

Sustainable antibacterial food wrap that changes colour

30 September 2024 | News

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Scientists from NTU Singapore have created a biodegradable food wrap that changes colour when the food it protects has spoiled. The wrap also has antibacterial properties that could protect the food from microbial contamination.

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Avocado pits are the critical ingredients for making the wrap, while starch from durian and jackfruit seeds is also used.

The researchers said that the avocado seed extract used in the food wrap contains catechin and chlorogenic acid, which help prevent oxidation and stop the growth of harmful bacteria like *Staphylococcus aureus*, which produces toxins that can lead to food poisoning.

The avocado seeds contain a natural compound named "Perseorangin". This compound is sensitive to changes in pH value and changes its colour at different pH levels depending on how alkaline or acidic it is.

To indicate food spoilage, the wrapping turns from a translucent yellow to a deep brown colour when the nitrogen compounds are produced by bacteria when amino acids in protein-rich foods such as seafood and meat are broken down.

The smart wrap was able to warn of food spoilage up to two days before the shrimp was discoloured and emitted foul odours. This visual alert could significantly improve the monitoring of food freshness and potentially avert illness by dissuading people from eating food that may look fresh but has started rotting.

Lead author Professor William Chen, Director of NTU's Food Science and Technology programme, who led the study, said: "We have developed a new food wrap expected to have a profound impact on reducing food wastage by harnessing the power of nature, namely the antimicrobial and anti-spoilage compounds in discarded avocado pits."