

INDIAN START-UPS LOOK TO THE LAB FOR THE FUTURE OF MEAT

Relevant for: Science & Technology | Topic: Biotechnology, Genetics & Health related developments

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“In 12 months, it would be possible to have a lab-grown meat burger,” said Sandeep Sharma, a scientist who’s spent over two decades in India’s leading vaccine companies and now the CEO and co-founder of Neat Meatt.

It is among the handful of Indian companies that are employing advances in cell biology and protein synthesis to solve a global challenge: how to ensure that a rising world population gets better, cheaper protein from fewer animals and diminishing cultivable land.

Some companies have bet on modifying plant products like soya, for instance, and processing it to the extent that its texture feels like meat and others, such as Neat Meatt are trying to derive cells from species that can be coaxed into meat. Unlike such plant-based meat, Neat Meatt aims to make lab-grown or so called ‘cultivated meat.’

Three kinds of cell-lines are critical to recreate meat: fibroblasts — the cells that form connective tissue and collagen — myoblasts, which form muscles and adipocytes, which make up fat tissue. “The bigger challenge is in bringing all of these together,” said Mr. Sharma whose team is developing these at centres based in Delhi University, South Campus and at the ICAR-National Research Centre for Meat.

Cell-lines are a group of cells derived from an animal that can be used to recreate several of their kind indefinitely. However, deriving an ideal stock is often a challenge because of which some companies have set their sights on relatively simpler life forms such as shrimp and prawn, whose texture and taste are ostensibly easier to create.

Nithin Shetty of Pune-based Klevermeat faced challenges with sourcing live shrimp in Pune, from which he needed cells to create cell lines. “We have finally managed to get such shrimp and in the process of getting cell lines. Once we perfect this — and this is potentially a huge market in itself — we could consider moving on to fish such as *rohu* and *katla*,” he told *The Hindu*.

A summit was organised here by the Good Food Institute (GFI, India), a non-profit that works with start-ups, research bodies and government bodies to promote ‘smart protein’ or foods that are high on protein but require less land and water and aren’t reliant on slaughtering animals and sea-life. These can include coarse cereals, such as millets, or algae and — at the extreme — lab-grown meat. Varun Deshpande, Managing Director, GFI (India), said the export market for such meat out of India was expected to be 1,300 crore-4,100 crore and could create 15,000-50,000 jobs by 2030 if enabling policy conditions were present. So far, the total invested capital globally in cultivated meat is around \$ 1.3 billion, the organisation added.

Cultivated meat was targeted at non-vegetarians, and those who’d want to continue to experience the taste and texture of meat but would like their meat to be ‘cruelty-free’ and in consonant with the challenges posed by climate change, said Mr. Shetty. “A kilogram of shrimp in India can cost over 1000 and while cultivated meat will be slightly more expensive now, it will eventually be comparable or cheaper,” he added.

However even vegetarians concerned about the carbon footprint from cattle and methane emissions have an alternative to one of India's most widely consumed foods — milk. Bharat Bakaraju, CEO of Phyx44, a Bangalore-based biotechnology startup, is recreating the genes that make cow milk. "If soya-based milk is one end and the real milk is at the other, we are somewhere in the middle so far," he said of his progress. Cultivated meat needs infrastructure that's similar to that needed to make vaccines — such as bioreactors that can multiply the required cells to cater to demand — and scaffolds which are organic moulds into which cells can be incubated and grown to achieve a desired structure akin to, say a chicken tikka or a shrimp cocktail. There are already companies in India, that don't plan to directly make such meat, but make the intermediary tools to create these products.

These startups expect developments internationally to influence India. In December 2020, the Singapore Food Agency (SFA) granted the world's first regulatory approval for cultivated meat to Eat JUST, Inc., to sell its cultivated chicken nuggets. The United States Department of Agriculture and, Food and Drug Administration have announced plans to implement a joint regulatory framework.

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