Online Appendix: The Effectiveness of Carbon Labels *

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Contents

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Appendix A Experiments 1 and 3: Additional tables and figures

A.1 Randomization checks

Table A.1 shows a randomization check for participants of Experiment 1. Participants are computer assigned into one of the following three groups: 1) Label condition in the second round and Offset condition in the third round, 2) Control condition in the second round and Label condition in the third round, 3) Control condition in the second round and Control condition in the third round. Table A.1 tests whether there are significant differences between these three groups in age, gender, student status, employment, vegetarianism, and hunger at the time of the experiment. There is a higher proportion of non-vegetarians in the group "Control, then Control" (significant at the 5% level), but the groups do not significantly vary otherwise.

To test whether the higher proportion of non-vegetarians impacts results, I perform the main analysis separately for vegetarian and non-vegetarian participants. These analyses should not be influenced by the higher proportion of non-vegetarians in the control group. Results are shown in Table A.11 and Table A.12. Results only including non-vegetarians are similar in coefficient size to the main results. I thus do not believe that the higher proportion of non-vegetarians in the "Control, then Control" group poses a reason for concern.

Table A.1. Randomization Experiment 1

	Average value					
	(1)	(2)	(3)	(4)	(5)	(6)
	Age	Male	Student	Working	Non-veg.	Hungry
Control, then Control	-0.59	-0.00	0.08	0.05	-0.15**	0.02
	(1.09)	(0.07)	(0.06)	(0.07)	(0.06)	(0.38)
Control, then Label	-0.80	-0.01	0.01	0.10	-0.08	-0.05
	(1.08)	(0.07)	(0.06)	(0.07)	(0.06)	(0.38)
Constant	24.60***	0.33***	0.78***	0.58***	0.80***	5.16***
	(0.62)	(0.04)	(0.03)	(0.04)	(0.04)	(0.21)
Control, then Control	60	70	70	70	70	70
Control, then Label	62	69	69	69	69	69
Label, then Offset	126	148	148	148	148	148
Observations	248	287	287	287	287	287

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: The analysis checks whether there are significant differences in any of the six variables between treatment groups. The group "Label, then Offset" is the baseline category. I do not have full observations for the variable "age", since some participants reported unrealistic numbers Summary statistics for each variable are shown in Table A.3.

Table A.2. Randomization Experiment 3

	Average value					
	(1)	(2)	(3)	(4)	(5)	(6)
	Age	Male	Student	Working	Non-veg.	Hungry
Attention+Offset, then Attention+Labels	0.04	-0.01	-0.00	0.00	0.03	0.27
	(0.88)	(0.06)	(0.05)	(0.05)	(0.05)	(0.29)
Attention+Labels, then Attention+Offset	-0.53	0.02	0.01	-0.04	0.04	0.10
	(0.89)	(0.06)	(0.05)	(0.05)	(0.05)	(0.30)
Constant	25.93***	0.45***	0.69***	0.75***	0.74***	4.73***
	(0.63)	(0.04)	(0.04)	(0.04)	(0.03)	(0.21)
Attention, then Attention	124	151	151	151	151	151
Attention+Label, then Attention+Offset	126	144	144	144	144	144
Attention+Offset, then Attention+Label	131	149	149	149	149	149
Observations	381	444	444	444	444	444

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: The analysis checks whether there are significant differences in any of the six variables between treatment groups. The group "Attention, then Attention" is the baseline category. I do not have full observations for the variable "age", since some participants reported unrealistic numbers Summary statistics for each variable are shown in Table A.4.

A.2 Representativeness of the sample

Tables A.3 and A.4 report descriptive statistics for experiments 1 and 3. Table A.5 reports descriptive statistics elicited in a survey among student canteen guests, as described in section E.8. I use this survey data to assess the similarity of Experiment 1 and 3 participants to the relevant student canteen guest population. In terms of age, participants of experiments 1 and 3 are slightly older than the student canteen guests in my survey (average age of 24 and 26 vs. an average age of 23 in the survey). The proportion of males is slightly lower in Experiment 1 (33%) and slightly higher in Experiment 3 (45%) than in the survey (41%). The proportion of students is higher in the survey (93%)than in experiments 1 and 3 (80% and 69%). However, it is likely that my survey over-proportionally surveyed student canteen guests who are students. In the student canteen purchase data analyzed in Experiment 2, 12% of guests paying with an individualized payment card are employees, 86% are students and 2% are non-student and non-employee.[1] Participants in Experiments 1 and 3 are less likely to be vegetarian than the average student canteen guest: While 75% and 76% of participants in Experiments 1 and 3, respectively, are non-vegetarian, only 66% of student canteen guests are non-vegetarian.

The largest differences between the experiment sample and survey and student canteen data are thus the proportion of non-students and the proportion of non-vegetarians. Section A.8 thus repeats the main

1. This is the only demographic characteristic reported in the student canteen purchase data. I thus rely on the survey data for the other characteristics.

analyses from experiments 1 and 3 splitting by whether participants are students or employees. Results seem broadly similar across students and non-students. However, compared to students, non-students seem to react less precisely to emission amounts, but react relatively uniformly to all high-emission meals (Table A.14), and labels seem to have no additional effect once participants have been made attentive of emissions (Table A.22), again suggesting a more rigid reaction by non-students. Comparing vegetarians and non-vegetarians, a similar picture emerges, with non-vegetarians reacting less precisely to emission amounts and previous understimation than vegetarians (Tables A.11 and A.15).

Table A.3. Socio-economic summary statistics for Experiment 1

Variable	Explanation	Mean	Std. Dev.
Age	Age of participant	24.27	6.9
Male	Dummy: 1 if participant is a man	0.33	–
Student	Dummy: 1 if participant is a student	0.80	–
Working	Dummy: 1 if participant is working in some form	0.62	–
Non-vegetarian	Dummy: 1 if participant eats meat	0.75	–
Hungry	Hunger on scale of 1 to 10 beginning experiment	5.16	2.58
N	288		

Notes: Table shows average socio-economic summary statistics for participants of Experiment 1.

Table A.4. Socio-economic summary statistics for Experiment 3

Variable	Explanation	Mean	Std. Dev.
Age	Age of participant	25.77	7.02
Male	Dummy: 1 if participant is a man	0.45	–
Student	Dummy: 1 if participant is a student	0.69	–
Working	Dummy: 1 if participant is working in some form	0.74	–
Non-vegetarian	Dummy: 1 if participant eats meat	0.76	–
Hungry	Hunger on scale of 1 to 10 beginning experiment	4.85	2.54
N	444		

Notes: Table shows average socio-economic summary statistics for participants of Experiment 3.

Table A.5. Socio-economic summary statistics for student canteen guests - survey data

Variable	Explanation	Mean	Std. Dev.
Age	Age of participant	23.04	3.88
Male	Dummy: 1 if participant is a man	0.42	0.49
Student	Dummy: 1 if guest is a student	0.95	0.23
Non-vegetarian	Dummy: 1 if guest eats meat	0.67	0.47
N	1,703		

Notes: Statistics are based on the surveys I conducted among student canteen guests in April and June. I include only survey respondents who visited a student canteen at least once in the 14-week study period and paid with their individual payment cards. See E.8 for details on the survey design. To preserve anonymity (since I also asked these survey participants about their study field), I elicited age in intervals. To reach an estimation of the mean age, I set the age equal to the midpoint of each interval. For 13% of respondents, I have the information that they are below 20. For the calculation, I estimate their age at 18. For 54% of respondents, I have the information that they are between 20 and 23 (which I set to 21.5 for the estimation), 21% of respondents are between 24 and 27 (set to 25.5), 6% of respondents are between 28 and 31 (set to 30), and 4% of respondents are 32 or older (set to 35). I did not directly elicit vegetarianism, but I elicited how much of a role animal rights play in participants' consumption decisions. I code participants reporting the highest degree of importance as vegetarians.$N = 1,669$ for gender since 34 respondents either did not want to provide their gender or identified as non-binary.

Table A.6. Socio-economic summary statistics for student canteen guests - consumption data

Variable	Explanation	Mean	Std. Dev.
Student	Dummy: 1 if guest is a student	0.86	0.34
Non-vegetarian	Dummy: 1 if guest eats meat	0.66	0.47
N	10,155		

Notes: Statistics are based on guests making at least one purchase with their individual payment cards in the 14-week study period, excluding Ukrainian refugees receiving meals for free as an interim solution for part of the study period.

A.3 Descriptive statistics on baseline WTP for meals

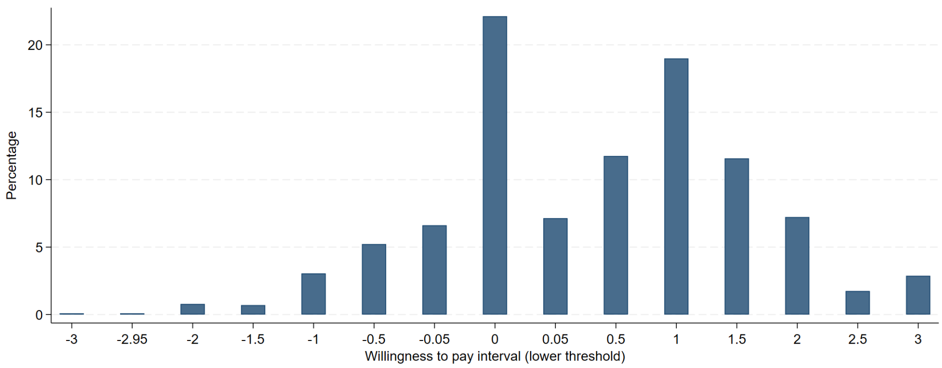


Figure A.1. WTP indicated for meals in the baseline purchase decisions in Experiment 1

Notes: $N = 1,148$ (287 participants making 4 baseline decisions each).

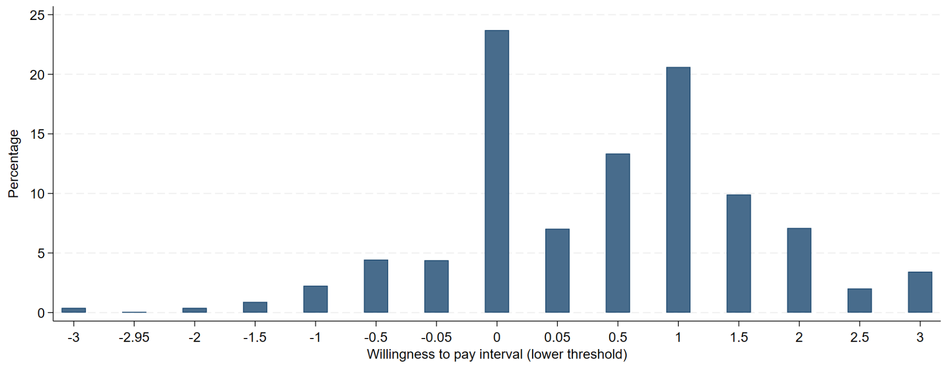


Figure A.2. WTP indicated for meals in the baseline purchase decisions in Experiment 3

Notes: $N = 1,776$ (444 participants making 4 baseline decisions each).

A.4 Test for effect of labels on meal perception

Table A.7. Test for effect of labels on perception of calories

	Guess of calories in				
	(1)	(2)	(3)	(4)	(5)
	Meat low	Veg high	Meat high	Sandwich	Veg low
Sees carbon labels	89.49	127.61	25.29	21.27	83.28
	(85.02)	(79.35)	(48.74)	(20.48)	(71.59)
Constant	608.00***	510.07***	708.04***	275.23***	521.23***
	(37.10)	(47.64)	(42.79)	(16.40)	(36.57)
Participants control	70	70	70	70	70
Participants treated	217	217	217	217	217
Observations	287	287	287	287	287

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: The analysis checks whether Experiment 1 participants who saw carbon labels during the experiment perhaps perceive the nutritional quality of the experiment meals differently. As a proxy, I let participants estimate the calories of the experiment meals at the end of the experiment (see D.5 for the guessing screens). This analysis tests whether calorie guesses significantly differed across treatment groups for the different meals. These are one meat meal low in emissions (chicken), one veg. meal high in emissions (cheese and veg.), one meat meal high in emissions (beef), a cheese sandwich, and one veg. meal low in emissions.

A.5 Simulation to calculate emission savings in Exp. 1

To estimate the emission savings conveyed by the data collected in Experiment 1, I simulate how experiment participants would have chosen on four days with a typical canteen offer. The offer on each of these exemplary days is as follows:

- Day 1: Canteen offers Filled courgettes with potato croquettes or Chicken Schnitzel with rice at a price of €3.05 each, as well as a cheese sandwich at a price of €1.50
- Day 2: Canteen offers Filled courgettes with potato croquettes or Beef ragout with potatoes at a price of €3.05 each, as well as a cheese sandwich at a price of €1.50
- Day 3: Canteen offers Italian vegetable ragout with pasta (€2.75) or Chicken Schnitzel with rice (€3.05), as well as a cheese sandwich at a price of €1.50
- Day 4: Canteen offers Italian vegetable ragout with pasta (€2.75) or Beef ragout with potatoes (€3.05), as well as a cheese sandwich at a price of €1.50

I chose the meals because these are the four meals I use in the baseline purchase decisions in Experiment 1 and I know participants' taste preferences for these meals accordingly. The student canteen in Bonn always offers one meat meal and one vegetarian meal, so I designed the four days to cover all possible combinations of the four meals. The four meals are regularly offered in the student canteen, and I use the student canteen's prices for these meals in the simulations. Further, the student canteen always offers cheese sandwiches and prices these at €1.50, so this is included on all days as a third option.

I then simulate in the following manner how each participant would have chosen between the three available options:

- For non-vegetarians: For each of the two warm meal options, I calculate the difference between the WTP participants indicated for this option relative to the cheese sandwich, and compare it to the true price difference between warm meal and sandwich. I assume the participant chooses the meal option for which this difference is the largest, i.e. consumer surplus is the highest. If the difference is negative, I assume they choose the cheese sandwich. For example, on Day 3, if a participant indicates a relative WTP of €2.00 both for the Chicken Schnitzel and the Italian vegetable ragout, I would compare the respective consumer surplus of €2.00 - €1.55 = €0.45 and €2.00 - €1.25 = €0.75, and assume that the participant would have chosen the Italian vegetable ragout on Day 3.
- For vegetarian participants, there is only one warm meal option offered in the canteen every day. Thus, I compare whether reported WTP relative to the cheese sandwich is higher than the relative price. For example, for Day 3, I would check whether relative WTP for the pasta is at least €1.25 and assume the participant then eats pasta, and assume they eat the cheese sandwich otherwise.

I include only participants in this condition who experience the Label condition during Exp. 1, and simulate these participants' choices once based on the WTP values they indicate at baseline, and then again based on the WTP they indicate when they see carbon labels. For each condition, I calculate and compare aggregate emission savings. Average emissions per lunch are 0.904 kg at baseline, and 0.861 kg with labels. The difference in emissions is thus 43 gram, or 4.8% of baseline emissions.

A.6 Distribution of individual treatment effects in Exp. 1

Using only observations from the 217 participants who experienced carbon labels in Experiment 1 (868 observations), I can run spec. (2) in Table 1 at the individual level. 59% of individual-level coefficients estimated are negative, 12% are zero, and 29% are positive. Estimated coefficients range between -6.2 and 2.4. Coefficients are plotted in Figure A.3 below. I truncate the 10% most extreme coefficient estimations for better readability.

