



BugBox Ltd.

Edible Insects Mass Rearing Technology and Software

Presentation

Key problem – **too much manual labor force!**

Thailand cricket farms

(method used worldwide)

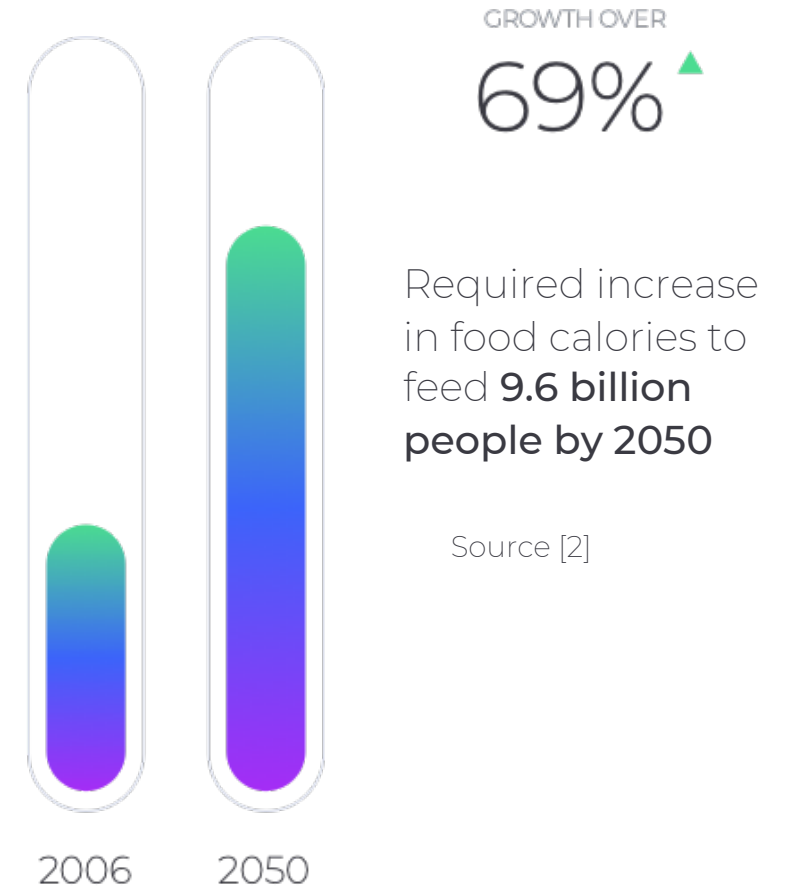


annual production capacity of one farm - 375 kg/av



Global market demand for meat is growing

Urbanization, population growth and a rising middle class lead to **greater meat consumption**



The edible insects market up **to 70%**

Achieving more than **\$1,2 billion by 2022**

The highest growth will come from the sale of coated edible insects - **85%**

Global prices for insect protein powder for a food

Asia



2016 summer: **\$ 10-13 / kg**

2019 summer: **\$ 29 / kg**

Thailand Unique

Source [5.1]

North America



2016 summer: **\$ 49 / kg**

2019 summer: **\$ 100 / kg** ▲

ENTOMOFARMS

Source [5.2]

Europe



2016 summer: **€ 55 / kg**

2019 summer: **€ 330 / kg** ▲

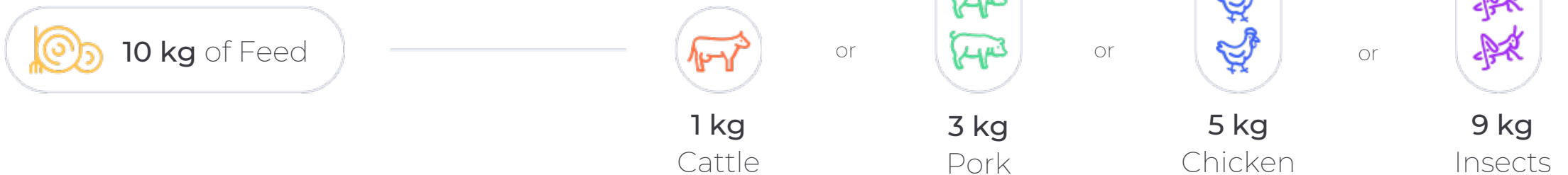
KRECA / PROTI-FARM

Source [5.3]

