

Collaboration between Research and Industry in insect sector

Case study



Christophe TRESPÉUCH

MUTATEC, a historical and reference player in the European insect sector

A structuring precursor of the insect sector in Europe (member of IPIFF)

Since 2015, MUTATEC produces insect proteins for animal feed, with a **local and sustainable business model**

R&D Centre (insect nutrition and zootechnics, product quality and safety, applications)



Reference shareholders:
SEDE (VEOLIA Group)
and **LE GOUessant**

Since 2022, operates a **demonstrator industrial plant** in Cavillon (Vaucluse, FRANCE)

In the **Top 3 producers in France since 2018**, drawing the interest of main feed and petfood players

MUTATEC produces insect proteins in circular economy

Our farms rely on a **short and circular agricultural model**: reasonable size, inputs collected locally within 50 km from the farm.

Low carbon emitter

Unique **expertise** in the supply, preparation and blending of a wide range of agricultural and food losses to feed insects, thanks to the characteristics of the **Black Soldier Fly**.



Our model **addresses food losses** (30% of world's production), and **does not consume inputs usable for food production**

In 2023, MUTATEC valorized **3'700 tons of food losses** to produce 450 tons of insects, processed into Insect Meal, Insect Oil and whole popped dried larvae

Case study: EU funded project Horizon 2020

21	10	8	48
Partners	European Countries	Million Euros	Months

Bioconversion of underutilized resources into next generation proteins for food and feed

Call for projects: H2020

Start: October 2019

Duration: 4 years

Cost: 9.4 M€

Funding: €8.0 million including €339 K for MUTATEC

Scope: Microalgae, single-celled proteins and insect proteins for food and feed

MUTATEC Objectives: Product features for Aqua and Poultry. Improvement of environmental impact.

Partners: 21.



Case study: EU funded project Horizon 2020

From a pilot scale to industrial scale

From Châteaurenard (1st pilot)

1 breeding “aviary”

1 zone for the substrate preparation & transformation

20 kg of insect meal / week



To Caumont-sur-Durance (2nd pilot)

- 3 breeding “aviaries”
- 1 zone for the substrate preparation
- 1 zone for the transformation
- 150 kg of insect meal / week



Case study: EU funded project Horizon 2020

How were the fundings used? From pilot to industrial scale



Construction of DEMOTEC, industrial demonstration farm



Heat treatment machine equipped with shelves



PAP Processing workshop completed

Case study: EU funded project Horizon 2020

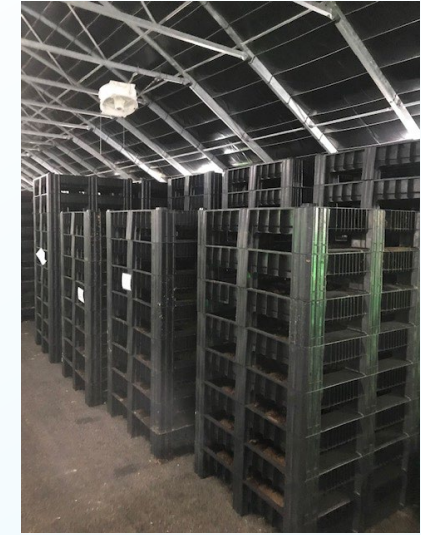
How were the fundings used? From pilot to industrial scale



DEMOTEC



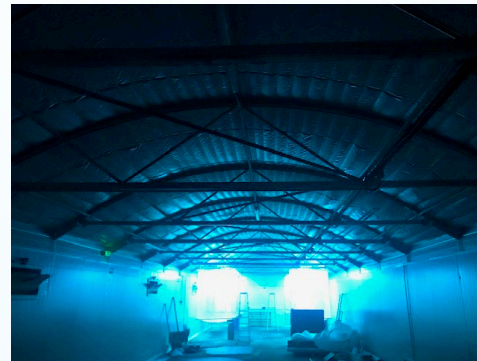
Automatized line



Insect farming trays



Substrate preparation



Insect farming building



Processing zone

Case study: EU funded project Horizon 2020

21	10	8	48
Partners	European Countries	Million Euros	Months

Main Research Partner: University of Bologna (IT).

