

Using BSF

To feed animals, fertilize crops, and strengthen livelihoods.
MBC Solutions Program



Nutritious BSF, boosting livestock

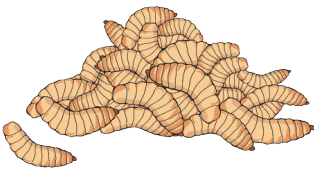
Nutrients in dried BSF

Protein: helps animals grow, produce (milk, meat, eggs) and stay healthy.

Fat: energy for growth, better digestion, tastier meat.

Calcium and Phosphorus: strengthen and improve bone growth, essential for egg production.

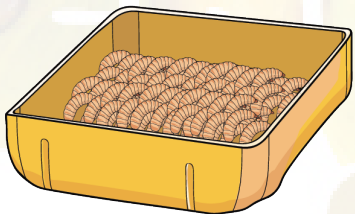
Methionine and Lysine: support rapid growth and strengthen immunity.



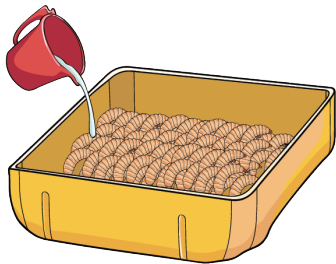
Protein	38,5 - 63 %
Fat	6,6 - 39 %
Calcium	1,7 - 3,2 g/kg
Phosphorus	3 - 4,5 g/kg
Methionine	6 - 8 mg/g
Lysine	4 - 5 mg/g

(Barragan-Fonseca et al., 2017; Shumo et al., 2019)

Types of BSF processing for animal feed



Fresh BSF larvae



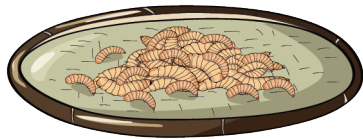
Rinsed BSF

- Rinse thoroughly with clean water.



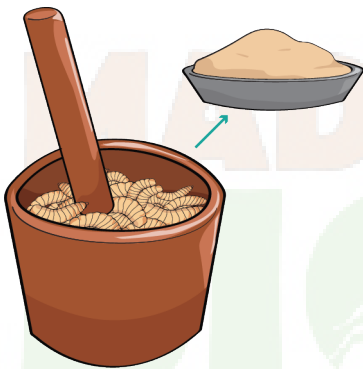
Boiled BSF

- To kill them and ease digestion.
- Boil for 3–5 minutes.



Dried BSF

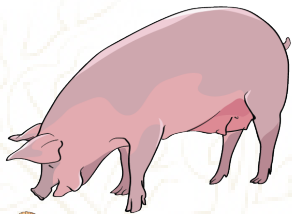
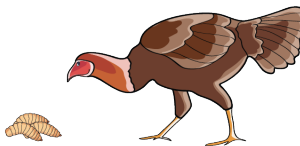
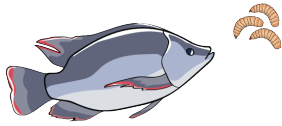
- Easier to store.
- Easier to turn into powder.
- Dry for 2–3 days, depending on the weather.



BSF Powder

- Mix with regular feed.
- Store in a dry, tightly closed container.
- Keep in a dry place away from sunlight.
- Can be stored for 3–6 months.

Introducing BSF into livestock feed



Common feed that can be partially replaced with BSF:

- Fish meal
- Soy
- Corn
- Rice bran

Replacement rate: 10–50% of the regular feed.

Guidelines:

- Do not change the feed suddenly, introduce BSF gradually.
- Start by replacing 10% of the regular feed with BSF.
- Can be fed daily according to the animals' needs.
- Do not exceed 75% BSF in the total feed.
- Alternate BSF forms (dried / fresh / powdered).
- Monitor feed intake, health, growth, production and adjust if needed.

All these types can be fed to chickens, fish, and pigs.

BSF frass: a natural superfertilizer for better yields



Manure
Exuviae
Uneaten feed
Dead BSF

- Nitrogen (N):**
 - Helps leaves grow and stay green.
 - Increases plant height.
- Phosphorus (P):**
 - Strengthens roots.
 - Improves stem growth.
 - Increases yield (fruits and vegetables).
- K (Potassium):**
 - Improves plant health.
 - Protects against diseases.
 - Enhances quality of fruits and vegetables.

Nutrients	BSF frass fertilizer (%)	Cattle manure (%)	Chicken manure (%)
Nitrogen (N)	0,6 - 5,1	0,3 - 1,6	0,6 - 1,6
Phosphorus (P)	0.2 - 5,2	0,1 - 0.3	0,1 - 0,7
Potassium (K)	0.2 - 4,5	0,2 - 1,1	0,1 - 0,7

(FAO, 2005; Lomonaco et al., 2024)

When the waste is fully decomposed, it can be used immediately.

Harvesting

- If there is still a lot of rice bran or leftover waste that hasn't been decomposed, it should be turned into compost.

Composting

- Layer the different elements alternately.
- Water every 7 days.
- Turn every 15 days.
- After 5–8 weeks, compost is ready when it has no bad smell, dark in color, and soft.

How to process BSF frass

Drying

- Place on clean ground or tray.
- Leave to dry in the sun for a few days, depending on the weather, and mix frequently.
- Once fully dry, store in a tightly closed bag.

Usage

- Smaller amounts needed because it is richer in nutrients.
- Can be used on all crops: maize, rice, vegetables,...

Crops	BSF fertilizer amount (kg/are)	Cattle manure amount (kg/are)
Rice	35	100
Vegetables	50	150

Benefits for livestock farming

- Reduces spending on animal feed.
- Supports faster growth and healthy weight gain in animals.
- Improves animal growth, health, and product quality (meat, milk, eggs).
- Leads to better food for people due to higher-quality products.
- Increases overall production, improving livelihoods.

Benefits for agriculture

- High-quality natural fertilizer.
- Improves soil and increases crop yield.
- Saves money: reduces fertilizer costs for farmers.
- Strengthens natural defenses: helps plants protect themselves against diseases and pests.

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