

Innovating for sustainability

Nick Piggott, Co-CEO and Co-founder of insect meal producer Nutrition Technologies describes its beginnings and growth trajectories

Nutrition Technologies, a pioneer of sustainable agriculture in Malaysia, manufactures protein, oil, and organic fertiliser from black soldier fly (*Hermetia illucens*) larvae. Its zero-waste production model delivers insect-based products beneficial to pet food, livestock, and aquafeed industries. Through a blend of beneficial microbes and larvae, cultivated on traceable agro-industrial by-products, they have created an eco-friendly production system with minimal energy usage and zero waste.

Since its establishment in 2015, the company has grown exponentially, with a primary production plant in Johor Bahru and facilities in multiple locations. Research collaborations with regional institutions and a research partnership with Evonik drive product innovation, supported by investors like Sumitomo Corporation and Bunge Ventures.

Recent milestones include partnerships with Sumitomo Corporation for distribution in Japan and the launch of organic biofertilisers.

Nick Piggott and Tom Berry are Co-CEOs and founders of Nutrition Technologies. Nick brings entrepreneurial expertise from founding Coffee Couriers and program management experience from his work with the United Nations Population Fund (UNFPA) in Sierra Leone. Before co-founding Nutrition Technologies, Tom specialised in risk management at Salamanca Group and served in the British Army and the United Nations in Sierra Leone. Together, Tom and Nick leveraged their diverse backgrounds to propel Nutrition Technologies' mission of sustainable agriculture and environmental stewardship.

In this email interview, Nick Piggott explores the genesis of insect meal production in Malaysia, the sustainability initiatives and how Nutrition Technologies sets itself apart.

Exploring the genesis of insect meal production in Malaysia

AAP: What are the key drivers behind starting insect meal production in Malaysia?

Since starting the company in 2015 in Vietnam, Nutrition Technologies has expanded and grown. It now has the main production plant, laboratory and office at multiple sites in Johor Bahru, Malaysia, with supporting laboratories and offices in Vietnam and Singapore.

NP: We are strategically located in Malaysia, not only because it has the optimal natural conditions for breeding our tropical fly, but also because we have a great opportunity to make significant positive impacts and address several UN SDGs (United Nations Sustainable Development Goals) targets. This is possible through our zero-energy breeding and rearing models, reducing energy costs and associated emissions.

Malaysia also has a supportive regulatory environment, with strong oversight from the Department of Veterinary Services who supported us in being the first Asian producer to export insect meal to the European Union and a growing number of government policies, strategies



On how technology determines pricing strategies, Nick Piggott, Co-CEO and Co-Founder of Nutrition Technologies says, "We use zero energy and our overheads are lower compared to European manufacturers."

and roadmaps that align to promote Malaysian AgTech businesses and develop the local biotech ecosystem.

On the feedstock and scalability plans

What is your feedstock? Are there limitations regarding volume and scalability?

Our black soldier fly live in open-air cages outside our factory, happily breeding, and inside our warehouse, feeding on vegetables and grain by-products, including beer and coffee. Black soldier fly love coffee! Johor Bahru is the heart of food processing for Singapore, so we have extensive raw material options. We also use a lot of low-grade palm by-products that cannot otherwise be used for animal feed, so we are genuinely reclaiming nutrients that would otherwise be lost. Malaysia generates around 4 million tonnes of palm waste annually, so there's plenty of supply!

We do have plans to expand in the next year or so to a second factory (also in Malaysia) to keep up with the growing demand and to support Malaysia's ongoing quest for food security. The Prime Minister has been publicly pushing the AgTech agenda recently, so the timing is great for us.

What are the specifications of your insect meal, and what markets do you primarily target?

Our insect meal is made from 100% black soldier fly larvae, and we offer a range of specifications depending on the customer's application. For example, we sell a lot to the swine sector, which prefer a full-fat meal (based on the attractive fatty acid profile), but the aquafeed customers

generally prefer a defatted meal. The fatty acid profile is heavily weighted towards saturated fats (approx. 60%), with a high proportion of lauric acid and other MCFAs (medium chain fatty acids).

