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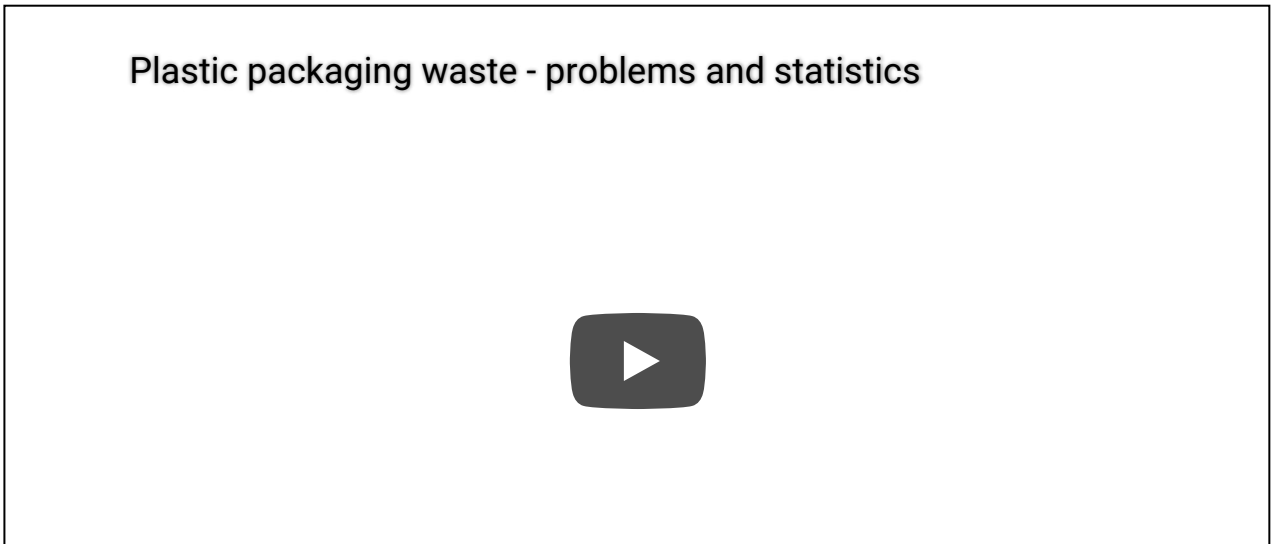
Biodegradable Food Packaging Protects Against Harmful Microbes

WRITTEN BY: Ryan Vingum (/profile/ryan-vingum)

Plastic packaging. Everything we seem to buy nowadays is packaged in plastic, from toys, foods, and more. In fact, humans produce an estimated 300 million tons of plastic waste each year, (https://www.unep.org/interactive/beat-plastic-pollution/) with about 14.5 million tons (https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific-data) of plastic containers and packaging materials produced. This number represents almost 5% of all solid waste produced yearly. That's a lot of plastic, much of which makes its way into landfills and even our oceans; knowing that it could take a few hundred years for plastic to decompose, the environmental consequences of such plastic waste are cause for alarm.

The packaging industry, given such pervasive commercial need, is the largest consumer of synthetic plastics. This isn't to say packaging isn't important: it can be an essential way to maintain the freshness of certain foods, like fruits and vegetables. However, given the environmental consequences of heavy plastic usage, there is an even greater, pressing need for new packaging technologies that are eco-friendly.



Researchers at Nanyang Technological University and Harvard have come up with a packaging material that does double duty: it's biodegradable and protects food from harmful microbes, which could extend the freshness and shelf life of produce like fruits and vegetables.

According to a new article published in *ACS Applied Materials & Interfaces* (https://pubs.acs.org/doi/10.1021/acsami.1c12319), the new packaging is made of various antimicrobial and biopolymer compounds, including zein, a corn protein. An electrospinning technique is used to weave these different components together into a packaging material.

When testing their product to gauge its antimicrobial abilities, researchers found that exposure to various food bacteria and fungi or humidity stimulated the packaging to release antimicrobial compounds. Researchers tested their packaging on strawberries and compared it to traditional strawberry plastic packing. They found that the synthetic packaging extended the shelf life of strawberries by a few days, a promising result. The packaging also helps fight bacteria that grow on the packaging as well as on the food itself.

And because the packaging is made of the corn protein zein, researchers may have found a material that, when used on a wide scale, could significantly reduce the amount of plastic packaging we normally see in our grocery stores to contain food. And, as researchers hope, the packaging could have many more uses, as well.

Sources: Eureka Alert! (https://www.eurekalert.org/news-releases/938972); ACS Applied Materials & Interfaces (https://pubs.acs.org/doi/10.1021/acsami.1c12319); UNEP (https://www.unep.org/interactive/beat-plastic-pollution/); EPA (https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific-data)

About the Author

(/profile/ryan-vingum)

Ryan Vingum (/profile/ryan-vingum) (https://www.linkedin.com/in/ryan-vingum-2969b553/)

Science writer and editor, with a focus on simplifying complex information about health, medicine, technology, and clinical drug development for a general audience.

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