

What more can retail stores do to improve sustainability with regards to plastic packaging?

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Plastic packaging is widely used within retail stores across the UK. It's a versatile and cheap type of material that can be easily manufactured. However, there are clear indications showing that supermarkets need to reconsider the use of one-use plastic packaging.

Harmful to marine life, around 8 million tonnes of plastic waste ends up in the ocean each year. Microplastics such as polyethylene and polyester, commonly used for plastic shopping bags, packaging and clothing items, along with pre-production plastic 'nurdles' can now be found on every beach in the world. These are being eaten by some of the most iconic species. 'Nurdles' were recently found in the stomachs of puffins, which indicates that plastic is being consumed by larger animals further up the food chain.

Through the effects of tide changes, sunlight and temperature, microplastics degrade smaller in size, thus resulting in smaller marine life. Filter feeding marine animals like Muscles, Zoo Plankton and Barnacle often consume microplastics as they cannot separate them from their natural food. The plastics build up in their stomachs and guts and cannot be digested, resulting in lower growth and eventually death. Being the foundation of the food chain, fish higher up the chain consume smaller portions, resulting in a decreased level of growth which consequentially has a knock-on effect on all marine life.

According to research made by Scottish Association for Marine Science (SAMS) in Oban, some of the world's deepest living marine creatures were found with microplastics inside them. Small microplastic pieces as small as 0.2mm had been found in the stomachs of 48% of the animals they'd sampled, that lived more than 2,000m (6,561.8ft) beneath water level.

Plastic waste is not only harmful to the animal's digestive system. Many animals like sea birds, dolphins, seals and turtles are at potential risk of being entangled in plastic bags, packaging and other debris that have not yet been broken down to microplastics.

Located in the central North Pacific Ocean, is the Great Pacific Garbage Patch, also known as the Pacific Trash Vortex, which are large floating islands of plastic. There are also large islands of plastic floating in the Indian and Atlantic Ocean. Studies made by SES (Sea Education Society) scientists in the Atlantic show that there are 580,000 pieces of plastic per square kilometre. The patches are large quantities of plastic that meet and converge where currents meet in the oceans.



Some retail stores opt to introduce 'plastic-free aisles' but personally, I do not think that this is enough to improve sustainability with regards to plastic packaging and the state of our oceans.

'Iceland' and 'The Food Warehouse by Iceland' have both boldly promised to rid of all plastic packaging from their own branded products by the year 2023. A survey carried out by Iceland foods revealed that 80% of customers would buy and prefer products without plastic packaging. However, to date, customers don't have much of a choice with regards to buying products without plastic packaging at value prices. Iceland is well known for its cheap prices, introducing plastic-free packaging could be a great step forward with regards to sustainability and even publicity from eco-enthusiasts and consumers alike. However, stores across the world have already introduced plastic-free packaging but many believe it's extremely overpriced.

One independent supermarket based in Copenhagen uses zero plastic packaging. Instead, the owner introduced a system of filling organic, compostable bags with dry foods, whereas liquid based products such as milk and yoghurts would be filled into glass

jars or containers, and then weighed on a scale to determine a price.

A woman named Lauren Singer who owns the 'Packagefree' store based in Brooklyn goes by the saying "Trash is for tossers". She believes that people who buy her products aren't only buying package free products, but are also experiencing her ideal way of living. She sells products like bamboo tooth brushes to metal, refillable jars of shampoo. These seem ideal and appropriate to positively impact our so called 'throwaway society' however, the prices she offers for the products seem ridiculously steep, with the shampoo being priced at \$30.



If UK retail stores were to adopt a similar system where there is no plastic packaging, they will need to retain the cheap prices they are well known for while doing so.

Under a new 'Plastic pact', the Government-backed waste charity 'Wrap' has organised an agreement with every major UK supermarket, pledging to eradicate unnecessary single-use plastics by the year 2025. To succeed, the pledge states that plastic packaging will only be used for products if deemed "absolutely necessary". Over 40 firms have agreed and promised that within 7 years, all plastic packaging they create will be reusable, recyclable or compostable. Big brands like Nestle, Coca-Cola, Birds Eye, Arla and Britvic are all in on the act and have estimated that two thirds of their packaging will be recycled or composted, which is 45% more than it is to date. In my opinion, these influential companies should do more to ensure sustainable packaging is used rather than assuming how people will choose to dispose of them. We already have recyclable materials used as packaging within retail, but this does not necessarily mean it'll be recycled.

