

# Can edible insects *really* reduce our ecological footprint and save wild species?

In 2013, the Food and Agriculture Organization of the United Nations published a report on edible insects. It argued that increased insect consumption could combat problems inherent in the global food system – ecological degradation, malnutrition and food insecurity – and reduce humanity’s ecological footprint (van Huis *et al.*, 2013).

The authors highlighted advantages of insects over conventional livestock for meeting protein demand. Insects are poikilotherms, metabolizing organic matter without using it to maintain body temperature, and so the efficiency with which they convert feed to human-edible matter is higher than that of mammalian or avian livestock. They require little land or water compared to vertebrates, are less likely to transmit zoonotic infections (owing to their genetic distance from humans), and emit relatively small amounts of greenhouse gases (GHGs). If GHG emissions, land use and water use are the aspects of food production that we need to address, insects seem to be a good option.

## Edible insects in practice

However, the above claims are based on a combination of science and scientifically based speculation. The need for the latter exists because there are few commercially viable insect production systems for which data on GHG emissions, land use and water use are available. The data that do exist are non-uniform: while some do suggest that insects can be produced at a lower cost to the environment than conventional livestock, others put insects on a par with poultry in terms of their environmental footprint (Dobermann *et al.*, 2017).

## The importance of feed and geography

The key to low-ecological-impact insect production probably lies in the feed that is used to rear them, and in the geographic location of rearing facilities. Grain-based feed has a substantial ecological footprint, and is the main contributor to the overall ecological impact of insect livestock. Insect rearing necessitates high temperatures and humidity, which require energy to maintain. Given a scenario in which insects are fed on commercial feed and kept alive via high-energy climatic regulation systems, the ecocentric action we should all be taking, I believe, is clear: eat more plants, particularly since using crops destined for livestock feed as human food instead could greatly reduce ecological impacts (Clark and Tilman, 2017). This scenario is pertinent because legislation dictates approved feed for livestock, forcing facilities rearing insects for food or feed to use commercial livestock feed.

Yet many insects are generalist feeders and can be raised on food waste, which does not bear the same ecological burden (van Huis and Oonincx, 2017), and insect rearing facilities based in warmer regions are likely to have comparatively lower energy usage. A clear understanding of the food safety implications, and clearer legislation, are needed, but it is conceivable that insects reared on waste streams in tropical climates could be approved as food. In such a scenario, incorporating insects into our diets as a conscious replacement for livestock will certainly reduce our ecological footprint.

## The bigger picture

The rationale behind ecological footprints is that reduced individual GHG emissions,

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land use and water use will bring benefits to the planet. However, for this to happen in practice, changes to the food system such as the promotion of edible insects must be accompanied by other measures. A more sustainable food system from the perspective of humans and livestock should combat structural inequality, empower producers, improve animal welfare and control antibiotic use. A more sustainable food system for the planet as a whole should also include a conscious effort to directly address ecological damage, preserving the ecosystems that remain and reclaiming for nature land that has been spared (Lamb *et al.*, 2016).

### Should we be eating edible insects now?

Edible insects have a better potential for being an sustainable choice than other forms of animal protein. To realize this potential, it is imperative that their introduction into the wider food system is accompanied by legislation and policy that explicitly prioritize reduced ecological

impact through the use of food waste as feed, the preservation of habitat, and the regeneration of wild nature in reclaimed land. Until this happens, I think that a plant-based diet – perhaps with the occasional insect- or poultry-based treat – remains the most ecologically sustainable choice. ■

### References

- Clark M and Tilman D (2017) Comparative analysis of environmental impacts of agricultural production systems, agricultural input efficiency, and food choice. *Environmental Research Letters* **12**: 064016.
- Dobermann D, Swift JA and Field LM (2017) Opportunities and hurdles of edible insects for food and feed. *Nutrition Bulletin* **42**: 293–308.
- Lamb A, Green R, Bateman I *et al.* (2016) The potential for land sparing to offset greenhouse gas emissions from agriculture. *Nature Climate Change* **6**: 488.
- van Huis A and Oonincx DG (2017) The environmental sustainability of insects as food and feed. A review. *Agronomy for Sustainable Development* **37**: 43.
- van Huis A, Van Itterbeeck J, Klunder H *et al.* (2013) *Edible Insects: Future prospects for food and feed security* (FAO Forestry Paper 171). Food and Agriculture Organization of the United Nations, Rome, Italy.

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