Individual-level coefficients are largely in line with the coefficient estimated in the main analysis in Table 1 (-0.12). This suggests that the main result is not driven by few particular individuals, but reflected in the behavior of a majority of the sample.

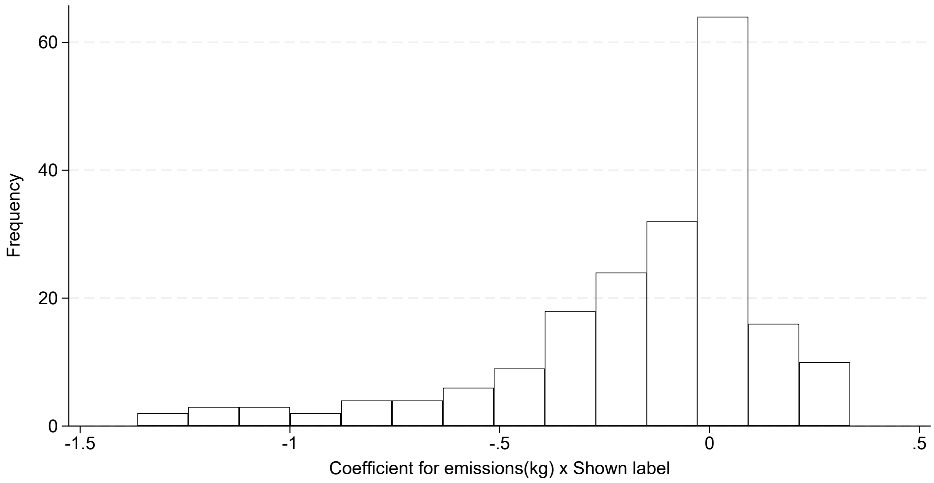


Figure A.3. Individual-level coefficients estimated in Experiment 1

Notes: Individual-level coefficients for "Emissions(kg) x Shown label" in Spec. (2) of Table 1. $N = 197$ (10% most extreme coefficients truncated).

A.7 Pre-registered main effects Exp. 1 and Exp. 3

Experiments 1 and 3 were pre-registered on #AEARCTR-0007858 and #AEARCTR-0008435.

For Experiment 1, besides the analysis shown in the main text, I pre-registered an analysis pooling all data from Experiments 1 and 3. I include a description of results and respective results below. Results are in line with those described in the main text and included here for completeness.

Table A.8 pools all data from Experiments 1 and 3. The baseline condition is the Control condition from Experiment 1, and rows 1 and 2 show that there is generally no effect of asking participants twice for their WTP, regardless of low- or high-emission meal. Rows 3 and 4 capture effects of participants seeing a carbon label, regardless of whether they are in a Label treatment, Attention+Label treatment, or an offset condition. I consider the offsetting notice participants in the offset conditions see to also be a carbon label and thus include them in this category. Rows 5 and 6 pick up differential effects of the offsetting treatments relative to the other labeling treatments. This is an increase in WTP for high-emission meals, in line with the labels removing some environmental guilt. Rows 7 and 8 pick up effects of being in an Attent condition (including Attention+Label and Attent+Offset, which decreases WTP for high-emission meals. Rows 9 and 10 pick up effects of being in an Attent condition *when any label is also present* (this includes both Attention+Label and Attent+Offset). These terms test whether "attention + label" is more or less than the sum of the separate attention and label effects. Rows 11 and 12 then capture any additional differential effect specific to the Attent+Offset treatment relative to Offset.

Table A.8. Experiments 1 and 3: Comparison of treatment effects

	Change in WTP compared to baseline
	(1)
Low	-0.05^{*}
	(0.03)
High	0.02
	(0.02)
Low x Label	0.14^{***}
	(0.04)
High x Label	-0.31^{***}
	(0.05)
Low x Label x Offset	-0.03
	(0.04)
High x Label x Offset	0.23^{***}
	(0.05)
Low x Attent	0.04
	(0.04)
High x Attent	-0.10^{***}
	(0.03)
Low x Attent x Label	-0.16^{***}
	(0.06)
High x Attent x Label	0.21^{***}
	(0.06)
Low x Attent x Label x Offset	0.05
	(0.04)
High x Attent x Label x Offset	-0.07
	(0.05)
Control for third round	0.00
	(0.01)
Participants control	139
Participants label	217
Participants offset	148
Participants attent	151
Participants attent+offset	293
Participants attent+label	293
Observations	5,848

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This analysis was pre-registered in Schulze Tilling (2021b). Regression combines data from Experiments 1 and 3. Dependent variable: within-subject change in WTP for a meal, compared to baseline. Effects are split into effects for meals with low emissions (defined as meals with emissions lower than that of the alternative option, the cheese sandwich) and meals with high emissions (meals with emissions higher than the sandwich). The baseline condition is Control. "Low" and "High" respectively turn 1 for low-emission and high-emission meals. "Low x Label" and "High x Label" respectively turn 1 for low-emission and high-emission meals in the Label, Attention+Label, Attent+Offset and Offset conditions. I consider participants in the Offset condition as having received a labeling treatment, since they are shown a label indicating the emissions of each of the meal options (zero). Differing effects relative to the Label condition are captured by "Low x Label x Offset" and "High x Label x Offset", which respectively turn 1 for low-emission and high-emission meals in the Offset condition. "Low x Attent" and "High x Attent" respectively turn 1 for low-emission and high-emission meals in the Attention and Attention+Labels and Attention+Offset conditions. "Low x Attent x Label" and "High x Attent x Label" respectively turn 1 for low-emission and high-emission meals in the Attention+Labels *and* Attention+Offset conditions. "Low x Attent x Offset" and "High x Attent x Offset" respectively turn 1 for low-emission and high-emission meals in the Attention+Offset condition. Standard errors are clustered at the individual level.

Tables A.9 and A.10 show the additional analyses I pre-registered for Experiment 3. I pre-registered to examine WTP for meals as the dependent variable, while including participant × meal fixed effects. As shown in section A.10 this is econometrically equivalent to using the change in WTP as the outcome variable, as I do in the main text analyses. I chose to use the change in WTP as the outcome variable in the main text for exposition reasons. Col. (1) of Table A.9 directly examines the effect of providing labels additionally to directing attention to carbon emissions, and the effect of offsetting relative to directing attention and providing labels. Similarly, Col. (2) performs a similar analysis interacting the emissions of each meal with treatments rather than using the Low and High indicators. Table A.10 further examines the effect of carbon offsetting relative to making participants attentive, excluding data from the Attention+Label condition. Col. (2) examines the effect of directing attention and offsetting as a function of emissions guessed by participants.

Table A.9. Experiment 3: Analysis label and offsetting effects

	WTP	
	(1)	(2)
Low x Attent x Label	−0.02	
	(0.04)	
High x Attent x Label	−0.10***	
	(0.04)	
Low x Attent x Label x Offset	0.02	
	(0.02)	
High x Attent x Label x Offset	0.16***	
	(0.02)	
Low x Attent	−0.01	
	(0.03)	
High x Attent	−0.08***	
	(0.03)	
Emissions(kg) x Attent x Label		−0.01
		(0.03)
Emissions(kg) x Attent x Label x Offset		0.07***
		(0.02)
Emissions(kg) x Attent		−0.07***
		(0.02)
Attent x Label		−0.07**
		(0.03)
Attent x Label x Offset		0.06***
		(0.02)
Attent		−0.00
		(0.02)
Control for third round	−0.00	−0.00
	(0.01)	(0.01)
Constant	0.70***	0.70***
	(0.01)	(0.01)
Participant x Meal FE	Yes	Yes
Participants attent	151	151
Participants attent+offset	293	293
Participants attent+label	293	293
Observations	5,328	5,328

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This analysis was pre-registered in Schulze Tilling (2021a). Dependent variable: WTP for a meal. The specification is similar to the main-text model (see Section A.10), but includes interactions for the Offset condition and uses individual × meal fixed effects with WTP as the dependent variable (see section A.10 for details). Effects are split into low- and high-emission meals (defined relative to the cheese sandwich). All participants in this sample are attentive after the baseline round. "Low x Attent" and "High x Attent" respectively turn 1 for low-emission and high-emission meals for all decisions in rounds 2 and 3. "Low x Attent x Label" and "High x Attent x Label" respectively turn 1 for low-emission and high-emission meals in the Attention+Labels, and Attention+Offset conditions. "Low x Attent x Label x Offset" and "High x Attent x Label x Offset" turns 1 for low-emission and high-emission meals in the Attention+Offset condition. Variables in Col. (2) are defined similarly, with a general indicator for each condition and an interaction between treatment indicator and the difference in emissions between meal and cheese sandwich. Includes only data from Experiment 3. Standard errors are clustered at the individual level.

Table A.10. Experiment 3: Analysis offseting effects based on participants' emission guesses

	WTP	
	(1)	(2)
Low x Attent x Label x Offset	−0.00	
	(0.04)	
High x Attent x Label x Offset	0.06*	
	(0.03)	
Low x Attent	−0.00	
	(0.03)	
High x Attent	−0.08***	
	(0.03)	
Guessed emissions(kg) x Attent x Label x Offset		0.08*
		(0.04)
Guessed emissions(kg) x Attent		−0.08***
		(0.03)
Attent x Label x Offset		−0.00
		(0.04)
Attent		0.00
		(0.03)
Control for third round	−0.01	−0.01
	(0.02)	(0.02)
Participant x Meal FE	Yes	Yes
Participants attent	151	135
Participants attent+offset	293	264
Observations	4,156	3,751

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This analysis was pre-registered in Schulze Tilling (2021a). Dependent variable: WTP for a meal. Here, the definition of low- and high-emission meals is based on participants' guesses for the meals and the cheese sandwich. This analysis excludes participants in the ATTENTION+LABEL condition. Low-emission meals are meals for which the respective participant guessed lower emissions than for the cheese sandwich, and vice versa. Similarly, Col. (2) uses the guessed difference in emissions. In this analysis, I exclude, for each meal, those observations with the 10% most extreme deviations of guesses from actual emissions. Standard errors are clustered at the individual level.

A.8 Results split by (non-) vegetarians and (non-) students

Experiment 1.

	Change in WTP compared to baseline	
	(1)	(2)
High emission meal x Shown label	-0.26***	
	(0.05)	
Low emission meal x Shown label	0.17***	
	(0.06)	
High emission meal	0.00	
	(0.02)	
Low emission meal	-0.10**	
	(0.05)	
Emissions(kg) x Shown label		-0.12***
		(0.03)
Emissions(kg)		0.03**
		(0.01)
Shown label		-0.04
		(0.04)
Control for third round	0.01	0.01
	(0.04)	(0.04)
Constant		-0.05*
		(0.03)
Participants control	96	96
Participants treated	169	169
Observations	1,244	1,244

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.11. Replication of Table 1 including only non-vegetarians

	Change in WTP compared to baseline	
	(1)	(2)
High emission meal x Shown label	-0.53***	
	(0.11)	
Low emission meal x Shown label	0.11	
	(0.07)	
High emission meal	0.06	
	(0.05)	
Low emission meal	-0.02	
	(0.04)	
Emissions(kg) x Shown label		-0.75***
		(0.18)
Emissions(kg)		0.08
		(0.08)
Shown label		-0.08
		(0.05)
Control for third round	0.04	0.04
	(0.04)	(0.04)
Constant		0.00
		(0.02)
Participants control	43	43
Participants treated	48	48
Observations	460	460

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.12. Replication of Table 1 including only vegetarians

	Change in WTP compared to baseline	
	(1)	(2)
High emission meal x Shown label	-0.29***	
	(0.05)	
Low emission meal x Shown label	0.15***	
	(0.05)	
High emission meal	-0.01	
	(0.02)	
Low emission meal	-0.08**	
	(0.03)	
Emissions(kg) x Shown label		-0.13***
		(0.03)
Emissions(kg)		0.01
		(0.01)
Shown label		-0.05
		(0.04)
Control for third round	0.01	0.01
	(0.03)	(0.03)
Constant		-0.04**
		(0.02)
Participants control	114	114
Participants treated	169	169
Observations	1,372	1,372

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.13. Replication of Table 1 including only students

	Change in WTP compared to baseline	
	(1)	(2)
High emission meal x Shown label	-0.41***	
	(0.09)	
Low emission meal x Shown label	0.03	
	(0.07)	
High emission meal	0.12**	
	(0.06)	
Low emission meal	0.08	
	(0.07)	
Emissions(kg) x Shown label		-0.08
		(0.08)
Emissions(kg)		0.02
		(0.03)
Shown label		-0.22***
		(0.07)
Control for third round	0.05	0.05
	(0.09)	(0.09)
Constant		0.10*
		(0.06)
Participants control	25	25
Participants treated	48	48
Observations	332	332

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.14. Replication of Table 1 including only non-students

Experiment 3.

	Change in WTP compared to baseline	
	(1)	(2)
Underestimated emissions	-0.11**	
	(0.04)	
Underestimation (in kg)		-0.06**
		(0.03)
Control for third round	0.05	0.05
	(0.05)	(0.05)
Constant	-0.12***	-0.16***
	(0.04)	(0.04)
Participants	227	220
Obs. underestimate	451	420
Obs. overestimate	418	367
Observations	869	787

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.15. Replication of Table 4.3 including only non-vegetarians

	Change in WTP compared to baseline	
	(1)	(2)
Underestimated emissions	-0.21***	
	(0.07)	
Underestimation (in kg)		-0.14**
		(0.06)
Control for third round	0.05	0.13
	(0.10)	(0.09)
Constant	-0.02	-0.18**
	(0.09)	(0.07)
Participants	66	64
Obs. underestimate	104	96
Obs. overestimate	144	130
Observations	248	226

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.16. Replication of Table 4.3 including only vegetarians

	Change in WTP compared to baseline	
	(1)	(2)
Underestimated emissions	-0.18***	
	(0.04)	
Underestimation (in kg)		-0.10***
		(0.03)
Control for third round	0.10*	0.11**
	(0.05)	(0.06)
Constant	-0.12**	-0.21***
	(0.05)	(0.04)
Participants	203	198
Obs. underestimate	383	361
Obs. overestimate	391	340
Observations	774	701

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.17. Replication of Table 4.3 including only students

	Change in WTP compared to baseline	
	(1)	(2)
Underestimated emissions	-0.00	
	(0.05)	
Underestimation (in kg)		-0.02
		(0.04)
Control for third round	-0.06	-0.06
	(0.08)	(0.09)
Constant	-0.05	-0.05
	(0.06)	(0.05)
Participants	90	86
Obs. underestimate	172	158
Obs. overestimate	171	153
Observations	343	311

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.18. Replication of Table 4.3 including only non-students

	Change in WTP compared to baseline
	(1)
High emission meal x Shown label	-0.10**
	(0.04)
Low emission meal x Shown label	-0.06
	(0.05)
High emission meal	-0.11***
	(0.03)
Low emission meal	-0.01
	(0.04)
Control for third round	0.04
	(0.03)
Participants attent	112
Participants label	227
Observations	1,804

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.19. Replication of Table 5 including only non-vegetarians

	Change in WTP compared to baseline
	(1)
High emission meal x Shown label	-0.12
	(0.08)
Low emission meal x Shown label	0.03
	(0.06)
High emission meal	-0.05
	(0.04)
Low emission meal	-0.04
	(0.04)
Control for third round	0.02
	(0.04)
Participants attent	39
Participants label	66
Observations	576

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.20. Replication of Table 5 including only vegetarians

	Change in WTP compared to baseline
	(1)
High emission meal x Shown label	-0.17***
	(0.04)
Low emission meal x Shown label	-0.02
	(0.05)
High emission meal	-0.08***
	(0.03)
Low emission meal	-0.03
	(0.03)
Control for third round	0.05*
	(0.03)
Participants attent	104
Participants label	203
Observations	1,644

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.21. Replication of Table 5 including only students.

