

HOW TO:

DEVELOP

THE THAI CRICKET INDUSTRY

TOWARDS

SUSTAINABLE

FOOD SUPPLY CHAINS



GLOBAL BUGS



European
Commission

★ SEAL OF ★
EXCELLENCE

*Certificate delivered by the European Commission,
as the institution managing Horizon 2020,
the EU Framework Programme for Research and Innovation 2014-2020*

The project proposal 859107, **EntoPark**

**The largest automated insect breeding farm based
on vertical farming under controlled environment**

Submitted under the Horizon 2020's **SME instrument phase 2**
call **H2020-EIC-SMEInst-2018-2020 (H2020-SMEInst-2018-2020-2)** of 9 January 2019
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SME instrument

by

Global Bugs Holding

Tappgränd 19
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following evaluation by an international panel of independent experts

**WAS SCORED AS A HIGH-QUALITY PROJECT PROPOSAL
IN A HIGHLY COMPETITIVE EVALUATION PROCESS***

This proposal is recommended for funding by other sources since Horizon 2020 resources available for this specific Call were already allocated following a competitive ranking.

* This means passing all stringent Horizon 2020 assessment thresholds for the 3 award criteria (excellence, impact, quality and efficiency of implementation) required to receive funding from the EU budget Horizon 2020.

Corina Cretu,
Commissioner for
Regional Policy

Carlos Moedas
Commissioner for Research
Science and Innovation

Brussels, 05/03/2019



Global Bugs Asia Co., Ltd.

The COVID-19 pandemic has visible implications on the well-functioning of agriculture and other sectors directly involved in food production activities (e.g. declining agricultural workforce or heavily disrupted supply chains) – **including on the insect production sector.**

The European Green Deal initiated by the European Commission sets out how to make Europe the first climate-neutral continent by 2050. It maps a new, sustainable and inclusive growth strategy to boost the economy, improve people's health and quality of life, care for nature, and leave no one behind.

This pamphlet has its purpose to describe the benefits and necessities for Thailand to take the leading position in South East Asia when it comes to producing alternative and sustainable proteins based on crickets.



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INTRODUCTION

From innovative biocontrol enterprises to ingenious food and feed pioneers, several industrial projects have emerged around the globe (e.g. Southeast Asia, US and Canada). Presently, Europe is a leader in terms of industrial and technological advancement in the area of insect production, with one exception, Global Bugs Asia in Thailand.

Global Bugs Asia promoted by the Board Of Investment (BOI) with its head office located in Bangkok and the production unit placed in Prachuab Kirikhan is managed by a team of senior Thai and Swedish entrepreneurs with the aim to become one of the largest cricket producing companies in the world bringing Asian traditions of entomophagy with Swedish high tech solutions together, presenting the EntoBox solution, the heart of the EntoPark cricket production and processing in Thailand.

Our novel methodology lies in the EntoBox, a cricket cultivation box with 7 subsystems designed to facilitate all stages of the breeding cycle, resulting in higher egg success rate, doubling the harvesting cycles per year (10 cycles vs. 5):

The EntoBox represents a real paradigm shift in the cricket's rearing systems. Conceived to be vertically stacked in 6 boxes per pallet at a total height of 9 meters, it allows for automatic internal transportation using AGV's taking 6 boxes at the time from the farming area to the process area.

Therefore, EntoBox allows to drastically upscale the production (750 kg/m²-350 tonnes) per year and ensure uniformity and quality in a closed production environment.

NEEDS AND STRATEGIC INTELLIGENCE

The COVID-19 pandemic has visible implications on the well-functioning of agriculture and other sectors directly involved in food production activities (e.g. declining agricultural workforce or heavily disrupted supply chains) – including on the insect production sector. The European Green Deal initiated by the European Commission sets out how to make Europe the first climate-neutral continent by 2050. It maps a new, sustainable and inclusive growth strategy to boost the economy, improve people's health and quality of life, care for nature, and leave no one behind.

For Thailand, this could open up tremendous opportunities for the cricket industry to become a world leader of cricket production and export of cricket powder as a sustainable and alternative protein source, but it is also surrounded with high demands from EFSA, the European Food Safety Association.

The Farm to Fork Strategy is at the heart of the Green Deal. It addresses comprehensively the challenges of sustainable food systems and recognises the inextricable links between healthy people, healthy societies and a healthy planet. The strategy is also central to the Commission's agenda to achieve the United Nations' Sustainable Development Goals (SDGs).

All citizens and operators across value chains, globally, should benefit from a just transition, especially in the aftermath of the COVID-19 pandemic and the economic downturn.

A shift to a sustainable food system can bring environmental, health and social benefits, offer economic gains and ensure that the recovery from the crisis puts us onto a sustainable path. Ensuring a sustainable livelihood for primary producers, who still lag behind in terms of income, is still essential for the success of the recovery and the transition.

The COVID-19 pandemic has underlined the importance of a robust and resilient food system that functions in all circumstances and is capable of ensuring access to a sufficient supply of affordable food for citizens. It has also made us acutely aware of the interrelations between our health, ecosystems, supply chains, consumption patterns and planetary boundaries.

