PHAIR
Psychology of Human-Animal Intergroup Relations

PsychOpen GOLD

Empirical: Single or Multiple Studies

# Educational Presentations Reduce Meat Consumption Across Two Universities

Elise Hankins[1,2§], Chloe Balhatchet[3§], Christopher Bryant[1], Matti Wilks[2], Chris Macdonald[4], Rebecca Hankins[4], Patience Abugu[5], Tommy Walker Mackay[6], William McFarlane Smith[7], H.-W. Hazel[8], Sophie Clargo[7]

**[1]** *Bryant Research, London, United Kingdom.* **[2]** *School of Philosophy, Psychology and Language Sciences, University of Edinburgh, Edinburgh, United Kingdom.* **[3]** *Selwyn College, University of Cambridge, Cambridge, United Kingdom.* **[4]** *Lucy Cavendish College, University of Cambridge, Cambridge, United Kingdom.* **[5]** *Churchill College, University of Cambridge, Cambridge, United Kingdom.* **[6]** *Trinity College, University of Cambridge, Cambridge, United Kingdom.* **[7]** *Downing College, University of Cambridge, Cambridge, United Kingdom.* **[8]** *Clare College, University of Cambridge, Cambridge, United Kingdom.*

[§] *These authors contributed equally to this work.*

Psychology of Human-Animal Intergroup Relations, 2025, Vol. 4, Article e18523, https://doi.org/10.5964/phair.18523

**Received:** 2025-06-22 • **Accepted:** 2025-09-17 • **Published (VoR):** 2025-12-04

**Handling Editor:** Chris Hopwood, University of Zürich, Zürich, Switzerland

**Corresponding Author:** Elise Hankins, Bryant Research, 71-75 Shelton Street, Covent Garden, London, WC2H 9JQ, United Kingdom E-mail: elise@bryantresearch.co.uk

**Supplementary Materials:** Code, Data, Materials [see Index of Supplementary Materials]

## Abstract

Reducing consumption of animal products is crucial to addressing the climate crisis. Educational interventions have shown promise in promoting plant-based diets, but the picture is not yet clear. Across two interventions, we examined whether brief, targeted video interventions could influence real-world dietary behaviours in university settings. Study 1 ($n$ = 39) employed food vouchers as a behavioural measure, revealing a significant effect: participants who watched a video focusing on the environmental tolls of animal agriculture (versus plant-based foods) were 2.5 times more likely to redeem their vouchers for vegetarian/vegan meals compared to the control group. Study 2 expanded the intervention scope (employing both an environmental- and ethics-focused intervention) and altered the outcome measure (measuring selection of vegan vs non-vegan meals at a university formal dinner). Study 2 ($n$ = 102) effectively reduced selections of meals containing

meat, but the effect was weaker than in Study 1. Methodological differences and sample limitations may explain the effect size discrepancies. These interventions highlight the potential of educational interventions for meat reduction in university contexts. To expand on this study's results, we encourage future research to explore sustained dietary changes post-intervention, rather than single meal choices, and to test a variety of intervention videos.

## Keywords

diet, vegan, vegetarian, plant-based, education

## Non-Technical Summary

### Background

The planet faces significant environmental threats, driven in large part by the way we produce and consume food, especially meat and animal products. Raising animals for food contributes greatly to deforestation, biodiversity loss, and climate change. Further, it is an extremely inefficient system, requiring extensive land and resources compared to plant-based options. Recognising this, growing research shows that educational programs can effectively reduce meat consumption. A number of studies demonstrate that providing information about the realities of animal agriculture to students can shift their behaviour, sometimes lasting for years, and is a cost-effective way to cut carbon emissions. However, some interventions only impact knowledge or attitudes, not actual eating habits.

### Why was this study done?

Building on evidence that education can reduce meat consumption, our study aimed to test if a brief video presentation could influence real-world food choices in university settings. We sought to use new educational materials and track actual food purchases, rather than relying on intentions or self-reported habits, to provide more reliable insights. We conducted two interventions using slightly different methods to measure food choices.

### What did the researchers do and find?

**Study 1:** We recruited 39 participants at a UK university, dividing them into two groups. One group watched a video on the environmental impacts of animal agriculture, and the control group watched a video about renewable energy. Afterward, all participants received a free food voucher for a local café. Café staff, unaware of the video conditions, recorded whether the voucher was used for a vegetarian/vegan (veg*n) meal or a meal that contains meat. We found a significant difference: 72.7% of participants who saw the environmental video chose veg*n meals, compared to only 29.4% in the control group. This means the environmental presentation made participants about 2.5 times more likely to choose a veg*n meal.

**Study 2:** Expanding on Study 1, we recruited 102 students at a different UK university. This time, participants were divided into three conditions: the same control video from Study 1, the same environmental video from Study 1, and an ethics-focused video (on animal agricul-

ture) by the same makers. In exchange for watching a video, participants received a free ticket to a formal university dinner, pre-selecting either an "omnivorous" or "plant-based" meal. When combining both treatment groups (environmental and ethics), we found they were significantly more likely to choose a plant-based meal (about 20% chose plant-based) compared to the control group (0%). While the combined effect was significant, individual video types didn't reach full statistical significance on their own, though the environmental video showed a stronger trend. This suggests the educational videos collectively had an impact.

**What do these findings mean?**

Our two interventions at UK universities demonstrate that short educational videos can influence real-world food choices, encouraging more vegetarian or vegan selections. This effect was consistent across two different measurement methods (café vouchers and formal dinner choices).

