

Abstract

Waste in general and plastic in particular is a big problem nowadays. The Czech Republic ranks among the winners in the sorting of plastic waste, but not all sorted waste is further used. According to the Plastics Europe portal (2022), the most used method of handling plastic waste in Europe is energy recovery, followed by recycling. It is precisely the increased share of recycling that would better correspond to the principles of the circular economy, which is why in my work I dealt with a new method of separation and processing of food waste in disposable packaging and the subsequent assessment of the usability of the separated plastics. Currently, the used method is waste crushing, separation of the biological component and its energy use in a biogas station.

In the theoretical part of my bachelor's thesis, I focused on the general characteristics of vermicomposting, packaging, recycling, plastic waste, and last but not least, I describe the methods of handling bio-waste in supermarkets.

Part of the work was an experiment that verified the potential of a newly designed method of separating biowaste and plastic disposable packaging using earthworms on a pilot scale. The experiment was based on the assumption that the earthworms used would be able to transform food waste in disposable packaging into vermicompost without the need to disturb or crush these packaging. They can then be easily separated and handed over for recycling. The tests took place in the composting plant of the Florium company in Ostrov near Prachatic. The plastic packaging was separated using a vibrating sieve in the Dekonta company's technical premises in Slaně. There was also a visit to the biogas station in Příbyšice, where currently unsold food and packaging from supermarkets are collected. It has been found that plastic waste is crushed and then processed into an alternative fuel. The fermentation residue from bio-waste is used as a liquid fertilizer for the farmer and the farmer who comes to collect it. Subsequently, an oral consultation took place with a representative of the recycling company PESL, s.r.o., to find out whether the separated plastic packaging is suitable for recycling.

The results showed that earthworms are able to penetrate organic material through plastic packaging, but these packaging are no longer suitable for recycling. It has proven to be the best option to bring these wastes to biogas stations, which can further utilize them.

Keywords: disposable packaging, plastic waste, recycling, vermicomposting