Product delivered:

2020 + 2021: 650 kg meal

Sea bream in experimental station

Salmon in experimental station + field test

2022: 700kg meal

Broilers in experimental stations

2022: 4'000kg meal

Mediterranean fish in field trials

2022: 2'500kg meal

Turkeys in field trial



Case study: EU funded project Horizon 2020

Process optimization: modification of some equipments

Communication, Publications and lectures about results

- Articles:

- MUTATEC social networks
- All About Feed, <https://www.allaboutfeed.net>
- World Aquaculture Magazine www.was.org
- Aquaculture Magazine <https://aquaculturemag.com>
- Poultry World <https://www.poultryworld.net>

- Presentation and poster in international events:

- EAAP 2023, Annual meeting of European Federation of Animal Science, Lyon (FRA) <https://www.eaap.org>
- Aquaculture Europe 2023, <https://aquaeas.org>.
- IFW 2024, Singapour
- EAAP 2024, Firenze (ITA)

Amadori

June 2024

NEXTGEN
PROTEINS

Black soldier fly meal inclusion in broiler and turkey diets: effects on growth performances, meat quality and health

Presented by Christophe TRESPÉUCH

MUTATEC
Bioconversion by insects

C. Guidou¹; C. Trespeuch¹; F. Sirri²; A. Bonaldo²; F. Ceccaroni³; B. O. Smáráson⁴; M. Zampiga²

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naturAlleva

MOWI

Aquascot

matís

June 2024

NEXTGEN
PROTEINS

Black soldier fly meal inclusion in seabream and salmon diets: effects on growth, fish quality and health performances

Presented by Christophe TRESPÉUCH

MUTATEC
Bioconversion by insects

C. Guidou¹; C. Trespeuch¹; A. Bonaldo²; L. Parma²; S. Busti²; F. Brambilla³; L. Martinez Rubio⁴; A. Davie⁵; B. O. Smáráson⁶

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Case study: PINHS Project



Poultry fed with Insects: Nutritional, Health and Sustainability benefits

Call: France FUTUR ELEVAGE & INSTITUT CARNOT

Funding requested: €251,127 for 3 years.

Start: March 2020.

Objective: to evaluate the effects of the use of BSF in broiler feed through a multidisciplinary approach.

- Characterization of BSF Products
- Life Cycle Assessment
- Effects on broilers

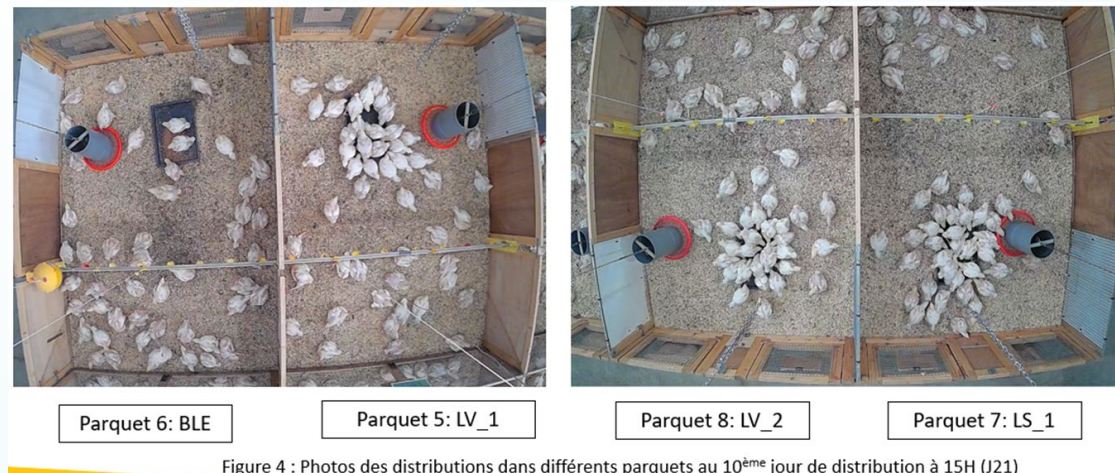
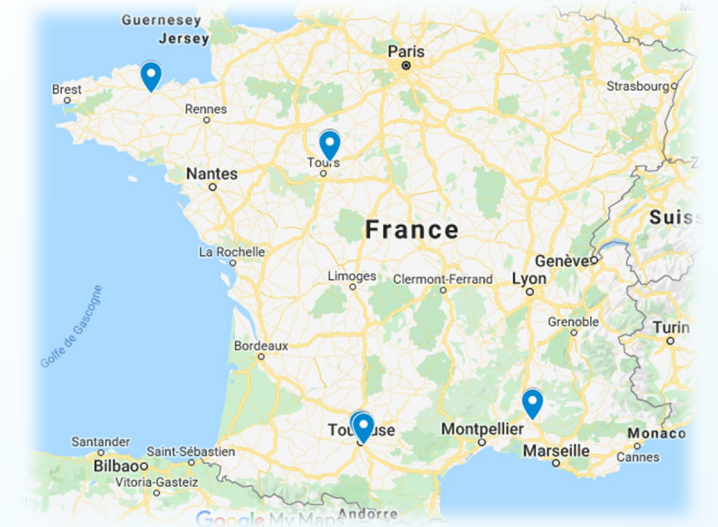


