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SINGAPORE

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A new smart and sustainable food packaging

Developed a food packaging material that is antimicrobial and could be used instead of plastic

Plastic is the most common material for food packaging and unfortunately it is irreparably polluting our planet. A solution to this problem could come from the collaboration between two teams of researchers from Nanyang Technological University (NTU) in Singapore and Harvard Chan University of Public Health, in the United States, who have developed a new material for food packaging. biodegradable, non-toxic and antimicrobial, which would extend the shelf life of fresh produce.

The food packaging pioneered by the researchers is produced by electrospinning from a corn protein called zein, starch and other naturally

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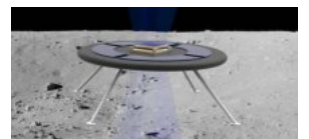
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compounds, including chitin and chitinase, commonly found in lemon and in other citrus fruits. In laboratory tests, when exposed to increased humidity or enzymes from harmful bacteria, the fibers in the package have been shown to release natural antimicrobial compounds, killing even the most dangerous bacteria such as E.Coli, Listeria and several types of mushrooms capable of contaminating and spoiling food, thus ensuring the packaging can withstand various exposures and last for months.

The package is described as “smart” because it is designed to release the necessary amounts of antimicrobial compounds only in the presence of the bacteria. This targeted action, therefore, would allow the food to last longer before decaying. In one experiment, for example, strawberries wrapped in the new packaging stayed fresh for 7 days before developing mold, while those stored in traditional plastic fruit boxes stayed fresh for only 4 days.

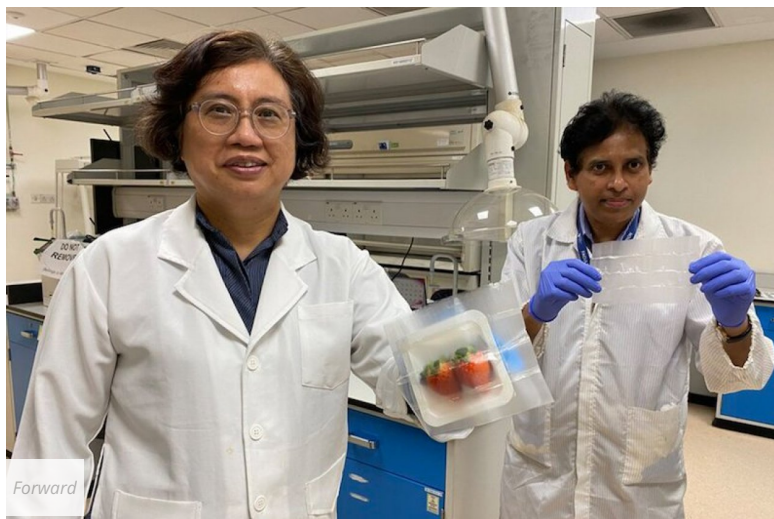
Additionally, as bacteria-fighting compounds grow on the surface of the package and on the food product itself, as well as fruit and vegetables, they can be used for a wide variety of food products such as meats and convenience foods.

'This solution could be a better option for packaging in the food industry, as it has demonstrated superior antimicrobial qualities in combating a myriad of food-related bacteria and fungi that could be harmful to humans,' said Professor Mary Chan. , Director of the NTU Center of Antimicrobial Bioengineering. «The packaging can be applied to various products such as fish, meat, vegetables and fruit. The intelligent release of antimicrobials only in the presence of bacteria or high humidity, provides protection only when necessary, thus minimizing the use of chemicals and preserving the natural composition of packaged foods ».

The researchers now hope to refine their technology by collaborating with some industrial partners, with the aim of commercializing the product within the next few years.

They are also currently working on developing other technologies to make biopolymer-based smart food packaging materials to improve food safety and quality. The study was published in the ACS Applied Materials & Interfaces journal.

food packaging bacteria



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