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Gleaning as a Tool to Shed Light on Food Losses: A Five-year Quantitative and Qualitative Study in Catalonia.

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Abstract

Food loss and waste (FLW) stem from structural problems within the current agrifood system and entail social, economic and environmental consequences. Food losses (FL) at the primary production stage have often been neglected, particularly in the European Union (EU), where a definition of FL is missing (Directive (EU) 2018/851, 2018). Consequently, their quantification is not required by Member States (MS) under Delegated Decision 2019/1597. However, the Food and Agriculture Organization (FAO) does define FL (FAO, 2019), and their reduction is included in the Sustainable Development Goals (United Nations, 2015), to which EU MS are committed. Considering its wide-ranging impacts across the territory (Shahbazi et al., 2025), especially the economic implications for the primary sector, further research on FL is needed to establish effective measures for the prevention and reduction of this problem. Gleaning tackles FL by redistributing surplus produce from fields to social organisations, contributing to food security and raising awareness on FLW. It also emerges as a tool to better understand such issue by conducting direct measurements and identifying its main causes, thereby enabling the collection of context-specific information that supports the development of solutions adapted to the realities of each territory. For this case study, data were collected in Catalonia between May 2021 and November 2025 through gleaning activities, using a mixed-methods approach that combined quantitative and qualitative data. To estimate potential FL, understood as the production that would have remained in the field if it had not been gleaned, direct measurements took place (n = 547), covering 40 crop types grouped into seven categories: (I) stone and pome fruits, (II) citrus fruits, (III) bulbs, tubers and roots, (IV) fruit vegetables, (V) leafy vegetables, (VI) inflorescence vegetables, and (VII) legumes. For each measurement, potential FL (kg/ha) were estimated. The main FL causes were identified through semi-structured interviews (n = 494) based on six dimensions (Vidal-Monés, 2021): aesthetic requirements of crops, low prices, lack of personnel, absence of buyers for harvested produce, inadequate in-farm infrastructures, and absence of competitive processing plants. The data were statistically analysed to calculate the average potential FL in the plots under study, identify the main causes, and determine significant differences in the magnitude and FL causes between different crop types. This study provides a novel contribution to the quantification of FL and the understanding its causes through gleaning, highlighting its potential as a sustainable tool for knowledge generation through direct measurements and FL reduction.

Keywords: Food loss, Gleaning, Measurements, Food loss causes, Fruits and vegetables

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