

Abstracts

Session 3

Eating to Save The Planet: Evidence from a Randomized Controlled Trial Using Individual-Level Food Purchase Data

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Meat consumption is a major driver of climate change. Interventions that reduce meat consumption may improve public health and promote environmental sustainability. We conducted a randomized controlled trial to examine the effects of an awareness-raising intervention on meat consumption. We randomized undergraduate classes into treatment and control groups. Treatment groups received a 50-minute lecture on how food choices affect climate change, along with information about the health benefits of reduced meat consumption. Control classrooms received a lecture on a placebo topic. We analyzed 49,301 students' meal purchases in the college dining halls before and after the intervention. We merged food purchase data with survey data to study heterogeneous treatment effects and disentangle mechanisms. Participants in the treatment group reduced their purchases of meat and increased their purchases of plant-based alternatives after the intervention. The probability of purchasing a meat-based meal fell by 4.6 percentage points ($p < 0.01$), whereas the probability of purchasing a plant-based meal increased by 4.2 percentage points ($p = 0.04$). While the effects were stronger during the semester of the intervention, dietary shifts persisted and remained statistically significant through the full academic year. Our study provides evidence that an intervention based on informing consumers and encouraging voluntary shifts can effectively reduce the demand for meat. Our findings help to inform the international food policy debate on how to counter rising global levels of meat consumption to achieve climate change goals. To our knowledge, our study is the first to assess the effectiveness of an educational intervention to reduce meat consumption using such high-quality data (i.e. individual-level food purchases) over a prolonged period.

Trends in UK meat consumption: Analysis of the National Diet and Nutrition Survey Rolling Programme Years 1-9 (2008/09-2016/17)

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Background

Meat consumption negatively affects the environment, with meat production being one of the largest contributors to global warming and environmental degradation.

Methods

This study describes recent trends in red, white, and processed meat consumption within the UK, using data from the National Diet and Nutrition Survey Rolling Programme (2008/09-2016/17), and the associated changes in environmental impact. We used multivariable linear regression models to examine differences by gender, ethnicity, socio-economic status, and year of birth.

Results

From 2008 to 2017, average daily meat consumption per capita decreased from 103.7g to 91.7g per day ($P=0.007$), including an absolute reduction of 8.4g ($P<0.001$) and 8.7g ($P<0.001$) in red and processed meat respectively, and a 5.1g increase ($P=0.001$) in white meat. Collectively, these changes led to a significant reduction in land use (-16.8%, $P=0.013$), freshwater withdrawals (-10%, $P=0.047$), and stress-weighted water use (-17%, $P=0.013$) over the whole period. The two middle birth year groups (1960-1979 and 1980-1999), those living in the most deprived areas, and white individuals were the highest meat consumers. The decline in meat consumption was significantly faster in women than men ($P=0.038$). Meat intake increased over time among those born after 1999, those living in moderately deprived areas, and those in Asian/Asian British and Black/Black British populations.

Conclusion

Despite these reported reductions in meat intake, reaching meat consumption targets that align with sustainable diets will require a significant acceleration of this trend.

Humane Halos from Environmental Practices in Dairy Production

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Awareness of the impacts of our food choices on planetary health is growing, with scientists and policymakers calling for a shift from animal products to more plant-based diets. Whilst recent surveys indicate that sustainability concerns may be contributing to a decline in demand for meat, cheese consumption continues to rise globally despite its environmental consequences.

Consumer research consistently shows that many people also care about how animals are treated and are willing to pay more for humanely-sourced food. A new market sector has emerged which caters to the demands of these value-driven consumers. However, attempts to change the market through ethical purchases may be thwarted by advertising strategies which exploit the “halo effect”, a cognitive bias which manifests when first impressions of one attribute influence subsequent evaluations of unknown attributes.

This research investigates how two ethical domains, environmentalism and animal welfare, interact to influence consumer choice. In an online experiment, we recruited 267 participants and randomly assigned them to read either a pro-environmental, anti-environmental, or ethically neutral vignette about a cheese company. After being asked to rate the dairy on how well it treats its cows – an issue on which no information had been provided – participants indicated how frequently they would recommend the cheese compared to other brands. Results from a moderated mediation analysis confirm that framing a dairy as pro-environmental improved participants' perceptions of its treatment of its cows: a “humane halo” effect. Animal welfare ratings predicted product consumption recommendations, indicating the humane halo acted as a mediator. The strength of this mediated relationship depended on participants' environmental values, but only if they received negative information about environmental practices. Our findings suggest different strategies may be effective in crafting messages designed to shift consumers to more sustainable diets.

Sustainable and acceptable school meals through optimization analysis: an intervention study

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Background

School meals hold considerable potential to shape children's diets and reduce food-related greenhouse gas emissions (GHGE)—in the short and long term. This study applied linear optimization to develop a GHGE-reduced, nutritionally adequate, and affordable school lunch menu. The effects on food waste, consumption and pupils' satisfaction with the meals were evaluated.

Methods

A pre-post design was employed to assess the effects of implementing an optimized lunch menu on daily food waste, consumption and pupils' school meal satisfaction in three schools (grades 0-9) from one Swedish municipality. A food list containing amounts, prices, nutrient content, and GHGE-values of all foods used for a previously served (baseline) four-week lunch menu was created. Using linear programming, this food list was optimized for minimum deviation and constrained to ensure nutritional adequacy and a reduced climate impact. The optimized food list was developed into a new (intervention) lunch menu. The baseline and intervention menus were served for four weeks, respectively. Prepared, wasted and leftover food were weighed daily during both periods. Mean and slope differences in daily food waste and consumption between the two periods were assessed. School lunch satisfaction was assessed with an online questionnaire at baseline and during the intervention.

Results

Optimization resulted in a food list that was 40% lower in GHGE, met all nutrient recommendations for school meals, and cost 11% less compared to baseline. The intervention menu was served as planned, with only minor changes required (for practical reasons). Plate waste, serving waste, consumption and school lunch satisfaction did not differ significantly from baseline, in any of the schools.

Conclusions

The findings demonstrate that school meals can successfully be improved regarding health and environmental sustainability using linear optimization, without negative effects on food waste, consumption or cost. This approach offers the necessary flexibility to tailor menus towards different priorities and could therefore be transferred to other types of meal services.

Are supermarkets well placed to deliver less and better meat to consumers?

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Retailers can play an important role in facilitating a transition to healthier, more sustainable diets in the UK. They have been implementing strategies aimed at helping customers make healthier choices and are now considering how to broaden this to include sustainability, which is a live discussion in the UK retail sector.

Focusing on ‘less and better meat’ as a core component of healthy, sustainable diets, this study investigates retailer perceptions of healthy, sustainable diets; and retailer strategies and challenges to providing and promoting customer purchasing of ‘less and better meat’.

Results from a series of semi-structured interviews with senior health and sustainability professionals within the UK retail sector indicate that retailers have a diverse understanding of healthy, sustainable diets that seldom includes ‘less and better meat’. Retailers are adopting a range of different strategies linked to ‘less and better meat’ – from improving the sustainability of their meat supply chains to influencing customer purchasing through ‘nudge’ interventions. While strategies related to ‘better meat’ are being adopted, no retailer is implementing nudge interventions focused on reducing purchasing of meat products. The promotion of healthier, more sustainable diets is seen by some retailers as a way of positively engaging with customers and improving brand loyalty, but there are external barriers to reducing purchasing of meat products that are beyond the direct control of the retailer.