Price difference is mainly based on achieved quality standards and followed safety requirements for a human consumption

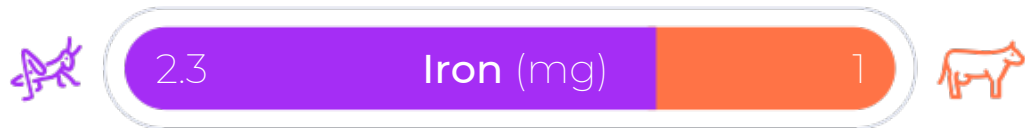
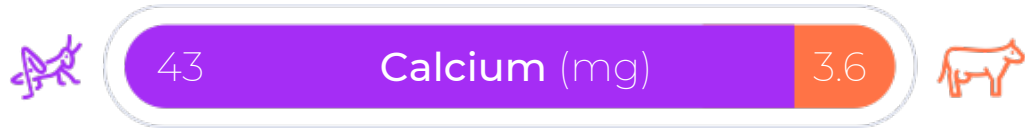
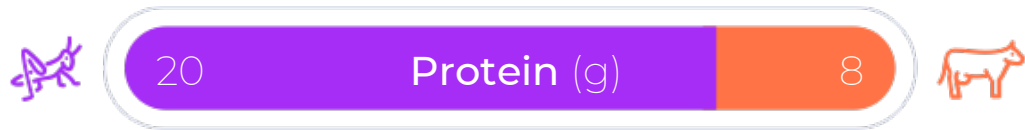
Animal based amino acids – **only alternative are edible insects**

Insects are the most **effective & sustainable** source of nutrition



Animal based amino acids – ecological footprint

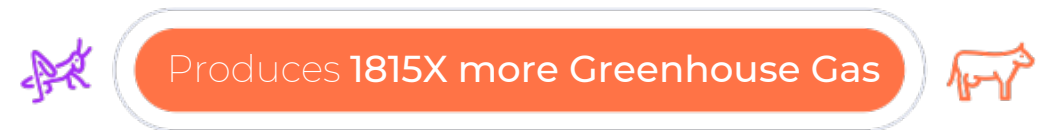
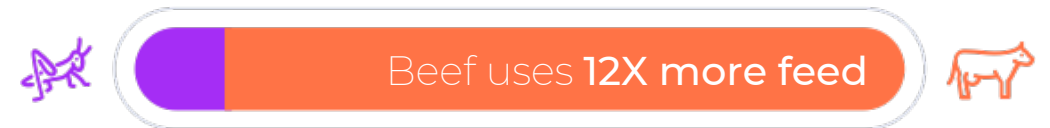
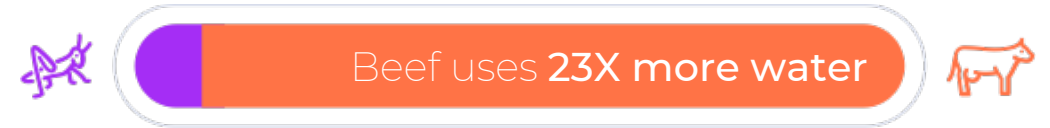
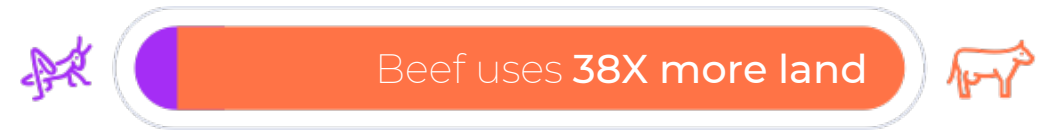
Nutrition