Figure 4 : Photos des distributions dans différents parquets au 10^{ème} jour de distribution à 15H (J21)

Case study: PINHS Project

3 years, Research French partners

Focus on broiler

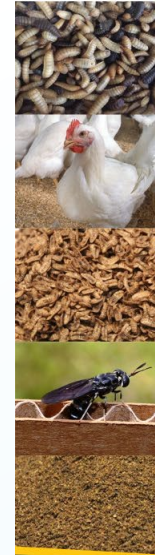
- 1 - Digestibility
- 2 - Welfare (BSF as enrichment material)
- 3 - Performances (zoo. ; meat ; health)

3 BSF products:

- defatted meal
- whole dehydrated larvae
- whole live larvae

Exploitation & Dissemination:

- MUTATEC social networks
- Scientific articles
- Presentations and posters in international events:
 - EAAP 2023, Annual meeting of European Federation of Animal Science, Lyon (FRA) <https://www.eaap.org>
 - IFW 2024, Singapour



Black Soldier Fly products inclusion in broiler diets : effects on animal performance, meat quality, health, and welfare



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Case study

University of Avignon (FRA)

- Contribution to PhD: Eco-extraction of insect ingredients
 - Innovation & patents
 - Articles

University of Torino (ITA, Pr L. GASCO):

- Regular cooperation since 2017 (Trials on trouts, AQUAEXCEL....)
 - Presentations in scientific events
 - Articles

ONIRIS

- New substrates

IPIFF

- New substrates, Nutritional and health benefits

Miscellaneous demands from Research Centers in Europe

Contracted investigation services

Failures

- Too short deadlines, too many partners, no leader, miss of innovation (similar project already financed), collapse of a partner...



Collaboration between Research and Industry: main results

30 tests in experimental stations and field conditions.

25+ scientific publications

Trouts (FRA, IT, POR), shrimps (ECU, EU), salmon (NOR, UK), sea bream (IT, CRO), Poultry (FRA, IT), Petfood (FRA, IT)

Contributes to in-depth technical knowledge of products

CertiFLY Program: 5 health certificates obtained from the authorities

Commercial launch

Aquaculture, Petfood, Ornamental animals and Poultry.

Products commercially used in FRA, IT, SWI, NOR, GER, SLK.

Knowledge gaps: Benefits on health prevention: microbiota, immunity, etc...

Knowledge gaps: Use of new substrates (former foodstuffs containing meat and fish, catering waste)

Key points to remember

An **experienced coordinator** in call and fundings

A **leader** able to define **scientific priorities**

Well **defined scope**



Should fit and support **strategic plan**

Reasonable and feasible **applications**

Mind **Intellectual properties** issues

Realistic and respected **timelines**

Collaboration between Research and Industry in insect sector



Case study

<http://mutatec.com>

<https://www.linkedin.com/company/mutatec>

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