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Damgaard, Anders; Bisinella, Valentina

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What type of shopping bag to use? Perspectives on the functionality and recycling of polymers

Anders Damgaard¹*, Valentina Bisinella¹

¹: DTU Environment,
*Corresponding author email: adam@env.dtu.dk

When standing at the supermarket line and realising you have forgotten to bring a shopping bag the question often arise on which bag to choose? Here the consumer have to pick between a number of different bags made of paper, plastic or other organic materials (cotton, jute, etc.). This bring some users to ask which bag is the most environmentally friendly to choose?

This question is currently being addressed at DTU Environment. Often people would think that the “natural” materials are better than plastic, as it is created from renewable feedstocks, but is this really the case. In the study we consider both the production costs, but do also look into aspects such as the functionality of the bag (durability, volume weight capacity), the potential for recycling, and the other different disposal pathways.

In the study we have looked at a number of different plastic bags currently on the market, which are:

- low-density polyethylene (LDPE)
- recycled polyethylene terephthalate (PET)
- biodegradable carrier bag made of a starch-polyester (biopolymer blend)
- a more durable bag, often with stiffening inserts made from non-woven polypropylene (PP)
- a more durable bag, often with stiffening inserts made from woven polypropylene (PP)
- cotton bag
- paper bag

These types of carrier bags are each designed for a different number of uses. Those intended to last longer need more resources in their production and are therefore likely to produce greater environmental impacts if compared on a bag to bag basis. To make the comparison fair it is therefore necessary to consider the impacts from the number of bags required to fulfil the functional need for the consumer.

The results show that production methods and disposal options, often plays as large a role, as the material type used in the production of the bag. The reason for this is that recycling options and durability is closely linked to these aspects. For the user this means that they also need to think about how they want to use the bag, and not only what seems to be the best option.