 30g Acheta Whole

 30g Beef

Environment



Species farmed in artificial conditions for feed & food

for Feed



Mealworm
Tenebrio molitor



Black Soldier Fly
Hermetia illucens

for Food



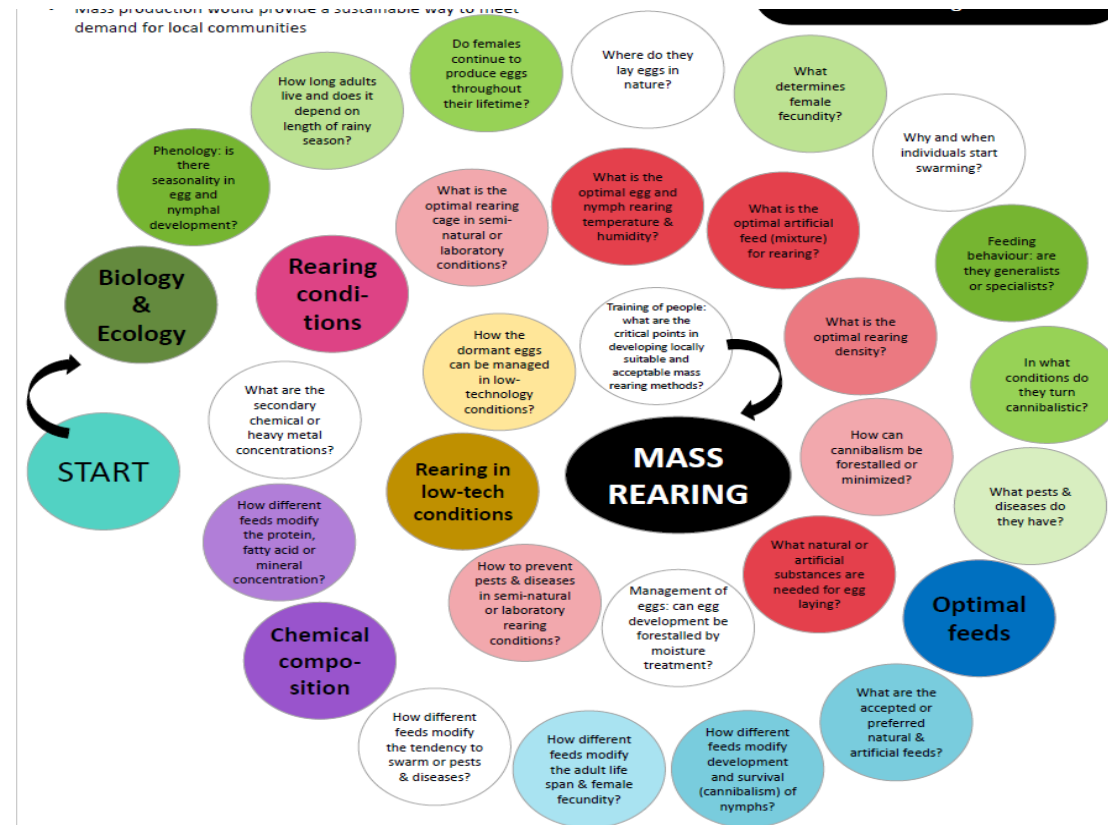
Crickets
Acheta domesticus
and other crickets



Grasshoppers
Ruspolia differens and
other grasshoppers

species BugBox is focusing

We know how to rear edible insects (*Orthoptera*) in big scales





Our technology creates new insect industry standards

Business model

we franchise or lease:

- **fully automated edible insect mass-rearing & production factory**

we sell:

- mass-rearing “REACTOR” ’s
 - fully automated
 - manually operated
- ecological bio-mass - insect powder & oil, fertilizer

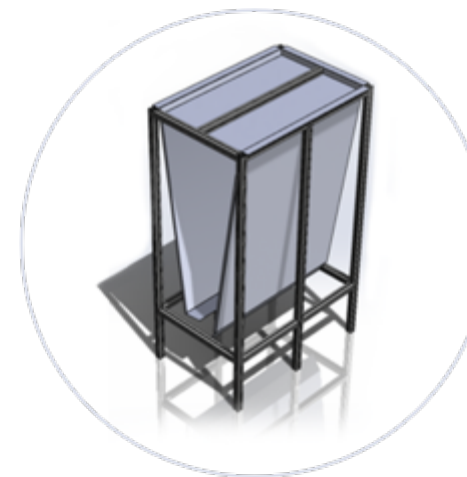
we charge monthly fee* for:

- maintenance
- software use

we collect all the data from sold factories

* fee is related on production capacity of production unit

BugBox innovative solution – mass-rearing “REACTOR”



Autonomous & closed environment allows to control & standardize:

- watering
- feeding
- cleaning
- lights
- temperature/moisture system
- eggs laying & hatchery system
- extinction of insects
- transport to production
- weight
- up to 100 000 insects in one REACTOR (10m³)
- production - 1,2T/annually (WW*)
- suitable for different (*Orthoptera*) species
- easy cleaning, sterile
- durable
- no side effects to insects
- cost effective solution
- **one FTE can operate up to 100 reactors**

