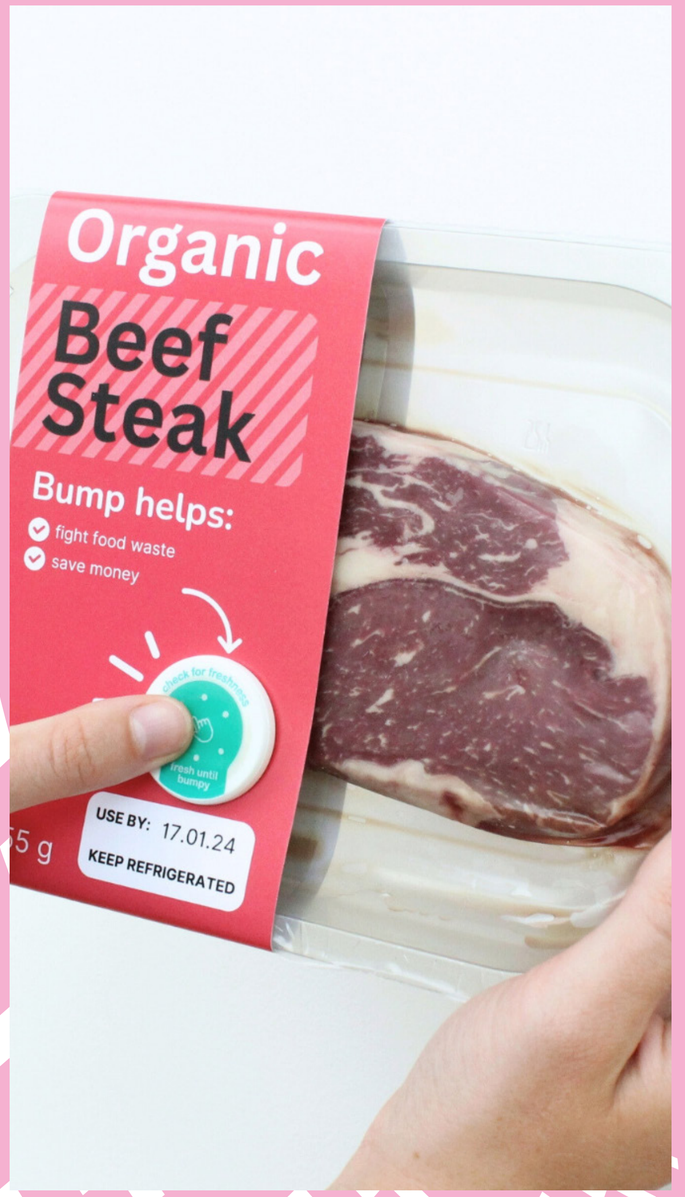
Designing a Smarter Way to Reduce Food Waste



Bump by Mimica is a tactile freshness indicator that allows consumers to feel when food has actually spoiled, rather than relying solely on printed expiry dates. Developed from a student design project, it uses temperature-responsive materials to provide a more accurate guide to food freshness.

Food waste is one of the most significant environmental challenges of our time. Around the world, millions of tonnes of food are discarded every year, often not because it has spoiled, but because printed expiry dates suggest it might have. These dates are designed to prioritise safety, but they are usually based on worst-case scenarios. As a result, large amounts of perfectly edible food are thrown away. This raises an important question. If information on packaging influences how people behave, could design offer a better way to communicate when food has actually gone off?

Bump by Mimica

While studying industrial design, Solveiga Pakštaite began exploring how packaging might communicate freshness more accurately than traditional printed expiry dates. That exploration eventually led to the creation of Bump, a project that investigates how materials and packaging design can help reduce unnecessary waste. At the centre of the concept is Bump, a tactile freshness indicator that responds to temperature changes and allows people to feel when food has genuinely spoiled. Bump is not intended to replace expiry dates, but to supplement and extend them, the label allows consumers to check freshness through touch by running a finger across its surface, users can gain a clearer indication of the product's condition.

Global Impact

While studying at Brunel University in London, Solveiga began exploring how design could address the growing problem of food waste. Many foods remain safe to eat beyond their expiry date if they have been stored correctly. By developing a system that reacts to the conditions food experiences during storage and transport, she hoped to create a more accurate guide to freshness.