	Change in WTP compared to baseline
	(1)
High emission meal x Shown label	0.04
	(0.08)
Low emission meal x Shown label	-0.03
	(0.08)
High emission meal	-0.14**
	(0.06)
Low emission meal	-0.00
	(0.06)
Control for third round	-0.01
	(0.04)
Participants attent	47
Participants label	90
Observations	736

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.22. Replication of Table 5 including only non-students

A.9 Replication excluding round 3 observations

Table A.23. Replication of Table 1 excluding round 3 observations

	Change in WTP compared to baseline	
	(1)	(2)
High emission meal x Shown label	-0.34^{***}	
	(0.06)	
Low emission meal x Shown label	0.15^{**}	
	(0.06)	
High emission meal	0.02	
	(0.02)	
Low emission meal	-0.05	
	(0.03)	
Emissions(kg) x Shown label		-0.15^{***}
		(0.04)
Emissions(kg)		0.03^{**}
		(0.01)
Shown label		-0.07^{*}
		(0.04)
Constant		-0.02
		(0.02)
Participants control	139	139
Participants treated	148	148
Observations	1,148	1,148

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.24. Replication of Table 4.3 excluding round 3 observations

	Change in WTP compared to baseline	
	(1)	(2)
Underestimated emissions × Shown label	-0.22^{***}	
	(0.04)	
Overestimated emissions × Shown label	-0.10^{**}	
	(0.04)	
Underestimation (in kg)		-0.06^{*}
		(0.03)
Constant		-0.17^{***}
		(0.03)
Participants	144	140
Obs. underestimate	269	248
Obs. overestimate	281	248
Observations	550	496

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.25. Replication of Table 5 excluding round 3 observations

	Change in WTP compared to baseline
	(1)
High emission meal x Shown label	-0.11^{**}
	(0.05)
Low emission meal x Shown label	-0.06
	(0.05)
High emission meal	-0.09^{***}
	(0.03)
Low emission meal	-0.01
	(0.03)
Participants attent	151
Participants label	144
Observations	1, 180

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A.10 Exp. 1: Alternative econometric specifications

Alternatively to the estimation approach described in Section 2.2, one could instead estimate the following specification:

$$\begin{aligned} WTP_{ijm} = \alpha_{im} &+ \beta_1(High_m \times Post_j) + \beta_2(Low_m \times Post_j) + \delta_1(High_m \times Post_j \times Label_{ij}) \\ &+ \delta_2(Low_m \times Post_j \times Label_{ij}) + ThirdRound_j + \varepsilon_{ijm} \end{aligned} \quad \text{(A.1)}$$

This specification is more similar to a classic diff-in-diff approach. Instead of directly using the difference between indicated WTP for a meal and baseline WTP as the dependent variable (as in 1), I use raw WTP of individual i in round j for meal m as the dependent variable. Accordingly, I also include observations from the baseline elicitation round in the regression.

α_{im} are individual and meal-specific fixed effects. These are 1156 fixed effects in total: 289 participants × 4 meals. These fixed effects control for individual-specific baseline tastes. Note that it would not make much sense to include merely a single fixed effect for each individual. A single fixed effect would capture the average WTP of each individual across the four meals. However, I expect the effect of the carbon labels to differ across meals. WTP for low-emission meals should increase as a result of the label, while WTP for high-emission meals should decrease. It is thus insufficient to control for individuals' WTP averaged across meals. To illustrate with an example, imagine I only had two meals, one low-emission and one high-emission meal. An individual has a WTP of €1.00 for the low-emission meal and a WTP of €3.00 for the high-emission meal. When the individual sees the carbon labels, he adjusts his WTP for the low-emission meal upward to €2.00 euros, and his WTP for the high-emission meal downward to €2.00 euros. Treatment effects are thus sizable. However, his average WTP for the two meals did not change, and a regression including a single individual fixed effect term would falsely not identify a treatment effect.

$(High_m \times Post_j)$ is an indicator variable for whether the meal causes higher emissions than the sandwich, and interacted with the elicitation round $j > 1$, i.e. it being the second or third round of elicitations and not the baseline round. $(Low_m \times Post_j)$ is the equivalent indicator for low-emission meals. Note that all meals are classified either as Low_m or $High_m$. The two variables thus together capture the $Post_j$ effect, and a separate $Post_j$ indicator would be dropped due to collinearity. I also do not include separate controls for Low_m and $High_m$ since meal characteristics are captured by the α_{im} fixed effects.

$(High_m \times Post_j \times Label_{ij})$ interacts the high-emission and $Post_j$ indicator with an indicator for whether individual i saw carbon labels in round j. This describes the average causal effect of carbon labels on WTP for a meal that is high in carbon emissions. $(Low_m \times Post_j \times Label_{ij})$ describes the average causal effect of carbon labels on WTP for a meal that is low in carbon emissions. $ThirdRound_j$ is an indicator of whether it was the third round of decisions. Standard errors are clustered at the individual level.

Spec. (1) in Table A.26 shows regression results. They are very similar to those reported in the main text. Spec. (2) replicates Spec. (2) of Table 1 with a fixed effect approach and also finds similar results as reported in the main text.

Table A.26. Replication of Experiment 1 results with fixed effects approach

	WTP	
	(1)	(2)
High x Post x Label	-0.30^{***}	
	(0.04)	
Low x Post x Label	0.09^{**}	
	(0.04)	
High x Post	0.01	
	(0.02)	
Low x Post	−0.03	
	(0.04)	
Emissions(kg) x Post x Label		-0.12^{***}
		(0.03)
Emissions(kg) x Post		0.01
		(0.01)
Post x Label		-0.08^{***}
		(0.03)
Post		−0.02
		(0.02)
Control for third round	0.01	0.01
	(0.03)	(0.03)
Constant	0.65^{***}	0.65^{***}
	(0.01)	(0.01)
Participant x Meal FE	Yes	Yes
Participants control	139	139
Participants treated	217	217
Observations	2,852	2,852

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

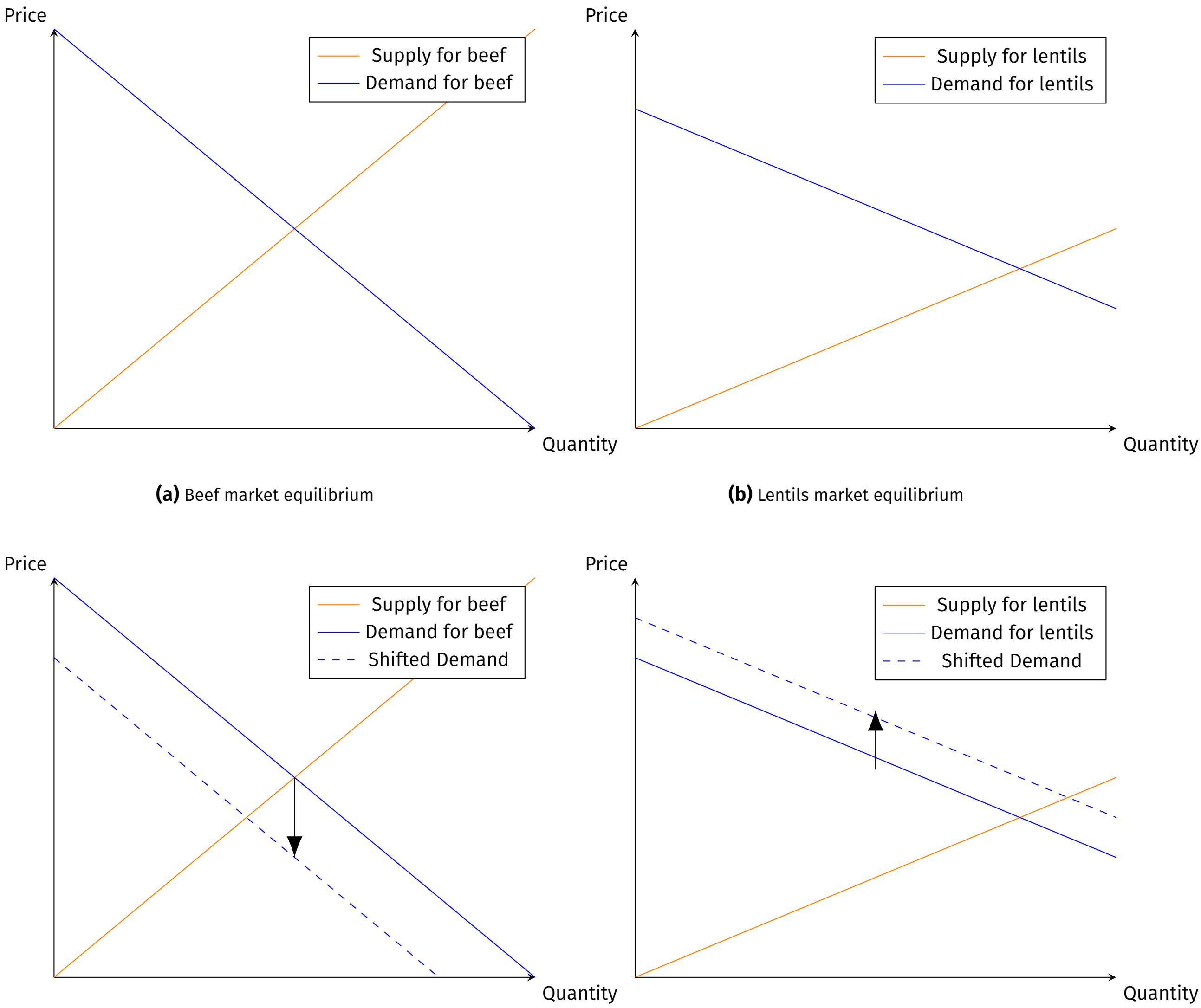
Notes: Table replicates the estimation in Table 1 using WTP for meals directly as the outcome variable, instead of taking the difference. Spec. (1) corresponds to Equation A.1 and includes individual× meal fixed effects. It does not include a "Post" or a "Post× Label" variable, because "Low emissions meal" and "High emissions meal" are mutually exclusive. In spec. (2), emissions (kg) are defined as the emissions caused by the meal relative to the cheese sandwich. This is positive for "high-emission" and negative for "low-emission" meals. Standard errors are clustered at the individual level.

A.11 Exp. 1: Intuition behind expressing effect sizes in terms of a carbon tax

One of the main results shown in section 2.2 is that carbon labels in Experiment 1 produce a similar impact as would result from a carbon tax of €0.12 per kg or €120 per tonne. The underlying assumption for this comparison is that a shift in the demand curve due to the installation of carbon labels affects total quantity similarly as a would a shift in the demand curve due to the installation of a carbon tax.

To illustrate this point, I first show in Figure A.4 how carbon labels and a carbon tax would affect price and quantity purchased in two specific product markets: beef and lentils. Images (a) and (b) show a stylized illustration of how the current market equilibrium in the beef market and the lentils market might look like. In each market, the equilibrium price and quantity is determined by the intersection of the supply and demand curves. Image (c) shows how the beef market would be affected by a downward shift in the demand curve. This shift in the demand curve could either result from consumers being willing to pay less for beef due to carbon labels, or consumers being willing to pay less because a carbon tax will be added to their purchase. The downward shift in the demand curve leads to the demand curve and supply curve now intersecting at a lower price and a lower quantity. Image (d) shows how the lentils market would be affected by an upward shift in the demand curve. This shift could again either result from consumers being willing to pay more for lentils as they recognize their good environmental performance on the carbon labels, or consumers being willing to pay more because there will be no carbon tax added to their purchase. The upward shift in the demand curve leads to the demand curve and supply curve now intersecting at a higher price and a higher quantity.

More generally, one could think of demand for emission-heavy goods in a more abstract sense, with there being some demand curve describing consumer demand for different items as a function of how much emissions result from their production. A carbon tax would shift this demand curve downward, just as would carbon labels. My analysis in section 2.2 quantifies the shift occurring through the labels in terms of which height of a carbon tax would be required to shift this demand curve downward by the same extent. Note that my estimate of €0.12 per kg averages over all participants, i.e. it already incorporates that some consumers might be reacting to the labels more strongly than other consumers.



(a) Beef market equilibrium

(b) Lentils market equilibrium

(c) Shifted demand in beef market

(d) Shifted demand in lentils market

Figure A.4. Comparison of supply and demand in beef and lentils markets

A.12 Exp. 3: Descriptives on under- and over-estimation

Table A.27. Under- and over-estimation of meal emissions

Meal	Relative emissions	No. underestimated	No. overestimated	No. correct	Total
Vegetable pasta	-0.2 kg	31	249	13	293
Chicken w. rice	0.7 kg	47	163	17	227
Courgettes w. fries	0.7 kg	249	33	11	293
Cheese pasta	0.5 kg	31	24	11	66
Beef w. potatoes	2.7 kg	193	32	2	227
Stir-fried veg.	-0.3 kg	4	61	1	66
Total		555	562	55	1.172

Notes: Based on participants in the ATTENTION+LABEL treatment. I show under- and overestimation of the emissions caused by those meals that are also used in the experiment decisions. Relative emissions are emissions relative to the cheese sandwich (0.7 kg). I classify a participant as underestimating this amount if their guess for the meal's emissions minus their guess for the cheese sandwich is lower than the actual relative emissions. I classify a participant as overestimating this amount if their guess for the meal's emissions minus their guess for the cheese sandwich is higher than the actual relative emissions.

Table A.28. Number of under- and over-estimations per participant

No. overestimated	0	1	2	3	4	Total
No. underestimated						
0	0	0	0	2	10	12
1	0	1	21	54	0	76
2	1	24	128	0	0	153
3	4	31	0	0	0	35
4	17	0	0	0	0	17
Total	22	56	149	56	10	293

Notes: Based on participants in the ATTENTION+LABEL treatment. I show under- and overestimation of the emissions caused by those meals that are also used in the experiment decisions. Relative emissions are emissions relative to the cheese sandwich (0.7 kg). I classify a participant as underestimating this amount if their guess for the meal's emissions minus their guess for the cheese sandwich is lower than the actual relative emissions. I classify a participant as overestimating this amount if their guess for the meal's emissions minus their guess for the cheese sandwich is higher than the actual relative emissions. Each cell shows the number of participants with the respective number of under- or over-estimations.

Table A.29. Number of participants who correctly guessed how the four decision meals rank relative to each other

No. of correctly ranked meals	No. participants
0	66
1	35
2	135
3	48
4	9
Total	293

Notes: Table shows how many participants put meals on the correct rank, i.e. they guessed the lowest emission amount to the lowest-emitting meal, the highest emission amount to the highest-emitting meal, etc. For meat-eating participants, the meals on places 2 and 3 are very similar, so I count a meal as correctly ranked regardless of whether the ranking resulting from the participant's guesses is rank 2 or 3.

