New Bacteria-Killing, Biodegradable Packaging Keeps Food Fresher Than Plastic

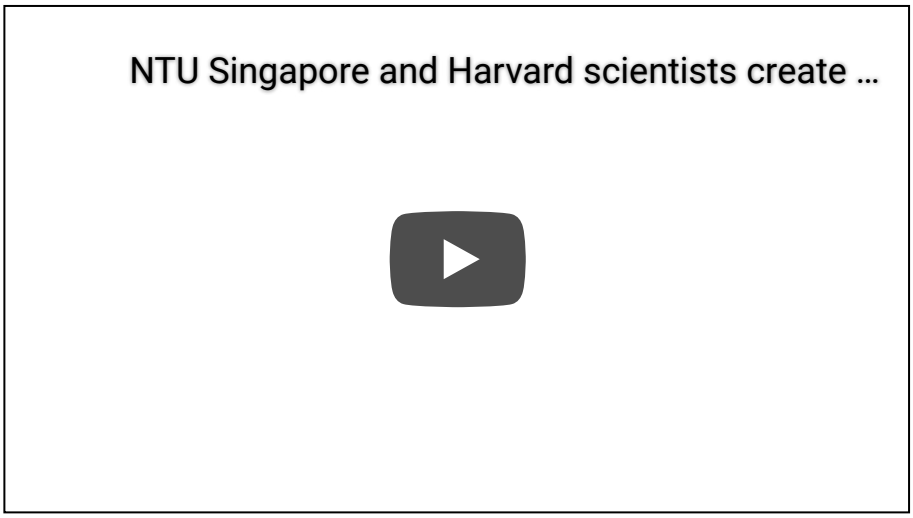
By Mikelle Leow, 04 Jan 2022

Image via Nanyang Technological University

Eco alternatives are being discovered and developed on a daily, but finding a solution for food packaging has always been a challenge. For a long time, fossil fuel-based plastics have been the most "sustainable "options as it's difficult to find a material that's just as durable and effective at maintaining shelf life.

That problem might soon be a thing of the past. Scientists from Singapore's Nanyang Technological University (NTU) and the United States' Harvard T.H. Chan School of Public Health have invented a natural, plastic-like packaging that's not only biodegradable but also keeps food fresh longer than its muse—and that's all thanks to its bacteria-killing properties.

The material consists of a protein from corn called zein, starch, and other natural biopolymers, as well as natural antimicrobial compounds like oil from thyme and citric acid from citrus fruits.



Lab tests showed that the packaging could release those antimicrobial components when in the presence of environments with greater humidity or enzymes from bacteria dangerous to humans, killing bacteria like E. coli and Listeria, in addition to fungi.

Impressively, it kept strawberries fresh for a full week before they'd develop mold. In comparison, strawberries in regular plastic fruit boxes only retained their freshness for four days. The team documented their findings in the *ACS Applied Materials & Interfaces* scientific journal.

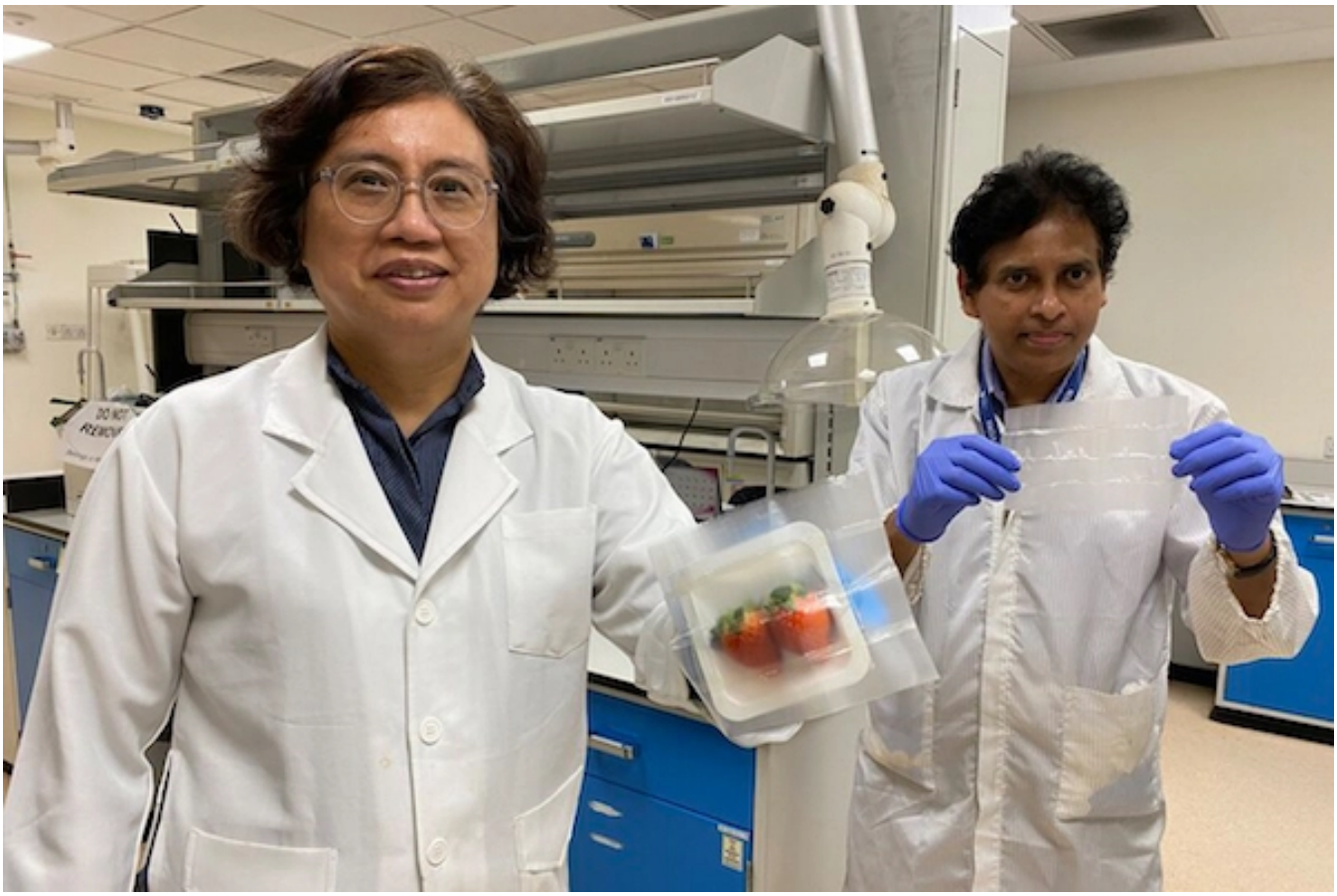
To prevent the ingestion of too many antimicrobial compounds, antimicrobials are kept at a safe minimum, allowing the food packaging to react only when there's increased humidity or bacteria.

"The smart release of antimicrobials only when bacteria or high humidity is present provides protection only when needed, thus minimizing the use of chemicals and preserving the natural composition of foods packaged," explains NTU Center of Antimicrobial Bioengineering director Prof Mary Chan, who led the project, via *Mashable SE Asia*.

Not only can this plastic alternative prolong shelf life and reduce food waste, but its enhanced abilities in maintaining freshness make it reusable for months too, thus serving as a cleaner replacement for single-use plastics that clog up the oceans.

It's an effective storage option for a wide variety of foods, including fruits and vegetables, raw meat, and ready-to-eat meals.

"This invention would serve as a better option for packaging in the food industry," says Prof Chan.



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