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Responsibility

Can seafood waste help keep produce pesticide-free and extend its freshness?

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By Responsible Seafood Advocate

New seafood waste material can absorb pesticides and herbicides from produce and possibly extend its shelf life

University of Maryland researchers have developed a material from seafood waste that can remove chemical pesticides and herbicides from fruits and vegetables. This material could help extend the shelf life of produce, making it a valuable tool for preserving agricultural harvests.

The new technology, derived from crab and shrimp shells, is designed to form a microscopically thin nanocrystal layer on the treated produce, removing chemical residues. The work, **published in *Matter*** ([https://www.cell.com/matter/abstract/S2590-2385\(24\)00323-0](https://www.cell.com/matter/abstract/S2590-2385(24)00323-0)), was a collaboration among researchers in the Departments of Materials Science and Engineering (MSE) and Nutrition Food and Science (NFSC).

“This work offers a viable solution to improve food safety associated with our daily life,” said Qin Wang, a professor in nutrition and food science and collaborator in the study.

Pesticide residues on fruits and vegetables have been linked to severe health problems, including increased risks of cancer, attention-deficit hyperactivity disorder and Alzheimer’s disease. Common household cleaners, ranging from vinegar and soda solutions to more costly alternatives like hydrogen



University of Maryland researchers have developed a material from seafood waste that can remove chemical pesticides and herbicides from fruits and vegetables. Photo by [Mark Stebnicki](https://www.pexels.com/photo/assorted-vegetable-store-displays-2252584/) (<https://www.pexels.com/photo/assorted-vegetable-store-displays-2252584/>).

peroxide and ozone, are widely used to remove pesticides and herbicides, but they are either ineffective or damage the produce's appearance and taste. The washing process itself may also shorten the shelf life due to "micro-wounds" like bruises formed on the fruits' surface.

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- Food safety
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To address this issue, researchers developed a new type of porous material made of chitosan (abundantly present in shellfish waste) and copper, which has antimicrobial properties, and sprayed a thin layer on strawberries.

The researchers employed a smartphone app that consumers could use at home to check the chemical residue level, which found this new material was effective in absorbing them. The coating also enhanced the fruit's shelf life and was easily rinsed off.

Consisting only of materials and chemicals that are Generally Recognized as Safe (GRAS), a designation established by the U.S. Food and Drug Administration, the technology is also highly scalable.

[Read the full study here \(https://www.cell.com/matter/abstract/S2590-2385\(24\)00323-0\)](https://www.cell.com/matter/abstract/S2590-2385(24)00323-0).

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