A.13 Exp. 3: Results using alternative definitions

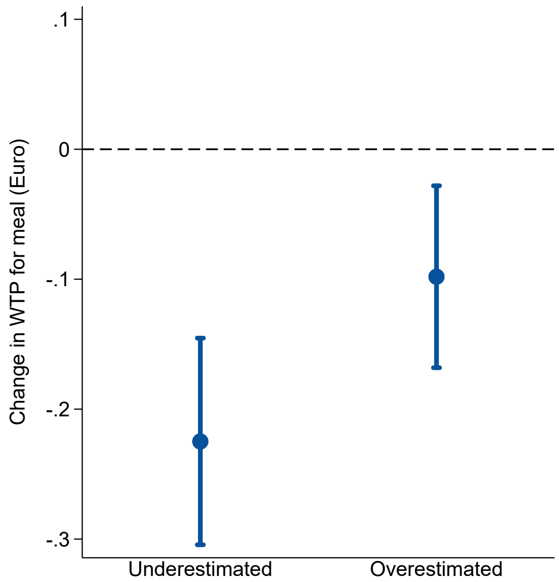


Figure A.5. Replication of Figure 12 based on under- or over-estimation of the meal. Notes: Figure based on under- or over-estimation of the meal instead of under- or over-estimation of the difference in emissions between the meal and the cheese sandwich. Bars indicate 95% confidence intervals. Figure visualizes spec. (1) in the Table to the right.

	Change in WTP compared to baseline	
	(1)	(2)
Underestimated meal × Shown label	−0.22***	
	(0.04)	
Overestimated meal × Shown label	−0.10***	
	(0.04)	
Underestimation meal (in kg) × Shown label		−0.04
		(0.03)
Shown label		−0.17***
		(0.03)
1 if third round	0.05	0.07
	(0.05)	(0.05)
Participants	293	276
Obs. underestimate	646	690
Obs. overestimate	450	375
Observations	1,096	1,065

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.30. Replication of Table 4.3 based on under- or over-estimation of the meal. Notes: Analysis uses data from the ATTENTION+LABEL condition. For Spec. (1), I drop 76 participant-meal combinations where *meal* emissions were correctly estimated. For each meal in spec. (2), the 10% most extreme guesses of the difference in *meal* emissions to the true meal emissions are dropped. Standard errors are clustered at the individual level.

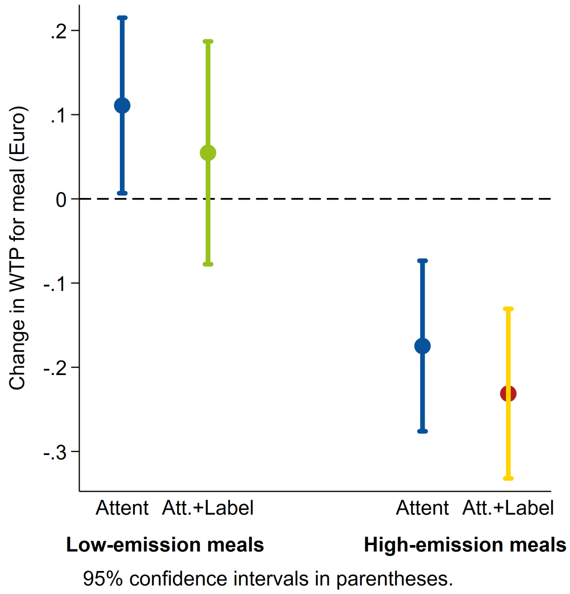


Figure A.6. Replication of Figure 13 including only participant-meal combinations for which guesses were accurate enough to receive a bonus payment (guess within 20% of true value, 543 observations). Bars indicate 95% confidence intervals.

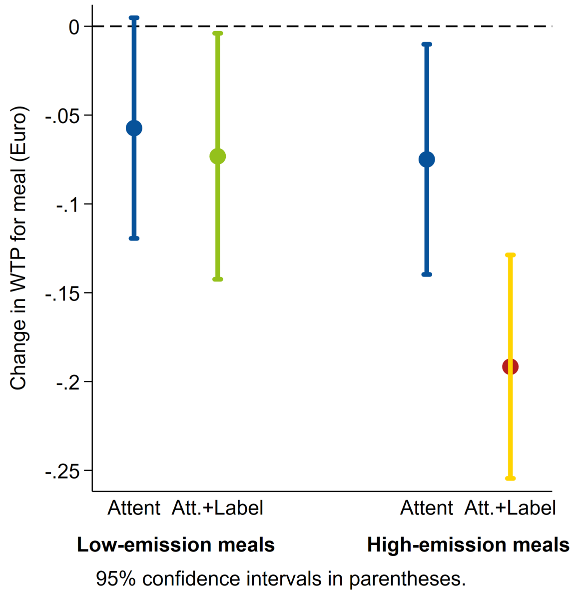


Figure A.7. Replication of Figure 13 including only participant-meal combinations where emissions were not guessed accurately enough to receive a bonus payment (guess not within 20% of true value, 1,837 observations)

Table A.31. Replication of Table 4.3 including exact guesses (Col. 1) and testing difference (Col. 2)

	Change in WTP compared to baseline	
	(1)	(2)
Underestimated emissions × Shown label	-0.23^{***}	-0.13^{***}
	(0.04)	(0.04)
Overestimated emissions × Shown label	-0.10^{***}	
	(0.04)	
Correct estimate × Shown label	-0.19^{**}	
	(0.08)	
Shown label		-0.10^{***}
		(0.04)
Control for third round	0.05	0.05
	(0.04)	(0.05)
Participants	293	293
Obs. underestimate	555	555
Obs. overestimate	562	562
Obs. exact	55	0
Observations	1,172	1,117

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Col. (1) additionally estimates an effect size for those participant-meal combinations in which participants correctly guessed the difference in emissions between meal and cheese sandwich. Col. (2) replicates Col. (1) of Table 4.3 to test whether effect sizes are significantly different in the case of underestimation.

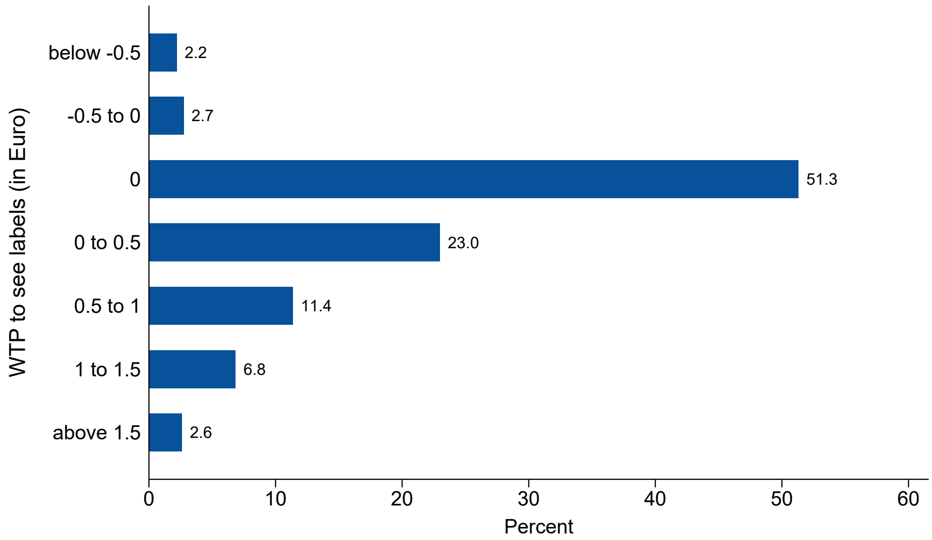


Figure A.8. Distribution of WTP indicated to see carbon labels on the final three consumption decisions

Notes: In Euro. Based on Experiments 1 and Experiment 3. Includes data from all 731 participants.

A.14 Participants' WTP for the presence of carbon labels

Table A.32. WTP for seeing carbon labels by treatment group

	WTP for labels
	(1)
Control, then Labels	−0.13
	(0.08)
Labels, then Offset	−0.11
	(0.08)
Attent, then Attent	−0.08
	(0.07)
Attent+Label, then Offset	−0.07
	(0.07)
Attent+Offset, then Labels	−0.04
	(0.07)
Constant	0.28***
	(0.06)
Participants control, then Control	70
Participants Control, then Labels	69
Participants Labels, then Offset	148
Participants Attent, then Attent	151
Participants Attent+Offset, then Labels	149
Participants Attent+Label, then Offset	144
Observations	731

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Average deviation from the average WTP to see emission labels for the final three consumption decisions, by treatment group. “Control, then Control” is the baseline condition.

Table A.33. Correlation between WTP for seeing carbon labels and individual characteristics

	WTP for the presence of carbon labels				
	(1)	(2)	(3)	(4)	(5)
Perceived strength of social norms	0.01**				
	(0.01)				
In favor of labels in student restaurant		0.03***			
		(0.01)			
Self-reported willingness to use info			0.03***		
			(0.01)		
Self-reported confidence in own knowledge				−0.01	
				(0.01)	
Eating self-control					0.00
					(0.01)
Constant	0.15***	−0.03	0.03	0.18***	0.21***
	(0.03)	(0.06)	(0.04)	(0.02)	(0.02)
Observations	731	731	731	731	731

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Notes: Dependent variable: WTP for seeing labels (in Euro) for the final three consumption decisions. “In favor of labels in student canteen” is measuring using approval of the statement “I would appreciate if the student canteen would introduce such a measure”. “Self-reported willingness to use info” is measured using approval of the statement “I would include this information in my decision.”. “Self-reported confidence in own knowledge” is measured with two questions: (1) approval of the statement “I already know without labels which emissions are caused by different meals.”, and (2) “I think this information will partially surprise me.” The perceived strength of social norms is measured using the procedure developed by Krupka and Weber (2013). Eating self-control is measured using the questions developed by Haws, Davis, and Dholakia (2016).

Table A.34. Correlation between WTP for seeing carbon labels and treatment effect

	WTP for labels	
	(1)	(2)
Estimate of individual's reaction to kg emissions	-0.31^{***}	
	(0.08)	
Estimate of individual's fixed reaction		-0.26^{**}
		(0.11)
Constant	0.15^{***}	0.18^{***}
	(0.02)	(0.02)
Participants Control, then Labels	61	61
Participants Labels, then Offset	133	133
Participants Attent+Offset, then Labels	138	138
Participants Attent+Label, then Offset	128	128
Observations	460	460

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable: WTP for seeing labels for the final three consumption decisions. Independent variables: I perform the analysis shown in Col. (2) of Table 1 separately for each individual shown carbon labels during the experiment, to calculate individual treatment effects. I then truncate the 10% most extreme coefficients, similarly to the visualization of individual treatment effects in Figure A.3. Using the remaining observations, Col. (1) regresses individual's WTP for seeing carbon labels on the coefficient I estimated for the individual for "Emissions(kg) x Shown label", i.e. the person's reaction dependent on emissions caused by the meal. Col. (2) regresses individual's WTP for seeing carbon labels on the coefficient I estimated for the fixed effect of "Shown label", i.e. the fixed reaction I estimate for this individual independent of meal emissions. The coefficients suggest that there is a correlation between showing a stronger reaction to carbon labels and being willing to pay a higher amount to be shown the labels.

A.15 Details of structural estimation and simulations

A.15.1 Estimation of basic model. To estimate the parameters of the structural model presented in section 6, I rewrite equations 11 to 14 as follows.

For equation A.2, I subtract equation 11 from equation 13:

$$WTP_m^{A+L} - WTP_m^B = \gamma(e_m^{prior} - e_o^{prior})(\theta - \kappa) - \gamma(e_m^{true} - e_o^{true})(1 - \kappa) \tag{A.2}$$

For equation A.3, I subtract equation 11 from equation 12:

$$WTP_m^A - WTP_m^B = \gamma(e_m^{prior} - e_o^{prior})(\theta - 1) \tag{A.3}$$

For equation A.4, I subtract equation 13 from equation 14:

$$WTP_m^{A+O} - WTP_m^{A+L} = \gamma(e_m^{true} - e_o^{true})(1 - \kappa) + \gamma(e_m^{prior} - e_o^{prior})\kappa \tag{A.4}$$

I then use data from Experiment 3 to estimate the parameters, inserting for each participant-meal combination participants' WTP for that meal and their prior beliefs of emissions. To reduce the effect of outliers, I drop, for each meal, the 10% of observations pertaining to the 10% most extreme guesses. This leaves me with 1.056 observations from 284 participants to estimate equation A.2, 1,104 observations from 146 participants to estimate equation A.3, and 1,056 observations from 284 participants to estimate equation A.4. For a better understanding of these observation and participant numbers, see Figure 9 that illustrates how experiment participants are allocated to the different treatment conditions in Experiment 3. I estimate the three equations simultaneously using GMM in Stata, from the starting values Gamma=0.107, Theta=0.038, and Kappa=0.168.

A.15.2 Estimation of model extended to welfare impact. To additionally estimate the effect of the labels on consumer welfare, I include an adapted version of equation 10 in the estimation. Specifically, I adapt it in two ways to reflect the experiment setting:

- I use participants' WTP to see or avoid carbon labels as a proxy for $u(P=1) - u(P=0)$. However, the mere act of asking participants whether they would like to see carbon labels makes them attentive of emissions. Thus, the counterfactual they will compare their choice under carbon labels, m^L, to will be the choice they make when attentive of carbon emissions, m^A.
- Participants indicate their WTP for meals relative to the cheese sandwich. I thus adapt equation 9 to be expressed relative to the consumption utility obtained from the outside option (cheese sandwich), v_o, the emissions caused by the outside option, e_o^{true}, and price of the outside option, p_o.

