



Image. MarcinZ83 in Pixabay, 2022.

The Nutritious Taste of the Food of the Future

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This problem situation was written by Jesús Rodrigo Rocha Martínez (rodrigo_rocha@tec.mx) and Jessica Romero Plasencia (jessica.romero@tec.mx), with the purpose of serving as discussion material in the classroom; it does not intend to illustrate good or bad administrative practices. This document was elaborated from secondary sources.

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A Natural Future

Malnutrition is a problem for Humanity. Nearly one third of the world's population lacks regular access to adequate food, and the number is on the rise. In fact, “Zero Hunger” is the Sustainable Development [Goal number 2](#) (United Nations, n/d). To add to that problem, most animal-derived protein sources are related to negative environmental consequences such as soil erosion, excessive water consumption and generation of undesirable greenhouse gases (Gómez, 2019).

Image. Climate change has affected the production of water and food.



Source. Marion in Pixabay, 2014.

With the purpose of promoting a healthy nutrition while respecting the environment, entrepreneurs Alejandro de la Brena, Cristina Clocchiattim and Francisco Pérez came up with the idea of using crickets (*Acheta domestica*) as a protein source. That is how Griyum is born. While they were students at Tec de Monterrey in 2016 they developed a business model to produce and sell cricket flour. Since then, their enterprise, Griyum, operates with success in Queretaro and Guanajuato Hstates in Mexico. Their insect processing technology lets them produce flour out of crickets, an almost tasteless flour that behaves as its wheat counterpart (Website of Griyum, s/f).

Alejandro de la Brena comments: “To produce 1 kg of flour, 15 thousand crickets are needed. To solve this challenge we developed a controlled production system, where the crickets grow in habitats that we provide and eat what we know is good. When they reach the last stage of growth, we put them in the cold and, because they are cold-blooded, they stop their metabolism and convert to the highest quality nutrients. It is easy to say but this took us almost 3 years and many many sleepless nights” (Website of Griyum, s/f).

“Once we had the system we began to produce, but we did this with allies. With the support of public institutions such as SDAyR, we passed on our cultivation technique to a group of 25 producers in rural communities so that they could start their own cricket breeding business and we integrated them as edible cricket suppliers to produce Griyum Flour” (Website of Griyum, s/f).

Green Entrepreneurship

It is true that cricket flour is expensive. Nevertheless, its protein content is superior to other traditional sources. It contains 65g of protein per 100g of flour, against the 10g traditional wheat flour provides or the 26g that 100g of beef have¹ (Castellanos, n/d). Because its protein is high quality and comes with fiber, it is easily digestible. Besides, the production “of cricket flour results in 25 times less deforestation, emits 100 times less polluting gases, and requires 2,000 times less water than the same amount of livestock protein” (Bathgate, Rae, 2021).

The purpose of the organization is to nourish Mexico. To achieve so and after three years of struggle, Griyum co-founders came up with an optimal way to operate a cricket farm in Rincon Ojo de Agua, a rural community in Queretaro State. They opted for a business-to-business (B-2-B) model to sell the produced flour to companies that make and sell high protein products. Consequently, they developed other small producers in the states of Queretaro and Guanajuato to become their providers, becoming socially responsible by doing so (De la Brena, 2018).

Currently they make sure to have an impact in the food system, climate change, wealth of small producers and nutritive value of processed food. Along with the production of crickets and its flour, their processes include growth technology transfer, methodology, training, and technical support (Website of Griyum, s/f).

“One of the great dilemmas of our time is how we will secure and provide plentiful, healthy and nutritious food for all”.

(Fanzo, 2015)

A Challenging Hop

Despite their nutritional value, the role of insects as edibles has to pass certain barriers, such as public acceptance and liking. Changing such stigma is a big challenge for companies like Griyum.

Besides the acceptance by the market to eat an animal perceived as a pest, the edible insects’ industry faces an additional obstacle. The lack of regulation specifically addressed to the use of insects as food constitutes a barrier for the industry growth. Even in Mexico, even though insects are eaten since centuries ago, there are no Official Mexican Standards -Normas Oficiales Mexicanas (NOMs)-specific for the regulation of insect food. In Argentina, on the contrary, there is an interest in adding cricket flour to foods, but insect food is not yet covered by the national Food Court (Lähteenmäki, 2020).

