

Nature Creation (Beijing) Technology Co., Ltd.

About the project

Around the world, over 931 million tons of food are thrown into the garbage every year. In China, urban food and beverage enterprises produce over 18 million tons of food waste every year. Most of this waste is sent to landfills and incinerators, causing downstream pollution. A small portion of this waste enters the food waste treatment plant and becomes raw material for the production of organic fertilizer and biogas.

Black soldier fly biotechnology can convert food waste into safe insect protein and oil. Unlike incineration and anaerobic technology, black soldier fly biotechnology can return food waste back to the food chain. If China’s urban kitchen waste was converted using black soldier fly technology, over 450,000 tons of dried worms (comparable to fishmeal) could be obtained—this is equivalent to 21% of China’s annual fishmeal consumption. Accounting for almost 40% of global fishmeal consumption,

China consumes a total of 1.8-2.1 million tons of fishmeal each year, relying on imports for 60-70% of its supply.

Nature Creation (Beijing) Technology Co., Ltd. (hereinafter referred to as “Nature Creation”) is the earliest environmentally-friendly biotechnology company in China that focuses on the industrial development of black soldier fly technology and the application of insect protein. The founding members of the company are from Tsinghua University, Xi’an Jiaotong University, China Agricultural University, and the University of Hohenheim in Germany.

Black soldier fly super protein factory

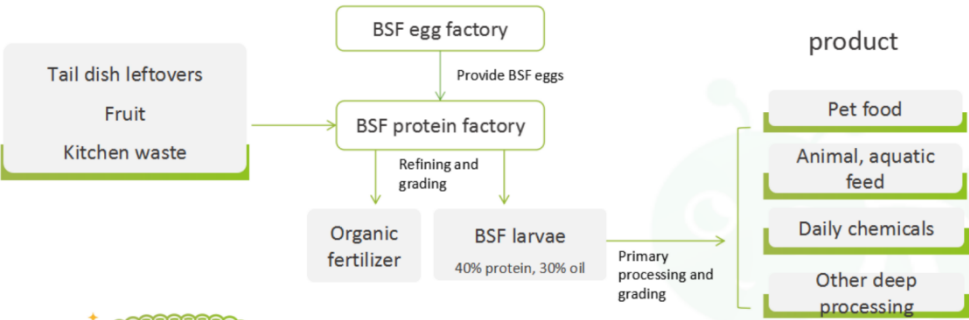
We have established a fully automatic black soldier fly breeding base, food waste treatment plant, and Toptech Ultimate Factory. This is a fully automated and standardized comprehensive factory which integrates treatment, breeding, production, and processing. The plant covers an area of 3000 square

Company Introduction

Advancing the World by Insects. Creating a Joyful Nature for the Behinds.



An environmentally friendly biotechnology company: using the biological characteristics of Black Soldier Fly to turn organic waste into treasure.




「黑水虻」BLACK SOLDIER FLY
FAO (联合国粮食及农业组织)
指定资源昆虫之一

- Feed on organic matter, no picky about food, eat more and fast. (The conversion time of food waste fruits and vegetables : 24 ~ 48 h)
- Insects have high nutritional value, rich in 40% protein and 30% oil.
- It is widespread in nature, and the morphology of the adults is similar to that of bee, non-toxic and harmless, and doesn't like being close to people.

meters. When fully opened, it can handle 100 tons of food waste per day and produce 20 tons of commercial insect products and 20 tons of organic fertilizer per day.

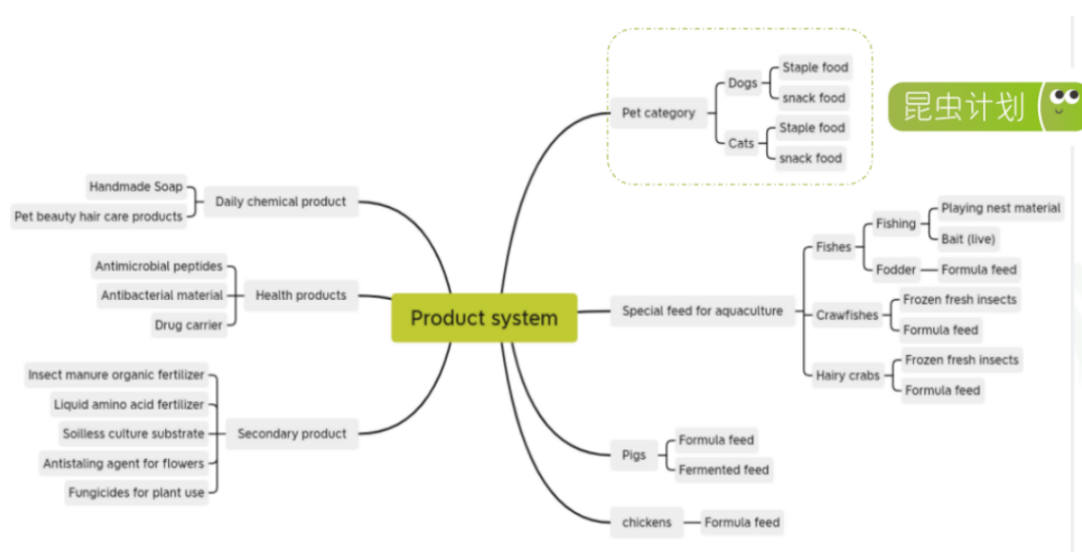
After being processed by this comprehensive factory, a large amount of food waste resources are converted into organic fertilizer and black soldier fly

