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Situational Determinants of Plate Waste at School Lunch in Public Primary Schools

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Abstract—Motivation: Plate waste has been an issue of concern at schools due to nutritional, economic, environmental and social impact. Plate waste at school lunch may be affected by several situational factors, namely presence of caregivers during meal period, time available for lunch, the noise level in the canteen, variation of children's appetite and energetic needs, disadjustment between meals served and children's preferences, scheduling constraints that interfere with meal consumption or result in meals being served when children are less hungry. Problem statement: To evaluate situational factors affecting plate waste at school lunch in primary schools. Approach: Plate waste of soup and main dish at school lunch was evaluated for all fourth-grade children aged 9 to 10 years old, attending to 20 primary schools at a Portuguese Municipality. Weighing of individual meals and leftovers was performed. Plate waste (%) was calculated by the ratio between food discarded and food served to the children. Information about potential factors influencing plate waste at school lunch was collected, including time spent during lunch, recess schedules, presence of teachers and other caregivers at school canteen, number of children at canteen during meals, meal starting time, existence of a school strategy to encourage consumption. Results: Plate waste was significantly affected by meal starting time. Children having lunch 30 minutes after ending classes had lower plate waste of soup ($p=0.002$) and main dish ($p=0.001$) than children having meal immediately after the end of classes and children having lunch later. It was found that a higher number of students at school canteen also determined high plate waste for soup ($r=0.170$; $p=0.001$) and main dish ($r=0.115$; $p=0.014$). Plate waste of the main dish was higher for children who spent more time at school canteen than for children who finished lunch faster ($r=0.155$; $p<0.001$). A significant influence of teachers' presence at school canteen was not observed. Additionally, a higher number of caregivers in canteen determined higher waste values for soup ($r=0.113$; $p=0.017$) and main dish ($r=0.158$; $p<0.001$). A higher plate waste for soup ($p=0.001$) and main dish ($p<0.001$) was observed at schools where children can leave the canteen whenever they want, comparing to schools where is mandatory for children to stay at the canteen during meal period. No differences were found for plate waste between children having recess before lunch and others having recess after lunch period. Conclusions: High values of plate waste were observed when no strategies exists at schools to encourage lunch consumption, a high number of children attending school

canteen probably associated to noise level and also when children have lunch immediately after classes ending. Encouraging school lunch consumption by caregivers, adjust lunch schedule to children's needs and allowing a period to play before lunch, as well as reduce the number of children attending simultaneously the school canteen appear to be potential strategies to reduce plate waste at school lunch.

Keywords—Children, determinants, plate waste, schools.

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