

THE DIFFERENCES BETWEEN:

CRICKET

PROTEIN POWDER AND

PROTEIN POWDER FROM

WHEY



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
in the area of **EIC-SMEInst-2018-2020**

SME instrument

by

Global Bugs Holding

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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.

With Global Bugs cricket powder and its recent line of protein bars, it's becoming clear that the very idea of what constitutes a "protein source" has shifted radically during the past 3 years. It's not just soy vs. whey anymore. Savvy consumers are being offered a portfolio that the health-conscious of even ten or twelve years ago couldn't begin to understand.

This pamphlet has its purpose to describe the differences between whey protein and cricket protein, not only in figures but also in medical terms.



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INTRODUCTION

Many countries in the tropics have long looked to insects for protein. Crickets are a complete protein meaning they contain all of the essential amino acids the body is not able to produce and must get from the diet. They are also naturally gluten free¹ and high in fibre. Cricket powder is made by drying whole crickets and grinding them down to be used for food additives, supplemental nutrition, just like our own Proothie protein bars. This means they are minimally processed, easier to digest and don't contain harsh chemicals.

Using crickets for nutrition purposes confer several advantages not only in terms of environmental impact, but also in terms of potential health benefits.

As opposed to beef and pork, crickets have less animal fat content. Science has unambiguously concluded that animal fat is less healthy than the non-animal derived fat contained in nuts and certain fruits such as avocado.

Introducing crickets as a food ingredient into the diet as a substitute for animal protein, hence lowers the detrimental heavy load of traditional unhealthy animal fat contained in beef and pork.

Crickets have healthy fat and contains the same omega-6 to omega-3 ratio as sardines.

¹ Depending if the cricket feed contain gluten or not

The list starting at page 6 below offers a helpful comparison of whey protein concentrate and Global Bugs 100% cricket powder.

The detailed amino-acid composition of cricket protein is also more favourable than that of beef and pork. The content of Leucine is of particular interest and is clearly lower, where beef has 2945 mg/100g, pork has 2185 mg/100g compared to whole crickets that have 6 mg/100g.

The amino-acid Leucine stimulates pathways that are linked to growth (including cancer) and ageing (IgF1 and mTOR pathway). Plant protein is sufficient to serve the demands of Olympic athletes and contains only small amounts of Leucine. Cricket protein contains more but the commonly used dairy protein from Whey contains clearly more, about 50%.

Inhibition of the mTOR pathway is linked to increased rejuvenation according to research conducted by Valter Longo, USA.

It is not surprising that this observation has attracted a lot of interest in view of the quest of youth perpetuated by many in modern civilisations. Moreover, a Nobel prize was awarded to Yoshinori Ohsumi 2016 for the revelation of the sophisticated process of autophagy that leads to rejuvenation of cell components.

The wear and tear of cellular processes inevitably leads to cell damage and autophagy is therefore a mechanism by which the cell literally can revitalise and replace old components with new and younger ones.

As mentioned, the inhibition of the mTOR pathway plays a key role in autophagy. And since this pathway is stimulated by the amino acids Threonine, Serine and Valine it should

obviously be an advantage if protein sources aimed for adult individuals contain less amounts of these amino-acids.

Compared with Whey protein, Cricket protein does indeed contain significantly less of these amino acids, shown below.

The data for Global Bugs cricket powder comes from a comprehensive laboratory test done by the Belgian laboratory Celabor as demanded by the European Commission in order for our products to be approved for export to the EU market.

Test item	Global Bugs Crickets	Whey	Units
Amino Acids			
Lysine	3.24	5.59	%
Methionine, (Methionine sulfone)	0.92	1.28	%
Cyst(e)ine, (Cysteique acid)	0.51	1.55	%
Aspartic acid	4.90	6.52	%
Threonine	2.21	4.14	%
Serine	2.65	3.09	%
Glutamic Acid	6.53	11.08	%
Proline	3.44	3.56	%
Glycine	3.22	1.11	%
Alanine	5.62	3.01	%
Valine	3.37	3.67	%
Isoleucine	2.38	4.03	%
Leucine	4.22	6.34	%
Tyrosine	4.93	1.69	%
Phenylalanine	2.29	1.94	%

Histidine	1.38	1.23	%
Arginine	3.91	1.53	%
Tryptophane	0.56	1.64	%
Nutritional data			
Energetic value	426.71	405	Kcal/100g
Energetic value	1783.65	1694	KJ/100g
Carbohydrates	0.33	5.0	g/100g
Sugars	0.33	5.0	g/100g
Proteins	71	75.4	g/100g
Fat	15.17	7.5	g/100g
Saturated fatty acids	5.46	3.0	g/100g
Mono-unsaturated fatty acids	3.57		g/100g
Poly-unsaturated fatty acids	6.14		g/100g
Fibers	12.92	0	g/100g
Sodium	0.99	0.5	g/100g
Vitamins			
Vitamin A	<1	0	mg/kg
Vitamin B1	0.06	0	mg/100g
Vitamin B2	1.86	0	mg/100g
Vitamin B12	22.6	0	µg/100g
Vitamin B3	10.8	0	mg/100g
Vitamin C	<50	0	mg/kg
Vitamin E alpha-tocopherol	4.14	0	mg/kg
Vitamin E gamma-tocopherol	9.49	0	mg/kg

Vitamins and minerals are much less, if existing at all, in whey protein. We have not found reliable data that shows any content of vitamins or minerals in whey protein powder.

Crickets have a high content of vitamin B12, where crickets are much superior to most insects that generally have insignificant amounts of this particular vitamin.

Crickets do also contain significant amounts of minerals such as:

Heavy metals, minerals and trace elements	Global Bugs Crickets	Unit
Ca	1393	mg/kg
Cd	<0.05	mg/kg
Fe	64	mg/kg
K	10627	mg/kg
Mg	1073	mg/kg
P	8690	mg/kg
Se	0.5	mg/kg

