

A zero-waste retail store, and package free distribution of oats and rapeseed oil

Is it good to sell food without packaging? And how do we sell food without generating any waste at all? Package-free is a way, but generally has to be combined with seven other categories to be justified.

Every year the average Swede generates 450 kg municipal waste, and the average Dane almost 800 kg. Currently, this waste is in a Scandinavian context incinerated, but the EU waste hierarchy requires us to move towards a system where we stop generating waste to begin with. When we look at food, packaging serves to protect the product and thereby mitigates waste generation. To tackle the problems of waste within the food industry, a new store concept has arisen which generally means removing disposable packaging in favor of reusable solutions. However, there is no consensus to whether this option actually is superior to how most stores currently operate, namely using disposable packaging to protect and market the product, and solving the waste generation by promoting recycling efforts.

A solution to this problem could be to adopt a zero-waste model of food distribution. The term zero-waste is often, but not always, used by stores that sell unpackaged food, since in theory the consumer would not generate any waste given that he or she does not waste any food at home. Zero-waste basically means that no or virtually no waste is generated in a system. This means that materials are not incinerated but instead used for as long as possible, and afterwards recycled without degradation.

In this study, a framework with eight different areas are identified and is intended to be used to design zero-waste distribution models of food. If a practitioner does not address all categories, he or she risks creating a system that generates even more waste, despite their initial intention to reduce it. An example is the conflict between transport distance and packaging. If reusable packaging solutions are used, it's important to keep all transport distances short, or in other words, regionalizing the food supply instead of relying on far-away imports. In most cases, disposable packaging solutions will outperform reusable ones when transport distances increase.

The other half of this work is two complete life cycle assessments of oats and rapeseed oil respectively. Based on a Danish package-free store, their distribution model is evaluated against two products from Swedish producers packed in disposable packaging. When oats are sold in bulk from a gravity dispenser, the savings and potential savings are large, up to 80 % in terms of packaging impact. If this system would lead to more food waste being generated, the package-free model has 8 % tolerance in terms of the emissions to climate change, but a very low tolerance in terms of acidification and eutrophication. The package-free rapeseed oil system uses reusable glass bottles. It can be defended if it is used by smaller stores with their own washing facility and as long as the glass bottles are reused at least five times, but the glass bottle would have to be reused about 20 times to actually generate any substantial savings.

In conclusion, it is recommended for all retail stores to redesign their distribution of oats and certain dry products. It is important to prioritize products that already have a low impact, such as barley, oats, lentils, and dry beans. Products such as nuts and rice should initially be excluded as the tolerance for an increase in food waste is negligible, and the actual waste generation should firstly be thoroughly investigated. For oils and other liquids, it is generally not recommended to implement this system at a larger scale, especially not if the stores were to use a centralized washing facility serving several different stores.