

TECH OFFER

Automated Edible Insect Protein Fractionation Process



KEY INFORMATION

TECHNOLOGY CATEGORY:

Sustainability - Food Security

Foods - Processes

Foods - Ingredients

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **THAILAND**

ID NUMBER: **TO175018**

OVERVIEW

The production of insect protein powder is currently a batch process that is labor intensive and has issues with product consistency upon scale up. This technology uses automation to upscale the edible insect (House Cricket; *Acheta domesticus*) protein fractionation process. This will allow for the processing of 1 ton of the cricket raw material per hour and produce 3-4 tons of the protein powder per day. It is a scalable, zero-waste process that reduces overall operation costs (taking time, labor, energy into account) by roughly 30%. It is also applicable to other insect species and can be customizable to produce insect protein products according to customers' needs.

The cricket protein powder has a higher quality, consistency and safety than other insect protein products and meet international standards for global markets. It is an alternative to meat and plant-based protein and contains naturally higher nutritional values (70% protein content, complete amino acids, BCAAs, dietary fibre, and micronutrients). High value by-products are also obtained from the main process including oil and chitin that can be used in cosmetics and supplements.

TECHNOLOGY FEATURES & SPECIFICATIONS

Automated continuous process

Specification of the technology:

- feed input: max. 1 ton raw material /hour
- output capacity: max 3-4 ton powder/day
- control heat treatments: max. 110 C with 2 steps
- component fractionation > drying > pulverization > sieving > bagging

Specifications of the cricket powder

- Particle size: <80 Mesh
- Colour: Light brown
- Appearance: Uniformly fine powder
- Flavor: Mild
- Storage: Ambient and dry
- Shelf life: 19 months at 25°C
- Allergens: Shellfish, May contain soy
- Contains >70% protein, <14% fat and 4.5% carbohydrates

POTENTIAL APPLICATIONS

Technology

- Insect farms looking to process their raw materials

Cricket Powder

- B2B
- Food manufacturers
- Food service
- Sports Nutrition
- Health and Wellness
- Shown application in protein blends, shakes, pastas, noodles, snacks, bars and bakery recipes

MARKET TRENDS & OPPORTUNITIES

The growing world population leads to increasing protein costs making it unaffordable for many people in developing countries. Insects are seen as an inexpensive source of protein that is increasingly being approved as a food source by regulatory authorities around the world. The global edible insect market and valued at \$294.9 million in 2017 and is projected to grow at a CAGR of roughly 10% till 2024, when it is estimated to reach \$722.9 million with insect-based protein food and beverage products (products that use insect as a source of protein) accounting for more than 40 percent. (Persistence Market Research, 2018)

UNIQUE VALUE PROPOSITION

- Scalable process with automation suitable for mass production
- Reduce energy and operational costs by at least 30% with minimal loss as compared to other insect protein processes
- High product consistency
- Fully utilize all parts of the insects with minimal waste
- Products are of high quality and high safety standards to improve consumer perception
- Extended shelf life due to reduced oxygen exposure
- Flexible and efficient process for any insect species