

Biosecurity risks of Black Soldier Fly larvae as an animal feed



Black soldier fly farming FACT SHEET

Key Points:

- Use of Black Soldier Fly larvae in animal feed appears to present low biosecurity risks to both animals and the environment.
- Current regulations regarding the use of Black Soldier Fly larvae in animal feed were developed when insects were not considered a potential feed source for livestock and are not consistent across states and territories.
- The development and approval of a rendering process might make it possible to enable the use of larvae fed swill and RAM as approved animal feed.

Introduction

There is growing interest in farming Black Soldier Fly larvae (Figure 1) for use in animal feeds (see fact sheet *Nutrition of animal feed products produced from Black Soldier Fly larvae*). This fact sheet addresses what is known about the biosecurity risks of using Black Soldier Fly larvae in animal feed and how their use is affected by current government regulations. It does not discuss the biosecurity risks of using Black Soldier Fly larvae in other products, such as Frass (see fact sheet *Potential environmental regulation classification and requirements for manure-derived Black Soldier Fly frass*).

Biosecurity risks

Using Black Soldier Fly larvae in animal feed appears to present low biosecurity risks to both animals and the environment. The larvae are not susceptible to animal pathogens and they do not cause proliferation of animal pathogens in their substrates (food sources). Black Soldier Fly larvae may use bacterial pathogens as a food source. Under certain conditions, the larvae can accelerate the *reduction* of bacterial pathogens in substrates. However, they rarely eliminate bacterial pathogens altogether. In addition, passive transfer of pathogens to livestock can occur if animals are fed fresh Black Soldier Fly larvae.

Black Soldier Fly larvae can reduce or even eliminate antibiotics and mycotoxins in substrates, but it is still uncertain whether they can reduce or eliminate viruses or prions in substrates (prions are the agent of bovine spongiform encephalopathy in cattle or 'Mad Cow Disease').

Many heavy metals in substrates tend to concentrate in Black Soldier Fly larvae. However, the processing of the larvae into animal feed (rendering) may lower heavy metal concentrations in the feed products.

Animal feed regulations

Australian state and territory regulations are essential to minimise the biosecurity risks associated with some types of animal feed. These regulations restrict what can be fed to livestock to prevent the introduction and spread of diseases to livestock and the environment.

For example, animal feed containing animal matter may be classified as 'swill' or 'restricted animal material' (RAM). Under all state and territory regulations, swill and RAM are prohibited from being fed to livestock.



Figure 1: Black Soldier Fly larvae



Current regulations regarding the use of Black Soldier Fly larvae in animal feed were developed when insects were not considered a potential feed source for livestock and are not consistent across states and territories.

Current regulations restrict what you are allowed to feed insect larvae and the intended use of the larvae. Under the regulations, Black Soldier Fly larvae that are fed food containing swill or RAM must be classified as swill or RAM themselves and cannot be fed to livestock (Figure 2).

However, this may not reflect the actual biosecurity risk of feeding rendered Black Soldier Fly larvae (Figure 3) to animals. The development and approval of a rendering process might enable the use of Black Soldier Fly larvae raised on swill and RAM as an approved animal feed.



Figure 3: Processed Black Soldier Fly larvae

	Aquafeed	Petfood	Poultry	Pigs	Ruminants
Aust Capital Territory	✓	✓	✓	✓S	✓S
New South Wales	✓	✓	✓	✓S	✓S
Northern Territory	✓	✓	✓	✓S	✓S
Queensland	✓	✓	✓S	✓S	✓S
South Australia	✓	✓	✓	✓S	✓S
Tasmania	✓	✓	✓	✓S	✗
Victoria	✓	✓	✓	✓S	✗
Western Australia	✓	✓	✓	✓S	✗

Legend:

Green tick: Animal food permitted to contain insects fed any substrate.

Pink tick: Animal food permitted to contain insects fed any substrate except swill and RAM.

Red cross: Animal food not permitted to contain insects.

Figure 2: Summary of state and territory restrictions on the use of insects to produce feed for different animals.



