



An innovative new plastic food wrap may revolutionize the way we package our food and reduce the amount of food we waste.

Image Source: Flickr user dvs

Since the 1980s, public concern about plastic products has been growing. While [BPA-containing plastic drinking bottles](#) and children's toys have borne the brunt of negative publicity, researchers are increasingly discovering that even BPA-free plastics may be releasing potentially harmful chemicals, particularly those which mimic estrogen. According to a 2011 study published in *Environmental Health Perspectives*, "70 percent of [BPA-free] plastic products released chemicals that acted like estrogen. And that was before they exposed the stuff to real-world conditions" such as UV radiation and temperature variation.¹ One of the most concerning plastics tested came in the form of plastic food wrap; designed to have extended, close contact with food products, often in cold conditions, these plastic films may present unique health risks to consumers who buy wrapped foods or used plastic wrap at home.

Thian Eng San and Tan Yi Min, however, want to change that. For the past three years, the two researchers from the National University of Singapore have devoted themselves to creating a chitosan-based plastic food wrap unlike any other. Derived from crustacean shells and fortified with grapefruit seed extract, the composite film offers a safe and environmentally friendly alternative to traditional plastic food wraps without the risk of estrogenic chemical leaching. "The film, which is free from chemical additives, has immense potential in food technology due to its biocompatibility, non-toxicity, short-term biodegradability, and excellent film-forming capability."² At a time when the public is becoming more wary of the health impact of plastics, this product could be the solution consumers are looking for.

But the film isn't remarkable just for its lack of chemical additives and eco-friendly formulation; by preventing the growth of fungi and bacteria while simultaneously blocking UV light to slow down oxidation and photochemical deterioration, it can actually help food remain fresh longer and shield against contamination. According to Thian and Tan's research, this innovative plastic food wrap

more that doubles the shelf life of perishable foods, enabling consumers to reduce food waste and realize both environmental and economic benefits.

“Increasing attention has been placed on the development of food packaging material with antimicrobial and antifungal properties, in order to improve food safety, extend shelf life, and minimize the use of chemical preservatives,” says Thian. “Consumers are also demanding that packaging materials be formulated from natural materials that are environmentally friendly and biodegradable while improving food preservation.”



Eco-friendly plastic food wraps could significantly reduce food waste and global food loss, but widespread use relies on visual appeal.

Image Source: Pexels user unsplash.com

Optimizing Benefits by Enhancing Mass Appeal

While the chitosan-based plastic film currently costs approximately 30% more than traditional plastic food wraps, Thian and Tan are investigating ways of bringing the cost down to match traditional plastic food wraps by the time it hits supermarket shelves. Even at the higher price, the researchers believe that many consumers will be willing to fork over the extra cash for a safe, ecologically responsible product, as many of us do for sulphate-free personal care items, organic produce, grass-fed dairy, and wild fish. But although a meaningful segment of consumers will no doubt be drawn to eco-friendly plastic food wrap and films made of natural materials for their health and environmental benefits alone, optimizing those benefits on a large scale requires widespread use.

To enhance appeal, alternative plastic films—whether chitosan-based or derived from another innovative technology—must not only offer comparable or superior *performance* to traditional products, they must also offer comparable or superior *appearance* to attract customers who are not willing to sacrifice the functional and aesthetic qualities of traditional products. This means clarity; films should be transparent, colorless, and allow the user to see exactly what is underneath the wrapping, facilitating attractive display and helping consumers readily evaluate the appearance of the food.



Spectrophotometric haze measurement allows you to analyze the appearance of alternative plastic food wraps to ensure clarity.

Image Source: Flickr user Steven Depolo

Measuring the Clarity of Eco-friendly Plastic Food Wrap

Spectrophotometers are a staple within today's modern plastics industry. Used for everything from [analyzing chemical compositions](#) to ensuring [accurate, consistent pigmentation](#), these sophisticated and flexible instruments are giving plastics producers greater insight into their products than ever before. Spectrophotometers also offer the best option for [evaluating clarity in plastic film products](#) via haze measurement.

Haze is a term used to define the cloudiness of a material caused by scattering of light. This effect can be influenced by the presence of elements within the polymer such as pigment particles and additives [and] is a key characteristic when determining the suitability of a transparent polymer in [a particular application].³

Haze prevents optimal performance of plastic food wrap by preventing the viewer from being able to see clearly through it, compromising functionality and aesthetic appeal. By measuring the relative percentage of light that is scattered more than 2.5° from the direction of the incident light beam, a spectrophotometer is able to rapidly quantify the degree of haze in a transparent sample, helping you evaluate formulation and process variables to ensure clarity.

HunterLab Haze Measurement

HunterLab has been a leader in the field of spectrophotometry for over 60 years and our instruments are renowned throughout the plastics industry for their innovative technologies and

user-friendly designs. Today, we offer a range of spectrophotometers that meet the geometric and spectral requirements needed to measure haze in transparent plastic films with unmatched precision. The newest addition to our line-up is the [HunterLab Vista](#), a revolutionary benchtop spectrophotometer that allows you to capture transmission color and haze measurement simultaneously at the touch of a button. With industry-first automatic calibration, embedded Essentials color QC software, and a small footprint, the Vista is a truly dynamic instrument that offers unprecedented functionality and flexibility for the highest level of quality control. [Contact us](#) to learn more about the Vista or any of our other spectrophotometers and let us help you find the perfect instrument to suit your unique needs.

1. "Study: Most Plastics Leach Hormone-Like Chemicals," March 2, 2011, <http://www.npr.org/2011/03/02/134196209/study-most-plastics-leach-hormone-like-chemicals>
2. "Eco-friendly Wrap Promises Fresher Food," February 24, 2016, <https://news.nus.edu.sg/highlights/10065-eco-friendly-wrap-promises-fresher-food>
3. "Transparent Plastics," <http://ultrapolymers.com/wp-content/uploads/2013/03/421049-Transparent-Plastics-LR.pdf>