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US scientists, Singapore to make food packaging that can kill bacteria

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Liputan6.com, Singapore - A team of scientists from Nanyang Technological University (NTU), Singapore and Harvard TH Chan School of Public Health, United States has come up with a new type of food packaging that addresses two major issues in today's food industry - waste and eco-friendly. environment.

According to a news release by the Singapore agency, the newly developed packaging is capable of eliminating bacteria while also being biodegradable. All this thanks to the main ingredient used in the manufacture of the packaging - zein, as quoted from Mashable Asia, Saturday (1/1/2022).

Proteins derived from foods such as gluten, zein are combined with starch and other natural compounds, and then processed through a method called electrospinning (using electrical power to produce fiber) to produce materials for packaging.

In laboratory tests, this ingredient was found to have antimicrobial properties due to its ability to produce enough bacteria-killing compounds to eliminate microbes such as E. and common fungi – usually the things that cause food to go bad quickly.

Even more impressive is the fact that these compounds are released only when needed – a feature that minimizes the risk of the antimicrobial being ingested by the consumer.

"Smart antimicrobial release only when bacteria or high humidity is present provides protection only when needed,

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In one experiment, the team wrapped fresh strawberries in new packages and compared the freshness of the fruits to those packaged in ordinary plastic boxes.

As a result, strawberries stayed fresh for seven days before developing mold, while strawberries in a plastic box only lasted four days before turning moldy.

Great Useful

Snack Illustration Credit: unsplash.com/Jade

While still in development, the researchers behind the packaging are already excited about the potential of their creation for the food industry.

First, packaging directly addresses the issue of food waste, with the additional two to three days of shelf life potentially offering businesses and consumers the opportunity to both save a lot in terms of food and money.

Philip Demokritou, co-lead for the project and a professor from the Harvard TH Chan School, said that "food safety and waste have become the major social challenges of our time, with enormous public health and economic impacts at the expense of food security."

"One of the most efficient ways to improve food safety and reduce spoilage and waste is to develop efficient biodegradable non-toxic food packaging materials," he added.

In addition, packaging is also touted as a strong alternative to traditional plastic boxes, bags and cartons due to its biodegradability – especially when used on a large scale.

The world's climate and pollution problems are largely contributed by the consumption of fossil fuels and products

Plastic Waste Illustration Credit: pexels.com/mali

According to a university statement, 55 per cent of Singapore's 1.76 million tonnes of domestic waste consists of plastic, with a third of that amount being food packaging.

So it's pretty clear how using new ingredients can serve to ease the pain of today's food packaging.

"Smart food packaging materials - when scaled up - can serve as an alternative to reducing the amount of plastic waste, as they are biodegradable," the university said. "The main ingredient zein is also produced from corn gluten flour, which is a waste byproduct of using corn starch or oil to produce ethanol."

It all sounds promising, and it appears to be one of many other alternatives to regular plastic packaging, but it may be some time before we see the team's creations become commercially available.

Currently, the team is looking for an industrial partner to help them increase their packaging production, with plans to go commercial "in the next few years".

They are also currently working on developing other ways to create biopolymer-based smart food packaging materials, with food safety and quality retention as primary goals.

The team's research has been published in the journalACS Applied Materials & Interfaces.