Minimising biosecurity risks

Even when Black Soldier Fly larvae are fed approved substrates, there may be pathogens or biohazards in the substrates that can be introduced into Black Soldier Fly larvae products (Figures 4 and 5).

To minimise these risks, there are several factors that should be considered during the process of farming Black Soldier Fly larvae:

- The Black Soldier Fly eggs and their rearing substrate (food) may be a source of pathogens.
- The substrate for Black Soldier Fly larvae should come from a known source, be government approved and information sought on whether it is free of contaminants.
- Attempts should be made to prevent pathogens being introduced to the Black Soldier Fly larvae rearing environment.
- The rendering and storage of feed products in a warm, moist environment is more likely to allow pathogens to proliferate.

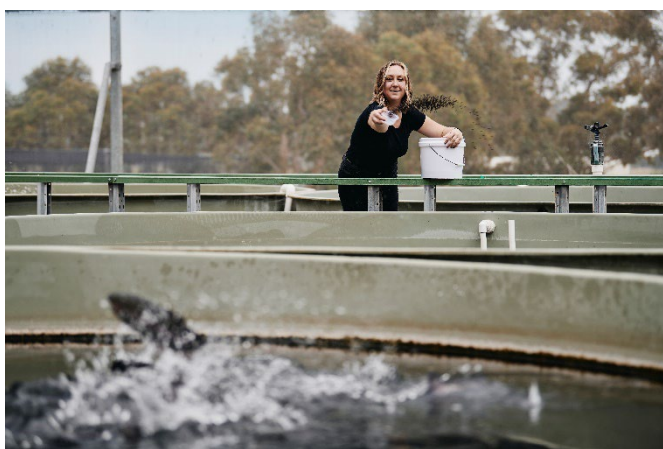


Figure 4: Processed larvae pellets as a potential animal feed product

Typical steps in Black Soldier Fly (BSF) farming

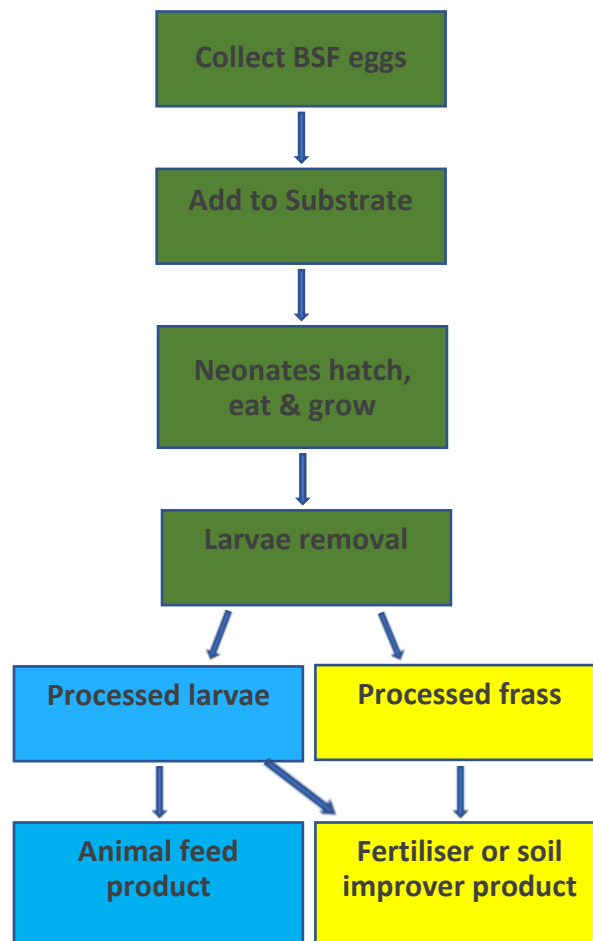


Figure 5: Although pathogens can be introduced through the process, the greatest potential for introduction is likely in the substrates, neonates and during the feed processing and storage.


Further reading

For more information and access to reports and publications, visit the website or contact a research team member.

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