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The public wants less plastic – how do we respond?

"Man in his quest for knowledge is determined, and cannot be deterred…We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard."

7 years after John F Kennedy's memorable speech at Rice Stadium, Neil Armstrong landed on the moon. To get from a speech in Texas to the moon required a phenomenal drive in technological and materials innovation. Just as the space race drove space innovation in the 1960s, the race to save the environment, driven by public opinion and legislation, is propelling eco-innovation today.

Seeing an Albatross feeding plastic to their chicks changes the way you think. One study suggests that 88% of people who watched this final episode of Blue Planet II have changed their attitude towards single-use plastics. This shift in public opinion has both encouraged our supermarkets to change their behaviour and prompted legislation designed to reduce the amount of single-use plastic. A number of supermarkets are now phasing out 5p single-use plastic bags and recently the European parliament has voted to ban single-use plastic cutlery, cotton buds, straws and stirrers. However, these are small steps and a lot more needs to be done.

One area in which single-use plastic is particularly widespread is in food packaging. A 2018 report[1] found that 810,000 tonnes of single-use plastic are placed on the market by the top 10 UK supermarkets every year, and that figure doesn't include single-use plastic carrier bags and bags for fruit and vegetables. Add that to the fact that single use plastic can take 450 years to biodegrade and it becomes clear that something needs to be done to tackle the growing mountains of single use plastic on the planet.

The answer, however, is far more complicated than simply stopping the use of plastic food packaging. Plastic food packaging is popular because it is extremely good at preserving food and therefore reducing food waste. Using 1.5g of plastic film to wrap a cucumber can extend its shelf lift from three days to 14 days and selling grapes in plastic bags or trays has reduced in store wastage of grapes by 20%[2]. Unfortunately, the many advantageous properties of plastics, such as their inertness and durability, are the very properties which cause the most problems when plastic is released into the environment.

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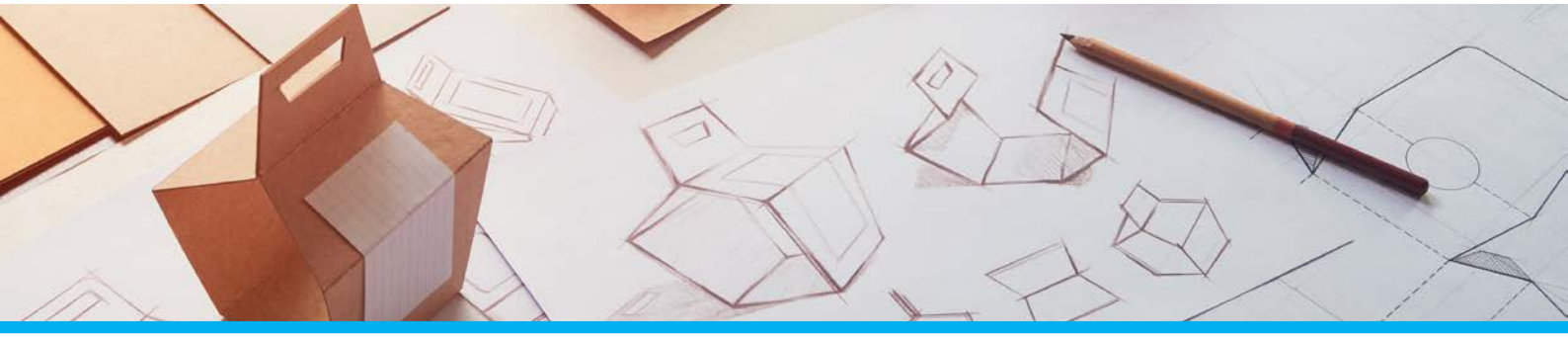
[1] https://eia-international.org/wp-content/uploads/Checking-out-on-plastics.pdf

[2] http://theconversation.com/why-some-plastic-packaging-is-necessary-to-prevent-food-waste-and-protect-the-environment-117479



Biodegradable and compostable plastics seemed to address the problem, by providing the advantageous properties in combination with the ability to breakdown, either in the natural environment or under composting conditions. However, recently these materials have also attracted criticism. Concerns have been raised about the chemicals and by-products that are being left behind after breakdown and also about the rate of degradation, with one study showing a "biodegradable" plastic bag still being intact and able to carry shopping three years after being exposed to the natural environment. There may still be a future for biodegradable and compostable plastics, but it seems more work is needed in this area.

