

Investigating the Efficacy and Sustainability Impacts of Educational Approaches in Reducing Plate Waste in School Catering

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Abstract

School meal programs play a critical role in addressing nutritional needs and shaping dietary habits among children worldwide. However, the staggering amount of food wastage within these programs, reportedly reaching up to 178 g/guest or approximately 20% of the served meals, poses significant challenges to sustainability and resource efficiency (Boschini et al., 2020; Lonska et al., 2022; Malefors, 2022; Pancino et al., 2021). In alignment with the objectives outlined in Agenda 2030 for sustainable food systems, there is a growing emphasis on mitigating the environmental footprint of school meal programs, with food waste reduction emerging as a pivotal target alongside dietary changes to ensure adherence to planetary boundaries (GCNF, 2022; Springmann et al., 2018). Addressing the food waste issue requires innovative interventions and educational approaches have emerged as promising strategies for mitigating food waste in school catering (Painter et al., 2016; Persson Osowski et al., 2022). However, despite the growing interest, evidence on the short and long-term efficacy and sustainability gains of such measures remains scarce. Thus, the present study aimed to examine the efficacy and sustainability impacts of educational interventions focused on reducing plate waste in school catering across Europe. The study implemented educational approaches in ten primary schools in Sweden from 2020 to 2022, three secondary schools in Germany from 2023 to 2024, and eleven secondary schools in Austria from 2022 to 2023. Specifically, interventions including plate waste trackers were tested in twelve schools (Sweden and Germany), pedagogic meals in five schools (Sweden), and kitchen workshops in eleven schools (Austria). Employing a multi-phase study design, including pre-intervention baseline establishment, intervention implementation, post-intervention evaluation, and

sustainability assessment, various educational approaches were tested and compared to control groups. Data collection involved quantification of plate waste during school lunches and recording the number of guests to calculate relative indicator of plate waste per guest. Preliminary findings from the study suggested a significant reduction in plate waste by implementing plate waste trackers in school canteens. These reductions were observed both in the short term and were sustained over the long term, as verified through comparison with control groups where no changes in plate waste were detected. Contrarily, no significant reductions were observed through the implementation of pedagogic meals or kitchen workshops, which may be explained by too low a proportion of participating children per school. Furthermore, sustainability impacts, including environmental, social, and economic aspects, were assessed, considering carbon footprint, and nutrient and economic losses embedded in the plate waste. By bridging the knowledge gap regarding the effectiveness and sustainability gains of educational approaches in tackling food waste in school catering, the present study provides valuable insights for policymakers, educators, and the scientific community striving for more sustainable food systems.

Keywords: Food waste, school meals, plate waste tracker, pedagogic meals, kitchen workshops, intervention study

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