Food waste caused by short shelf life can have an impact on packaging sustainability

Master thesis on: Integration of shelf-life in life cycle assessment of polymers
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When we go to the supermarket to buy food, we choose packaging that is more environmentally friendly. We bring the food home and sometimes forget to consume it before the Best before date, and thus throw it away. What if the food we throw away lowers the package's sustainability? Can the package then be termed sustainable? What if plastic packaging would have extended food shelf-life? Would that make it more sustainable?

Consumer preferences are changing, and they are now seeking for more sustainable food packaging. Plastics are becoming less attractive packaging in several parts of the world due to rising waste management concerns and marine pollution. Food packaging innovations have resulted in the development of biopolymers, which are manufactured from raw materials derived from food. Although many of these biopolymers are biodegradable, commercially available one often provides a shorter shelf life and therefore may contribute to food waste. Therefore, while assessing the environmental impact of food packaging, it is critical to consider its impact on food waste.

Food shelf-life refers to the period during which the food's quality is at its peak and acceptable to consumers. Food that is not consumed within its shelf-life becomes waste and adds to greenhouse gas emissions (GHG). So, if the packaging can prolong the shelf-life, it means the food will retain its quality for a longer period of time, resulting in less food waste and, as a result, lower GHG emissions.

This mater thesis estimates the shelf-life of fruit juice and ketchup packed in two different biopolymer (PEF & PLA) and PET bottles. For these packaging materials, the food waste due to shelf-life is calculated. The food waste is then incorporated into the packing material's environmental assessment. Following these steps will provide a better knowledge of the overall environmental impact of the packaging materials.

According to the study's findings, if packaging offers a longer shelf life, it can reduce food waste and, as a result, has the potential to decrease packaging's environmental impact. The environmental impact will also be determined by the type of food packaged as well as how the packaging is disposed of after usage. The study shows that, if plastic packaging materials, such as PET, are recycled properly, their environmental impact is reduced considerably.

So, as consumers, what can we do? As consumers, we should check to see if the packaging can be recycled, and if so, it should be sorted into recycling waste or deposited at a recycling station. What about biopolymers? The study shows, biopolymers can perform better than PET even when food waste is considered. Because the biopolymer industry is still in its infancy, it will take some time for them to become widely used. Meanwhile, as consumers, our priority should be to consume products before they expire and to sort waste properly after use, so that existing packaging materials can be recycled.