

Scientists develop biodegradable, antimicrobial food packaging

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Scientists have developed biodegradable **food** packaging material that kills microbes that contaminate foods. The waterproof packaging uses a type of corn protein called zein, plus starch and other natural compounds. A team of scientists from the Nanyang Technological University, Singapore and the Harvard T.H. Chan School of Public Health, U.S. developed the material.

According to a study published in ACS Applied Materials & Interfaces, the new packaging material could help increase fresh foods' shelf life by days. Lab experiments with the packaging showed its resilience when exposed to increased humidity or enzymes from harmful **bacteria**. The packaging releases natural antimicrobial compounds that can kill common fungi and bacteria such as E. Coli.

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Professor Philip Demokritou, Adjunct Professor of Environmental Health at Harvard Chan School, says that the new material could be instrumental in resolving the current food safety and **waste** problems. "Food safety and waste have become a major societal challenge of our times with immense public health and economic impact which compromises food security. 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," said Demokritou.



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The material is designed to release the exact required



that ensures that the packaging can endure exposure to different **environments**. It also takes away the risk of the antimicrobials being ingested and affecting the normal digestion process.

In one experiment conducted by the researchers, strawberries wrapped in the newly developed packaging stayed fresh for seven days before developing **mold**. On the other hand, fresh strawberries packaged in regular plastic boxes only lasted four days before developing mold.

The researchers say that the material’s ability to extend shelf life can help prevent food waste. The material is also being championed as an alternative to **plastic** packaging, which is known to cause pollution issues.

Professor Mary Chan, Director of NTU’s Centre of Antimicrobial Bioengineering and the lead author of the study, said, “This invention would serve as a better option for packaging in the food industry, as it has demonstrated superior antimicrobial qualities in combatting a myriad of food-related bacteria and **fungi** that could be harmful to humans.”

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Lead image via NTU and Harvard University

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