

Food waste generation in the grocery retail sector

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Abstract

When considering food production, it is approximated that about one-third of all food intended for human consumption is lost or wasted when assessed by weight [1]. However, when assessed in terms of caloric value, food wastage accounts for roughly one-quarter of the total food produced. Within the European Union (EU), food waste generation in 2011 is estimated to have reached 129 million metric tons, which represents approximately 20% of the total food produced in the region [2].

In particular, within the "Retail and Other Distribution" sector of the food industry, it is roughly estimated that around 4.6 million tons of food waste were generated in the EU in 2012 [3]. Although the retail sector's share of food waste along the supply chain may seem relatively small, addressing it is crucial due to its substantial influence on food waste generation in other stages of the supply chain, including suppliers, primary production, and consumers. In this study, a major supermarket chain in Greece has committed to supporting SDG 12.3, which aims to halve food waste in its own operations and contribute to reducing food waste among its suppliers and customers. To achieve this, the retailer collaborated with Harokopio University to establish a baseline for food waste in its entire supply chain for the year 2019. This collaboration aimed to provide external verification for the retailer's annual food waste assessments in its own operations, estimate food waste generated by its suppliers and customers, and lay the foundation for implementing or intensifying various food waste prevention activities.

This study presents the variation and composition of unsold food quantities, food waste, and food donations in the chain's operations (including stores and warehouses) for the years 2019 and 2020, with the goal of developing an effective waste prevention plan.

Detailed data regarding the quantity and value of each unsold food item, referred to as "shrink" hereafter, were extracted from the company's database into Excel files. Depending on the type of product, the quantity was recorded either in weight units or as the number of items, with all entries eventually converted into weight. Net weight (excluding packaging) was used for this purpose. In cases where such information was not available, typical unit weights from nutrition and dietetics databases were applied.

Furthermore, the monetary values of the total food handled by the chain were provided, and these were converted into weight units using value-to-weight coefficients for each year, as determined from the shrink files. Unsold food may be directed towards donation, returned to suppliers, or disposed of directly. The latter two pathways are classified as

food waste.

The data were analysed based on:

- i. the main store activity departments, i.e. fruits and vegetables, grocery, meat, fish, frozen, bakery, and pastry. and
- ii. the main reason for food not been sold as reported by the retailer, namely food donation, store food waste, warehouse food waste and store returns.

The results indicate that the main food waste quantities are generated by the fresh fruits and vegetables store department, followed by the dairy product department. The key outcome of this study is that food retailers can make meaningful changes to help limit food waste. The first, crucial step towards this direction is the establishment of reliable food waste baseline.

References

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