



**Factors for success: knowledge, capital and chain cooperation**

# The cultivation of insects: a small sector with great opportunities

# Summary

In Europe, there is an interesting upcoming market for the cultivation of insects, not only for consumer food products, but in particular for feed (animal food). Insects consist of various ingredients; proteins and oil are the most valuable. Insect proteins from the black soldier fly (BSF or *Hermetia illucens*) and the small mealworm (the so-called Buffalo worm) are the most competitive with fishmeal and soya protein-extract when it comes to pricing and quality.

The production volumes of insect breeders are still small. However, demand improves and in the near future an extension of production is expected. If insect breeders want to benefit from these upcoming markets, they have to increase their production volumes substantially and focus on mechanization and automation.

In order to create a good market position and steady product sales, the formation of innovative, closed production and sales chains is essential. The development of attractive concepts for consumers and a focus on the added-value of insects for the performance and health of fish, chicken or pig can offer a lot of opportunities.

## Small sector for small niche markets

The Dutch insect sector is small and consists of approximately 25 businesses. Most of these businesses breed one kind of insect, such as the mealworm, grasshopper, cricket or BSF. There is not much data available about production volumes and turn-over. An estimated 500 ton of insects is produced (wet) in the Netherlands, with a total turn-over from three to seven million euro. The frontrunners produce 50 per cent of this amount and invest in upscaling, mechanization and automation.

The European market for processing insects in consumer food is a niche market: European are not too fond of eating insects, unlike Asian people. Nevertheless, this market is growing steadily with 10 to 25 per cent on an annual basis, because of the growing demand of high-quality insect proteins, for example as special food for children and during sickness. Insects are included in the new Novel Food Regulation, that comes into force on January 1st 2018.

The market for hobby pet food, including living grasshoppers for reptiles, is stable. In the professional pet food industry, the demand for special pet food - cat and dog feed with insect proteins - is growing. This offers new options. Moreover, within existing European regulations it is possible to develop niche markets for feed, such as the procession of insect oil and living insects in poultry and pig feed.

## **New options in new markets**

In the upcoming years, legal barriers in the feed market will disappear. The TSE legislation (Transmissible Spongiform Encephalopathies regulation EC 999/2001) prohibits the application of insect proteins in feed, because it is an animal protein.

IPIFF, the international interest group for insect breeders and processors, is lobbying in Europe for a reform of insect legislation. In 2017, the European Commission will decide about the Insect Slaughterhouse Registration Law. If the commission takes a positive decision, the application of insect proteins will be allowed in aquaculture feed. In the short run (2017), this might open the way for a new market for insect



proteins. Moreover, in 2020 the TSE legislation for poultry and pigs is expected to be reformed and that will mean that the poultry and pig feed markets will open up for insect proteins as well.

## Good economic perspectives

At the moment, relatively small amounts of insect proteins are produced against relatively high prices. It is expected that within feed these products will first compete with fishmeal and/or high-quality protein-extract from soya beans. The European feed markets for aquaculture, poultry and pig are very promising, just look at the numbers below. Imagine that a small volume of the annual feed production is replaced by insect proteins. This will create the following potential sales volumes for insect proteins per year:

- ▶ 80,000 ton if 10 per cent of the fishmeal in Europe is replaced (>Q2 2017);
- ▶ 70,000 ton if 1 per cent of the total volume in broilers feed in the Netherlands is replaced (2020);
- ▶ 800 ton if 1 per cent of the total volume of high-quality suckling pig feed in the Netherlands is replaced (2020).

The conclusion is that in the short run, the potential market for insect proteins in feed is much bigger than the current supply. Even against a low trading price for insect protein powder, within only a couple of years the potential turn-over will amount to hundreds of millions of euros. It is expected that volumes will increase and prices decline in the case of further upscaling, mechanization and automation. This will enhance the competitive edge of breeders and improve economic perspectives in the long run.

## More circularity

Insects can transform organic bypass flows of agricultural sector and food processing industry into valuable commodities, such as insect proteins. These commodities can be applied in several market sectors, including (pet) food and feed. These applications are at the basis of new food chains for human and animal. In short, insects can close the loop. With the growth of the insect sector, the circularity of Dutch agriculture and food processing industry can increase.

## New chain structures

A close collaboration between chain partners is crucial for the accessibility of new niche markets, such as pet food and feed based on insect oil and living insects. In the short run, the organization of innovative, closed chains is the most logical means for developing these niche markets. In order to operate on the pet food and feed markets, insect breeders should offer substantial volumes of insect proteins with constant quality and delivery standards. Upscaling, mechanization and automation are required for this.

Traditionally, insect breeders follow all production steps in-house: from breeding up to packaging the products. For an extensive breeding of BSF and the small mealworm, the breeding of larvae can be outsourced, which is the case with calves. The benefit of this model is that the most difficult and knowledge-intensive steps are arranged on a central level, such as the breeding of production animals, mating and laying eggs. In this model, processing devices can be deployed efficiently too. For small family businesses, the opportunities to enter the market for insect proteins are limited. The level of investments and the complexity of breeding, combined with the chain collaboration needed, means that only innovative businesses have good perspectives for success.



## Colofon

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