



NTU Singapore

Scientists create bacteria-killing biodegradable food packaging

A team of scientists from the **Nanyang Technological University** (NTU) in Singapore, and the **Harvard T.H. Chan School of Public Health** in the US have developed an astounding material: food packaging that is not only biodegradable but antimicrobial as well. This means that the packaging, which is comprised of a type of corn protein called zein, along with starch and other natural compounds, kills microbes that contaminate foods.

This could help increase food safety while **reducing food waste** by adding days to fresh foods' shelf lives. The lab experiments conducted demonstrated that the packaging was resilient when exposed to increased humidity or enzymes from harmful bacteria and that it releases natural antimicrobial compounds that can kill common fungi and dangerous bacteria like *E. Coli*.

"Food safety and waste have become a major societal challenge of our times with immense public health and economic impact which compromises food security," says Professor Philip Demokritou, Adjunct Professor of Environmental Health at Harvard Chan School. "One of the most efficient ways to enhance food safety and reduce spoilage and waste is to develop efficient biodegradable **non-toxic** food packaging materials," he adds.

To ensure that the packaging can last in varying environments, the material was designed to release the exact required amounts of antimicrobial to handle any bacteria or humidity present in the food. This design also removes any risk of antimicrobials being ingested by the consumer.

“This invention would serve as a better option for packaging in the food industry,” says Professor Mary Chan, Director of NTU’s Center of Antimicrobial Bioengineering and the lead author of the study. Researchers believe that this material will not only help address issues with health and food waste but can also become an alternative to **plastic packaging**, one of the gravest **pollution problems** our planet faces today.

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