The impact varied in strength. Study 1 showed a very strong shift, almost reversing meal choices between groups. Study 2 also had a significant impact, though less pronounced. This difference might be due to perceived risk (casual café vs. formal dinner), the strict vegan option in Study 2 versus broader veg*n choices in Study 1, how menu options were presented, and various design limitations.

Our findings indicate that educational video interventions may be effective, particularly among UK university students. The environmental impact video was especially influential in Study 1. Future research should recruit larger samples, explore various types of environmental videos, and track dietary changes over longer periods for a comprehensive understanding. Despite limitations, this study adds to the evidence that education can be a powerful tool for promoting sustainable and ethical food choices in academic environments.

There is a growing scientific consensus that people in developed countries need to reduce their consumption of meat and animal products to mitigate the climate and nature crises (e.g. Bryant et al., 2024).

The overconsumption of animal products is driving environmental issues from climate change to biodiversity loss (Aiking & de Boer, 2020; Dasgupta, 2021). Feeding plants to animals for food, rather than feeding plants to people directly, is highly inefficient. An estimated 7-8% of the calories and protein fed to animals ends up in the animal products people consume; beef is the most inefficient, converting a mere 3% (Shepon et al., 2016). Though the picture of feed conversions is intricate (see Wilkinson & Lee, 2018), it is clear that significantly more food needs to be produced to sustain a diet with animal-based products. This reality further drives land use and deforestation (Theurl et al., 2020). Compared to food from animals, the environmental footprints of plant-based foods are orders of magnitude lower (Clark et al., 2019; Errickson et al., 2021).

In the last few years, a growing body of academic research has demonstrated that educational interventions in university contexts can reduce meat consumption. There is

now an abundance of evidence, including several randomised control trials, supporting the efficacy of educational interventions. For instance, Schwitzgebel et al. (2020, 2023) found that an educational intervention both increased students' perceptions that eating factory farmed meat is unethical and, according to food receipts, reduced their subsequent meat purchases. Meanwhile, in both studies, a control group showed no change. In another study, freshman undergraduates enrolled in a six-month course on food-related sustainability reduced their overall dietary carbon footprint by 7%, their dietary carbon footprint from beef by 19%, and their reported ruminant consumption by 28% compared to undergraduates enrolled in a climate change-related course that did not discuss food choices (Jay et al., 2019).

In fact, a systematic review and meta-analysis found that interventions targeting conscious decision-making significantly reduced meat consumption in university contexts (Chang et al., 2023).[1]

Results may also have lasting effects. Jalil et al. (2019) found that students who attended a 50-minute lecture on food choices and the climate and received additional information about the health benefits of plant-based eating reduced their consumption of meat and increased their consumption of plant-based foods compared to a control group. In a follow-up study (Jalil et al., 2023), students who engaged with these materials not only reduced their meat consumption by 5.6 percentage points, but this effect was sustained over three years.

Moreover, educational interventions to reduce meat consumption are a cost-effective option. According to Lohmann's (2023) commentary in *Nature Food*, the estimated cost to cut one ton of $CO_2$-equivalent emissions through such interventions is just $13.78. This is 73% lower than the U.S. government's current social cost of carbon (the quantified societal and economic damage instigated by $CO_2$), which is $51 per ton. These findings underscore that educational strategies are both impactful and economical.

However, some studies have showcased that educational interventions spur changes in knowledge, attitudes, and eating intentions but find no change in actual diet (e.g. Feltz et al., 2022; Mathur et al., 2021). Thus, interventions are not guaranteed to result in real behavioural change.

Given prior evidence of effective educational interventions for meat reduction and plant-based food uptake, we set out to employ a brief video intervention in university settings and track subsequent food choices. We consider this a conceptual replication of past research, using novel intervention materials and tracking food choices with new tactics. The relatively brief length of the videos (< 60 min) is of particular interest, as these short interventions are more easily employed at scale, as opposed to full university

1) Though, we should note that choice architecture interventions also reduced meat consumption, and multimodal interventions were found to be more effective than those solely targeting conscious decision-making or the built environment.

courses or even feature-length films. Crucially, this work uses behavioural measures of real food choices, rather than future food choice intentions, openness to diet change, or self-reported post-intervention diet choices. We view this as a necessary addition to the literature, as most studies of this nature—university interventions targeting conscious decision-making—rely on self-report and dietary intentions, rather than actual observed behaviours (Chang et al., 2023).

# Study 1

Study 1 aimed to understand the impact of a single educational video presentation on people's subsequent real-world dietary choices. Rather than investigating self-reported food choices or food choice intentions, this study relied on an observable behavioural measure—the redemption of food vouchers post-presentation.

Hypotheses were not pre-registered. We predicted that, compared to the control group, participants who watched a video on the climate impacts of animal agriculture would purchase a higher proportion of vegetarian or vegan (veg*n) meals (vs meals containing meat) at a local café.

## Materials and Method

### Participants

Though not pre-registered, we aimed to recruit a sample of at least 88 participants, guided by an a-priori power analysis in G*Power (Faul et al., 2009). This sample size was calculated for a goodness of fit chi-square test with a medium effect size ($w$ = 0.3), alpha of 0.5, 80% power, and one degree of freedom. This sample size proved infeasible within our time and resource constraints, and we report the results from our achieved sample size, with details of a sensitivity analysis provided in section *Results*.

We recruited a sample of 70 Edinburgh residents to take part in a study at the University of Edinburgh. Participants were split into treatment ($n$ = 40) and control ($n$ = 30). According to the study design, we could only include participants who redeemed their food voucher, resulting in a sample of 42 participants ($n_{Treatment}$ = 24, $n_{Control}$ = 18), with a return rate of 60% for each condition. Finally, we excluded participants who redeemed their voucher after being debriefed on the full nature of the study ($n$ = 3), resulting in a final sample of 39 participants ($n_{Treatment}$ = 22, $n_{Control}$ = 17).