If we are to remove plastic from our food supply, we will need to develop innovative new materials to replace it. Materials such as those used in Choose Water's plastic-free water bottle, which the inventor, James Longcroft, claims can fully decompose into non-toxic, environmentally friendly substances, may be one answer.

Case Study: James Longcroft, Choose Water

Is there a future for biodegradable or compostable plastics or do we need to develop completely new materials?

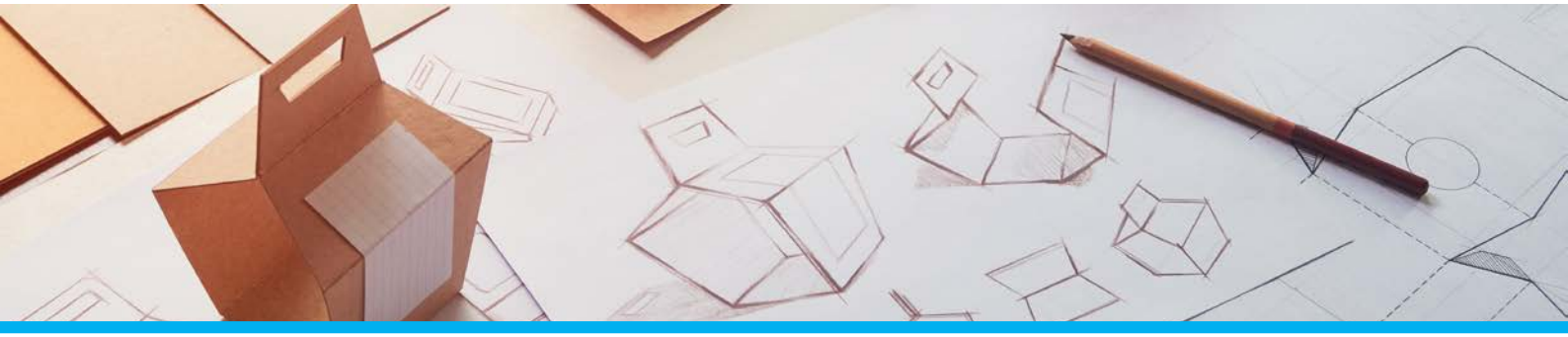
We would lean towards developing completely new materials. There is a lot of confusion over the term bioplastic. They do break down into non-toxic component materials, which is much better for the environment but people are not always sure how to dispose of them and only some materials biodegrade. In general we should try to move away from the term 'plastic' altogether as it has a stigma attached to it. This is the ethos we adopted, a packaging that could go in any bin without problems.

How do you approach storage when your packaging has a short shelf life?

We're aiming to have a fast turnover, and are currently in the process of researching techniques to extend our shelf life to over a year. In addition we have found that most single-use items are usually consumed within three weeks. It is a compromise between production and demand, we need to make sure that we are producing what we need and not wasting stock due to spoiling. Our bottle currently has a shelf life of three months but hopefully this will increase.

Is your product suitable for use as food packaging too?

In theory, yes, as our product is derived from entirely plant-based non-toxic materials. However, further testing is required to ensure that it is 100% suitable. Water is one of the most difficult substances to package as minor contamination will affect taste. So if we can prove the concept works with still water, we are confident it will work for other products that currently use plastic bottles.



There has been a steady increase over the last 10 years in the number of patent families filed per year which mention biodegradable or compostable plastics. The future will inevitably lead to more patents in this area accompanied by patents for new materials such as those used by Choose Water. Patent attorneys will spend their time grappling with ways to define these new materials and their functions, delineating biodegradable from compostable and decomposable and ensuring innovators have water-tight protection for their products.

Ultimately, the approach to reducing plastic food packaging will involve a variety of solutions, from promoting better recycling and reuse practices to developing improved biodegradable and compostable products and discovering entirely new, yet to be identified materials. It's a long road ahead, but thanks to the shift in public opinion and new legislation driving innovation, we are on our way. We can choose to do this, not because it is easy, but because protecting our environment is the right thing to do.

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