Our own software runs all automated systems as

- feed for insects
- every rearing REACTOR
- hatchery
- entire rearing farm
- production unit

- **it's easy to scale** - up to 1000 reactors
- **software secures IP for technology**

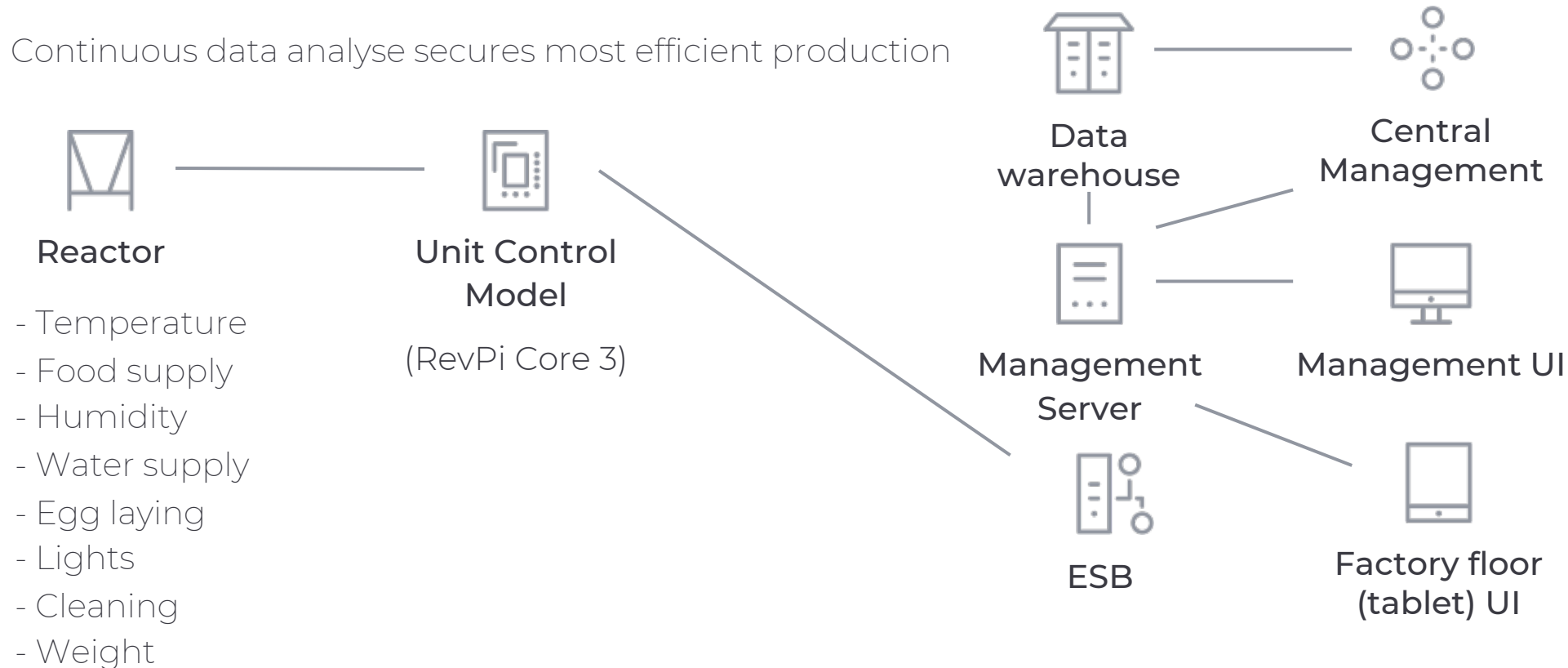
* wet weight



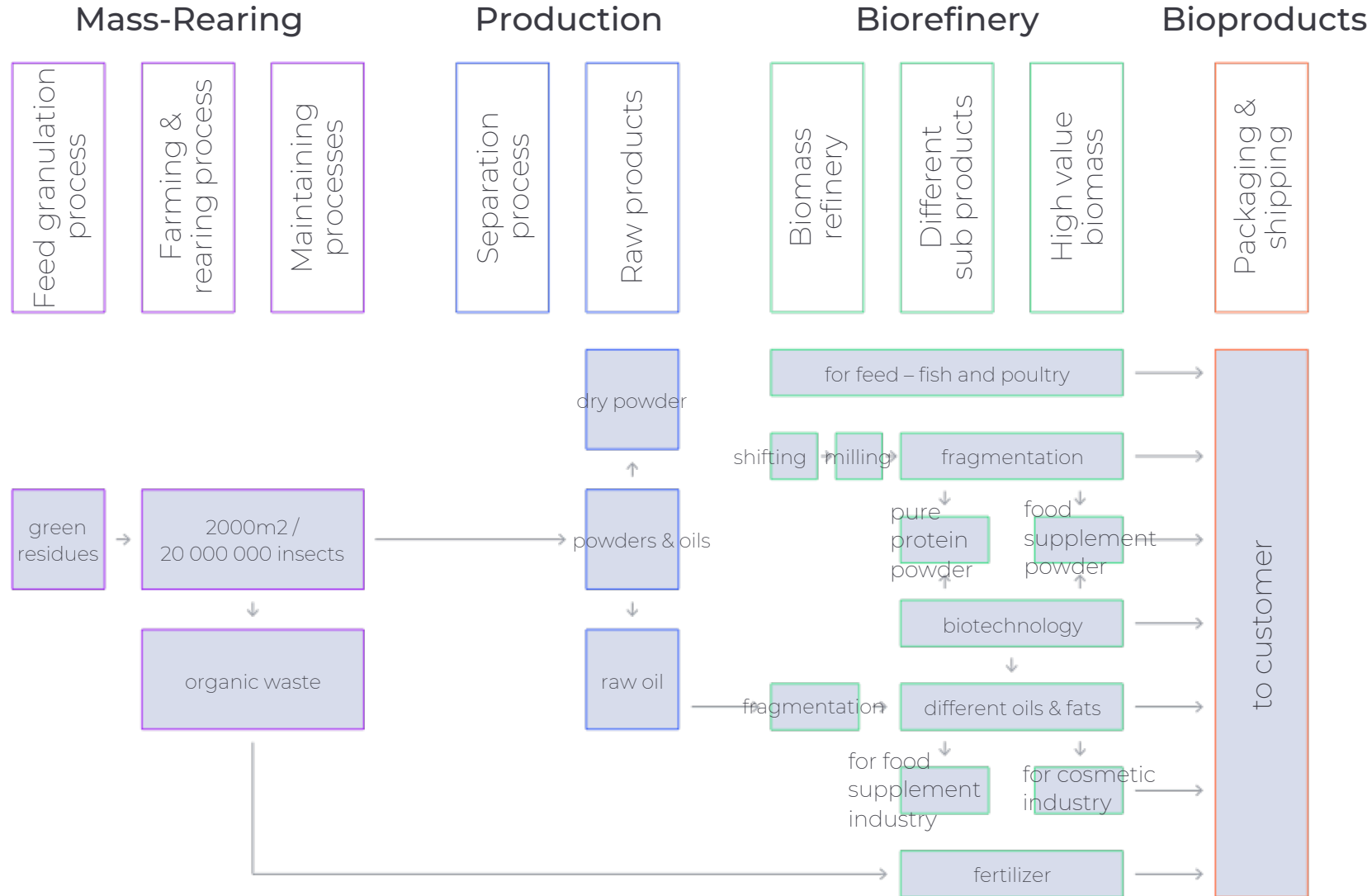
We measure everything!

Factory & “REACTORS” are **fully controlled by own software** which contains the best knowledge* of mass rearing of edible insects

Continuous data analyse secures most efficient production



* based on our own 5 years experiments in our R&D labs and the best global practises



Winner of *ClimateLaunchpad* Estonian competition 2016



Core team

Erlend Founder
CEO

Heikki Co-founder,
entomologist,
Prof. of East Finland
University, Finland

Philip biologist, East-African
business development
Prof. of Makerere
University, Uganda

