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Beyond Awareness: Consumer Segmentation and Behavioural Nudges for Household Food Waste Prevention

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Abstract

Household food waste represents one of the most significant sustainability challenges in Europe, accounting for nearly half of all edible food waste generated across the food system. Despite growing public awareness, food waste behaviours remain strongly embedded in everyday routines, contextual decision-making processes, and implicit perceptions surrounding food quality and acceptability. Within this context, the NAFW (Nudges Against Food Waste) project investigates how behavioural science approaches may support more effective household food waste prevention strategies. Implemented across five European countries (France, Germany, Hungary, Italy, and Sweden), the project combines stakeholder consultations and a large-scale consumer survey (n = 5,000). The survey integrates self-reported attitudes and perceptions, realistic behavioural scenarios, and an Implicit Association Task (IAT) focused on beauty bias toward imperfect food products. This methodological design enables the analysis of food waste behaviours across multiple levels of cognition and practice, capturing not only self-reported attitudes, but also contextualized behavioural choices and implicit associations. A Multiple Correspondence Analysis followed by Hierarchical Clustering identified four distinct consumer profiles structured around two main dimensions: food valorisation and behavioural control. The results demonstrate that low food waste outcomes may emerge through different behavioural pathways. While “Proactive Consumers” rely on anticipatory planning and highly structured food management practices, “Adaptive Consumers” achieve similarly low waste levels through reactive adaptation, flexibility, and preservation-oriented routines. Conversely, “Passive Consumers” display lower engagement in active food management, whereas “Rule-Based Consumers” combine stricter standards around freshness, appearance, and perceived food safety with lower tolerance toward food imperfections. Particular attention was paid to beauty bias and the acceptance of aesthetically imperfect products. The IAT results indicate that slightly damaged fruits and vegetables elicited weaker safety associations and stronger negative taste associations than perfect produce. However, the relative subtlety of these effects suggests that consumer perceptions of imperfect food are not fully polarized and may remain responsive to contextual influences and framing interventions. Furthermore, both perfect and imperfect products displayed similarly negative associations with “artificialness,” pointing toward the potential importance of naturalness framing in shaping acceptance. This hypothesis was further explored through scenario-based behavioural testing. When imperfect potatoes were presented with a “100% natural” nudge at point of purchase, acceptance increased across all consumer profiles. These findings suggest that consumer responses to imperfect produce are highly context-dependent and can be significantly influenced by relatively subtle framing interventions. More broadly,

the results highlight the potential of behavioural nudges targeting perceptions of naturalness, normality, and food value to reduce the rejection of aesthetically imperfect products. Overall, the findings underline the limitations of awareness-based approaches alone and support the need for more targeted, segmentation-based interventions accounting for the diversity of household food management styles, implicit perceptions, and contextual decision-making processes shaping food waste behaviours.

Keywords: Household food waste, Consumer segmentation, Behavioural nudges, Beauty bias, Food valorisation

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