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Beyond Quantification: Advancing Long-Term Food Waste Monitoring in Nursing Home

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Abstract

Food waste monitoring in nursing homes is recognised as an important component of sustainable food service management. However, long-term monitoring systems often face practical limitations. This study presents the continued development of a 2.5-year food waste monitoring project conducted in a nursing home using SmartBin technology. Building on previously established longitudinal monitoring data, the project was further expanded through complementary methodological and sustainability-oriented approaches. A one-week study of lunch plate waste composition was conducted to explore practical methods for estimating the relative proportions of food categories in mixed plate waste. In parallel, a Life Cycle Assessment (LCA) was conducted to examine the environmental impacts associated with observed patterns of food waste. In addition, post-intervention analyses were initiated to evaluate potential changes in food waste generation following interventions implemented within the nursing home.

Preliminary LCA results estimated an average climate impact of 0.465 kg CO_2 eq. per resident per day. Food waste generated during dinner contributed the highest environmental impacts, followed by lunch and breakfast. Composite dishes, semifluid and meat were identified as major contributors to the overall carbon footprint, while primary production was the dominant life-cycle stage responsible for environmental impacts.

The study highlights both methodological and practical considerations associated with implementing and expanding food waste monitoring systems in nursing home settings. This ongoing work contributes to the development of more comprehensive and practice-oriented approaches for food waste assessment and management in nursing homes.

Keywords: food waste, nursing home, smart bin, long term monitoring

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