### Procedure

The study was advertised on the University of Edinburgh campus and the surrounding community with flyers and posters, the PPLS digital student notice board and email list, the PPLS Sona System (a student participant recruitment platform), and social media via personal posts and paid ads. In the recruitment materials (see Supplementary Materials,

see Hankins, 2025), potential participants were informed that they would be watching a video on sustainability. Various dates and times were advertised, with participants unaware that showings of the control and treatment videos were randomly allocated between these dates. Recruitment materials also announced that participants would be compensated for their time with a free food voucher from a local café. Participants were not told at the time that the food vouchers were part of the study. However, to avoid deception, the recruitment materials included a note stating that the use of these vouchers may be tracked. Both the control and treatment presentations were held in-person on the University of Edinburgh campus. Participants gave informed consent before participating, were each given their free food voucher immediately post-presentation, and were fully debriefed by email four weeks after watching the video. These four weeks allowed participants time to redeem the vouchers while they were still naive to the full objective of the study. Participants could choose to withdraw their data post-debrief, though none opted to do so.

### Materials

Participants received either the treatment or control video presentation, randomly allocated to the best of our ability (see *Procedure*). Each video was approximately 40 minutes long (control = 38 min, treatment = 42 min). Our treatment condition comprised Educated Choices Program's (ECP) *The Planet and Our Plates* presentation (Educated Choices Program, n.d.-a), which describes the environmental impacts of animal agriculture versus plant-based food choices. For example, viewers learn about the land use of animal agriculture versus growing food for direct human consumption, feed-conversion ratios, the environmental consequences of aquaculture (e.g. ocean acidification), emissions from concentrated animal feeding operations (CAFOs), and more. Our control presentation comprised Patagonia Films' *We the Power: The Future of Energy is Community-Owned* (Patagonia, 2021), a short film documenting community efforts to produce and have autonomy over their own renewable energies rather than rely on large energy sectors.

Our outcome measure was participants' post-presentation food choices, measured via their use of the food vouchers. All vouchers were numbered, with even-numbered vouchers distributed to the treatment participants and odd-numbered to the control. Staff at the café marked the vouchers with either a "V" or "M" depending on if they were redeemed for a veg*n meal or one containing meat. Staff were blind to the condition. That is, they were not aware that the even and odd numbers signified anything. A researcher later collected and recorded these marked vouchers.

The café menu was constant across the study period, and participants could redeem their vouchers for any sandwich or toastie (i.e. grilled sandwich). Sandwiches and toasties were chosen, rather than the full food menu, to control for meal variability and ensure a relatively even split between veg*n options and those containing meat—the

sandwiches/toasties section of the menu had both veg*n and meat-inclusive options, while other sections (e.g. salads, soups) did not.

### Analysis

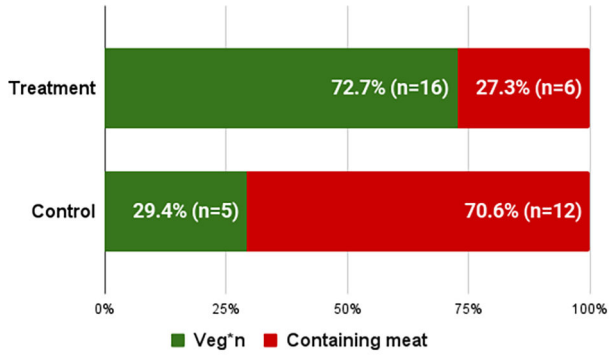
All statistical analyses were run in R (R Core Team, 2022), and the dataset and R code for this study are available on the Open Science Framework (OSF; see Hankins, 2025). We used a Pearson's chi-square test for independence to measure the association between video condition and food choices. Using this analysis, we could determine whether participants in the treatment group redeemed a greater proportion of veg*n meals, compared to the control. Results were considered statistically significant if $p < .05$.

## Results

We ran a sensitivity analysis in G*Power (Faul et al., 2009) to assess the minimum effect size we could reasonably expect to detect given our sample of 39 participants, aiming for an 80% chance of detecting a true effect (power = 0.8) while maintaining a 5% risk of a Type I error ($\alpha = 0.05$) for a Chi-squared test with 1 degree of freedom. According to this analysis, we were sufficiently powered to detect a minimum effect size ($w$) of about 0.45. The chi-square test for independence revealed a significant association between presentation condition and food choice, $X^2(1) = 5.60$, $p = .02$. This translates to a moderate-large effect size of $w = 0.43$, in line with our sensitivity analysis. Those who watched the presentation on the environmental repercussions of animal agriculture redeemed their food vouchers for veg*n meals 72.7% of the time, while control participants did so only 29.4% of the time (Figure 1). That is, participants in the treatment condition chose veg*n food 2.5 times more often than control participants.

**Figure 1**

*Food Choices, by Presentation Type*




*Note.* Veg*n refers to both vegetarian and vegan food options.

## Discussion

The data indicate that the climate-focused video intervention effectively altered participants' dietary choices, as far as can be assessed by one meal in the short-term. Participants who received the video intervention documenting the climate repercussions of animal agriculture versus those of plant-based foods were significantly more likely to use their voucher on a veg*n meal than participants who received the control intervention. In fact, the proportion of veg*n choices versus those containing meat is nearly perfectly reversed between conditions: 73% of treatment participants purchased veg*n meals (27% with meat), while 71% of control participants purchased meals with meat (29% veg*n).

