

## Long-lasting impact of information on meat consumption

Paul M. Lohmann<sup>1</sup>

<sup>1</sup>*El-Erian Institute of Behavioural Economics and Policy, Judge Business School, University of Cambridge, Cambridge, UK, [p.lohmann@jbs.cam.ac.uk](mailto:p.lohmann@jbs.cam.ac.uk)*

**Low-cost informational interventions promoting the environmental and health benefits of reducing meat consumption can stimulate long-lasting dietary change and build support for systemic meat reduction policies.**

Substantial reductions in meat consumption are crucial to attain climate targets and limit the numerous environmental impacts associated with livestock farming.<sup>1</sup> Policy interventions aimed at guiding individuals towards more plant-based diets and away from meat consumption hold the potential to mitigate climate change, while improving public health and animal welfare.<sup>2,3</sup> Yet, public and political appetite for more intrusive – and perhaps more impactful – interventions, such as bans or meat taxes, remains low.<sup>4</sup> Moreover, although consumers are increasingly knowledgeable about their dietary choices, many still underestimate the environmental impact of their food consumption and the health benefits of adopting plant-based diets.<sup>5</sup> In response, policy makers often emphasize the importance of information provision in the hope that educating consumers alone will encourage more sustainable diets. Although several studies have now documented significant positive effects from informational interventions, these are often small and short-lived, raising questions about their ability to bring about transformative dietary change.

Now, writing in *Nature Food*, Jalil and colleagues<sup>6</sup> show that a 50-minute lecture highlighting the environmental and health benefits of reducing meat consumption had long-lasting effects on the dietary behaviour of students at a residential college in the US. The authors conducted a randomised controlled trial (RCT) and were able to track actual food choices over several years. Study participants were recruited from undergraduate economics courses which were randomly assigned into treatment or control groups. Students in the treatment courses were given a 50-minute lecture raising awareness about the role of meat consumption in climate change and public health, while students in the control group were given a guest lecture on an unrelated topic. After three years, the authors assessed the effectiveness of the intervention by analysing data of over 100,000 actual meal choices made by study participants in the college dining facilities.

Results showed that students in the treatment group reduced their meat consumption by 9-11% depending on the type of meat, while increasing their consumption of vegetarian dishes by 20%. Astonishingly, these effects showed no signs of fading over time and even slightly increased towards the third year of observation. Men and women responded differently to the intervention, with women reducing their consumption of poultry and fish, and men primarily reducing their beef intake in favour of vegetarian alternatives. Across

the three-year period, a decrease of 0.354 kg CO<sub>2</sub>eq in the average meal carbon footprint was observed, mainly attributed to men reducing their beef consumption.

The success of the intervention can be credited to its careful design, centred around a “win-win” messaging approach – which highlights the dual benefits of reducing meat consumption for both personal and planetary health, closely aligned with the EAT-Lancet Commission’s “good for the planet and human health” messaging strategy.<sup>1</sup> The first half of the lecture focussed on the climate benefits of reducing meat consumption, whereas the second half discussed the health benefits by addressing common misperceptions around meat consumption and health. The lectures incorporated a range of pedagogical methods (including videos, handouts and interactive elements) systematically targeting the four rationalizations (“natural, normal, necessary, nice”) commonly used to justify meat consumption. Study participants were also provided with a list of plant-based meals available in the campus dining facilities, offering an immediate path to action, alongside a pro-social appeal to reduce meat consumption in favour of plant-based meals to tackle climate change.

The findings of this experiment contradict most of what is known today about the alleged ineffectiveness of information and education. The findings suggest that targeted and high-quality educational interventions can be a highly cost-effective policy tool, even if executed only once. The authors estimate that their intervention cost only \$13.78 per metric ton CO<sub>2</sub>eq saved. Assuming that the effects would persist beyond the three-year observation period and extend to meals consumed outside of college dining facilities, this value could be substantially lower. To put this into perspective, policy interventions are often considered cost-effective if they are less expensive than the social cost of carbon (the cost of emitting an additional ton of CO<sub>2</sub> in monetary terms) which the US government currently values at \$51 per metric ton.<sup>7</sup>

While education and information alone may be insufficient to bring about large-scale dietary changes in the broader population, the authors raise the important question of how educative interventions will interact with and complement other policy instruments aimed at encouraging sustainable diets. For instance, other forms of information provision strategies, such as carbon footprint labelling<sup>8</sup> or nudges that incorporate reflective elements,<sup>9</sup> are likely to be more effective if people understand and support their underlying objective.<sup>10</sup> Increased societal awareness of the harmful effects of meat may be crucial in building support for more politically contentious policies such as restrictions on meat availability or price increases, which could then drive shifts in food habits towards a more plant-based diet.<sup>11</sup> Finally, Jalil and colleagues stress the importance of creating supportive physical food environments in which high-quality, nutritious and tasty plant-based meal alternatives are readily available and affordable. It should thus be a policy priority to facilitate the creation of food environments in which sustainable food consumption is appealing, normal and easy,<sup>10</sup> in order to extract the full potential of educational interventions.

The results presented in Jalil and colleagues<sup>6</sup> are encouraging, and prompt future work on whether educational interventions can be readily scaled and transferred beyond the university setting. While university students may be particularly receptive to learning, other populations may be more difficult to reach and convince. For successful outcomes, educational interventions need to be customized to the

particular population targeted and perceived as credible and trustworthy. Given that eating habits and tastes are often formed at a young age, incorporating education on meat consumption into school curricula presents a promising pathway to changing long-term dietary patterns.<sup>2,10</sup> Ultimately, achieving pervasive behaviour change will require a mix of policy interventions and a concerted effort of multiple actors, yet educational policies will have an important role to play.

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## Competing interests

The author declares no conflict of interest