Then, the difference in utility consumers' experience in the presence of carbon labels, $u(P=1)$ relative to utility in the absence of labels, $u(P=0)$, is

$$u(P = 1) - u(P = 0) = u^{True}(m^{*L}) - u^{True}(m^{*A}) + F \tag{A.5}$$

and the true utility the consumer reaps from meal m in the experiment context is

$$u^{True}(m) = v_m - v_o - \gamma(e_m^{\text{true}} - e_o^{\text{true}}) - (p_m - p_o) \tag{A.6}$$

In the experiment setting, there are only two possible cases in which $u^{True}(m^{*L}) - u^{True}(m^{*A}) \neq 0$:

(1) The WTP which the participant indicates when seeing labels, WTP^{A+L} is higher than the price $p_m - p_o$ to receive meal m rather than the outside option o, but $WTP^A < p_m - p_o$

(2) The WTP which the participant indicates merely attentive, WTP^A is higher than the price $p_m - p_o$ to receive meal m rather than the outside option o, but $WTP^{A+L} < p_m - p_o$

In the experiment context, equation A.5 thus further transforms to:

$$\begin{aligned} u(P=1) - u(P=0) &= \mathbb{1}\Big(WTP^{A+L} \geq p_m - p_o\Big) \\ &\Big(v_m - v_o - \gamma(e_m^{\text{true}} - e_o^{\text{true}}) - E[p_m - p_o | WTP^{A+L} \geq p_m - p_o]\Big) \\ -\mathbb{1}\Big(WTP^A \geq p_m - p_o\Big)&\Big(v_m - v_o - \gamma(e_m^{\text{true}} - e_o^{\text{true}}) - E[p_m - p_o | WTP^A \geq p_m - p_o]\Big) + F \end{aligned} \tag{A.7}$$

When the participant indicates her WTP for the presence of labels, she weights each event with the probability of it occurring:

$$\begin{aligned} WTP^P = \; & Prob\Big(WTP^{A+L} \geq p_m - p_o\Big)\Big(v_m - v_o - \gamma(e_m^{\text{true}} - e_o^{\text{true}}) - E[p_m - p_o | WTP^{A+L} \geq p_m - p_o]\Big) \\ & -Prob\Big(WTP^A \geq p_m - p_o\Big)\Big(v_m - v_o - \gamma(e_m^{\text{true}} - e_o^{\text{true}}) - E[p_m - p_o | WTP^A \geq p_m - p_o]\Big) \\ & +F \end{aligned} \tag{A.8}$$

In the experiment, relative meal prices $p_m - p_o$ are drawn from a uniform distribution, with each value between -3 and 3 being equally likely, in five-step intervals. Thus, $Prob(p \leq x) \approx (x+3)/6$. Similarly, $E[p|p \leq x] \approx (x-3)/2$. Inserting this above:

$$\begin{aligned} WTP^P = \; & \Big((WTP^{A+L} + 3)/6\Big)\Big(v_m - v_o - \gamma(e_m^{\text{true}} - e_o^{\text{true}}) - (WTP^{A+L} - 3)/2\Big) \\ & -\Big((WTP^A + 3)/6\Big)\Big(v_m - v_o - \gamma(e_m^{\text{true}} - e_o^{\text{true}}) - (WTP^A - 3)/2\Big) + F \end{aligned} \tag{A.9}$$

For the estimation including welfare impact, I add equation A.9 to the estimation of equations A.2 to A.4, as well as participants' WTP for the presence of labels, and estimate the four equations simultaneously. In Col. (6), I use only observations from those having experienced the Attention+Label condition to estimate equation A.9, since those participants who experienced only the Attention condition might not be able to form accurate expectations over the items in equation A.9. This leaves 1,056 observations from 284 participants to estimate equation A.2, 1,104 observations from 146 participants to estimate equation A.3, 1,056 observations from 284 participants to estimate equation A.4, and 1,056 observations from 284 participants to estimate equation A.9 in Col. (6), and 2,160 observations from 430 participants in Col. (7).

I estimate equation A.9 for every meal I observe participants' choices on, using the same WTP^P for a single individual (as each participants only indicates his WTP to see carbon labels once), but using participant and meal-specific baseline WTP, emission values, and emission guesses. By using this estimation method, I essentially assume that participants form their valuation for the presence of carbon labels based on the emission labels to the meals they were shown beforehand. When I ask experiment participants for their WTP for the presence of labels on their three final meals, I do not tell them in advance which meals these will be, and only tell them that these will be three new meals which they have not seen in the experiment previously. It would thus be natural that participants extrapolate from the meal choices they made previously in the experiment.

A.15.3 Estimation results. Table A.35 shows estimation results. Col. (1) - (5) estimate the basic model, while Col. (6) and (7) estimate the extension of the model to consumer welfare. Column (1) shows the main basic specification,and col. (2)-(5) show that estimates are similar in alternative specifications of the basic model. In column (2), I re-estimate the model imposing that $\kappa = 0$, i.e. that individuals completely trust the emissions information. In column (3), I re-estimate the model imposing that $\theta = 0$, i.e. that individuals are completely inattentive to carbon emissions in the absence of an intervention. In column (4), I impose $\theta = \kappa = 0$. In column (5), I impose $\theta = 1$, assuming that consumers are fully attentive to carbon emissions, even in the absence of labels.

Estimated parameters are similar in the extended model. Participants in the Attention condition have not seen emission labels before indicating their WTP for the presence of labels, and would thus have to form a less informed expectation over the first two terms in A.9. I thus do not include them in the main estimation of F (Col.(6) in Table A.35. Col. (7) in Table A.35 includes these observations and estimates similar to the previous specification. Table A.32 shows that the average WTP indicated for the presence of carbon labels does not differ across treatments.

Table A.35. Structural estimates of model parameters including data on WTP for the presence of carbon labels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Theta	0.16	0.03				0.18	0.18
	(0.18)	(0.17)				(0.17)	(0.17)
Gamma	0.12***	0.10***	0.10***	0.10***	0.12***	0.12***	0.12***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Kappa	0.21		0.12		0.12	0.23	0.23
	(0.20)		(0.19)		(0.21)	(0.20)	(0.20)
F						0.21***	0.20***
						(0.01)	(0.01)
Observations	3,216	3,216	3,216	3,216	3,216	3,216	3,216

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Analysis is based on data from Experiment 3. For each meal, the observations corresponding to the 10% most extreme guesses of the difference in emissions to the cheese sandwich (in terms of deviation from the true emission value) are dropped. Regression does not include a constant, since the estimation follows the model outlined in Section 2. Column (1) shows the main estimation, based on equations A.3, A.2, A.4. Columns (2)–Column (5) each modify the model in Column (1) as follows: Column (2) imposes $\kappa = 0$. Column (3) imposes $\theta = 0$. Column (4) imposes $\theta = \kappa = 0$. Column (5) imposes $\theta = 1$. Column (6) shows values estimated for the model extended to consumer welfare. Column (7) includes values for WTP for the presence of labels indicated by participants in the Attention treatment.

A.15.4 Simulation of the effects of different interventions. In the model described in Section 6, introducing carbon labels affects consumers by making them both informed and attentive. Using estimated parameters, I can compare the importance of each of these two effects in driving consumers' responses to carbon labels. I simulate how experiment participants would react to different interventions in the student canteen context: 1) a KNOWLEDGE intervention making them informed, but not attentive, 2) an ATTENTION intervention making them attentive, but not informed, 3) a LABEL intervention making them both attentive and informed, 4) a carbon tax of €120 per ton, and 5) a ban on meat. The revenue from the carbon tax is redistributed lump-sum to student canteen guests.

This simulation is based on participants' tastes for different student canteen meals as elicited in Experiment 3, participants' prior estimates of emissions as elicited in Experiment 3, my estimates of θ, γ, and κ which I assume are homogeneous across participants, the model specification shown in Section 6, and some assumptions on what constitutes a typical student canteen offer and pricing structure.

I use Experiment 3 data to predict how experiment participants would make typical student canteen choices in the absence of any intervention, as well as under different interventions. Based on the WTP which participants indicated for each of the four meals at baseline, I can predict how experiment participants would make their consumption choice in a typical canteen setting, i.e. with a meal offer and pricing structure typical at the university of Bonn.

I assume the following meal offer and pricing structure for the simulations. Specifically, I simulate how participants would choose on the following four exemplary days:

- Day 1: Canteen offers Filled courgettes with potato croquettes or Chicken Schnitzel with rice at a price of €3.05 each, as well as a cheese sandwich at a price of €1.50
- Day 2: Canteen offers Filled courgettes with potato croquettes or Beef ragout with potatoes at a price of €3.05 each, as well as a cheese sandwich at a price of €1.50
- Day 3: Canteen offers Italian vegetable ragout with pasta (€2.75) or Chicken Schnitzel with rice (€3.05), as well as a cheese sandwich at a price of €1.50
- Day 4: Canteen offers Italian vegetable ragout with pasta (€2.75) or Beef ragout with potatoes (€3.05), as well as a cheese sandwich at a price of €1.50

I chose these meals because these are the four meals I use in the baseline purchase decisions in Experiment 3 and I know participants' taste preferences for these meals accordingly. The student canteen in Bonn almost always offers one meat meal and one vegetarian meal, so I designed the four days to cover all possible combinations of the four meals. The four meals are regularly offered in the student canteen, and I use the student canteen's prices for these meals in the simulations. Further, the student canteen always offers cheese sandwiches and prices these at €1.50, so this is included on all days as a third option.

I then simulate in the following manner how each participant would choose between the three available options:

- For non-vegetarians: For each of the two warm meal options, I calculate the difference between the utility a participant perceives for this option relative to the cheese sandwich, and compare it to the true price difference between warm meal and sandwich. I assume the participant chooses the meal option for which this difference is the largest, i.e. consumer surplus is the highest. If the difference is negative, I assume they choose the cheese sandwich. For example, on Day 3, if I calculate a participant's perceived utility to be €2.00 both for the Chicken Schnitzel and the Italian vegetable ragout, I would compare the respective consumer surplus of €2.00 - €1.55 = €0.45 and €2.00 - €1.25 = €0.75, and assume that the participant chooses the Italian vegetable ragout on Day 3.

- For vegetarian participants, there is only one warm meal option offered in the canteen every day. Thus, I compare whether perceived utility relative to the cheese sandwich is higher than the relative price. For example, for Day 3, I would check whether relative WTP for the pasta is at least €1.25 and assume the participant then eats pasta, and assume they eat the cheese sandwich otherwise.

Participant's choices at baseline are straight-forward to calculate: I simply compare the WTP participants indicated at baseline with the prices charged by the different options and assume the participant chooses the option generating the highest consumer surplus.

To calculate choices with an intervention solely increasing attention, I first calculate participant's perceived WTP for a meal if only attention is raised, based on equations 11 and 12.

$$WTP^A = v_m - v_o - \gamma(e_m^{prior} - e_o^{prior}) \tag{A.10}$$

Based on this equation, I use participants' baseline WTP and prior emission estimates as well as the estimated model parameters to calculate participants' perceived WTP in the ATTENTION condition, and then simulate meal choices as in the previous calculation.

A KNOWLEDGE treatment is assumed to lead to the consumer updating her emissions estimate according to 8 without directing attention.

$$WTP^K = v_m - v_o - \theta\gamma(1-\kappa)(e_m^{true} - e_o^{true}) - \theta\gamma\kappa(e_m^{prior} - e_o^{prior}) \tag{A.11}$$

I calculate perceived WTP and simulate meal choices as in the previous calculation.

A LABEL treatment combines both of the previous effects

$$WTP^L = v_m - v_o - \gamma(1-\kappa)(e_m^{true} - e_o^{true}) - \gamma\kappa(e_m^{prior} - e_o^{prior}) \tag{A.12}$$

I calculate perceived WTP and simulate meal choices as in the previous calculation.

Finally, perceived WTP with a CARBON TAX and MEAT BAN is as at baseline. However, I increase prices in the CARBON TAX treatment to incorporate a carbon tax of €120 per ton, and in MEAT BAN I modify the four exemplary days shown above to exclude the meat option. Table 6 in the main text shows simulation results.

A.15.5 Robustness: Analysis assuming interventions impose additional psychological cost. One might be concerned that the ATTENTION and LABEL conditions impose additional psychological costs on consumers. As a robustness check, I re-estimate the model and re-run the simulations assuming that the LABEL condition additionally imposes a psychological cost of $\gamma(1-\kappa)(e_m^{\text{true}} - e_o^{\text{true}}) + \gamma\kappa(e_m^{\text{prior}} - e_o^{\text{prior}})$, while the ATTENTION condition imposes an additional psychological cost of $\gamma\left(e_m^{\text{prior}} - e_o^{\text{prior}}\right)$. Participants' *true utility* in Equation 9 is unaffected by these additional costs; i.e., these are psychological costs created by the interventions. One can also interpret this scenario as the interventions not setting salience θ to 1 (full salience), but to 2 (over-attentive).

Table A.36 reports the resulting parameter estimates and Table A.37 shows the corresponding simulations. The effect on consumer welfare is now negative for all interventions. This is partly mechanical: setting $\theta = 2$ doubles the perceived emission disutility, so the structural estimation recovers a lower γ than in the baseline (see Section 6). As a result, moving toward lower-emission meals yields smaller welfare gains than before. In addition, the imposed psychological costs directly reduce utility in the Attention and Label conditions.

The average decrease in consumer welfare caused by labels is about 5 ¢ per choice. Contrasted with the 21 ¢ psychological benefit estimated from participants' WTP for the presence of labels, the overall welfare impact of labels remains positive, though smaller than in the baseline case. For carbon taxes, I estimate a slight welfare decrease (0.05 ¢) in this scenario, reflecting the lower estimated γ, which reduces the welfare benefit from shifting toward lower-emission foods.

Table A.36. Structural estimates of model parameters including data on WTP for the presence of carbon labels

	(1)
Theta	0.31
	(0.36)
Gamma	0.06***
	(0.01)
Kappa	0.21
	(0.20)
Observations	3,216

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Analysis is based on Experiment 3. For each meal, the 10% most extreme prior–true emission deviations are dropped. No constant is estimated, consistent with the model in Section 2. Column (1) shows a robustness check of the main estimation (equations A.3, A.2, A.4; cf. Table A.35, Col. 1) under the assumption that interventions double psychological costs (equivalently, $\theta = 2$ under Attention and Label).

Table A.37. Simulations assuming raising attention creates psychological costs

	# of choices			Δ GHGE	Δ consumer welfare			
Intervention	sandwich	veg.	meat	Mean	Mean	SD	Min	Max
None	73.1%	18.1%	8.8%					
Attention	74.4%	18.1%	7.4%	−0.0267	−0.0485	0.1130	−1.7368	0.0697
Knowledge	73.1%	17.3%	9.6%	0.0027	0.0000	0.0027	−0.0722	0.0213
Labels	74.1%	18.6%	7.3%	−0.0337	−0.0491	0.0374	−0.4030	0.0515
Carbon tax	72.4%	19.9%	7.7%	−0.0310	−0.0005	0.0652	−0.3125	0.1062
Meat ban	78.3%	21.7%		−0.1472	−0.0435	0.1898	−1.4334	0.0870

Notes: Estimated changes in choices, greenhouse gas emissions (kg CO_2e/meal), and consumer welfare (€/meal) when interventions impose additional psychological costs. In this specification, $\gamma = 0.06^{***}$, $\theta = 0.31$, and $\kappa = 0.21$. Simulations use the estimated parameters, experiment data, and the canteen offer/pricing structure.

A.15.6 Robustness: Analysis assuming offsetting does not completely remove guilt. The analyses above assume that the Attention+Offset treatment fully removes environmental guilt. Section D.4 provides descriptive evidence that offsetting removes at least part of participants' environmental guilt, but it may not eliminate it entirely. To examine sensitivity, I re-estimate the model and re-run the simulations assuming that offsetting removes 70% of perceived guilt (i.e., 30% remains). Formally,

Attention+Offset Treatment (30% of emissions considered):

$$WTP_m^{A+O} \;=\; v_m - v_o \;-\; 0.3\,\gamma\big(e_m^{\text{prior}} - e_o^{\text{prior}}\big), \tag{A.13}$$

with salience normalized to $\theta = 1$ under Attention and Attention+Offset. Subtracting equation 13 from this yields

$$WTP_m^{A+O} - WTP_m^{A+L} \;=\; \gamma(1-\kappa)\big(e_m^{\text{true}} - e_o^{\text{true}}\big) \;+\; \gamma(\kappa - 0.3)\big(e_m^{\text{prior}} - e_o^{\text{prior}}\big). \tag{A.14}$$

I replace equation A.4 with (A.14) and estimate the system as before. As shown in Table A.38, all three parameters, θ, γ, and κ, are estimated to be higher, and all are highly significant. Table A.39 shows the resulting predicted effects on choices, emissions, and consumer welfare. Consumer behavior and emission reductions are identical to the main estimation, but predicted welfare effects differ. Driven mainly by the higher estimate of γ, all interventions now appear more beneficial in terms of consumer welfare. In particular, the Attention intervention becomes welfare-increasing, and the welfare effects of the Label and carbon tax interventions remain positive and similar in magnitude to the main specification.