Given the substantial impact of this educational video presentation on participants' real-world food choices, this type of intervention may be worth pursuing in university settings, or even beyond. Granted, additional research should be conducted to assess whether the striking results were a mere aberration, or if meat reduction consistently follows this type of intervention.

This study specifically showcases that an environmental angle may be highly impactful. However, we are hesitant to solely promote presentations focusing on the environmental tolls of animal agriculture, as presentations that centre on human health or animal welfare may be just as—or even more—effective at reducing meat and animal product consumption. Additionally, even environmental-focused videos are highly variable in content, authority, production value, style, etc. Thus, a different environmental-focused video may not produce the same impact as the one used in this study.

In addition to the above caveat, this study carries three main limitations. The first is generalisability. Our sample sizes were small, and made smaller by the fact that we had to exclude participants who did not redeem their voucher (as without a voucher, we had no outcome to measure). Both groups redeemed vouchers at the same rate (60% return rate), indicating balance between our groups. However, this exclusion structure still could have introduced bias, which we cannot fully account for given our data limitations, and we encourage future research to account for this type of potential bias. Apart from this, other generalisability concerns remain. While our study was sufficiently powered with our given sample size, we caution against sweeping generalisations. This study involved a single treatment presentation primarily focusing on the environmental repercussions of meat and animal products compared to plant-based foods. Thus, generalisations about other presentations, even those similar in content, are beyond the scope of this study.

Additionally, this study took place on a university campus and was primarily advertised to university students. Consequently, our results may not represent the general public, as university students tend to be more politically left-leaning (e.g. Apfeld et al., 2022; Hastie, 2007; Scott, 2024) and concerned about environmental issues (e.g. Filho et al., 2023; Tavolacci & Ladner, 2024), for example. Moreover, the recruitment materials noted that participants would watch a video on sustainability, which may have introduced

a self-selecting bias of sustainability-concerned individuals (i.e. those most likely to be influenced by the video content). Granted, with a self-selection bias of this nature, we might also expect a higher baseline level of veg*n meal selections across both conditions, diluting the actual effect of the video.

The second limitation involves social desirability bias. We cannot be entirely sure that participants were naive to the true objective of the study (i.e. recording the use of vouchers post-presentation), though we took measures to avoid this. As such, participants in the treatment condition may have spent their vouchers in a way they believed aligned with the researchers' goals. Future research should find creative ways to further mitigate this possibility.

The third limitation is that vegetarian and vegan food choices were collapsed. As a result, we cannot say whether the treatment presentation prompted mostly vegan food choices, vegetarian choices, or an equal split. To address this limitation, future research should consider distinguishing between these food categories.

# Study 2

Study 2 aimed to expand on Study 1, both in terms of the number of participants and in the types of educational interventions. In addition to the treatment video used in Study 1 that focuses on the environmental impacts of our diets, Study 2 also included a treatment video that focuses on the ethics of our diets. As in Study 1, participants' real food choices were recorded rather than dietary intentions or self-reported food choices. In a slight deviation from Study 1, participants were awarded a free ticket to a 3-course formal dinner at the University of Cambridge for participating (rather than a free food voucher). Researchers could then use the formal dinner registrations to record participants' subsequent meal selections at the formal dinner.

We predicted that participants who watched either treatment presentation would select a higher proportion of plant-based meals (vs meals with meat) than participants who watched the control presentation. We made no predictions regarding the efficacy of the environment-focused versus ethics-focused interventions, instead treating this as an exploratory investigation. However, it is important to note that hypotheses were not pre-registered and are therefore considered exploratory by definition.

## Materials and Method

### Participants

Sample size was not pre-registered, though we aimed to achieve a sample of at least 88 participants according to the power calculation from Study 1.

We recruited an initial sample of 104 University of Cambridge students. These participants were split between two treatment conditions ($n_{Environmental}$ = 45, $n_{Ethics}$ = 37) and

one control ($n$ = 22). Condition was not allocated randomly (see *Procedure*). According to the study design, only participants who went on to log their meal choice (associated with their formal dinner ticket) could be included in the final analysis, resulting in a final sample of 102 participants ($n_{Environmental}$ = 45, $n_{Ethics}$ = 37, $n_{Control}$ = 20).

### Procedure

Participants were recruited from five University of Cambridge colleges via emails and messages sent out to all students at each of the colleges (see Supplementary Materials, Hankins, 2025). Contrary to Study 1, recruitment materials did not mention sustainability, in order to capture a more general sample. Participants were invited to watch a 45-minute presentation in exchange for a free ticket to a private 3-course formal dinner held at an independent college from those participating. After completing a consent form, participants watched either a treatment (environmental- or ethics-focused) or control presentation in person, depending on their college. Videos were allocated across colleges (rather than randomly allocating videos across participants) to avoid cross-communication about the purpose of the study between students viewing different presentations. Immediately after watching the presentation, participants were given a generic survey on how effective they believed the presentations to be as an educational tool. This survey was implemented to de-emphasise the true objective of the study — to measure participants' meal choices.

Two days after the presentation, to give time for reflection, participants were emailed the online registration form for the formal ticket where participants indicated whether they would like an omnivorous (containing meat and/or fish) or plant-based (containing no animal products) meal; the actual menu options were not disclosed. Specifically, after watching the presentation and receiving their free formal dinner ticket, participants had three days to select their meal choice. Researchers then cross-referenced these meal choices with the presentation that participants saw.

After the formal dinner took place, debriefing emails were distributed to inform participants of the true purpose of the study and to offer them the opportunity to withdraw their data, which none did.

