



GOSPODARKA OBIEGU ZAMKNIĘTEGO



INSECTUM

Closing loops for organic waste by innovative technologies using BSF insects

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September 19th, 2018



In composting since 2010



INSECTUM



**VŠĮ ŽIEDINĖ
EKONOMIKA**

www.circulareconomy.lt



The problem



NETHERLANDS

541

POLAND

247

FRANCE

136

SLOVENIA

72

(Estimates 2010)

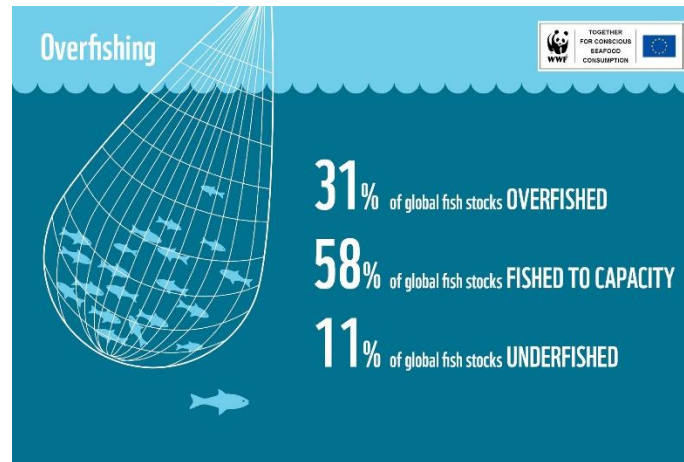


The problem II



70 % of forest loss due to agricultural deforestation.

EU - large soy importer.



About 40 % of Baltic Sea - overfished



Eutrophication in Baltic Sea



Hierarchy



Good example:

French law regarding supermarket waste:

1. Prevention
2. Donation
3. Feeding animals
4. Composting or energy



Why Black soldier fly?

