Too hard to swallow?

Feeding ourselves – and doing so sustainably – are challenges faced around the globe. With the need to find protein alternatives and more options on our doorstep, insects are being touted as a good solution for people, animals and the environment.

As world population increases, so too does the demand for food, especially meat. Unfortunately, traditional livestock production is exasperating water and land resources and will not, experts say, be able to meet future needs. Food scientists are certain that entomophagy – the human consumption of insects – can.

Insects are high in protein, fat and mineral content; they also grow quickly, require minimal space and can be reared on waste streams, including edible by-products from the food industry. And, nearly two billion people around the world – notably in Asia, Africa and Latin America – already consume more than 2,000 different types of insects, most of which are consumed or sold locally in street markets.

Insects are already a natural part of the diet of pigs, poultry and fish, and can, in certain countries, also be used in animal and pet food. This frees up natural resources and diverts more grain to human consumption – good news, given it’s estimated that a third of the world’s cereal production is currently fed to animals. Using insects in feed also minimizes fishmeal production and therefore the impact of overfishing. Processed insects also have applications in medicine, cosmetics and alcohol.

INSECTS AS FOOD

Depending where you are, the legal path to bring insect-based foods to market ranges from simple to more complex. In the UK, U.S., Australia, New Zealand and Canada edible insects fall under existing food regulations. In Switzerland, three insect species are approved for use in food. In 1997, the EU adopted the Novel Food Regulation, identifying as “novel” any food or food ingredient which had not been used for human consumption to any significant degree in the EU before May 15, 1997, including “food ingredients isolated from animals.” The vagueness of the language, which for example, made no reference to whole insects or ingredients from whole insects, led to diverse interpretations.

In 2015 the language was finally clarified to cover whole insects and their parts and defined the standards and authorization procedures for the commercialization of “novel” foods, with the law coming into effect in 2018. As a result, insect-based products, even those previously approved, had to be submitted for a safety review by the end of January 2019 before being placed (or placed again) on the EU market.

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How insects stack up to traditional livestock

<table>
<thead>
<tr>
<th></th>
<th>Beef 169 kcal</th>
<th>Pork 186 kcal</th>
<th>Chicken 152 kcal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>20.6</td>
<td>20.1</td>
<td>19.9</td>
</tr>
<tr>
<td>Fat</td>
<td>9.3</td>
<td>12.4</td>
<td>7.2</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>3.8</td>
<td>3.5</td>
<td>1.81</td>
</tr>
</tbody>
</table>

Figures represent averages as species and diet all affect the nutrition profile; Nutrient content per 100g edible portion.

Beef: Pork

According to Meticulous Research, even in the face of 2018 – with the U.S and Canada predicted to deliver the appearance, color and smell, then acceptance will be much higher. Only when they're processed will we see more widespread interest and insect-based foods becoming a sustainable industry.”

INSECTS AS FEED

The target audiences are generally categorized as: adventurous eaters, health-conscious consumers or sustainability-minded eaters, often between the ages of 18-35, with children aged 4-8 also showing significant interest.

The EU feed laws are relaxed, it’s likely this market will explode, as companies are already geared up to produce tons a day if necessary.

Given the slow adoption of edible insects, it seems likely that the feed side will move more quickly. However, learnings around rearing, processing and supply can be transferred to the food side, explains Sindermann:

“If you can process insects or insect larvae in such a way that you get a neutral protein source in terms of taste, appearance, color and smell, then acceptance will be much higher. Only when they're processed, will we see more widespread interest and insect-based foods becoming a sustainable industry.”

DIRK SINDERMANN, HEAD OF PROCESS TECHNOLOGY - RENEWABLE RESOURCES, GEA

To maximize their sustainability, insects will need to play a critical role in the circular economy by being reared on leftover crops, food, food by-products and other kinds of waste (e.g. manure). Where countries land on the pre- and post-consumer waste continuum remains to be seen and will no doubt be hotly debated, but it will help “offset” the relatively high energy used during rearing, which depends on warm, ambient temperatures.

Lastly, increasing urbanization and the mimicking of ‘Western’ values has caused some people to give up the practice of eating insects. A concerted effort is required to keep existing insect-eating traditions alive while continuing to promote it elsewhere – ensuring that early adopters have a positive experience. Changes in production and supply chain strategies will need to be explored to ensure new urbanites still have access to insect-based foods. Other watch-outs include: overexploitation, pollution, the use of pesticides and deforestation which need to be mitigated globally to safeguard existing insect populations.