When only 70% of guilt is assumed to be removed in the Attention+Offset treatment, the model observes the same behavioral difference between Attention+Offset and Attention+Label as before, but can no longer attribute this change to guilt being fully eliminated. The only way to rationalize the same behavioral response with less guilt removed is that the underlying guilt from emissions must be stronger. As a result, the model increases the estimated γ. Since parameters are estimated jointly and γ enters the other equations, the higher estimate for γ also affects estimates of θ and κ.

Table A.38. Structural estimates under partial offsetting (70% of perceived guilt removed)

	(1)
Theta	0.41***
	(0.12)
Gamma	0.17***
	(0.03)
Kappa	0.45***
	(0.14)
Observations	3,216

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Analysis is based on Experiment 3. For each meal, the 10% most extreme prior–true emission deviations are dropped. No constant is estimated. Column (1) re-estimates equations A.3, A.2, and A.14 (cf. Table A.35, Col. 1) under the assumption that offsetting removes 70% of perceived guilt (30% remains).

Table A.39. Simulations assuming offsetting removes 70% of guilt

	# of choices			Δ GHGE	Δ consumer welfare			
Intervention	sandwich	veg.	meat	Mean	Mean	SD	Min	Max
None	73.1%	18.1%	8.8%					
Attention	74.4%	18.1%	7.4%	−0.0267	0.0010	0.0210	−0.1292	0.3220
Knowledge	73.1%	17.3%	9.6%	0.0027	0.0003	0.0149	−0.1922	0.3220
Labels	74.1%	18.6%	7.3%	−0.0337	0.0024	0.0225	−0.0074	0.3220
Carbon tax	72.4%	19.9%	7.7%	−0.0310	0.0021	0.0697	−0.3125	0.3412
Meat ban	78.3%	21.7%		−0.1472	−0.0333	0.1718	−1.4237	0.3220

Notes: Estimated changes in choices, greenhouse gas emissions (kg CO_2e/meal), and consumer welfare (€/meal) under partial offsetting (70% of perceived guilt removed). Parameters re-estimated under this assumption are $\gamma = 0.17^{***}$, $\theta = 0.41^{***}$, and $\kappa = 0.45^{***}$ (see Table A.38). Choices and emissions mirror the main simulation, while welfare impacts are more positive, primarily because the higher estimated γ increases the welfare benefit from shifting toward lower-emission meals.

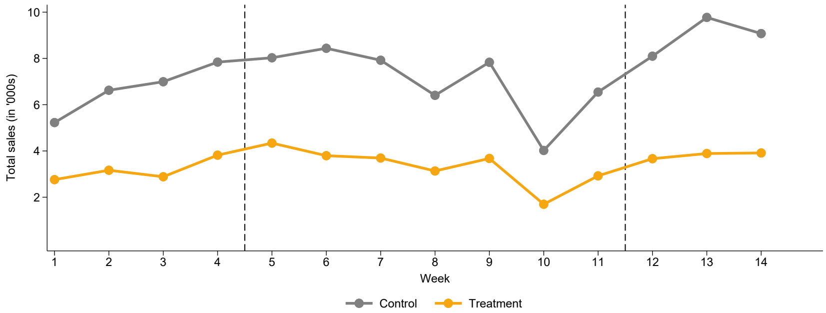


Figure B.1. Weekly student canteen sales of main meal components

Notes: Raw aggregate sales of main meal components, excluding sales to Ukrainian refugees $N = 150{,}320$. Weeks 1–4 are the pre-intervention period (April 2022), weeks 5–11 are the intervention period (May to Mid-June 2022), and weeks 12–14 are the post-intervention period (last week of June and two weeks of July 22). The drop in sales in week 10 is likely due to the one-week Pentecost holidays, during which no classes took place. Week 14 is excluded from the main analysis since it preceded an irregular two-week closure of the treatment canteen, and week 5 is excluded since it coincided with the Healthy Campus week. See main text for further details.

Appendix B Experiment 2: Additional tables and figures

B.1 Time trends

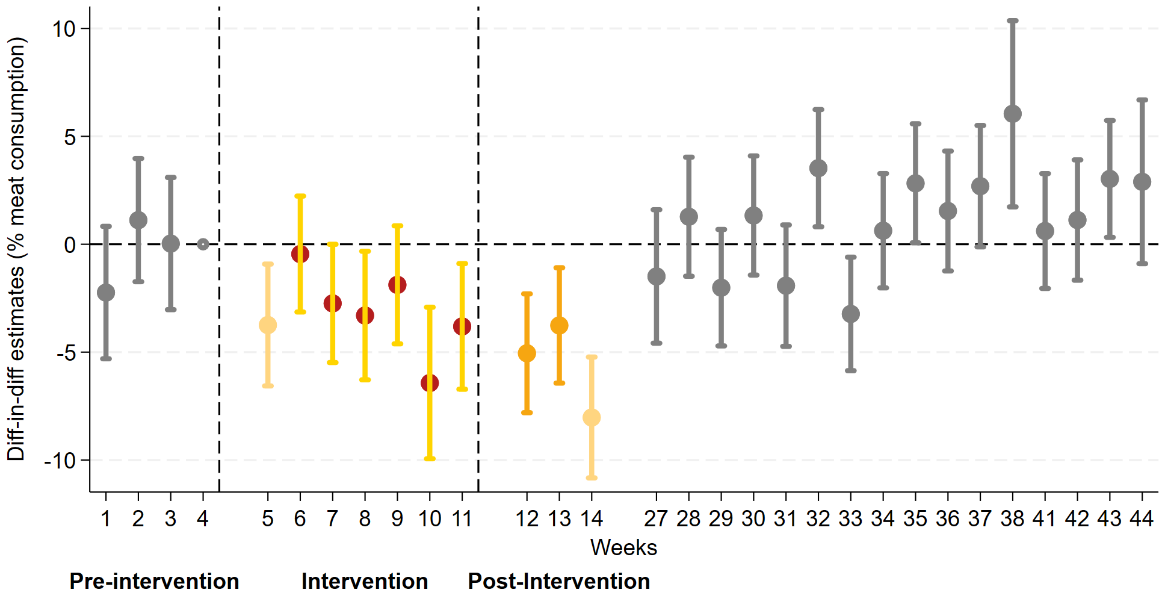


Figure B.2. Event study including data from the following semester

Notes: Difference in difference estimates of the likelihood of consuming the meat option (in percentage points), using week 4 of the pre-intervention phase as a baseline. Weeks 1–4 constitute the pre-intervention phase, while weeks 6–11 constitute the intervention phase, and weeks 12–14 the post-intervention phase. Week 14 is excluded from the main analysis since it preceded an irregular two-week closure of the treatment canteen, and week 5 is excluded since it coincided with the Healthy Campus week. See main text for further details. Weeks 27 onward pertains to the new semester. The regression specification closely follows specification (2) in Table 2. An ITT analysis is not possible using this data set, since individuals' anonymized ID numbers differ between the study period and the following semester. Weeks 15 to 26 are excluded due to the semester break. Weekly time controls, day-of-the-week controls, meal controls and canteen controls are included. Bars indicate 95% confidence intervals.

Table B.1. Regression coefficients for the event plot in Figure 8 - Part 1

	(1)
	Choice of meat
Treated × Week 1	0.67
	(2.80)
Treated × Week 2	1.71
	(2.48)
Treated × Week 3	-1.45
	(2.52)
Treated × Week 5	-6.37**
	(2.55)
Treated × Week 6	-1.97
	(2.27)
Treated × Week 7	-5.02**
	(2.46)
Treated × Week 8	-6.66**
	(2.80)
Treated × Week 9	-5.12**
	(2.49)
Treated × Week 10	-8.08**
	(3.98)
Treated × Week 11	-6.60**
	(2.82)
Treated × Week 12	-11.14***
	(2.63)
Treated × Week 13	-6.73**
	(2.80)
Guests control	1,381
Guests treated	476
Observations	39,959

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable: 0/1 indicator for consumption of the meat option, multiplied by 100 to enable the interpretation of coefficients as percentage points. Regression additionally includes the coefficients shown in the subsequent table B.2 and weekly controls, day-of-the-week controls, and a set of binary controls to control for the meat and vegetarian main meal offered in the canteen assigned according to ITT classification. Standard errors are clustered at the guest level. Table is continued on the following page (Table B.2)

Table B.2. Regression coefficients for the event plot in Figure 8- Part 2

	(1)
	Choice of meat
ITT control for second veg. offered	-1.54
	(1.02)
ITT control for second meat offered	2.80**
	(1.15)
ITT guest	-2.59
	(2.49)
ITT guest goes to 2nd control canteen	2.65
	(2.99)
Guests control	1,381
Guests treated	476
Observations	39,959

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Continuation of Table B.1. Regression coefficients for the event plot in Figure 8. Dependent variable: 0/1 indicator for consumption of the meat option, multiplied by 100 to enable the interpretation of coefficients as percentage points. Regression additionally includes the coefficients shown in the preceding table B.1 and weekly controls, day-of-the-week controls, and a set of binary controls to control for the meat and vegetarian main meal offered in the canteen assigned according to ITT classification. Standard errors are clustered at the guest level.

B.2 Additional analyses on labeling effects

The pre-registration to Experiment 2 can be found under Aspredicted #95108).

I pre-registered to examine:

(1) **The effect of the labels on meat consumption.** This analysis is shown in the main text, with robustness checks reported in Table B.3, B.4 and B.5. Appendix E.5 and E.6 further probe the robustness of results to alternative data-preparation methods. I focus on meat consumption as the main outcome variable, since it is entirely within guests' control whether they choose a meat or a vegetarian dish. In contrast, this is not the case for other outcome variables, such as choosing a yellow-labeled meal or a meal with less than 500 grams of CO_2e, which depend on whether such an option is actually available in the canteen on that day. These outcomes therefore partly reflect menu design rather than pure behavioral change. Results from these variables are thus less transferable to other canteens or to the same canteen under a different menu cycle (which changes every six weeks). During the sample period, the meat option always had higher or roughly identical emissions compared to the vegetarian option. Table B.3 gradually adds the controls shown in the main text. Table B.4, Col. (4) estimates a binomial generalized linear model with a log link to estimate multiplicative effects of the labels on the probability of choosing a meat meal, yielding estimates in line with the main text.

    In the main regressions, I use heteroskedasticity-robust standard errors for analyses using the full data set, and cluster at the individual level in the ITT specifications. The identifying assumption is that canteen assignment is independent of potential outcomes conditional on observed covariates. The ITT regressions in Col. 4 and 5 in Table 2 include individual fixed effects, which absorb all time-invariant guest heterogeneity such as dietary preferences, demographics, or psychological traits, making the identifying assumption plausible. To address serial correlation in residuals due to repeated observations of the same individuals over time, I cluster standard errors at the individual level.

    While one might wish to cluster at the level of the canteen as the level of treatment assignment, the experiment has only three canteens. With so few clusters, conventional cluster-robust inference becomes unreliable. For transparency, Table B.5 reports an additional specification using the full data set and clustering standard errors at the canteen level via a wild bootstrap procedure designed for few clusters. The estimated effect remains directionally consistent and is statistically significant at the 20 percent level. Although the reduced significance is unsurprising given the limited number of clusters, the results support that the main findings are not driven by the inference choice.

(2) **The effect of the labeling intervention on guests' likelihood of choosing a green-, yellow-, or red-labeled meal.** Results are reported in Table B.6 and suggest that consumption of green- and yellow-labeled vegetarian meals increases in response to the labels, while consumption of yellow-labeled meat meals and red-labeled meals (all meat) decreases. These results must be interpreted in light of the offering context: guests typically chose between a green-labeled vegetarian and a red-labeled meat meal (about 45% of days), a green-labeled vegetarian and a yellow-labeled meat meal (24%), a yellow-labeled vegetarian and a yellow-labeled meat meal (23%), or a yellow-labeled vegetarian and a red-labeled meat

meal (7%). Accordingly, the regressions in Table B.6 control for the label colors of the meals on offer on a given day.

(3) **The effect of the labeling intervention on greenhouse gas emissions.** Results are shown in Table B.4. Again, results must be seen within the canteens' offering context: the emissions of the two main meals on a given day vary substantially. Average emissions of the meat meal offered decreased between the baseline and labeling period (from 1.8 kg to 1.4 kg CO_2e), while average emissions of the vegetarian meal remained around 0.4 kg. Together with different baseline meat-consumption levels (51% in the control group and 41% in the treatment group), such variation can generate misleading results when a naïve difference-in-differences strategy is applied. For instance, if the labels had no behavioral effect and meat consumption remained constant, a simple DiD would estimate a decrease of 0.4 kg $\times$ 0.51 = 0.20 kg for the control group and 0.4 kg $\times$ 0.41 = 0.16 kg for the treatment group, suggesting a spurious 40-gram *increase* in emissions attributed to the labels despite no behavioral change. The estimation in Table B.4 therefore (i) controls for the emissions of the meals offered on each day, allowing their effects to differ between treatment and control canteens, and (ii) relies on a multiplicative model estimated via Poisson Pseudo-Maximum-Likelihood (PPML) as the main specification. Following Santos Silva and Tenreyro (2006), PPML provides consistent estimates in the presence of heteroskedasticity and directly models proportional rather than absolute changes, which is conceptually appropriate when the intervention is expected to affect emissions in relative terms. I estimate that emissions decreased by approximately 3% as a result of the labels, consistent with the main-text findings.

(4) **The effect of the labels on guest numbers.** Figure B.1 shows that sales developed similarly in the two canteens throughout the sample period. As an additional analysis, Table B.7 expands the ITT sample into a panel format by filling in zeros for days on which a given guest did not visit the canteen. I then repeat ITT analyses using a guest's decision to visit or not visit as the outcome variable. The coefficient during the labeling period is negative but insignificant, while the post-intervention coefficient is negative and significant. However, it is unlikely that the labeling intervention caused a decrease in canteen visits during the post period; this pattern more plausibly reflects end-of-semester differences in campus attendance, with treatment-canteen guests being less present during the final weeks. The main ITT analysis including individual fixed effects should not be affected by such variation in visiting frequency.

Table B.3. Meat as outcome variable, using all data. Shows gradual addition of controls.

	Meat choice (pp.)			
	Base	+ Meal controls	+ Sec. meal controls	+Week controls
Treatment × Label period	-0.02***	-0.02***	-0.02***	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
Treatment × Post period	-0.05***	-0.06***	-0.05***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)
Treatment	-0.10***	-0.07***	-0.06***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)
2nd control restaurant		0.07***	0.08***	0.07***
		(0.00)	(0.00)	(0.00)
Label period	0.01**			
	(0.00)			
Post period	-0.01			
	(0.00)			
Control for second veg. offered			-0.03***	-0.03***
			(0.01)	(0.01)
Control for second meat offered			0.04***	0.05***
			(0.01)	(0.01)
Constant	0.51***	0.44***	0.44***	0.64***
	(0.00)	(0.01)	(0.01)	(0.03)
Week fixed effects	No	No	No	Yes
Control for offer	No	Yes	Yes	Yes
Observations	124,830	124,830	124,830	124,830

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: All specifications are estimated as linear probability models (LPMs). The dependent variable is a binary indicator for choosing the meat meal; coefficients are reported as changes in the likelihood of choosing the meat meal, measured in percentage points. The table adds the controls introduced in the main Table 2 incrementally. Column (1) reports the baseline difference-in-differences specification. Column (2) adds binary controls for the specific main vegetarian and meat meal options on offer (*Control for offer*) on a given day in a given canteen. Column (3) additionally controls for whether a second vegetarian or meat option is available on that day. Column (4) further includes week fixed effects and day-of-the-week fixed effects for the treatment period.