The Technology

At the heart of the design is a temperature-sensitive gel contained within a small label or bottle cap. This gel is calibrated to break down at roughly the same rate as the food it accompanies. When the product is fresh, the surface of the label feels smooth. As time passes and the food begins to spoil, the internal gel gradually changes structure. This transformation causes bumps present underneath the gel to be revealed.

Consumers run their finger across the label. If it feels smooth, the food is still good to eat. If bumps can be felt, the product has spoiled. This tactile interface makes the system intuitive and easy to understand. It also introduces an important element of inclusive design. Because the label can be read through touch rather than sight, it is accessible to people with visual impairments as well as those who may struggle to interpret printed dates.

Real-World Conditions

One of the biggest limitations of traditional expiry dates is that they assume poor storage conditions. Food may be transported incorrectly or stored at room temperature, so manufacturers use cautious dates to protect consumers. However, most consumers store food correctly in refrigerators or cool environments. In these situations, products may remain safe to eat for longer than the printed date suggests. Mimica's Bump indicator responds directly to temperature changes, meaning it reflects the real conditions experienced by the product.

If food has been stored properly, the surface may remain smooth for longer. If it has been exposed to higher temperatures, the bumps will appear sooner. This responsiveness allows producers to safely extend printed expiry dates while still maintaining consumer safety.

Concept to Product

Turning the concept into a working product required collaboration across several disciplines. Mimica brings together designers, engineers and food scientists to refine the technology and adapt it for different food groups.

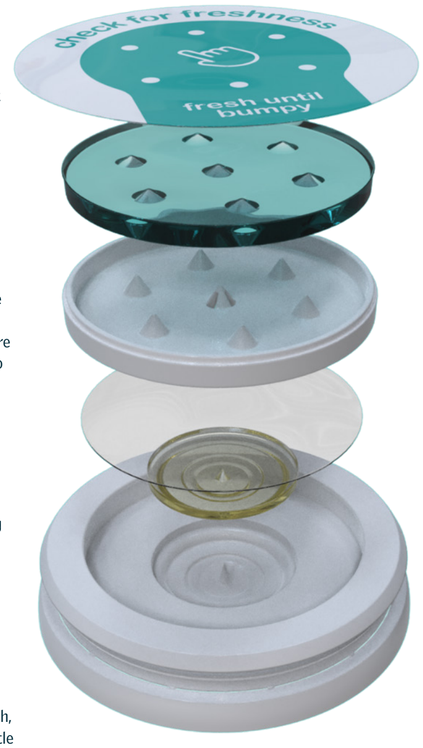
The gel chemistry inside the label must be calibrated so that it reacts at the correct rate for specific foods. The system can be integrated into packaging in the form of either a small label tag or designed bottle cap. The technology has been designed to fit easily into existing manufacturing systems. This means food producers can integrate it into their packaging processes without major changes to production lines. The materials used are also compatible with recycling systems, helping to maintain the sustainability of the packaging.

Reducing Waste

In the UK, around 70% of discarded food could still have been consumed. Mimica designed Bump to reduce this unnecessary waste while improving confidence in food safety. The technology also benefits producers and retailers. Longer shelf life can reduce product losses in supermarkets and increase consumer trust in packaged foods.

Growing Innovation

The company has developed both Bump Tag, designed for packaged foods such as meat and fish, and Bump Cap, which integrates directly into bottle caps for products like milk or juice. Production facilities are expanding and industry trials are underway with food manufacturers. The technology has also attracted attention from sectors beyond food, including pharmaceuticals and vaccines, where monitoring temperature exposure is critical.



Classroom Context

The project demonstrates how design can combine science, engineering and user experience to solve complex problems. It also highlights the importance of inclusive design, ensuring that solutions are accessible to as many people as possible. Sometimes the most effective ideas come from rethinking how everyday products communicate information.

By replacing uncertainty with clear, tactile information, the design encourages consumers to make more informed decisions about the food they buy. In a world increasingly focused on sustainability and resource efficiency, innovations like Mimica demonstrate how thoughtful design can reshape the systems we rely on every day.

Classroom Connection

Packaging more than it's primary use

This free context explores 'Packaging with more than its primary use', focusing on packaging design, sustainability and repurposing through design, exploring materials, manufacturing methods and environmental impact.

Free KS3 Context
tinyurl.com/42ddcvdm