Tõnis engineer,
“REACTOR” & production
line development, factory
automatization

Siim IT architect,
software development for
automatization

Kätrin nutritionist, CFFT expert,
B2C product development



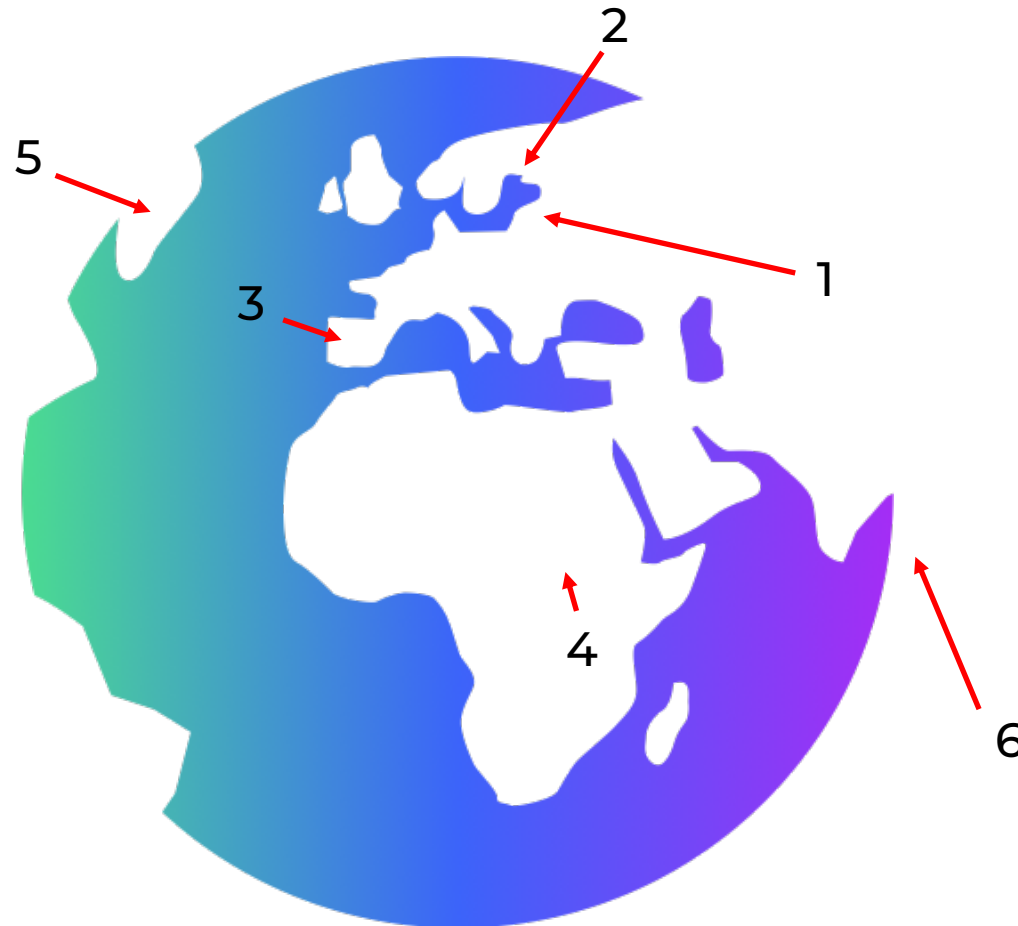
Investors & Advisors

**Paulo
Andrez** former president of EBAN
(European Business Angel Network)

**Ivar
Siimar** former president of EstBAN
(Estonian Business Angel Network)



Our current R&D locations



1. ESTONIA
R&D center, technology solutions,
software development
2. FINLAND
entomology research & test center
3. PORTUGAL
first planned experimental rearing
plant & factory
4. UGANDA
entomology research & tests field
laboratory
5. CANADA
cooperation partner for B2C products
6. INDONESIA
cooperation partner for a farming

Insect powder based B2C products developed by *BugBox*

Ready recipes:

