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Using Incidental Data from a UK Supermarket to Explore the Interplay between Environmental Sustainability, Health, and Cost of Food and Drink Purchases

Emma Wilkins¹, Mariana Dineva¹, Mark Green², Mark Gilthorpe³, Alexandra Johnstone⁴, Maddie Thomas⁵, Nilani Sritharan⁵, and Michelle Morris^{1,5}

¹School of Food Science and Nutrition, University of Leeds, Leeds, United Kingdom

²Department of Geography & Planning, University of Liverpool, Liverpool, United Kingdom

³Obesity Institute, Leeds Beckett University, Leeds, United Kingdom

⁴The Rowett Institute, University of Aberdeen, Aberdeen, United Kingdom

⁵Leeds Institute for Data Analytics University of Leeds, Leeds, United Kingdom

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Introduction & Background

There is limited research into the environmental sustainability of foods and diets, and how these covary with healthiness and cost. Supermarket loyalty card data presents a valuable resource to explore these factors, with advantages over traditional dietary data, such as scale and objectivity.

Objectives & Approach

We described the relationship between the environmental footprint (EF), cost, and 'High in Fat Salt and Sugar' (HFSS) status for food and drinks available to purchase from a major UK supermarket. Loyalty card data included >160 million purchases by de-identified customers in Yorkshire and the Humber in 2022. EF (per kg and total from sales) were estimated for each product from published data on mean greenhouse gas emissions (GHGE), land use, and water use for 43 food commodities.

Relevance to Digital Footprints

Incidental data from loyalty cards provides insight into the interplay between food sustainability, HFSS status, and cost, which could help shape policy and/or supermarket interventions to improve population and planetary health.

Results

EF estimates (per kg) were available for 27,761 products (99.8% of sales). Foods products in the highest versus lowest third of GHGE were more expensive (median £10.40 versus £4.40) and comprised a higher percentage of HFSS products (34.2% versus 19.5%). This trend was repeated across all products for land use and water use. Comparing the highest versus lowest tertiles of EF, median cost was 2.4 and 1.7 times higher and the percentage of HFSS foods was 2.3 and 1.4 times higher for land use and water use, respectively.

In contrast, when exploring total sales footprints (data available for 98.8% of sales), these trends were no longer observed. This is likely because cheaper products tend to be bought more often and have a bigger sales footprint, obscuring the general product trends observed above.

Conclusions & Implications

By weight, products that are more sustainable tend to be cheaper and are less likely to be HFSS, suggesting changes to purchasing behaviours that improve both human and planetary health while maintaining or reducing consumer costs may be possible. Further research could therefore investigate specific dietary 'swaps' to achieve these aims.

Keywords

consumer data, loyalty card, sustainability, food system, consumer purchasing patterns

