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Editorial: Insects: A source of safe and sustainable food?

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Editorial on the Research Topic

Insects: A source of safe and sustainable food?

Insects represent a promising source of animal proteins for food and/or feed. In recent years, interest in using insects has grown considerably based on the increasing number of research papers being published, and the growing number of insect farming operations and processing plants being developed. FAO backed the launch of research programs for insect farming in developing countries and promoted communication campaigns that raised western interest in this food and feed source. Efforts to innovate methods, scale up farming, and introduce derived products into different market channels are now blossoming around the world. Each country is developing models to exploit the potential of different insect species within its own research and business environment. This special issue showcases examples of different models to utilize insects in both human foods and animal feeds. [Anankware et al.](#) reviewed the scientific literature to collect information about the nutrient composition of five edible insect species of socio-economic importance in West Africa: *Hermetia illucens* (black soldier fly), *Musca domestica* (house fly), *Rhynchophorus phoenicis* (African palm weevil), *Cirina butyrospermi* (shea tree caterpillar), and *Macrotermes bellicosus* (African termite). The goal was to discuss the potential of these species in the fight against malnutrition. [Ayieko et al.](#) studied the scientific literature available on western consumer perceptions of insects as food in order to define a potential strategy to exploit traditional insect-based foods in the local hospitality industry. [Grabowski et al.](#) discuss two major concerns surrounding insect exploitation in western countries: safety and sustainability. Safety is an essential prerequisite for a substance to be considered as food. Most western countries require a pre-market scientific assessment to establish safety. Sustainability is the main reason many new businesses are investigating and promoting alternative sources of animal proteins. [Meza-Cureño et al.](#) from Mexico discuss the nutritional potential of a local edible grasshopper species (*Sphenarium purpurascens*) with a known local market share. They considered its fitness for both food and feed. The authors also discuss reasons to prioritize the use of this insect as human food. [Galecki et al.](#) discuss the potential use of

insects as sources of alternative animal protein for feed purposes in Poland. They started with a list of species of interest and conclude that *Tenebrio molitor* and *Hermetia illucens* are the most suitable for sustainable production systems.

As the present issue shows, broadening the use of insects as food offers a feasible means to address famine and malnutrition and increase family incomes in developing countries. Increasing the use of insects as food also can reduce harvesting pressure on wild species, preserving biodiversity. Insects provide high levels of protein, and the food products derived from insects are relatively cheap and easy to produce. In these countries, a small-scale business model requiring minimal initial investment is a prerequisite for broad adoption.

In the western world, insect farming and production can reduce the environmental footprint of animal husbandry; the environmental footprint for raising insects is lower than for other animals, and thus provides a positive impact on climate change. The key is to develop businesses in the context of Sustainable Development Goals. A large-scale farming model can minimize production costs while increasing yields, however, consumer acceptance is the main limitation.

In addition to considering insects as food, the western world is learning about the advantages of using insect proteins as feed. This application does not conflict with consumers' squeamishness about eating insects directly, nor with competitive businesses such as animal farming. This option has the potential to drastically reduce food production costs. At present, the main limitation is the lack of legislation permitting farmed insects as a feed substrate. While these two paths are synergic, they also have different aims that must be preserved.

There are risks ahead: a competition between animal and human food sources might arise, and those industries might exploit a low-cost workforce for the benefit of western economies and consumers. Having different target insect species in the two production models could help avoid these pitfalls. Synergies based on training and information sharing should be supported between the production systems to facilitate the development of safe and efficient supply chains.

Author contributions

JK has conceptualized and written the editorial. All authors contributed to the article and approved the submitted version.

Conflict of interest

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