It is clear that we need to do much more to keep ourselves and the planet healthy. The current pandemic is just one example.

The increasing recurrence of droughts, floods, forest fires and new pests are a constant reminder that our food system is under threat and must become more sustainable and resilient.

Typhoons and floods are becoming more intense and frequent as Thailand and the rest of Southeast Asia bear the brunt of climate change.

Long coastlines and heavily populated low-lying areas make the region of more than 640 million people one of the world's most vulnerable to weather extremes and rising sea levels associated with global warming.

Governments are under pressure to act quickly or risk giving up improvements in living standards achieved through decades of export-driven growth.

Southeast Asia faces a dual challenge. It not only must adapt to climate change caused largely by greenhouse gases emitted over decades by advanced economies—and more recently by developing economies such as China and India—it also must alter development strategies that are increasingly contributing to global warming.

The region's growing reliance on coal and oil, along with deforestation, are undermining national pledges to curb emissions and embrace cleaner energy sources.

FOOD PRODUCTION IS RESPONSIBLE FOR ONE-QUARTER OF THE WORLDS GREENHOUSE GAS EMISSIONS

To help reduce the environmental and climate impact of animal production, avoid carbon leakage through imports and to support the ongoing transition towards more sustainable livestock farming, crickets require far less land, water and feed to produce 1 kg of crickets, compared to e.g. 1 kg of cattle, pigs and chickens. Crickets have a high food conversion rate: crickets need six times less feed than cattle, three times less than sheep and pigs, and twice less than broiler chickens to produce the same amount of protein.

Crickets can be grown on organic waste and they require less land, water and energy for rearing. Besides, they emit less greenhouse gases (GHG) and ammonia than livestock and are low risk of transmitting diseases.

Therefore, a wider adoption of entomophagy (i.e. insect consumption) will help to alleviate growing pressure on the environment, ensure food and feed security and provide a healthy life for present and future generations.

In Europe, the EC will facilitate the placing on the market of sustainable and innovative feed additives. It will examine EU rules to reduce the dependency on critical feed materials (e.g. soya grown on deforested land and fishmeal resulting in overfishing) by fostering EU-grown plant proteins as well as alternative feed materials such as crickets.

Furthermore, the Commission is undertaking a review of the EU promotion programme for agricultural products, with a view to enhancing its contribution to sustainable production and consumption, and in line with the evolving diets.

In relation to meat, that review should focus on how the EU can use its promotion programme to support the most sustainable, carbon-efficient methods of livestock production. It will also strictly assess any proposal for coupled support in Strategic Plans from the perspective of the need for overall sustainability.

KEY AREA OF RESEARCH

A key area of research will relate to microbiome, food from the oceans, urban food systems, as well as increasing the availability and source of alternative proteins such as insect-based proteins, and also efficient cricket feed free from non sustainable protein sources as soy- and fishmeal.

Feed forms up to 70% of the cost of cricket production and hence is financially the single most important element in cricket husbandry.

The majority of Thai cricket farmers will face challenges in breeding crickets for export due to hard export and import regulations at the global market in general and especially to the fast growing EU market.

The European Food Safety Authority (EFSA) will implement the new EU Novel Food regulations at the end of 2020, where Global Bugs is an active part in the approval for crickets at the EU market through our participation in the Belgian Insect Industry Federation ([Biif](#))

Japan has the same hard regulations and the North American market will most probably implement similar regulations, thus making it harder to export than today.

Therefore, many farmers could support the growing alternative protein industry by also growing different kind of key ingredients for cricket feed such as cassava where the root is used for human consumption and the leaves for cricket feed. By doing this they will have two sources of income, crickets for the local market and markets in neighboring countries and feed ingredients for cricket feed for both domestic and international markets.

CRICKET FARMING

The growing demand for high protein food for sports nutrition, dietetic food or food supplements creates further opportunities. Currently the use of cricket-derived ingredients in such specialized products is a niche, but it is forecasted to develop rapidly in the next few years. Furthermore, the development of the cricket as food market in general and especially on the new and fast growing markets in EU and North America, will be driven by accessibility, consumer acceptance and sociocultural evolution.

For the APAC region, we see an increased interest from large enterprises in the food production sector to boost the nutrition content in traditional asian food such as instant

noodles and dumpling skins. Presently they contain few nutrients and high amounts of sodium and MFG.

Our cricket powder contains more calcium than milk, more magnesium and nearly twice as much iron than spinach, twice as much phosphorus and vitamin B12 than tuna and more potassium than beet greens. The powder also contains 19 amino acids including all essential 9, where the content of the vital acid Lysine is 3.24% which is equal to a ribeye steak found on the 10th place of the 200 foods highest in Lysine. On top of this, the powder contains twice as much vitamin B3 than beef and nearly twice as much vitamin B2 than almonds (source: My Food Data).

Our Cricket Powder originates from our own farmed crickets, grinded into 100% pure powder. Our farm and process factory are both certified for highest food safety according to GAP and GMP/HACCP, respectively and will also receive certification by the BSCI (Business Social Compliance Initiative).



Global Bugs cricket powder used in pasta, pizza, bread, etc., above and Japanese ramen noodles below.