Table B.4. GHGE as outcome, using all data

	Log GHGE (% change)		Log GHGE (kg change)	Meat choice (% change)
	PPML	Log	OLS	Bin. GLM
Treatment × Label period	-2.77*	-4.26***	-0.02	-4.73***
	(1.42)	(0.99)	(0.01)	(1.52)
Treatment × Post period	-5.14***	-3.12***	-0.04***	-11.87***
	(1.36)	(1.18)	(0.01)	(1.86)
Treatment	-15.29***	-12.05***	0.01	-19.20***
	(1.39)	(1.46)	(0.03)	(0.99)
Label period	1.48**	-0.24	0.00	1.83**
	(0.73)	(0.58)	(0.01)	(0.78)
Post period	2.83***	-2.45***	-0.03***	-1.45
	(0.77)	(0.69)	(0.01)	(0.95)
Emissions veg. meal offered	35.57***	131.90***	0.47***	
	(1.40)	(2.52)	(0.01)	
Emissions meat meal offered	28.39***	19.64***	0.52***	
	(0.30)	(0.48)	(0.01)	
Treatment × Emissions veg. meal offered	22.45***	18.67***	0.07***	
	(2.32)	(2.26)	(0.02)	
Treatment × Emissions meat meal offered	-1.22***	-3.42***	-0.10***	
	(0.43)	(0.65)	(0.02)	
Constant	-46.73***	-62.72***	-0.01	-49.28***
	(0.46)	(0.36)	(0.02)	(0.31)
Observations	124,830	124,830	124,830	124,830

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Specifications analyze the effect of carbon labels on greenhouse gas emissions (GHGE). Columns (1),(2) and (6) estimate multiplicative models in which coefficients are expressed as percentage changes, obtained as $100(\exp(\beta) - 1)$. Column (1) reports Poisson Pseudo Maximum Likelihood (PPML) estimates, the preferred specification. Column (2) instead uses the logarithm of GHGE as the depende is inconsistent under heteroskedasticity (Santos Silva and Tenreyro, 2006), these results should be interpreted with caution. Column (3) assumes an additive model with GHGE in kilograms as the outcome, providing absolute rather than proportional effects. Specifications (1)-(3) control for the emissions content of the vegetarian and meat dishes on offer and their interactions with treatment, ensuring that identified effects reflect behavioral rather than mechanical menu-driven changes. Column (4) uses a binomial generalized linear model with a log link to estimate multiplicative effects of the labels on the probability of choosing a meat meal. Coefficients can be interpreted as percentage changes in the likelihood of meat choice, comparable to the approximately 5% effect reported in the main text.

Table B.5. Meat as outcome variable, using all data. Shows alternative econometric models.

	Meat choice
	Clustered SE P-values in brackets
Treatment × Label period	-0.022
	(0.136)
Treatment × Post period	-0.047
	(0.148)
Treatment	-0.097
	(0.115)
Label period	0.009
	(0.280)
Post period	-0.007
	(0.217)
Constant	0.507
	(0.109)
Observations	124,830

Notes: **Values in brackets are wild-bootstrap p-values**. Specification follows the basic regression in Table 2, Col. (1), but standard errors are clustered at the canteen level using a wild bootstrap procedure with Webb weights. This specification is reported for transparency; however, inference should be interpreted with caution because there are only three clusters, and cluster-robust methods are known to be unreliable with very few clusters.

Table B.6. Choice of green, yellow, or red-labeled meal, using all data

	Choice of meal with label color			
	Green	Yellow Meat	Yellow Veg.	Red
Treatment × Label period	0.01	-0.01**	0.02***	-0.01***
	(0.01)	(0.00)	(0.00)	(0.01)
Treatment × Post period	0.05***	-0.03***	0.00	-0.02***
	(0.01)	(0.01)	(0.00)	(0.01)
Treatment	0.07***	-0.05***	0.02***	-0.05***
	(0.00)	(0.00)	(0.00)	(0.00)
Label period	-0.01***	0.00	-0.00*	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)
Post period	0.00	0.01***	0.00	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)
Green meal on offer	0.50***	-0.05***	-0.46***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)
Yellow meal on offer	-0.00	-0.05***	0.10***	-0.04***
	(0.00)	(0.00)	(0.01)	(0.01)
Red meal on offer	-0.00**	0.00	0.11***	0.40***
	(0.00)	(.)	(0.01)	(0.01)
Constant	0.01	0.07***	0.36***	0.07***
	(0.00)	(0.00)	(0.01)	(0.01)
Observations	124,830	124,830	124,830	124,830

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable: 0/1 indicator for whether a guest chooses a meal with the respective label color. Column (1) corresponds to consumption of a green-labeled option, Column (2) to a yellow-labeled meat option, Column (3) to a yellow-labeled vegetarian option, and Column (4) to a red-labeled option. Green-labeled options are always vegetarian, and red-labeled options always contain meat. All specifications are estimated as linear probability models and include controls indicating whether a green-, yellow-, or red-labeled meal is one of the main dishes on offer that day.

Table B.7. Decision to visit one of the student canteens as outcome variable

	Likelihood of visiting canteen (and consuming...)		
	Visit	Visit+Meat	Vist+Veg
Treatment × Label period	-0.01	-0.02**	0.01
	(0.01)	(0.01)	(0.01)
Treatment × Post period	-0.04***	-0.05***	0.00
	(0.01)	(0.01)	(0.01)
Label period	-0.12***	-0.05***	-0.07***
	(0.01)	(0.00)	(0.00)
Post period	-0.11***	-0.04***	-0.06***
	(0.01)	(0.01)	(0.01)
Constant	0.45***	0.22***	0.23***
	(0.00)	(0.00)	(0.00)
Week fixed effects	No	No	No
Guest fixed effects	Yes	Yes	Yes
Guests control	1,352	1,352	1,352
Guests treated	461	461	461
Observations	114,372	114,372	114,372

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: All specifications are estimated as linear probability models (LPMs) using the extended ITT panel dataset, which includes zero entries for day–guest combinations in which a guest did not visit the canteen. The dependent variable differs by column: Column (1) is a 0/1 indicator for whether the guest visited the canteen; Column (2) is a 0/1 indicator for whether the guest visited and consumed a meat meal; and Column (3) is a 0/1 indicator for whether the guest visited and consumed a vegetarian meal.

Table B.8. ITT analysis excluding observations deviating from a guest's ITT classification

	Meat choice (pp.)		
	ITT	ITT w. FE	ITT w. FE and DE
Treatment × Label period	-0.03***	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)
Treatment × Post period	-0.05***	-0.04***	-0.04***
	(0.01)	(0.01)	(0.01)
Treatment	-0.02		
	(0.02)		
2nd control restaurant	0.03		
	(0.03)		
Sec. veg. offered	-0.01	-0.01	-0.02*
	(0.01)	(0.01)	(0.01)
Sec. meat offered	0.04***	0.04***	0.03***
	(0.01)	(0.01)	(0.01)
Constant	0.62***	0.64***	0.46***
	(0.04)	(0.04)	(0.01)
Week fixed effects	Yes	Yes	Yes
Control for offer	Yes	Yes	Yes
Guest fixed effects	No	No	Yes
Guests control	1,352	1,352	1,352
Guests treated	461	461	461
Observations	34,983	34,983	34,983

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: All specifications are estimated as linear probability models (LPMs). The outcome is the likelihood of meat consumption. This table reports the individual-level (ITT) specifications corresponding to Columns 3–5 of Table 2, re-estimated on a restricted sample that excludes all guest–canteen combinations differing from each guest's ITT classification (i.e., observations of a guest dining in a canteen that is not the canteen they most frequently visited during the pre-intervention period). Standard errors are clustered at the guest level. All specifications include binary controls for the specific main vegetarian and meat meal options on offer (*Control for offer*) and controls for whether a second vegetarian or meat option is available. Columns (1) and (2) include week fixed effects and day-of-the-week fixed effects, while Column (3) replaces these with more granular date fixed effects.

B.3 Field survey results

Below I describe the results of surveys conducted in the control and treatment canteens pre- and post-intervention, as described in section E.8.

Did treatment canteen guests see the labels? Of the post-intervention survey respondents, 499 went to the treated student canteen at least once during the intervention period. 57% of these report having seen the labels.

Did control canteen guests see the labels? 425 of the post-intervention survey respondents went to the control but not the treatment canteen during the intervention period, according to their individual student canteen cards. However, they might have in fact still gone, but not paid with their individual cards. Of these respondents, 8% report having seen the labels.

Do canteen guests feel they reacted to the labels? Of the post-survey respondents who noticed the labels and visited the treated student canteen at least once during the intervention period (285 participants), 24% report not having incorporated the labels in their decisions, 32% report having incorporated them a bit, 25% moderately, 15% relatively strongly, and 4% strongly.

How do canteen guests make their consumption choices? 34% of guests report making their choice mainly using the information given on the canteen website. 31% mainly use the digital billboards. 34% report mainly deciding by looking at the food counters. Figure 7 in the main text shows how the carbon labels were shown in each of these decision contexts.

B.4 Additional analyses on estimation of price effects

This section shows additional checks to section 3.2 assessing the effect of a carbon tax in the natural field setting. In the main specification, I include controls for the specific meat meal offered, group-level controls for vegetarian meals, time controls, and controls for the labeling period. The identifying variation therefore comes from two sources:

- A given meat meal can be paired with different vegetarian meals within the same category. I assume that vegetarian meals in a category (fried/breaded, oven-baked, or curry/ stir-fry) are similarly attractive.
- Prices for vegetarian and meat meals increased in October 2022, also affecting the resulting price difference between vegetarian and meat meals. The price increase was not a uniform amount added to all meals. While the price of the meat meal on average increased by €0.50, this increased varied between €0.45 and €0.65 for specific meat meals. For vegetarian meals, the increase was €0.35 on average, and varied between €0.10 and €0.80 for specific meals. These price changes add further variation to the above point.

The student canteen in Bonn is a non-profit organization aimed at serving the students. Prices are thus fixed to reflect the cost of the ingredients plus a part of the canteens' fixed costs (Studierendenwerk Bonn, 2025). Due to their non-profit nature, the canteen would not pair a meat and a vegetarian option in a strategic way to maximize profits. However, a higher price for a meat meal could reflect more attractive ingredients, and these ingredients might also make the meal more popular. I thus include meat meal specific controls in the main analysis. Similarly, the price increase occurred in a time of generally increasing price levels, and it is thus sensible to include time controls in the main analysis.

To provide more intuition on the variation in the data and test robustness, I provide the following additional analyses:

- Table B.9 estimates the specifications from Table 3 with different control sets. Col. (1) and (2) show estimations without any controls. Col. (3) and (4) add time controls (week effects and day-of-the-week effects), as well as controls for treatment canteen and respective interactions for the labeling and post-intervention period. Col. (5) and (6) additionally control for the type of vegetarian meal on offer and the specific meat meal offered (i.e. the full set of controls from the main specification). Adding controls yields more pronounced effects, suggesting that price differences correlate with other characteristics (time trends, meat meals on offer) which dampen the estimated price effects in the analysis without controls.
- Table B.10 shows different variants of the main specification, including only data from before the price change (Col. 1), exchanging the meat-meal-specific controls for more crude controls solely for the type of meat meal (Col. 2), testing whether price effects significantly differ in the treatment canteen (Col. 3), and testing whether effects differ by the price of the vegetarian meal on offer, to check whether the change in the general price level after the price increase affects estimates (Col. 4). I find no statistically significant

evidence of effects differing on days when a relatively cheap (price lower than €1.80, around 60% of observation days) vegetarian meal is offered, or of pricing effects differing for the treatment canteen.

To ease comparison of the observed price effects with previous and concurrent literature, I calculate price elasticities (Table B.11). Note that my analysis of price effects differs from conventional price elasticity estimation in two main ways:

- First, the variation in meat price I analyze is variation in the *price difference between the meat option and the vegetarian option*. Focusing on this relative price, rather than fluctuations in the absolute meat price, allows me to capture more directly the behavioral margin most relevant for a potential carbon tax. If the student canteen were to implement such a tax, the most straightforward way to do so would be to increase the price difference between meat and vegetarian dishes, rather than the overall price level.[2]
- Second, the resulting demand fluctuations I observe are changes in demand for the meat option *relative* to the vegetarian option. This outcome is directly analogous to my main outcome variable in the carbon-label analysis, facilitating a clean comparison between the effects of the labels and of a hypothetical tax.

These analysis choices make the comparison between carbon labels and a carbon tax more meaningful but may complicate direct comparison with elasticity estimates from the wider literature. Moreover, my elasticity estimates are based on the price of the meat meal component, but the ingredients for this component are rarely 100% meat. Filets, steaks, etc. are often filled with vegetables or cheese, sometimes breaded on the outside, and often served with sauce or garnish. My main pricing analysis takes this circumstance into account, since the carbon-tax simulations are based on the emissions difference between the average emissions of the canteens' meat (type) meals and its vegetarian meals, which already incorporates average meal composition and thus maps the tax into per-meal price changes on the correct margin. However, this circumstance additionally complicates comparison with elasticities measured in a supermarket context and should be kept in mind in the following comparisons. I first compare my estimates to those reported by Roosen, Staudigel, and Rahbauer (2022), who use German household scanner data to estimate meat price elasticities. Their population is thus comparable to my canteen guest population. Roosen, Staudigel, and Rahbauer (2022) estimate uncompensated price elasticities of –0.861 (poultry), –0.966 (pork), and –0.960 (beef), and compensated elasticities of –0.771, –0.791, and –0.878, respectively. For low-income households, arguably the most comparable group to my student sample, they estimate smaller elasticities of –0.591, –0.654, and –0.438. These are close to the elasticities I estimate in the student-canteen data (–0.342, –0.918, and –0.435). While demand for pork is also most price-elastic in Roosen, Staudigel, and Rahbauer (2022), the difference is much starker in my results. One possible explanation is that Roosen, Staudigel, and Rahbauer (2022) rely on self-reported household scanner data, whereas my data are based on actual canteen transactions.

Consistent with this, Liu and Ansink (2024), who use non-self-reported supermarket scanner data from the Netherlands, find a similarly pronounced difference between pork and other meat types, estimating elasticities of –0.976, –2.090, and –0.594 for poultry, pork, and beef, respectively. Unlike Liu and Ansink (2024),

2. The introduction of a linear carbon tax need not imply a general increase in the price level, since the canteen could simultaneously decrease the price of the vegetarian meal.

I estimate an elasticity of zero for fish (–0.891 in their study), likely reflecting the specific context of my data: fish is almost exclusively served on Fridays and is more popular than other meats.[3] Eating fish on Fridays may be habitual or culturally motivated,[4] making it less responsive to short-term price changes.

3. On days when fish is served, it is chosen by 50% of guests, while meat is consumed by 45% on average.
4. In many Christian traditions, fish is eaten on Fridays.