### Materials

Participants received either a treatment (environmental- or ethics-focused) or control video presentation, depending on their college, each with a run time of 38–53 minutes. For the environmental-focused treatment condition, we again used ECP's *The Planet and Our Plates* presentation (Educated Choices Program, n.d.-a), which focuses on the environmental impacts of animal agriculture versus plant-based food choices. The ethics-focused treatment condition consisted of ECP's *Food for Thought* presentation (Educated Choices Program, n.d.-b), which critically examines the ethical impacts of modern animal agriculture. The presentation highlights animal welfare concerns as well as the signifi-

cant physical and psychological occupational hazards faced by workers, demonstrating how consumer demand drives these issues. Both treatment videos are comparable in narrative style and structure, production quality, source credibility, and visual style.

Our outcome measure was participants' post-presentation food choices, measured via their food selection on their formal dinner registration. The registration allowed the choice of either an omnivorous or plant-based generic meal (the actual menu was unspecified), with an additional section to list any dietary requirements (free response).

### Analysis

The dataset and R code for this study are available on the OSF (see Hankins, 2025). Similar to Study 1, we used R (R Core Team, 2022) to conduct a Pearson's chi-square test for independence, measuring the association between video condition and subsequent meal choice. Using this analysis method, we could determine whether treatment participants went on to select a greater proportion of plant-based meals, compared to the control. Results were considered statistically significant if $p < .05$. We collapsed the treatment conditions (environmental-focused, ethics-focused) for the analysis, comparing treatment versus control outcomes.

Why opt to collapse the treatment conditions as the first point of analysis? We were concerned that separating the environmental and ethics conditions would perpetuate a common shortcoming in messaging studies, especially in the context of animal advocacy. Studies of this nature often test various messaging strategies (e.g. "health", "animal welfare", "environment") and then report on whether one message is more effective than another. However, no single experimental condition can represent the entire message. A "health" message, for example, can vary extensively—one may focus on cancer risk or cardiovascular health, another on antibiotic resistance, another on pandemics, and so forth. These submessages under the "health" umbrella are not necessarily equally effective. We did not want to fall into the trap of treating our singular video conditions as all-encompassing representations of "ethics" and "environmental" messages. Therefore, we decided to aggregate these video conditions and treat the subsequent "treatment versus control" result as the principal finding. Moreover, although unfortunately not preregistered, this was the original analysis plan. In an ideal scenario, we would have run an array of different "ethics" and "environmental" videos to better capture the efficacy of these messaging strategies. However, this was not feasible in the present setting.

As a purely exploratory measure, we then ran a second chi-square separating the $\text{treatment}_{\text{Environmental}}$ and $\text{treatment}_{\text{Ethics}}$ conditions (i.e. we did not collapse them) to observe differences in efficacy between them. Finally, we ran pair-wise analyses to check for significant differences between each group: $\text{treatment}_{\text{Environmental}}$ and control, $\text{treatment}_{\text{Ethics}}$ and control, and $\text{treatment}_{\text{Environmental}}$ and $\text{treatment}_{\text{Ethics}}$. These pairwise comparisons were considered statistically significant if $p < .01667$, applying the Bonferroni correction for multiple comparisons.

Throughout the analyses, we validated whether a chi-square or Fisher's exact test was appropriate, given our relatively small sample sizes. When more than 20% of expected values in a frequency table were under 5, we opted to run a Fisher's exact test. In such cases, we report the results from Fisher's exact tests rather than chi-square.

Prior to running any analyses, we noted that zero control participants opted for the plant-based meal, indicating that there were no existing (i.e. pre-intervention) veg*ns in the control condition. This was highly unusual, and we considered it may not be good practice to compare a control condition of entirely omnivores with two treatment conditions that (assumedly) had a mix of omnivores and veg*ns. Hence, we attempted to exclude existing veg*ns in the treatment conditions. To best approximate who was an existing veg*n, we looked at the "dietary restrictions" section of participants' tickets (separate to the meal choice section) and excluded participants who wrote "vegan" or "vegetarian". This was a rough approximation admittedly, as it likely did not capture all veg*ns in the sample (some veg*ns may have left the dietary restrictions section empty). Moreover, those that noted "vegan" or "vegetarian" in this section may not have been existing veg*ns at all; they may have been persuaded by the intervention. Given the uncertainty surrounding this issue, we opted to run all analyses again with veg*ns (as we approximated) excluded, but we do not report those results here (rather, see corresponding results in Supplementary Materials, see Hankins, 2025).

## Results

When $\text{treatment}_{\text{Environmental}}$ and $\text{treatment}_{\text{Ethics}}$ were collapsed, condition and meal choice were significantly associated (Fisher's exact test, $p = 0.04$). That is, the treatment conditions yielded significantly more plant-based meal choices than the control. Specifically, treatment participants selected the plant-based meal about 20% of the time (proportion = 0.195), versus 0% (proportion = 0.000) in the control group. We performed a sensitivity analysis in G*Power (Faul et al., 2009; one-tailed, p1 ≤ p2, p2 = 0.195, alpha = 0.05, power = 0.8, group 1 = 20, group 2 = 82) to detect whether our design was sufficiently sensitive to detect this difference in proportions. Using proportion 2 (0.195) as our anchor, results indicated that we were sufficiently powered to detect a situation where the proportion in group 1 was approximately 0.003 (or less). Therefore, results indicated that our design was sensitive enough to detect the observed difference in proportions.