We are 2 years into a research partnership with Evonik, working on identifying the limiting amino acids in black soldier fly production and optimising the larvae's amino acid profile. So far, results are great. We also did a salmon feed trial with AB Agri in the UK in 2023 as part of a Horizon 2020 project and saw digestibility scores of 90.1% for crude protein, and 90% plus for almost all of the individual amino acids.

We sell mostly to livestock and aquafeed mills in ASEAN markets, as our company focuses on supporting food security, although we also sell to pet food manufacturers. In 2023, we released two new bio-fertiliser and disease-prevention products (Diptia and Vitalis) for the Malaysian agricultural sector, so we're also doing a lot of work in that area.

Where does Nutrition Technologies stand today, and what have been key milestones along the way?

As with any young, ambitious company, every time we meet a target, we set a new one, so we're always chasing something! We have met our factory utilisation and output targets, and we're now working on developing and launching new portfolio of products. We expect to have a new range of animal feed products in 2024, as well as expanding our range of plant health products and the markets that we can export them to, including Thailand, Indonesia, and the Philippines.

Technology determines pricing strategies

What distinguishes Nutrition Technologies from other players in the industry?

We use zero energy, and our overheads are lower compared to European manufacturers. Our broader portfolio of products means we benefit from economies of scope, meaning we can control the selling price of all of our products, as we have a wider revenue base than any other producer. On the production side, our fermentation technology enables us to use lower-grade raw materials that otherwise wouldn't provide sufficient nutrition to the larvae.

However, by growing bacterial biomass in the fermenter, we're effectively farming microbes to feed the larvae, to feed the fish, to feed the people!

Scale up and pricing dynamics

How do you plan to scale up operations, and what factors influence your pricing strategy?

We are developing plans for a second site in Malaysia already, which we expect to be operational in 2026. Using the same blueprint as we have today minimises risk, and we have very forward-leaning investors and regulators here in Malaysia. We have always shied away from charging a 'sustainability supplement', where we sit in the value chain, any additional costs that we charge need to be absorbed by someone or passed right the way through to consumers, which is currently challenging.

We price based on the nutritional + functional value of the products only and trial data. Insect meal and oil should get into a formula on merit rather than by forcing it in for sustainability objectives. Because we work on that basis, we're incredibly competitively priced in both aquafeed and livestock sectors.

Logistics considerations

How do logistics costs impact your production, and what are your transport logistics within ASEAN countries?

All our materials are locally sourced, so we have limited logistics costs. We have a range of suppliers for each material we use so we can move between suppliers when they adjust their pricing to keep our input costs stable.

We manufacture in Malaysia, but we are located about 20km from Singapore port. Our outbound logistics costs are extremely low, and shipping is frequent to every corner of the world. We get 40 containers to Bangkok in a few days for under USD1,000 and to Rotterdam in 4 weeks.



Photo credit: Nutrition Technologies

Embracing sustainability initiatives

Tell us about your sustainability initiatives and how you see your contribution to a circular economy.

Our business model is based on nature's own decomposition ecology to create a virtuous cycle, reusing today's waste to make tomorrow's raw materials. As we look to close the loop and build a circular economy, we recognise that we are one part of a wave of change helping to create a more sustainable and inclusive tomorrow.

The UN SDGs help chart a course towards that future. We demonstrate our commitment by aligning with and measuring ourselves against the relevant UN SDGs. We are active members of the UNGCMYB (UN Global Compact Malaysia & Brunei), and we have won awards in the last two years running at the UN Global Compact as Sustainability Icons, and for Gender Equality. We also have an internal ESG Committee, a Board Level ESG sub-committee and produce an annual sustainability report.

Future trajectories and market expansion

Lastly, what are the expansion plans, particularly for the aquafeed sector?

We continue to look for opportunities to work with feed producers in the region on refining product applications, as well as developing and testing new products. We have a product coming out for ornamental fish later this year, as well as some species-specific 'enriched' products in the pipeline, which we are keen to get into customers' hands.

We see many uses for our core Hi.Protein® product range, both full-fat and defatted, in companion animals, livestock and aquafeeds. These products offer nutritional or functional benefits, and I can only see their uptake growing over the coming years.