The BBC recently estimated that 8.3 billion tonnes of virgin plastic has been produced to date, and as of 2015, approximately 6.3 billion tonnes of plastic waste has been generated, with only 9% of that being recycled, 12% incinerated and a staggering 79% being accumulated in landfill or the natural

environment. I believe this emphasises the need to raise awareness for consumers to realise the impact of plastic waste on our environment, and the possibilities of recycling and reusing materials.

Black plastic trays commonly used for ready meals are expected to get the axe, along with snap pots of yoghurts, beans and numerous other products. Vegetable packaging is also under threat, to be replaced by selling loose vegetables only.

This move is a "World first" and experts hope that this will encourage countries around the world to follow suit, with big brands like Coca Cola for example operating and being an influential figure in countries around the world.

So, what more can retail stores do to improve sustainability with regards to plastic packaging? A question commonly asked is 'why not just use bioplastics?' Biodegradable plastics aren't made from our finite resources of fossil fuels, and some believe it is the best solution for retail packaging.

Bio based plastics stem from renewable bio mass sources, they require less energy to be manufactured than plastics that originate from petroleum and can occasionally be composted. Starch can be used in its raw state, or it can be processed further by bacterial fermentation to create bio-based monomers, which can then later be polymerized into bioplastic.

Biodegradable petroleum-derived plastics can either be oxy-degradable or compostable. Oxy-degradable plastics can break down to little pieces but their biodegradability is not scientifically proven.

However, biodegradable plastics used for packaging applications like 'BASF Ecoflex' is partially bio-based polyester. This means it has similar properties of ordinary polyethylene but is "fully biodegradable under composting conditions."

Ecovio however, consists of polylactic acid and ecoflex.

Personally, I do not believe this is the best solution for one simple reason – Disposal. Bioplastics only biodegrade under composting conditions therefore, it all depends on the preferred methods of disposal of consumers, which currently isn't sustainable. One way bioplastics could be used successfully is if the Government, supermarkets and big brands like Coca cola raise more awareness of plastics and possibly offer incentives like return schemes to entice consumers to recycle or dispose of items more sustainably.

An alternative to bioplastic is 'Starch based biodegradable packaging, which can contain more than 70% starch. The higher the percentage of starch, the quicker the plastic will break down. For

example, 'packaging peanuts' can dissolve in water in around 15 minutes. Starch extraction is a process used for starch-based plastics, and occurs naturally in plants such as potatoes, maize, wheat and rice, as well as many others. Where bioplastics are made through bacterial fermentation of starch, starch-based plastic is produced using the raw material. Raw starch is also used for papermaking to add strength, textiles and as sugar in processed food. However, the argument many people have against this type of starch-based packaging, is that the land would be better off used for growing vegetables and plants for consumers, rather than processing them further for starch extraction.

My view on the situation is that disposal and raising awareness is the key to improve sustainability with regards to plastic packaging. To tackle this blight, the government have recently announced that they will introduce a deposit return scheme on all one-use unnecessary plastic packaging like plastic bottles, as well as glass and metal. Before they introduce this system to England, they aim to analyse and research how such a scheme would work in the UK and investigate further opportunities to raise awareness. I believe this is a great way to introduce an incentive to ensure consumers dispose of their waste as correctly and sustainably as possible.

How likely is it for this system to succeed in the UK however? Germany, Denmark and Sweden currently have deposit return schemes in place and have deemed to be successful to date. These deposit return schemes sees consumers pay an up-front deposit starting from 8p in Sweden to 22p in Germany. They have made it possible for consumers to return their waste to supermarkets and receive their deposit. There are also devices like vending machines which work similarly, but in a reverse mode. This sees consumers of plastic bottles being able to place their waste into the machine and it gives money in return. After waste is returned from the consumers, it is then the businesses responsibility to ensure the waste is disposed of correctly and safely. This system has seen Germany's recycling rate rise to a staggering 97%.

In conclusion, a zero-waste system implies that by eliminating waste from packaging and a system of deposit for refillable bottles or other reusable packaging is the most effective way to reduce waste and also the extraction of raw materials.

If we in the UK, and retail stores nationwide are to be sustainable with regards to plastic packaging, we need to advance towards a system of refillable, reusable packaging, starch based or biodegradable plastics, with incentives to dispose of them

sustainably. Raising awareness of the severity of the situation is a solution but is already in action and isn't enough.

Although the state of our oceans and the amount of plastic waste generated is horrendous, I believe that if the Government decides to enforce their plans to introduce the deposit return scheme, although it is a long journey, we will be on the right track to improving our environment.

"Future generations will look back on this decision as a piece of supremely enlightened policymaking, and one that raises the prospect of the world's most beautiful country becoming free from drinks container litter at last."

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