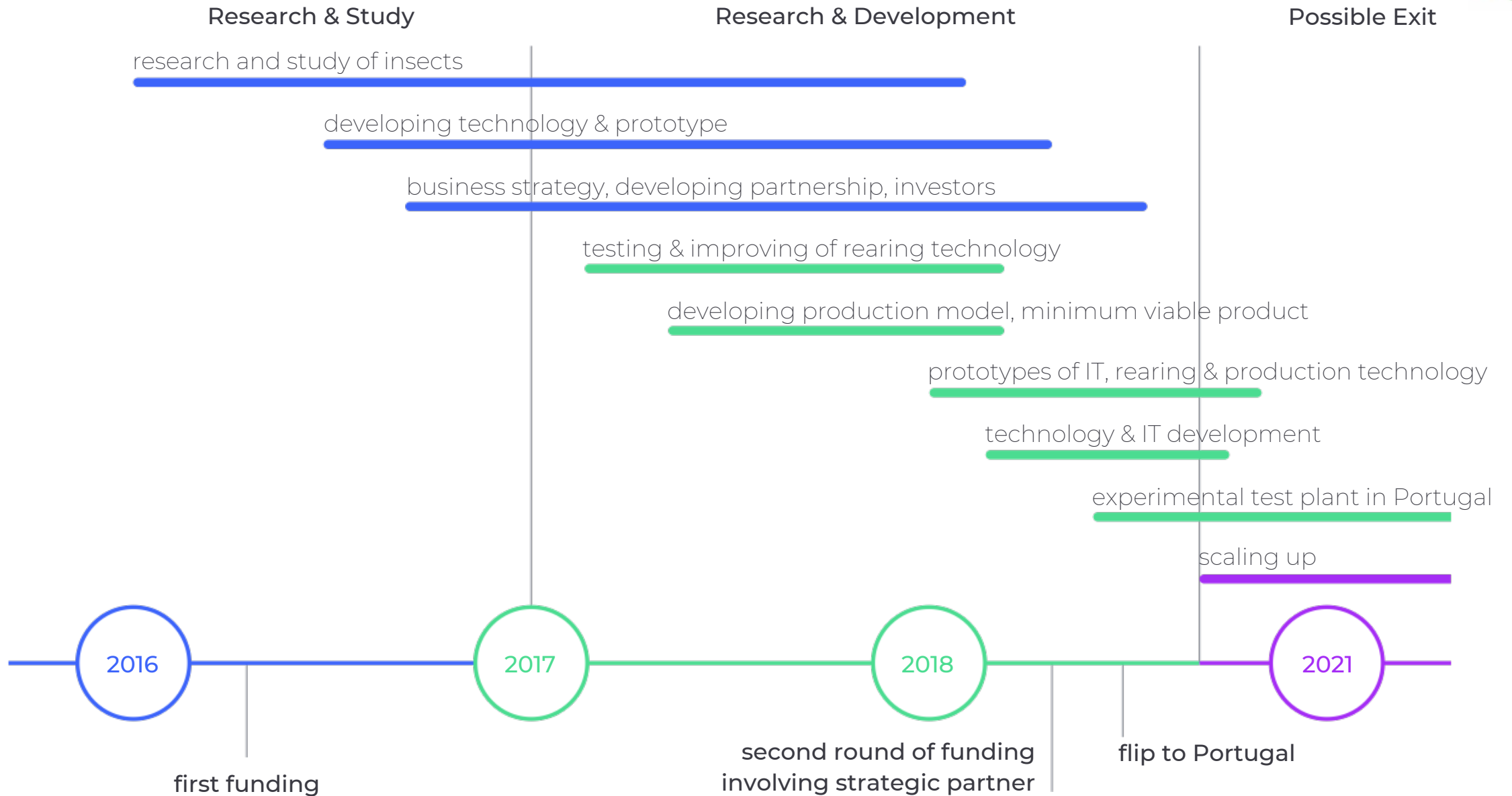
- cookies
- gingerbread
- wholegrain snacks
- morning crisps
- white chocolate with crickets etc

Under development:

- pasta products
- pet food
- fish & poultry feed



Timeframe





Contact

BugBox Ltd. – Estonia 🇪🇪

Insect Biomatrix Lda – Portugal 🇵🇹

Erlend Sild

CEO & Founder

erlend@bugbox.ee

erlend@insectbiomatrix.com

tel: +372 510 0889

skype: erlendsild

www.bugbox.ee

Sources

Source [1]: Wageningen University 2016

<http://www.wageningenacademic.com/doi/abs/10.3920/JIFF2017.0018>

Source [2]: <http://ow.ly/rpfMN>

Source [3]: <https://arcluster.com/global-edible-insects-market-projected-to-grow-70-percent-through-2016-2021/>

Source [4]: <https://www.statista.com/statistics/882321/edible-insects-market-size-global/>

Source [5.1]: <https://www.thailandunique.com>

Source [5.2]: <https://ca.entomofarms.com/collections/cricket-powder>

Source [5.3]: <https://www.krecafood.com/insect-powder/crickets/>