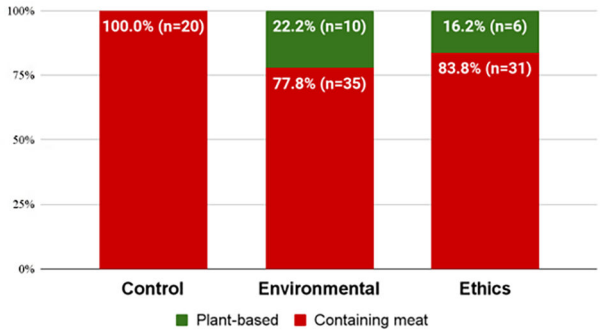
We then ran a chi-square test to parse out any individual effects from the presentations, as an exploratory measure. That is, $\text{treatment}_{\text{Environmental}}$ and $\text{treatment}_{\text{Ethics}}$ were not collapsed when comparing against the control.[2] This test yielded non-significant results, $X^2$ (2, $N$ = 102) = 5.18, $p$ = .07, indicating that the significant effect observed previously had been washed out. To deduce which relationships were significant, we

2) Notably, this exploratory test was not sufficiently powered. A post hoc test in G*power indicated an achieved power of 0.52 (effect size $w$ = 0.2254, alpha = .05, total sample size = 102, $df$ = 2).

conducted pairwise analyses, comparing $\text{treatment}_{\text{Environmental}}$ and control, $\text{treatment}_{\text{Ethics}}$ and control, and $\text{treatment}_{\text{Environmental}}$ and $\text{treatment}_{\text{Ethics}}$. Accounting for the Bonferroni correction for multiple comparisons ($p < .01667$), no relationships were significant. However, the $\text{treatment}_{\text{Environmental}}$ and control comparison yielded a marginally significant result (Fisher's exact test, $p = .02$); the relationship between $\text{treatment}_{\text{Ethics}}$ and control and that between $\text{treatment}_{\text{Environmental}}$ and $\text{treatment}_{\text{Ethics}}$ were not significant (Fisher's exact test, $p = .08$ and chi-square test, $p = .69$, respectively). See Figure 2 for all meal choices across conditions.

**Figure 2**

*Meal Selections Across Video Conditions*




## Discussion

In line with predictions, participants who watched a treatment presentation were significantly more likely to select the plant-based meal than control participants. When analysing the treatment video conditions separately rather than in aggregate, the environmental-focused intervention appeared to drive the effect. However, though on the cusp, the environmental-focused video still did not pass the threshold for statistical significance. As a result, we can discern that participants who watched a treatment intervention (ethics- or environmental-focused) selected significantly more plant-based meals than the control group, but we cannot discern whether a particular video intervention on its own produced a meaningful diet shift.

This study's main limitation lies in its sample size. Our additional, exploratory investigation—parsing out differences between individual intervention videos (ethics, environmental)—was underpowered. It is plausible that with additional participants, significant results would emerge, especially as the present results were nearing significance ($p = .07$); however, this is speculatory. Another limitation is the non-randomised design. All participants in college "A" were allocated a given video, all those in college "B" another, and so on, rather than participants being randomly assigned a video. It is possible that

participants in each college were distinct across relevant demographics, such as dietary restrictions, which may have influenced the results.

## General Discussion

Over two in-person interventions across two UK universities, this study investigated whether an educational video intervention could sway real-world food choices from meat-inclusive to veg*n. In both interventions, participants who watched an educational video on the environmental and/or ethical tolls of animal agriculture selected more veg*n meals than their control group counterparts. Additionally, this effect held across two different methodologies. In Study 1, participants were rewarded for their participation with a free food voucher, redeemable at a local café. Compared to control participants, those that watched the treatment video used their vouchers to redeem more veg*n meals. In Study 2, participants were rewarded with a free ticket to a formal dinner at the university. Compared to the control group, treatment participants were more likely to register for a plant-based (vegan) meal at the formal dinner.

Study 1 and 2 offered evidence that educational videos may be effective strategies to reduce meat consumption and increase veg*n food uptake. However, the impact varied in strength. Study 1 produced a striking result, with the proportion of veg*n and meat-inclusive meals nearly flipping exactly between the control and treatment groups. Study 2 also produced a significant result, but the impact was more subdued. We can attribute this to a number of factors.

First, it is possible that participants in Study 1 were more willing to "risk" choosing a veg*n option at a café while participants in Study 2 felt their meal choice carried more weight—that is, they thought they may not enjoy a plant-based meal and thought this choice would compromise how much they enjoyed the formal dinner (which is associated with higher value). Another explanation is that Study 1 included vegetarian and vegan meals under one umbrella, allowing participants to select a meal with (non-meat) animal products, such as cheese. Whereas, the singular choice of "plant-based" in Study 2 may have dissuaded participants from choosing it. Perhaps many more participants would have selected a vegetarian option, as opposed to plant-based (vegan), had that choice been available to them. Moreover, participants in Study 1 could see the full range of their options before selecting their meal, while participants in Study 2 were only given the binary choice of "omnivorous" or "plant-based". This may have influenced participants' choices, as a certain meal choice may have been more appealing than another (as opposed to the abstract "plant-based" category being more appealing).

This study carried four main limitations that future studies should address. The first is sample size. With the relatively small sample sizes across both studies, wider generalisations are not advised. What is effective among dozens of UK university students may not be indicative of responses across demographics. For example, university students

tend to be more politically liberal on social issues (e.g. Apfeld et al., 2022; Hastie, 2007; Scott, 2024) and environmentally-conscious (e.g. Filho et al., 2023; Tavolacci & Ladner, 2024)—and hence more likely to respond favourably to the video content. In fact, the findings may not generalise to all university students in the UK even. We highly encourage future studies to collect greater sample sizes, and ideally to conduct interventions across many universities spread across the UK for the most robust generalisability.