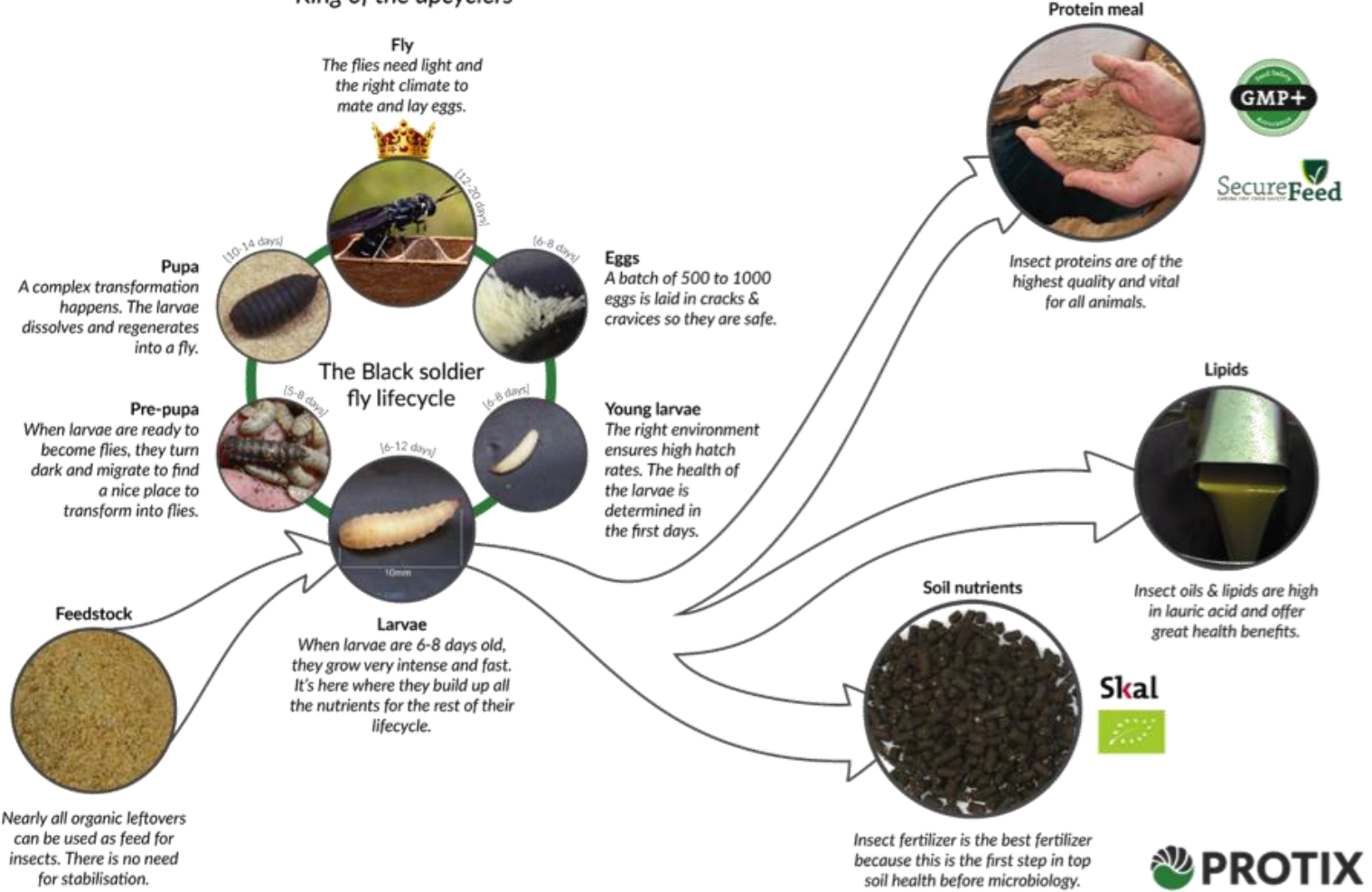


Ultimate eating machine



Black soldier fly life cycle

The BLACK SOLDIER FLY King of the upcyclers



BSF larvae uses



As live



As frozen

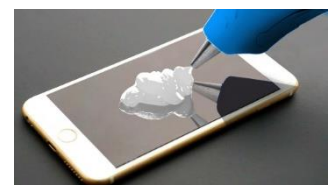


As dried



As larvae meal

As fat



BSF larvae frass uses



Insectum – first in EU to certify insect frass as suitable for organic farming

Organic matter	78 %
Organic carbon	41 %
N	1.5 %
P	0.5 %
K	1.4 %



BSF remaining uses



Flies



Puparium

Chitin & Chitosan:

- Agriculture
- Biocontrol
- Filtration
- Winemaking
- Bioprinting
- Weight loss



Cycle closes



Food production:
Agriculture,
Aquaculture,
poultry



**Supermarkets
Restaurants
Kitchens etc.**



Food consumption



Black soldier fly



Food Waste



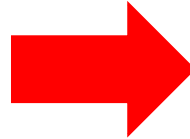
BSF and UN sustainability goals



Limits

Substrates

- ✓ Plant source
- ✓ Former food incl. dairy and eggs
- ✗ Former foodstuffs
incl. meat and fish
- ✗ Slaughterhouse product
- ✗ Animal excrements
- ✗ ...Others

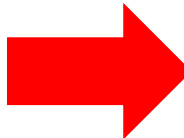







Black soldier fly larvae



Limits II

Black soldier fly larvae



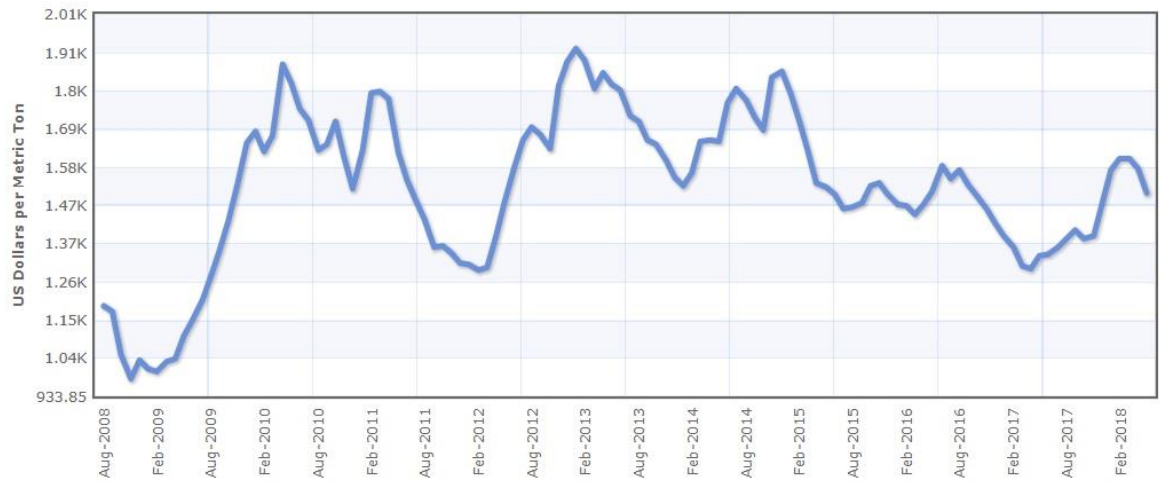
Species	Protein	FAT
	✓	✓
	✓	✓
	✓	✓
	✗	✓
	✗	✓



