

Questions asked during Webinar 17.11.20

Valuable insects: an emerging source of protein in Europe

Would the insects be able to be blended in products such as burgers etc. as a high protein boost?
This is one of the main goals of our current Valusect project. We are looking at ways to incorporate insect proteins into food formulations aiming to either replace other proteins sources, or increase the total protein content. Based on consumer surveys, we will be able to determine what kind of products are more acceptable for European consumers, so it could be burgers, sausages, bars, snacks...
Do insects have functional properties to help create a more meat like structure in plant based products like burgers and sausages?
Very interesting question. According to my experience, I have not seen reports on this but several techniques are available to imitate the meat protein texture, for example extrusion, 3D printing or the use of enzymes as transglutaminase. We are also exploring the functionality of insect proteins after being extracted and processed. So parameters as water and oil holding capacity will be determined, as well as emulsifying, gelling or foaming capacities.
Could you give some more examples of where revalorisation of meat products please?
If we look at our own research programme, we have developed processes to recover proteins efficiently from lungs, blood, hides, tendons, heart and pancreas; and from exudates or brines. Other research institutions developed similar processes to revalorise feathers, wool, hair or intestine and stomach. The vast majority are focused on obtaining purified proteins to be used as functional ingredients, material for bioplastics, and as sources of bioactive peptides or enzymes with industrial applications
Are insects regarded as farmed animals and how are these animals slaughtered humanely?
According to European legislation, insects are considered farmed animals and all the rules needs to be followed as per pigs or poultry. Most of processes include freezing as the most humane method for insect slaughter. Some other companies use shredding. The process does not take more than a second. Both techniques are approved by the Food & Agricultural Organisation (FAO).
Are any of your findings public? I am very interested on your research
At the moment we are working on two comprehensive reports studying two different topics: the use of food by-products as substrates and the impact of processing on nutritional, functional and safety properties of the insects. Once completed, these will be made available and also some scientific reports will be published in scientific journals.
From a sustainability perspective and looking at new trends in less processing of raw materials, how relevant is the separation of chitin fraction from protein fraction, since they appear to be forming a matrix difficult to separate. What is your opinion on this?
Several processes have been developed aiming to separate chitin from proteins. The use of alkalis or acids, or proteolytic enzymes have been tested successfully. It is very interesting to perform the cracking of the insects, since both fractions have very different applications and characteristics. From a sustainable point of view, fractionation will involve more resources than just using the whole insect; but the use of emerging technologies will help to minimise the use of resources to obtain such fractions.
How much feed do you need to grow insects? For example how much feed is needed for 1 kg of insects?

Based on the paper published by Raheem D, Raposo A, Oluwole OB, Nieuwland M, Saraiva A, Carrascosa C. (2019) *Entomophagy: Nutritional, ecological, safety and legislation aspects*. Food Res Int.; 126:108672; the amount of food input required to generate 1Kg of digestible mass from insects is of 2.1 kg for crickets. Which compared to 4.5 for chicken or 9.1 for pork, is quite low.

Once the EU novel food legislation has been passed, how long do you think it will take before new start-ups can begin using insects without going through the detailed application process?

Once the legislation has been approved, each company might have to submit their own claim, and to review and approve this may take around 12 -24 months.
But I am not an expert on the legislation part of the project, so the actual times may differ from my estimations.

How do you plan to collect the insects?

We have partners with excellent facilities to breed and rear insects under controlled conditions. These insects will be used for experimental trials and investigation. However, these cannot be used for sensory panels or to be tested by humans. For this purpose, we have accredited insect producers that will provide the insects we need for such analysis.

How are you planning to measure the sustainability of the insects in your project?

We will be looking at different aspects, for example mass balance and composition of the feed and the wastes generated. We will also monitor the use of water, and the emission of several gasses (e.g. CO, CO₂ and ammonia).
Since we are going to use only raw materials currently generated by the food industry, there won't be extra impact on acquiring the substrate for the insects. The whole idea is to reduce the amount of waste which has no further use and transform it into a final product that can be incorporated into the food chain.