Moreover, measuring post-intervention behaviour meant that our samples were especially limited, as we had to exclude participants who did not go on to redeem their food voucher (Study 1) or register for the formal dinner (Study 2). Measuring actual food choices, rather than dietary intentions or self-reported diet choices, was the crux of the study design, and with it came the obligation to exclude participants who did not make a food choice for us to measure. This exclusion structure could have introduced bias, however.

The second limitation lies in the outcome measure. The interventions' impact was measured with a single meal choice post-presentation. However, a single meal choice is likely not indicative of diet change. It remains possible that participants were swayed to reduce their animal product consumption or adopt more plant-based foods, but the single choice we recorded may not have captured this wider change. We recommend that future studies track participants' diets over a longer period of time to capture a fuller picture of diet.

Third, we did not collect demographic information in either study, leaving us unable to explore the potential impacts of factors such as ethnicity and gender. Moreover, this limitation left us unable to assess whether the treatment versus control conditions contained more or less pre-existing veg*ns. Theoretically, we may have had a larger proportion of pre-existing veg*ns in the treatment group(s), and this could have driven our observed effects. Future studies should measure pre-intervention dietary identity to rule out this possibility—and do so in such a way that does not give away the hidden study objective. We opted not to collect this information out of concern that asking participants about their diet would unintentionally reveal the true objective of the study (measuring food choices). However, we encourage future researchers to more tactfully manoeuvre this situation, balancing the imperative to conceal the outcome of interest while also collecting demographics. Finally, although the researchers attempted to hide the study objective from participants, participants in the treatment conditions may still have caught on to the study aim, and their awareness may have compromised the results in some way. Future research should take additional precautions to conceal the nature of the study.

This study showcases that educational video interventions may be effective among university students in the UK, impacting their real-world food choices. The environmentally-focused intervention was particularly influential, and most markedly so in Study 1. We encourage future studies to test other environmentally-focused videos of various

lengths, styles (e.g. slide-deck, personal interviews, etc.), authorship/credibility (e.g. non-profit, climate scientist, etc.), and sub-foci (e.g. emissions, land use, etc.) to discern which intervention is most effective. This study adds to the growing literature on educational interventions for meat reduction in university contexts, highlighting the potential efficacy of this intervention type.

**Funding:** This study was funded by the Educated Choices Program, a 501(c)(3) U.S. nonprofit organisation which creates and delivers educational content on the impact of dietary choices.

**Acknowledgments:** The authors have no additional (i.e., non-financial) support to report.

**Competing Interests:** The co-investigator Chris Bryant owns and works for Bryant Research, a research company which works with animal protection non-profits, including formerly working for Educated Choices Program, the NGO which produced the intervention materials and funded this study. The co-investigator Elise Hankins also works for Bryant Research. Outside of designing the intervention materials and funding this study, the Educated Choices Program had no role in the study in terms of design, analysis, and reporting.

**Author Contributions:** *Elise Hankins*—Methodology | Formal analysis | Investigation | Writing – original draft | Writing – review & editing. *Chloe Balhatchet*—Conceptualization | Investigation | Methodology | Project administration | Writing – review & editing. *Christopher Bryant*—Conceptualization | Funding acquisition | Methodology | Project administration | Supervision. *Matti Wilks*—Project administration | Writing – review & editing. *Chris Macdonald*—Project administration. *Rebecca Hankins*—Investigation | Methodology | Writing – review & editing. *Patience Abugu*—Investigation | Methodology. *Tommy Walker Mackay*—Investigation. *William McFarlane Smith*—Methodology. *H.-W. Hazel*—Methodology | Writing – review & editing. *Sophie Clargo*—Investigation.

**Ethics Statement:** Study 1 received ethical approval from the University of Edinburgh ethics review board within the School of Philosophy, Psychology and Language Sciences (PPLS; approval no. 394-2223/9). Study 2 received ethical approval from the Cambridge Psychology Research Ethics Committee (approval no. PRE.2024.032).

**Data Availability:** The datasets, R code, and Supplementary Materials are available on the Open Science Framework (see Hankins, 2025).

## Supplementary Materials

The datasets, R code, and Supplementary Materials are available on the Open Science Framework (see Hankins, 2025).

### Index of Supplementary Materials

Hankins, E. (2025). *Educational presentations reduce meat consumption across two universities* [Data, code, materials]. OSF. https://osf.io/vgpd5

## References

Aiking, H., & de Boer, J. (2020). The next protein transition. *Trends in Food Science & Technology, 105*, 515–522. https://doi.org/10.1016/j.tifs.2018.07.008

Apfeld, B., Coman, E., Gerring, J., & Jessee, S. A. (2022). The impact of university attendance on partisanship. *Political Science Research and Methods, 10*(1), 1–14. https://doi.org/10.1017/psrm.2022.33

Bryant, C., Aiking, H., Alessandrini, R., Behrens, P., Creutzig, F., Eshel, G., Green, R., Hutchings, N., Leip, A., Milo, R., Smith, P., & van Zanten, H. (2024). The Dublin Declaration fails to recognize the need to reduce industrial animal agriculture. *Nature Food, 5*, 799–801. https://doi.org/10.1038/s43016-024-01054-2

Chang, K. B., Wooden, A., Rosman, L., Altema-Johnson, D., & Ramsing, R. (2023). Strategies for reducing meat consumption within college and university settings: A systematic review and meta-analysis. *Frontiers in Sustainable Food Systems, 7*, Article 1103060. https://doi.org/10.3389/fsufs.2023.1103060

Clark, M. A., Springmann, M., Hill, J., & Tilman, D. (2019). Multiple health and environmental impacts of foods. *Proceedings of the National Academy of Sciences of the United States of America, 116*(46), 23357–23362. https://doi.org/10.1073/pnas.1906908116

