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HOW TO MEASURE MORE SUSTAINABLE HOUSEHOLD FOOD CONSUMPTION USING SUPERMARKET DATA?

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How to Measure More Sustainable Household Food Consumption using Supermarket Data?

The Environmentally Sensitive Shopper Index (ESSI)

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Background

Behavioural change by households is increasingly anticipated to make an important contribution to the reduction of greenhouse gasses (GHG) and other emissions (e.g., Schor, 2005).

Global studies have shown that to achieve GHG and other emission reductions from a consumption perspective important sectors to target are: food; housing; mobility; and, with increasing household income, manufactured products.

In Europe, food is responsible for 20–30% of the overall environmental externalities of household consumption (Tukker et al., 2010).

Monitoring of the environmental sustainability of food consumption at the household level is necessary to evaluate current performance and initiatives for change.

Sustainability assessment tools are commonly characterised by a production perspective.

The environmental economics literature has yet to propose a tool to measure environmentally sustainable food consumption at the household level.

Research question

How can we develop an indicator of environmentally sustainable household food consumption based on revealed preferences without complete knowledge of the environmental impact of all food products?

Design concepts

- Sustainable consumption is an ethical practice of consuming differently to reduce environmental impact (Evans, 2011).
- Focus on actual food purchase data (supermarket scanner data).
- The change and variation in the environmental sustainability of household food consumption can be captured from a number of key food categories — no need for an exhaustive view of total food consumption.

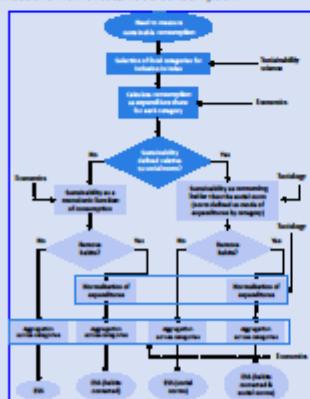


Figure 1. Indicator construction: the Environmentally Sensitive Shopper Index (ESSI)

PILOT Application

Data are for food purchases in the UK (Tesco supermarket: 16.5 million UK loyalty card holders).

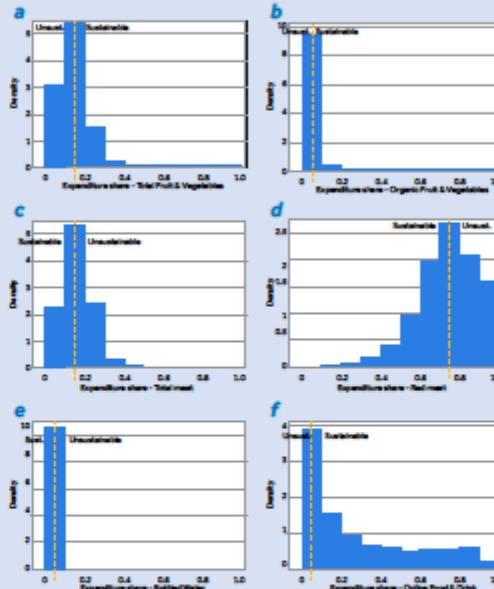


Figure 2: Mode of expenditure patterns by food category

Note: N = 200,889 UK consumers; zeros excluded from analysis.

The dashed line indicates the mode of the distribution.

The pilot application was used to test the ESSI on: criterion validity, content validity, and construct validity (see Kaplan et al., 1976).



Results and discussion

- The pilot results are for the period June 2009–May 2011.
- These show how the ESSI can serve to identify environmentally critical periods.
- Social norms have little effects on ESSI outcome.
- Habits have large effects on ESSI results.

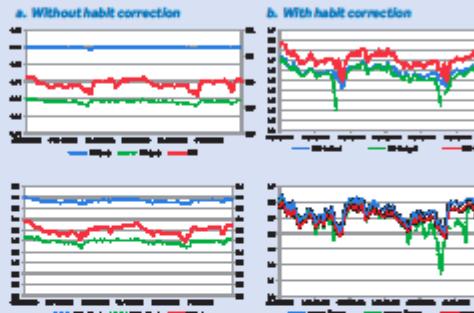


Figure 3 Graphic comparison of different versions of the ESSI index (weekly data)
Note: In each graph the y-axis on the right hand side refers to the sum version of the specific ESSI index. Abbreviations are as follows: ESSI-he = ESSI with habits correction; ESSI-en = ESSI based on social norms; ESSI(en)-hc = ESSI based on social norms with habits correction. The abbreviations (am) and (gm) indicate an aggregation by arithmetic mean or geometric mean.

Conclusion and further research

The index can be used to proxy sustainable consumption at the consumer end of the food chain, both through cross-sectional and repeated cross-sectional analysis. This enables a systematic monitoring of the environmental impact of food sales.

The resulting information can be used to enhance sustainability of household food consumption through marketing strategies, for instance through the promotion of environmental quality in those critical periods identified by the index (Christmas and summer for the UK).

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