

# Hakuna Matata: are insects the future of food?

*Winning article in the Science Communication Competition by Imogen Allen, University of Reading*

Zoonoses, antibiotic resistance, emissions: animal consumption is a triple threat. COVID-19, said to originate from a meat market, has killed over 350K worldwide already<sup>[1]</sup>. As the pandemic rages, destroying lives and livelihoods, it is only natural to consider more sustainable options for feeding growing populations: would farming insects mean no worries, or precipitate the end of our days?

## **'Slimy, yet satisfying'**

As Simba discovered in *The Lion King*, insects are more palatable than they initially appear. Furthermore, insects like crickets, palm weevil larvae and mealworm have been assigned healthier Nutrient Value Scores than beef or chicken<sup>[2]</sup>. As regards sustainability, it is comforting that the FAO (Food and Agriculture Organisation of the United Nations) suspects risk of zoonotic infections passing from insects to humans would be lower, as they are taxonomically more distant than conventional livestock<sup>[3]</sup>.

Furthermore, per kilo of digestible food, cows require 12-14 times more land and feed than insects. They also emit five times more carbon dioxide per kilogram of body mass gain and require 56 times more water per gram of protein produced<sup>[4]</sup>. Not only do they eat less, insect agriculture could actually regenerate inedible waste, converting 1.3bn tonnes of biowaste per year into edible food<sup>[3]</sup>.

## **'Ew, gross'**

Perhaps, however, Simba's initial reaction is not entirely unfounded. Currently waste-fed insects are only used for feed<sup>[5]</sup>. We simply do not know the pathogenic, allergenic and contaminant risk consequences of trillions of insects eating billions of tons of biowaste<sup>[6]</sup>. Insects are vectors of 'medically relevant pathogens' so zoonotic infections could arise



without stringent safety controls<sup>[3]</sup>. As the FAO notes, *'intensive insect rearing facilities will also be subject to the same pressures exhibited in animal production'*<sup>[3]</sup>.

Risks would also be apparent in the intensive treating of insects with antibiotics required to control infectious disease. Antibiotic-resistant bacteria are already one of the biggest threats to global health, food security and development<sup>[7]</sup>. Swapping vertebrates with insects will not eradicate the need for antibiotics<sup>[8]</sup> or their potential for misuse.

Add to this the risk of accidental release. Corn, beans and alfalfa in Mexico are already routinely attacked by the grasshopper *Sphenarium purpurascens*<sup>[9]</sup>. *Schistocerca gregaria*, a desert locust, has also been estimated to destroy crops to the value of US\$2.5bn and hundreds of thousands of tons

of grain<sup>[10]</sup>. Swarms of escaped insects could lead to ecological catastrophe and have knock on effects on other parts of the food supply system. Biocontainment, safety controls and processing biowaste to ensure nutritional consistency could prove resource intensive and expensive, but getting it wrong could be fatal<sup>[5]</sup>.

## **An alternative, problem-free philosophy**

Unlike Simba, most humans do not need animal protein. Balancing legumes, nuts and seeds can adequately meet our protein requirements<sup>[11]</sup> with less public health risks. Wealthy economies would not need insect agriculture if we stopped feeding 36% of the world's crop calories to animals, cut out animal waste and emissions, and put plants directly on our plates<sup>[12]</sup>.