European Network for Rural Development

Using food waste to produce animal protein from insects

EAFRD-funded projects

DENMARK

Local development

Location
Hjørring

Programming period
2014 – 2020

Priority
P6 – Social inclusion and local development

Measure
M19 – CLLD/LEADER

Funding (EUR)*
Total budget 94 949
EAFRD 40 775
National/Regional 1 804
Private 52 370
* Sum of two projects

Project(s) duration
2015 – 2016 & 2017 - 2017

Project promoter
MD ApS

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A micro enterprise received LEADER support and turned a hobby into a revenue-generating business: using insects to produce protein flour for animal feed.

Summary

A micro enterprise received LEADER support to establish a breeding and production facility for processing insects into protein flour. The project's vision was to become the first company in Denmark to produce insects and insecticides for animal feed on a large scale.

In collaboration with the Danish Technological Institute, the Nature Agency and Hjørring Municipality, the company took the first step towards this new way of producing animal feed that reduces environmental impacts and turns waste products, such as food waste and degassed manure, into input for protein production.


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Results

The company experiences greater demand than they can meet, including from foreign customers, and has reduced its imports of insects to 0%.

The first subsidy resulted in 2 full-time positions, and the next is expected to result in another 2 full-time jobs.

Through their involvement in the research project and the preparation of the production facilities, the company took the first step towards a new, more environmentally sustainable, way of producing protein.

The new heating system has resulted in significant energy savings.

Lessons & Recommendations

- ❑ Establishing the framework for the projects, and the development of the business in general, was complicated by the lack of pre-existing legislation regarding the insect industry. A specific insect category is missing in the legislative framework that applies for feed and food production at both the national and EU level.
- ❑ Support from LEADER was of critical importance to support this innovative but risky idea that only needed a small grant to get started.

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Context

Most of the protein in animal feed currently comes from soybeans, the cultivation of which requires large areas of land and high water consumption. It requires approximately one ha of land to produce one ton of soy per year. In addition, Denmark imports soy from the USA and other overseas countries. Today, more than 80% of the world's soybeans are used in animal feed, and the demand for meat for human consumption is rising.

To address these environmental challenges, insects are currently viewed as a sustainable alternative to soybeans as a source of protein in animal feed. Insects can feed on manure and other types of organic waste, and the breeding and production of insects requires only a tenth of the land, less labour and comes at a significantly lower environmental cost than soybean production. In fact, one hectare of land can produce up to 150 tons of insect protein, compared to one ton of soy. However, scientific research is still needed to establish whether diseases can be transmitted to humans, through the insects consumed by the animals.

In 2009, the beneficiary started breeding insects as a hobby, in his basement at home, to use as feed for his lizards because he had realized that the cost of insect production was much lower than buying the insects. This became the starting point for a long development from amateur/hobbyist producer to the establishment of an industrial production enterprise.

Objectives

The company's vision is to use waste products and to become the first company in Denmark to produce insects and insecticides for animal feed on a large scale, in buildings specifically designed for the purpose.

Two projects were implemented and were called: *'Extension of insect production, storage capacity, advertising car, webshop, access for lorries'* and *'Production of insect protein flour for animal feed based on new insect species'*. The first project aimed, initially, to expand the capacity of a hobby business and make it profitable. The second project sought to establish a breeding and production facility for insects; processing them into insect protein flour.

Activities

The company is involved in an ongoing research project with the Danish Technological Institute, the Nature Agency, Hjørring Municipality and three other companies. The promising research project seeks to produce insect protein flour for mink feed. The beneficiary thus aims to improve the infrastructure of the production facility, first to expand the insect production capacity, and then to trial the use of robotics in the mink-feed production process. The upgraded infrastructure will then be used to produce insect protein flour in large quantities at competitive retail prices.

Through the two projects, disused barn buildings were renovated and fitted out with production and storage facilities equipped with robot technology to aid the entire process: from breeding and rearing the insects, to processing them into protein flour.

Furthermore, as insects require a warm environment, the renovation works included full insulation of the buildings and the installation of a new and more environmentally friendly heating system to replace an old boiler.

Specially manufactured breeding boxes were installed to reduce the amount of labour associated with feeding and cleaning.

Timeline of first project:

Activity	Start date	End date
Advertising car	08-06-2015	01-07-2015
Webshop	01-07-2015	01-09-2015
Road improvement	01-07-2015	01-09-2015
Cold store	01-01-2016	01-06-2016
Renovation of room for insect production	01-03-2016	01-06-2016

Timeline of second project:

Activity	Start date	End date
Relocation of storage to a different room	02-01-2017	01-02-2017
Installation of heating system and other plumbing	02-02-2017	31-03-2017
Installation of new breeding system	31-03-2017	01-08-2017

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Main Results

At the start of the first project, the company imported 80% of the insects they sold from Dutch suppliers and therefore wanted to increase their own insect-breeding capacity to match the growing demand. Today, the company exploits Hjørring Municipality's biomass plant – using its by-products for insect feed - and supplies insects to Danish zoos and a number of pet stores. The company experiences greater demand than they can meet, including from foreign customers, and has reduced its imports of insects to 0%.

The first subsidy resulted in 2 full-time positions, and the next is expected to result in another 2 full-time jobs.

Furthermore, through their involvement in the research project and the preparation of the production facilities, the company took the first step towards a new, more environmentally sustainable, way of producing protein. A process that reduces its environmental impact by making use of waste products such as food waste and degassed manure.

The new heating system has resulted in significant energy savings.

Finally, the project holds a tremendously high growth potential, as the high level of demand creates the potential for replicating the model elsewhere and establishing production facilities in connection with any biogas plant, anywhere (as their degassed waste and by-products are perfect as insect feed). Such an expansion could result in dozens of rural protein production facilities leaving a positive imprint on the environment, economy and life in the countryside.

Key lessons

Establishing the framework for the projects, and the development of the business in general, was complicated by the lack of pre-existing legislation regarding the insect industry. A specific insect category is missing in the legislative framework that applies for feed and food production at both the national and EU level. For instance, it is unclear whether insect production falls under agriculture or industry law. And similarly, how are larva faeces to be classified: as compost, fertilizer or a residual product? This lack of legislation, that to a large extent stems from a lack of knowledge about food safety, makes it difficult for stakeholders to manoeuvre and to invest in the sector.

Nevertheless, the two projects are an example of how LEADER funding constitutes a resource that can create ripple effects and further projects and growth. It is of critical importance that funds are made available to small businesses that have a good idea and who only need a small grant to get started. The first project was assessed by LAG NORD to represent a significant risk, but with a high growth potential. The support from LEADER played a critical role in getting things off the ground.

"I think it's impressive what you can get out of very little. A small portion of feed is actually enough to breed 2 000 crickets, which have a sales value on the market for me as a wholesaler of 59 EUR"

Martin Dahl to DR (Denmarks Radio)

Additional sources of information

n/a

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