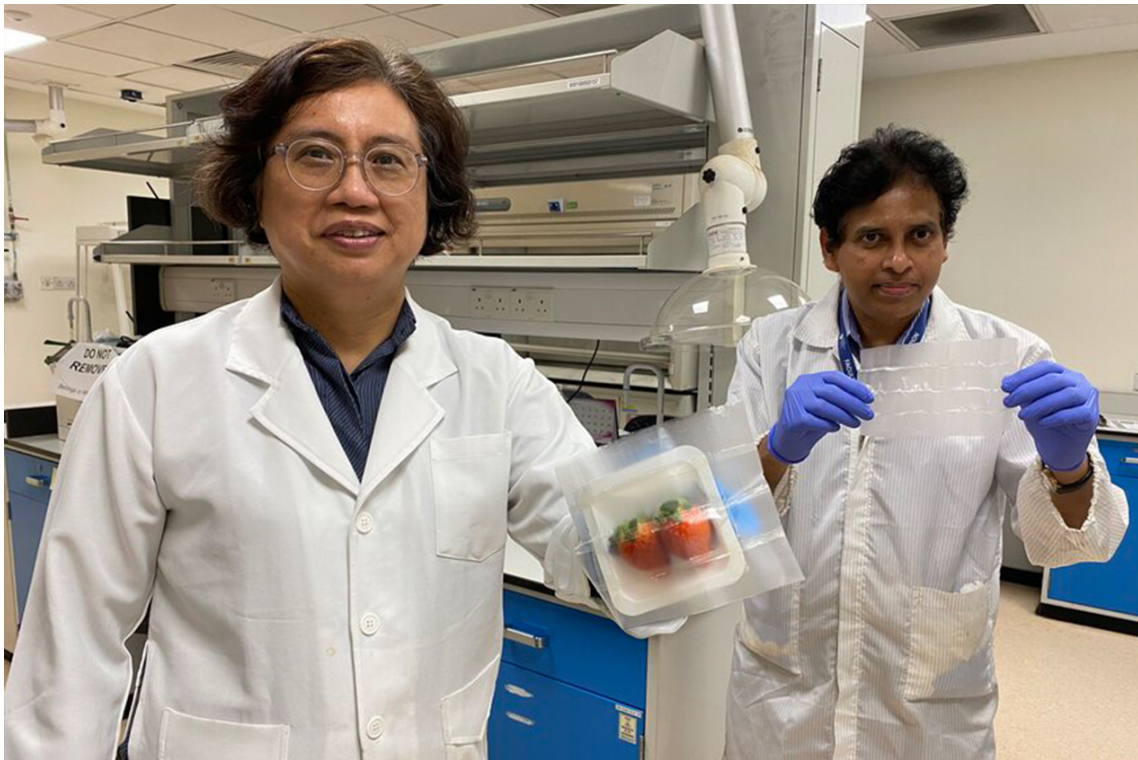


News Marketing Research Retail

Scientists unwrap a solution to non-plastic packaging

January 5, 2022

By Logan Caswell



As demand for non-plastic packaging wraps itself around the globe, companies are on the lookout for innovative alternatives to satisfy consumers' appetite. One solution may be at hand with news released recently that a team of scientists from Nanyang Technological University, Singapore (NTU Singapore) and Harvard T.H.

Chan School of Public Health, Boston, MA has developed a 'smart' food packaging material which is biodegradable, sustainable and even kills dangerous micro-organisms which are harmful to human health. The new material could also extend the shelf life of soft fruit for up to three days.

The waterproof packaging is made from a type of corn protein called zein, starch and other naturally derived biopolymers which are then infused with a mixture of organic antimicrobial compounds such as oil of thyme and citric acid. In controlled lab experiments, the packaging released natural antimicrobial compounds when exposed to increased humidity and killed common harmful bacteria such as *E. Coli* and *Listeria*, as well as fungi.

"Due to the globalization of food supply and attitude shift towards environmentally friendly food packaging, there is a need to develop biodegradable, non-toxic and smart/responsive materials to enhance food safety and quality," said Prof. Demokritou, Professor of Environmental Health at Harvard T.H. Chan School of Public Health.

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The packaging is designed to release only the necessary small amount of antimicrobial compounds when it detects the presence of increased humidity or bacteria. This ensures the packaging can last several months and endure multiple exposures. The studies also show the compounds not only combat bacteria that grow on the packaging surface, but also on the product itself, meaning it has the versatility to be used on a variety of products, including fruit and vegetables, raw meat and ready-to-eat meals. Additionally, experiments with fresh strawberries wrapped in the new material show encouraging results with fruit staying fresh and mold-free for seven days compared to regular-packed berries which showed signs of decay after only four days.

The advanced packaging material is produced by electrospinning the zein, the antimicrobial compounds with cellulose, a natural polymer starch that makes up plant cell walls, and acetic acid, commonly found in vinegar. Its development is part

of the University's goal to promote food tech solutions aligned with the NTU 2025 strategic plan aimed to develop sustainable solutions to address some of humanity's pressing grand challenges.

The NTU team and Harvard Chan School researchers are looking to ramp up their technology with an industrial partner with a view to commercialization within the next few years.