The production and commercialization of edible insects must comply with certain safety and preservation standards, as those stated by the Food and Agriculture Organization (FAO).

For more information click [HERE](#)

As Niranjana (2023) points out: "between 35% and 60% of the dry weight of insects is made up of protein. The lower end of the range is higher than most plant protein sources and the upper end is higher than meat and eggs. Insects are better than cattle at converting calories in their food into calories in their body. They also reproduce quickly and gain weight quickly."

The consumption of edible insects is on the rise. The edible insects’ industry will be worth 8 billion Dollars in 2030, according to Barclays (Taylor, 2019).

“It has been estimated that the edible insect industry will be worth more than \$360 million in the next five years – so it looks like cricket protein powder is here to stay” (Dr Henry, s/f).

¹ Per comparison purposes, 100g of egg have 12g of protein.

The future of insect farming is so promising that even the Food and Agriculture Organization of the United Nations (FAO) published an article called [Insects for food and feed](#) in 2012 which elaborates on the ideas that Forestry Department is looking to recognize traditional livelihood practices and that sustainably managed habitats is unfolding into a broad based effort to look into the multiple dimensions of insect gathering and rearing.

An Uncertain Destiny

As the market switches from a stigmatizing to a demanding one, Griyum faces a dilemma to choose among alternatives to strengthen and expand its business.

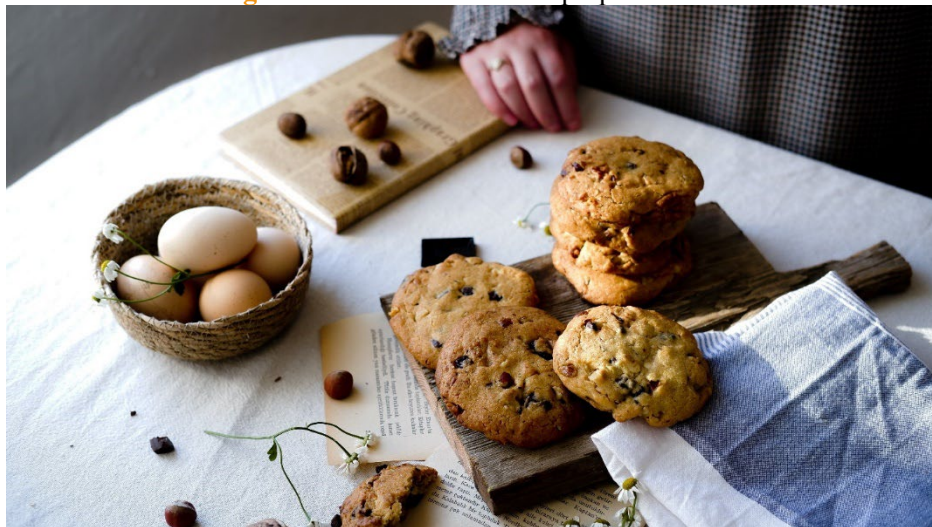
In the hypothetical case in which the company decides to hire an advisor, who helped it grow, should consider, the potential growth in alternate uses for the cricket flour. Namely the use for animal feeding can imply a wide market where it can be easier to overcome the current stigmas against insect eating.

The company could keep betting on insect powder (flour) for human consumption. Their business-to-business model has still a wide field to keep growing in Mexico. This alternative implies to continue developing new providers, probably conducting risk assessments to prevent them.

Another option is to diversify their products. Continuing with their cricket farming, Griyum could widen their offer to include whole insects and/or insect meals. The company knows the route to research and develop new technology and they can keep doing so.

In the future, Griyum may increase the number of cricket farms in its network and explore a business-to-consumer (B-2-C) product line.

Image. Cricket flour is used to prepare cookies.



Source. Beytlik in Pexels, 2022.

As a consultant, what strategy would you recommend to help Griyum become a highly valuable enterprise in 2050 by providing insect based food and having a positive impact in the environment? What would be the action plan to execute that strategy? Which indicators could help monitor the development towards a successful future?

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