

BIOTECHNOLOGY: UNLOCKING FOOD SECURITY CHALLENGES IN MALAYSIA



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The Deputy Minister of Science, Technology and Innovation (MOSTI), Datuk Arthur Joseph Kurup, recently emphasised that biotechnology can address Malaysia's food security challenges (<https://www.bernama.com/en/news.php?id=2175279>). Malaysian Bioeconomy Development Corporation (Bioeconomy Corporation), which drives biotechnology growth for economic development under MOSTI, supports this viewpoint.

The agency assists biotechnology organisations in developing innovative solutions to tackle food security challenges, such as food supply shortages, increasing production costs, and rising food prices. While biotechnology innovations may not solve all food security issues, they can offer practical solutions to significantly alleviate these challenges.

Firstly, biotechnology can lower food production costs by reducing input and raw material expenses. Local biotechnology firms produce alternative protein sources from plants and insects, such as Black Soldier Fly larvae that are protein-rich animal feed and convert organic waste into protein. This approach reduces reliance on costly imported animal feed like maize and addresses food waste.

The global insect feed market is predicted to reach RM9.7 billion by 2031, with the fly larvae segment projected to have the highest revenue and fastest CAGR of 26.5 per cent from 2022 to 2031, as per Allied Market Research. Biotechnology will undoubtedly contribute to this substantial growth.

Advanced technologies

Malaysian companies are adopting advanced technologies to increase breeding and production of main crops and vegetables like rice, cucumber, and chili. For instance, molecular breeding enables farmers to identify the best crop varieties without waiting for the plant to physically grow, while tissue culture allows for the production of planting materials without relying on seed germination time. These biotechnology applications save farmers significant time and produce planting materials with desirable traits, such as high yield and disease resistance, leading to increased crop productivity and profitability.

Local biotechnology firms also use palm oil mill waste and agro-byproducts to create biofertilisers and organic composts, enhancing crop yields by up to 40 per cent by harnessing the power of beneficial microbes. These products increase nutrient availability and revitalise soil health by nitrogen fixation and phosphate and potassium solubilisation. Using biofertilisers and biopesticides can also reduce reliance on harmful chemical fertilisers and pesticides, thus preventing resistance to pests and diseases, soil degradation, water pollution, and greenhouse gas emissions.

Moreover, advancements in cellular technology have enabled companies to produce alternative proteins like seafood and meat in laboratories without conventional farming methods, therefore reducing water consumption, land space, and greenhouse gas emissions.

Food security

The inaugural cultivated meat conference officiated by the MOSTI Deputy Minister in Kuala Lumpur on March 16 marked a significant step towards securing the future of food in Malaysia. Research and Markets estimates that by 2040, sixty per cent of meat products may be produced in bioreactors and sold in stores and restaurants worldwide. A local biotechnology company plans to set up Malaysia's first cultivated meat production facility in Penang in 2024, revolutionising the food landscape and offering an alternative option to feed the growing population.

Malaysian biotechnology companies are making significant strides, but larger-scale implementation is needed for profound impact on food security. MOSTI's National Policy on Science, Technology & Innovation and the National Biotechnology Policy 2.0 provide a solid framework, but practical implementation by public and private stakeholders is necessary.

Tax incentives under BioNexus Status and awareness programmes are helpful, but user engagement is crucial for biotechnology to be effective. Without users, biotechnology will remain theoretical without real-world impact on food security.

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