Using natural compounds to fight food waste

Harvard TH Chan School of Public Health and Nanyang Technological University researchers have developed biodegradable food packaging that may extend the shelf life of fresh fruit while killing harmful microbes.

Temps de lecture : minute

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Researchers used zein, a corn protein, along with starch and natural biopolymers, including citric acid and thyme oil, to make the waterproof packaging with electrospinning technology, which uses electrical force to assemble polymer solutions. They said trials had kept a pack of strawberries fresh for a week compared with the usual four days of freshness provided by conventional packaging. (*The Engineer*)

Why does this matter?

Food supply chains account for approximately a *third* of global greenhouse gas emissions. Additionally, the convenience and effectiveness of plastic food *packaging* has taken a toll on waterways and landfills, while food waste not only *produces* its own methane when left to rot, but also squanders the resources used during production.

Creating a sustainable and biodegradable food packaging solution that prolongs a food's shelf life could, therefore, significantly reduce the sector's environmental impact.

That’s a wrap on plastic

Food transportation and preservation has long relied on plastic packaging, but recent measures, in particular France’s *ban* on plastic for fruit and vegetables, suggests now is the time for manufacturers and retailers to *source alternatives*. Bio-based solutions are an exciting prospect because they maintain sustainability while using biological processes to restrict harmful bacteria. So, who else is exploring these techniques?

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Bio-based alternatives

Multiple firms have adopted a coating solution for protection. Apeel, for example, recently secured *$250M* for its food-safe powder coating on

avocados and citrus fruits which creates a barrier against water and oxygen. Israel-based *Sufresca*, meanwhile, has launched a water-based, edible coating that it claims can extend shelf life for fruit and vegetables by several weeks.

It's worth noting, however, the focus above is on fruit and vegetables. The "smart packaging" developed by the Harvard and Nanyang scientists is claimed to be compatible with raw meat and fish, providing more products with an extended shelf life.

Wider access to fruit and veg

Establishing a longer shelf life presents environmental benefits but could also have health implications. A short shelf life can often *inflate* the price of fruit and vegetables, creating a divide between those who can and cannot afford healthy, fresh produce. A scalable solution that can extend shelf life by several weeks could be essential in tackling *issues* surrounding the affordability of healthy eating while offering more potential for bulk ordering.

Lateral thought from Curation

The US's extensive corn production means *glucose-fructose syrup* features across a wide catalogue of food products to improve shelf life and flavouring, much to the detriment of public health.

Perhaps the application of zein – a corn protein – in this bio-based packaging solution suggests a healthier method of using corn to extend shelf life instead of pumping products full of sugar.

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