intestinal morphology and microbiota of ...

www.sciencedirect.com

black soldier fly | hermetia illucens

05/11/2023

Effects of partially defatted larvae meal of Black Soldier Fly (Hermetia illucens) on caecal microbiota and volatile compounds of Muscovy ducks (Cairina moschata domestica)

The present study explored the effects of substituting maize gluten meal with increasing levels of partially defatted black soldier fly larvae meal (BSFLM) in Muscovy ducks' diets on their caecal microbiota and organic volatile compounds. The ...

www.tandfonline.com

black soldier fly | hermetia illucens

27/10/2023

Soil amendment with insect frass and exuviae affects rhizosphere bacterial community, shoot growth and carbon/nitrogen ratio of a brassicaceous plant

Aims In terrestrial ecosystems, deposition of insect frass and cadavers in the soil influences soil characteristics, including microbial community composition, with consequences for plant growth and development. Insect frass and exuviae are ...

link.springer.com

hermetia illucens | tenebrio molitor

14/10/2023

Effects of black soldier fly (Hermetia illucens) larvae oil on fillet quality and nutritional traits of gilthead seabream

A study was conducted to evaluate the effects of dietary inclusion of black soldier fly (Hermetia illucens) larvae oil (HIO) on fillet fatty acid (FA) profiles and other nutritional traits of gilthead seabream (Sparus aurata). Four experimental ...

www.sciencedirect.com

black soldier fly | hermetia illucens

11/10/2023

Black soldier fly pulp in the diet of golden pompano: Effect on growth performance, liver antioxidant and intestinal health

Black soldier fly (Hermetia illucens) has been widely researched as a protein source for fish meal replacement in aquaculture, but few studies have focused on its potential as a feed additive for growth and immune enhancement. We conducted a ...

www.sciencedirect.com

black soldier fly | hermetia illucens

11/10/2023

Insights into the reduction of antibiotic-resistant bacteria and mobile antibiotic resistance genes by black soldier fly larvae in chicken manure

The increasing prevalence of antibiotic-resistant bacteria (ARB) from animal manure has raised concerns about the potential threats to public health. The bioconversion of animal manure with insect larvae, such as the black soldier fly larvae ...

www.sciencedirect.com

black soldier fly | hermetia illucens

05/10/2023

Black soldier fly larvae (Hermetia illucens) meal is a viable protein source for Atlantic salmon (Salmo salar) during a large-scale controlled field trial under commercial-like conditions

Black soldier fly larvae meal (BSFL) from Hermetia illucens is a promising alternative protein source in diets for farmed fish. The larvae can efficiently convert low-value organic material into high-value protein in a production cycle with ...

www.sciencedirect.com

black soldier fly | hermetia illucens

04/10/2023

[hal-04228910] Environmental impact potential of insect production chains for food and feed in Europe

Insects can address sustainability issues associated with current food systems by providing an alternative protein source to address hunger and disease. Only the production systems that rely on side-stream heat and alternate energy sources may ...

hal.science

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