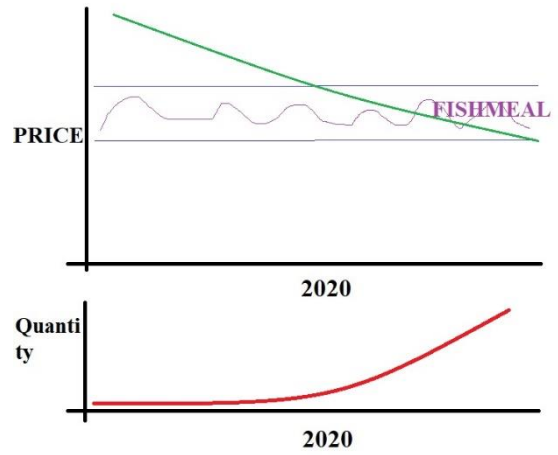
- 90000 t if 10 % of fish meal replaced
- 70000 t if 1 % of broiler feed in the Netherlands is replaced
- 800 t if 1 % of high quality suckling pig feed in the Netherlands is replaced



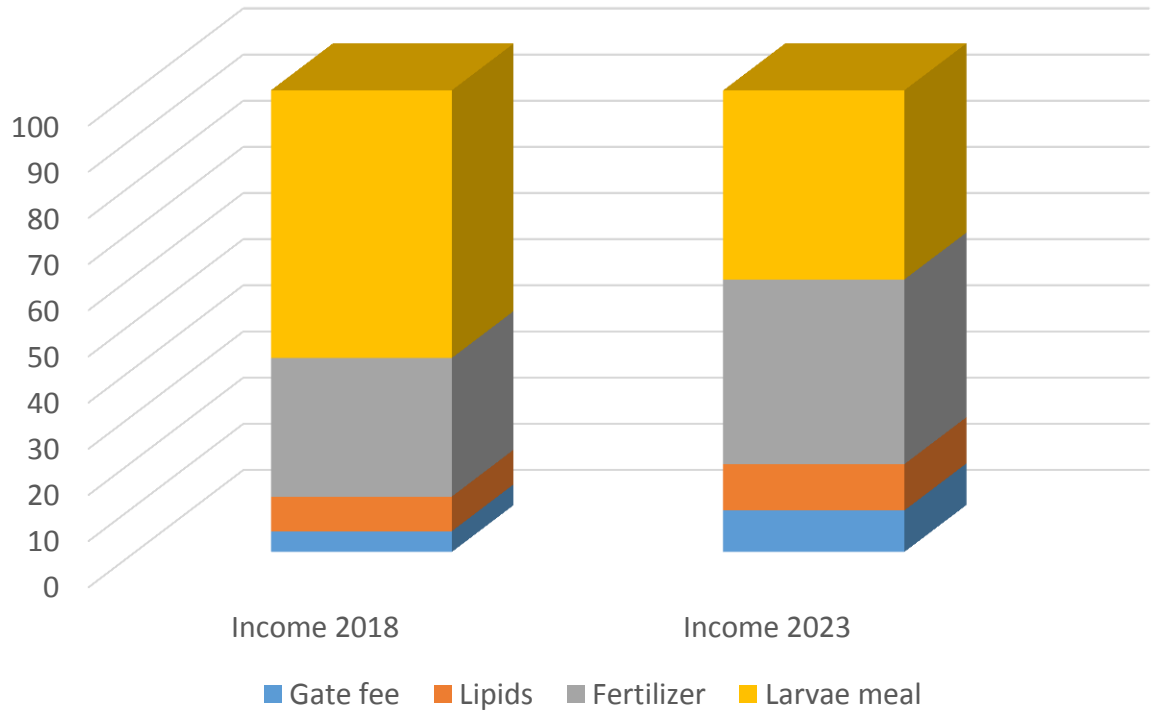
Economics II



Fishmeal price at September 2018:
1380 USD
1180 EUR



Income from Larvae growing, %



Insectum story



2016



2017
5 kg/day



2019
1500 kg/day



Where does it fit?



Mondello et al (2017) LCA for Retail food waste (1 t.)

BSF	-419.61 CO ₂ eq.
AD	-299.46 CO ₂ eq.
Composting	59.25 CO ₂ eq.



At the end – you are a solution

<p>EAT MORE PLANTS Enjoy vegetables and whole grains.</p> 	<p>EAT A VARIETY OF FOODS Have a colourful plate.</p> 
<p>WASTE LESS FOOD One third of food produced for human consumption is lost or wasted.</p> 	<p>MODERATE YOUR MEAT CONSUMPTION, BOTH RED AND WHITE Enjoy other sources of proteins such as peas, beans and nuts.</p> 
<p>BUY FOOD THAT MEETS A CREDIBLE CERTIFIED STANDARD Consider MSC, free-range and fair trade.</p> 	<p>EAT FEWER FOODS HIGH IN FAT, SALT AND SUGAR Keep foods such as cakes, sweets and chocolate as well as cured meat, fries and crisps to an occasional treat. Choose water, avoid sugary drinks and remember that juices only count as one of your 5-a-day however much you drink.</p> 





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Thank you!
Questions?



Let's make the future fly!