Dasgupta, P. (2021). *The economics of biodiversity: The Dasgupta review*. HM Treasury. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/962785/The_Economics_of_Biodiversity_The_Dasgupta_Review_Full_Report.pdf

Educated Choices Program. (n.d.-a). *The planet and our plates*. Educated Choices Program. https://www.ecprogram.org/the-planet-and-our-plates

Educated Choices Program. (n.d.-b). *Food for thought*. Educated Choices Program. https://www.ecprogram.org/fft-preview

Errickson, F., Kuruc, K., & McFadden, J. (2021). Animal-based foods have high social and climate costs. *Nature Food, 2*, 274–281. https://doi.org/10.1038/s43016-021-00265-1

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Feltz, A., Caton, J. N., Cogley, Z., Engel, M., Feltz, S., Ilea, R., Johnson, L. S. M., Offer-Westort, T., & Tuvel, R. (2022). Educational interventions and animal consumption: Results from lab and field studies. *Appetite, 173*, Article 105981. https://doi.org/10.1016/j.appet.2022.105981

Filho, L. W., Ayal, D. Y., Wall, T., Shiel, C., Paco, A., Pace, P., Mifsud, M., Salvia, A. L., Skouloudis, A., Moggi, S., LeVasseur, T., Antonio, G. V., Azeiteiro, U. M., Ioannis, N., & Kovaleva, M. (2023). An assessment of attitudes and perceptions of international university students on climate change. *Climate Risk Management, 39*, Article 100486. https://doi.org/10.1016/j.crm.2023.100486

Hastie, B. (2007). Cold hearts and bleeding hearts: Disciplinary differences in university students' sociopolitical orientations. *The Journal of Social Psychology, 147*(3), 211–241. https://doi.org/10.3200/SOCP.147.3.211-241

Jalil, A., Tasoff, J., & Bustamante, A. (2019). Eating to save the planet: Evidence from a randomized controlled trial using individual-level food purchase data. *SSRN*. https://doi.org/10.2139/ssrn.3444642

Jalil, A. J., Tasoff, J., & Bustamante, A. V. (2023). Low-cost climate-change informational intervention reduces meat consumption among students for 3 years. *Nature Food, 4*(3), 218–222. https://doi.org/10.1038/s43016-023-00712-1

Jay, J. A., D'Auria, R., Nordby, J. C., Rice, D. A., Cleveland, D. A., Friscia, A., Kissinger, S., Levis, M., Malan, H., Rajagopal, D., Reynolds, J. R., Slusser, W., Wang, M., & Wesel, E. (2019). Reduction of the carbon footprint of college freshman diets after a food-based environmental science course. *Climatic Change, 154*, 547–564. https://doi.org/10.1007/s10584-019-02407-8

Lohmann, P. M. (2023). Long-lasting impact of information on meat consumption. *Nature Food, 4*, 205–206. https://doi.org/10.1038/s43016-023-00721-0

Mathur, M. B., Peacock, J. R., Robinson, T. N., & Gardner, C. D. (2021). Effectiveness of a theory-informed documentary to reduce consumption of meat and animal products: Three randomized controlled experiments. *Nutrients, 13*(12), Article 4555. https://doi.org/10.3390/nu13124555

Patagonia. (2021, April 15). *We the power: The future of energy is community-owned | Patagonia Films* [Video]. Youtube. https://www.youtube.com/watch?v=75A9WGxoUn8

R Core Team. (2022). *R: A language and environment for statistical computing* [Computer software]. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/

Schwitzgebel, E., Cokelet, B., & Singer, P. (2020). Do ethics classes influence student behavior? Case study: Teaching the ethics of eating meat. *Cognition, 203*, Article 104397. https://doi.org/10.1016/j.cognition.2020.104397

Schwitzgebel, E., Cokelet, B., & Singer, P. (2023). Students eat less meat after studying meat ethics. *Review of Philosophy and Psychology, 14*, 113–138. https://doi.org/10.1007/s13164-021-00583-0

Scott, R. (2024). Why are graduates more socially liberal? Estimating the effect of higher education on political values through variation in university experience. *Political Studies, 73*(2), 885–903. https://doi.org/10.1177/00323217241266029

Shepon, A., Eshel, G., Noor, E., & Milo, R. (2016). Energy and protein feed-to-food conversion efficiencies in the US and potential food security gains from dietary changes. *Environmental Research Letters, 11*(10), Article 105002. https://doi.org/10.1088/1748-9326/11/10/105002

Tavolacci, M.-P., & Ladner, J. (2024). Eco-anxiety: An additional burden for university students? *European Journal of Public Health, 34*(Supplement_3), . Article ckae144.1352. https://doi.org/10.1093/eurpub/ckae144.1352

Theurl, M. C., Lauk, C., Kalt, G., Mayer, A., Kaltenegger, K., Morais, T. G., Teixeira, R. F. M., Domingos, T., Winiwarter, W., Erb, K.-H., & Haberl, H. (2020). Food systems in a zero-deforestation world: Dietary change is more important than intensification for climate targets in 2050. *The Science of the Total Environment, 735*, Article 139353. https://doi.org/10.1016/j.scitotenv.2020.139353

Wilkinson, J. M., & Lee, M. R. F. (2018). Review: Use of human-edible animal feeds by ruminant livestock. *Animal, 12*(8), 1735–1743. https://doi.org/10.1017/S175173111700218X

*Psychology of Human-Animal Intergroup Relations* (PHAIR) is the official journal of the Society for the Psychology of Human-Animal Intergroup Relations.

PsychOpen GOLD is a publishing service provided by the Leibniz Institute for Psychology (ZPID), Germany.