Assessing food waste generation in the food service sector; mission impossible?

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Abstract

Wholesome food wasted results in resource depletion, challenges for human health, GHG emissions, water pollution, and loss of opportunity to recover energy, organic matter, minerals, and water (Lasaridi et al., 2017). Due to the magnitude of these effects, prevention initiatives and sustainable management of food waste (FW) are essential if the UN Sustainable Development Goals (SDG), and especially SDG 12.3 are to be met (Chroni et al., 2022). Food is wasted throughout all stages of the food supply chain (Lasaridi, Terzis, et al., 2019). A significant fraction of the food is wasted at consumption stage, in which important factors contribute (e.g., managerial, behavioral, cultural). While to date households have been sufficiently studied (Abeliotis et al., 2019; Kritikou et al., 2021), food is also wasted in the food service sector (FSS) (Eriksson et al., 2018; Lasaridi, et al., 2019). With a 12% share, FSS makes a noticeable contribution to FW, particularly considering that 75% of that quantity represents the so-called "avoidable" FW fraction. Thus, assessing FW in the FSS is crucial for reshaping the current dysfunctional food system into a healthy, balanced, and sustainable one. In view of the complex FSS which involves different types and a variety of sizes, scales, and scope organizations, studies have been undertaken to understand the dynamics of FW (Amicarelli & Bux, 2021; Lasaridi, Terzis, et al., 2019). Their results are identifying the factors that contribute to FW and offer recommendations for consumer-focused preventative efforts or techniques. However, the FSS's complexity and variety remain a stumbling block. The objective of this work is to identify the dissimilarities among existing methods, techniques and tools, features and characteristics, limitations and delimitations, challenges, and opportunities, as well as results and best practices in the literature. A literature analysis on 70 FW quantification studies was carried out. Findings of wide geographical coverage, as well as broad spectrum of FSS sub-sectors, suggest lack of established and standardized definitions and approaches with varying (de)limitations, and uncertainties in data collection encompassing estimations throughout. This significantly affect their results in terms of waste quantities range (ranging from 9% of the food portion being wasted, up to 45%), as well as generalizability and comparability. This research argues that the majority of the approaches published, although scientifically sound, could only draw conclusions on a strict case-specific viewpoint, offering limited means -nevertheless still

useful- to support horizontal FW prevention measures, or FW management solutions across the FSS. Additionally, this study points out that a) a better understanding of the numerous contextual and cultural factors involved in FW and its management is decisive, and b) the similarities and differences between the magnitude and drivers of FW across all the different FSS sub-sectors is essential to impose sustainable prevention and mitigation measures and approaches.

Keywords: waste prevention, food waste, food service, circular economy, sustainability, SDG 12.3

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