

# Edible, Recyclable, Biodegradable Packaging Latest Weapons in War on Plastic Waste

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Wrapping food in plastic can reduce spoilage, but presents challenges related to waste recovery and recycling. It presents a tough choice for producers between prioritizing food waste or plastic waste, both of which are top-of-mind with consumers. For this reason, solutions that are biodegradable, recyclable, or both are gaining traction.

Scientists from the **U.S. Department of Agriculture** have discovered a way to use the milk protein casein to create an [edible packaging film](#) that is better at preventing spoilage than regular plastic. The film's small pores make it up to 500 times better at locking out oxygen, which can enhance the shelf life of food. Researchers added citrus pectin to the milk protein base to make the film more durable and increase its resistance to heat and humidity. The organic contents mean that the packaging can be eaten along with its contents, or will quickly biodegrade when thrown out.

“The coatings applications for this product are endless,” said **Laetitia Bonnaille**, a co-author of the research. “We are currently testing applications such as single-serve, edible food wrappers. For instance, individually wrapped cheese sticks use a large proportion of plastic — we would like to fix that.”

**Aquapak Polymers** has developed a [new polyvinyl alcohol \(PVOH\) polymer](#) that is both 100 percent recyclable and 100 percent biodegradable, and effectively bypasses the difficulties of separating film and rigid plastic. The new polymer could replace multilayer packaging for a wide range of products, such as pouches, films, wrappers, plastic windows in paper envelopes and bread bags, and more. It is particularly well-suited for food packaging since it acts as an oil, solvent and air barrier, keeping products fresher for longer.

“The polymer process developed by Aquapak is attracting a great deal of interest from the packaging, retail and waste sectors,” said Aquapak Polymers’ managing director, **Mike Everard**. “As a packaging material it outperforms both cornstarch and many conventional plastics, while also overcoming the usual barriers to recovery and recycling.”

The solution is FDA-approved and benign in the environment; it is non-toxic to marine life, is fully dissolvable in water treatment processes, and can be washed away safely with wastewater. It is also “easily separable” in a materials sorting facility for recovery and recycling, and degrades quickly in anaerobic digestion (AD) processes. The PVOH polymer is currently in the demonstration phase; Aquapak Polymers plans to build a full-scale production facility in 2017.

Packaging solutions with numerous disposal and recovery options such as Aquapak Polymer’s PVOH product are essential if we hope to usher in the “[new plastics economy](#),” the first step in overhauling plastic packaging materials, formats and [after-use systems and standards](#) to combat the plastic waste problem.

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