larvae. Organic fertilizer can be sold as gardening soil, and the larvae can be further processed into pet food, livestock and fish feed, household chemicals, and more.

Nature Creation took the lead in 2017 to develop the Black Soldier Fly into an insect-based fishmeal to supply the hairy crab market. This fishmeal gained

Product System Based on Black Soldier Fly Larvae

Advancing the World by Insects, Creating a Joyful Nature for the Behinds.



popularity in the market because it didn't degrade water quality and was convenient to use, yielding large, flavourful crabs with a low mortality rate.

In March 2021, the company launched its pet food division, the Insect Programme. The first insect-protein-based dog food hit shelves on May 20 and has been well received. A series of cat food and dog food products based on black soldier fly insect protein are currently being developed. The company has also successfully developed raw-material products for pet foods, including various insect protein powders, dried insects, and other raw materials which are ready to be introduced to pet food manufacturers.

Around the world, efforts have been invested in using insect protein as the main source of pet food protein. The British Veterinary Association and the Association of American Feed Control Officials (AAFCO) fully support the black soldier fly as a pet

food raw material. Pet food giants such as Nestle Purina and Mars have also stepped forward. One of the largest food companies in the United States, Archer Daniels Midland ADM (ADM), has cooperated with InnovaFeed in France to build the world's largest insect protein factory.

Using insect protein as the main protein source of pet food has the following benefits:

1. Generally speaking, the active oxygen free radicals in the body increase as the body ages. Studies have shown that black soldier fly protein has a significantly stronger ability to eliminate free radicals than fish and chicken protein. It can protect cells from oxidative damage caused by immune responses by scavenging free radicals and regulating the activity of myeloperoxidase, effectively reducing inflammation, delaying aging, and preventing hyperplasia.

- 2. The black soldier fly can produce abundant antibacterial active substances (commonly known as antibacterial peptides) upon induction. These substances are thermally stable, broad-spectrum antibacterial, and stimulating to immune function. They can help pets effectively resist germs and disease and also promote wound healing even after being isolated from the body.
- 3. Studies have shown that dogs with dry, dull, scaly, and non-pruritic skin diseases will have significant improvement after being supplemented with unsaturated fatty acids. It has also been proved that Ω -3 can effectively prevent or reduce the occurrence of cardiovascular disease (CVD), aid in retinal development, and increase brain cell activity, enhancing memory and cognitive function. Pets eating black soldier fly, which is rich in unsaturated fatty acids (Ω -3, Ω -6), will have healthier fur and reduced incidence of cardiovascular disease.
- 4. Most of the intestinal pathogenic bacteria are gram-negative bacteria, which produce endotoxins to cause disease in animals. The content of lauric acid in black soldier fly is very high. It is particularly effective in killing gram-negative bacteria and can guarantee pets' intestinal health.
- 5. The epidermis of black soldier fly is rich in chitin, which reacts with gastric acid in the stomach to form a stable gel which doesn't decompose in the intestine and helps to adsorb fat, cholesterol, and bile. After adsorption, fat, cholesterol, bile, and chitin gel are excreted in the feces, which can lower body fat, blood lipids, and cholesterol.

In addition to its applications in pet food, black soldier fly larvae can be added to pig and poultry feed to reduce dependence on imported soybeans and functional feeds. If it is added to aquaculture feed, dependence on fishery resources (replacement of fishmeal) can also be reduced, ultimately mitigating the destructive impacts of soybean production and fishing on the environment.

In general, the black soldier fly super protein factory has replaced the traditional food waste treatment

methods of landfill burial and incineration, reducing greenhouse gas emissions. The technology facilitates effective use of waste resources and produces protein products that reduce our reliance on food and fishery resources for pet maintenance, aquaculture, and pig and poultry breeding. All in all, it is a good demonstration of the realization of circular development in the food system.

We have established collaborations with three domestic listed companies engaged in food waste treatment and have built two pilot projects. In the future, our technologies will be promoted in 20 cities with populations over 5 million, 100 cities with populations over 1 million, and 200 cities with populations under 500,000.