Table B.9. Comparison of effects: labels vs. "carbon tax" without control variables

	Likelihood of consuming meat					
	(1)	(2)	(3)	(4)	(5)	(6)
	All	By type	All meat	By type	All	By type
Price difference (in €)	-0.01**		-0.07***		-0.09***	
	(0.00)		(0.00)		(0.01)	
Price difference (in €) x Chicken		0.01		-0.03***		-0.08***
		(0.01)		(0.01)		(0.02)
Price difference (in €) x Pork		-0.07***		-0.18***		-0.20***
		(0.00)		(0.01)		(0.02)
Price difference (in €) x Beef		-0.03**		-0.10***		-0.09**
		(0.01)		(0.02)		(0.04)
Price difference (in €) x Fish		0.09***		0.05***		0.02
		(0.01)		(0.01)		(0.02)
Chicken meal		0.01		0.01		-0.05***
		(0.00)		(0.01)		(0.01)
Pork meal		-0.01**		0.04***		0.10***
		(0.00)		(0.01)		(0.02)
Beef meal		-0.03***		0.00		0.13***
		(0.01)		(0.01)		(0.02)
Constant	0.46***	0.46***	0.51***	0.51***	0.53***	0.50***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.03)	(0.03)
Weekly time controls	No	No	Yes	Yes	Yes	Yes
Control for exact meat meal	No	No	No	No	Yes	Yes
Control for veg. meal type	No	No	No	No	Yes	Yes
Observations	362,686	362,686	362,686	362,686	362,686	362,686

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable: 0/1 indicator for consumption of the meat option. Linear probability regression drawing on student canteen data from April 2022–March 2023. The variable "Price difference" describes the price difference between the main meat and the main vegetarian meal component on offer. Columns (3) and (4) additionally include a set of binary variables to control for the week and day-of-the-week. Col. (5) and (6) include the full set of controls from Table 3. Col. (2, (4) and (6) do not include a "Price difference" variable because I include an interaction with all four meat types which are mutually exclusive and collectively exhaustive. The baseline category in Col. (2), (4) and (6) is whether a "Fish meal" was offered in the canteen and on the day the purchase was made. Col. (2)-(6) additionally include controls for the treatment canteen, treatment x label period and treatment x post-intervention period. Standard errors are robust.

Table B.10. Comparison of effects: labels vs. "carbon tax" robustness checks

	Likelihood of consuming meat			
	(1)	(2)	(3)	(4)
	Only before change	General controls	By treatment canteen	By veg. meal price
Price difference (in €)	-0.09***	-0.06***	-0.09***	-0.08***
	(0.03)	(0.01)	(0.01)	(0.01)
Price difference (in €) x Cheap veg. meal				0.00
				(0.02)
Cheap veg. meal				-0.01
				(0.02)
Price difference (in €) x Treatment canteen			0.01	
			(0.01)	
Treatment × Label period	-0.05***	-0.03***	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)
Treatment × Post period	-0.08***	-0.06***	-0.06***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)
Treatment	-0.01***	-0.03***	-0.03***	-0.03***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.52***	0.61***	0.53***	0.54***
	(0.03)	(0.02)	(0.03)	(0.03)
Weekly time controls	Yes	Yes	Yes	Yes
Control for exact meat meal	Yes	No	Yes	Yes
Control for veg. meal type	Yes	Yes	Yes	Yes
Observations	166,144	362,686	362,686	362,686

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable: 0/1 indicator for consumption of the meat option. Linear probability regression drawing on student canteen data from April 2022–March 2023. The variable "Price difference" describes the price difference between the main meat and the main vegetarian meal component on offer. Column (1) shows the specification shown in the main text, but restricts the sample to the period before the price change (i.e., data from April 2022 to September 2022). Column (2) replaces the meal-specific controls for the meat meal on offer on a given day with general categories (chicken on offer, pork on offer, beef on offer, fish on offer). Column (3) includes an interaction variable for whether the purchase is made at the treatment canteen (Price difference x Treatment canteen). Col. (4) includes an interaction variable to test whether effects significantly differ depending on the general price level. This is proxied with an indicator variable for whether the vegetarian meal on offer was relatively cheap (price lower than €1.80, which is the case for around 60% of observation days). Standard errors are robust.

Table B.11. Estimated elasticities

	(1) All meat	(2) By type
E_all	-0.445***	
	(0.055)	
E_chicken		-0.342***
		(0.070)
E_pork		-0.918***
		(0.083)
E_beef		-0.435**
		(0.191)
E_fish		0.078
		(0.073)
Observations	362686	362686

Notes: Elasticities estimated based on the coefficients reported in Table 3, average baseline likelihood of choosing the respective meat type, and average baseline price of the respective meat type.

Table B.12. Back-of-the-envelope effect of a €0.12 per kg carbon tax differentiating by type

Type	Price change Δp_k (€)	β_k (per €)	Implied Δd_k (pp)	Offer share (%)	Contribution (pp)
Chicken	0.084	−0.076 589	−0.643	30.7	−0.198
Pork	0.132	−0.200 870	−2.651	37.1	−0.984
Beef	0.384	−0.089 309	−3.429	13.1	−0.449
Fish	0.036	0	0	19.1	0
				Total (weighted across types)	**-1.630**

Notes: Price change Δp_k equals the tax rate (€0.12/kg) times the CO_2e gap between an average meal of type *k* and an average vegetarian meal (0.4 kg emissions). The resulting emission differences are: chicken: 0.7 kg; pork: 1.1 kg; beef: 3.2 kg; fish: 0.3 kg. The β_k are the estimated price coefficients from Table 3, Col. (2). Predicted demand changes are $\Delta d_k = 100 \cdot \beta_k \cdot \Delta p_k$ (percentage points). The total is a weighted average using the share of days each meat type is offered (Col. "offer share"). Emission differences and offer shares are calculated based on the period of the main analysis (weeks 1–13, excl. week 5) to ensure comparability with the label results.

Appendix C Applicability to other contexts

C.1 Heterogeneity estimates

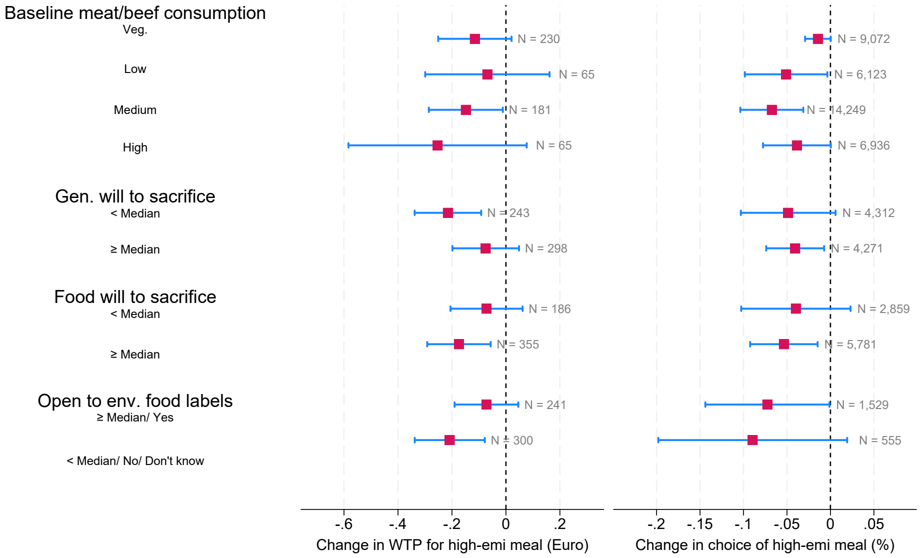


Figure C.1. Heterogeneity estimates across studies

Notes: Figure shows heterogeneity in treatment effects across studies. In this table, I show categories similar to Ho and Page (2023) for easier comparability. Left panel shows treatment effects in Exp. 1 (measured as the labels' effect on WTP for the less eco-friendly option, i.e. a stronger decrease implies a larger treatment effect). The left panel follows Spec. 1 from Table 1, but groups treatment effects for low-emission and high-emission meals. The right panel shows treatment effects in Exp. 2 (measured as the labels' effect on choosing the eco-friendly, i.e. the vegetarian option) and follows Spec. (4) in Table 2. For the right-panel heterogeneity estimates in Exp. 2 along the dimensions of general will to sacrifice, food-specific will to sacrifice for the environment and openness to env. food labels; I use the overlap between the ITT sample and the survey sample. I only collected openness to env. food labels post-intervention and only for treated guests, so the number of observations is lower for this dimension. In both panels, treatment effects are calculated as shifts towards the less carbon-friendly (i.e. in Exp. 2, the meat) option. In Exp. 1, Baseline beef consumption is measured as baseline WTP for the beef meal. General willingness to sacrifice for the environment in Exp. 1 is measured as mean agreement to the statements (with the second weighed negatively): Keeping my greenhouse-gas emissions as low as possible is something... I am willing to do even if it involves higher costs and effort.... I am only willing to do if others do it as well.... that aligns with my principles.... I feel personally responsible for.", all of which are measured on a 10-point scale. Food-specific will to sacrifice is measured as self-reported importance of environmental aspects in food choice, pre-intervention, measured on a 10-point scale. Openness to env. food labels is measured as approval to carbon labels being installed in the canteens, measured on a 10-point scale. In Exp. 2, I measure baseline meat consumption as percentage of pre-intervention meals that contain meat. General will to sacrifice for the environment in Exp. 2 is measured as the mean of pre-intervention agreement to the statement "Flying should be made more expensive since it is bad for the environment" and "It should be forbidden to build new houses that do not adhere to current environmental standards." (survey respondents only, each measured on a 7-point scale). Food-specific will to sacrifice is measured as self-reported importance of environmental aspects in food choice, pre-intervention (survey respondents only, measured on a 7-point scale). Openness to env. food labels is measured as approval to the labels being installed permanently post-intervention (survey respondents in treatment canteen only, measured as Yes/No/Don't Know). *N* in both panels relates to the number of observed food choices, see the tables in the section below for participant/ guest numbers.

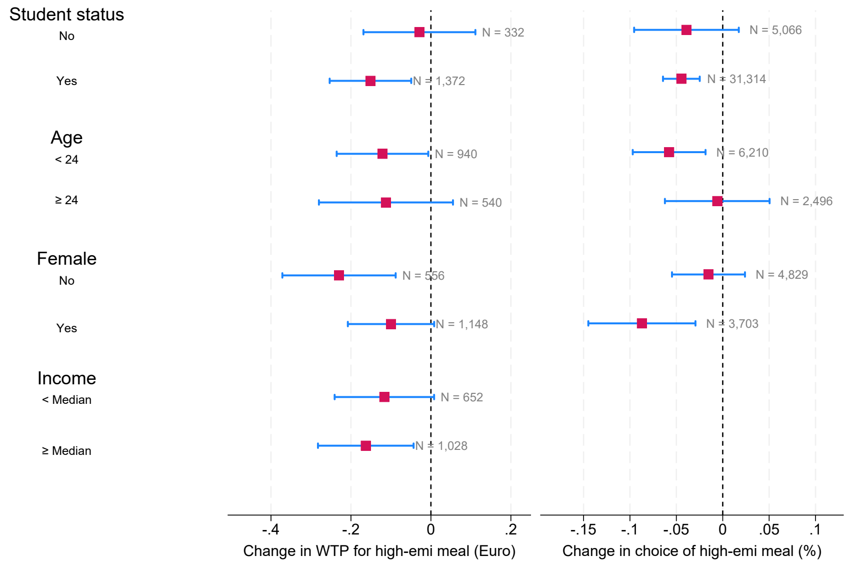


Figure C.2. Heterogeneity along demographic categories

Notes: Figure shows heterogeneity in treatment effects across demographic categories. Left panel shows treatment effects in Exp. 1 (measured as the labels' effect on WTP for the less eco-friendly option, i.e. a more negative coefficient indicates a larger treatment effect). The left panel follows Spec. 1 from Table 1, but groups treatment effects for low-emission and high-emission meals. The right panel shows treatment effects in Exp. 2 (measured as the labels' effect on choosing the eco-friendly, i.e. the vegetarian option). I use the overlap between the ITT sample and the survey sample. The right panel follows Spec. (4) in Table 2, measuring increased consumption of the eco-friendly, vegetarian option. Student status in Exp. (1) is self-reported, while it is registered in the canteen purchasing data in Exp. 2. Age and gender are self-reported (survey respondents only in Exp. 2). I chose a threshold of 24 since I only elicited age in crude categories in Exp. 2 (under 20, 20-23, 24-27, 28-31, 32 and older), and over half of survey respondents fell into the first two categories. I only elicit income in Exp. 2, asking for monthly net income in categories. *N* in both panels relates to the number of observed food choices.

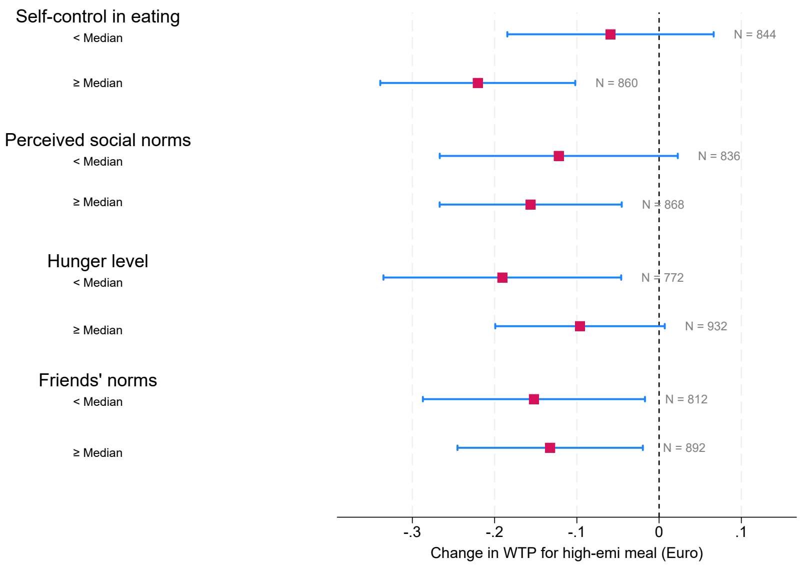


Figure C.3. Heterogeneity along psych. categories

Notes: Figure shows heterogeneity in treatment effects across psychological traits. Panel shows treatment effects in Exp. 1 (measured as the labels' effect on WTP for the more eco-friendly option). The left panel follows Spec. 1 from Table 1, but groups treatment effects for low-emission and high-emission meals. Panel only shows effects from Exp. 1 since no similar measures were elicited in Exp. 2. As a measure of self-control in eating behavior, I use a battery of 9 questions developed by Haws, Davis, and Dholakia (2016). To measure the strength of perceived social norms, I use a procedure similar to Krupka and Weber (2013). Hunger is self-reported on a 10-point scale at the beginning of the experiment. Friends' norms are elicited using the mean of agreement to these three questions: "Most people who are important to me … … think I should try to keep my greenhouse-gas emissions as low as possible. … will approve if I try to keep my greenhouse-gas emissions as low as possible. … try to keep their greenhouse-gas emissions as low as possible." *N* relates to the number of observed food choices.

C.2 Relation between environmental attitudes and baseline meat consumption

Table C.1. Exp. 1 Average baseline beef consumption by trait (only non-veg.)

Trait	Split	N	Mean	Std. Dev.
Gen. will to sacrifice	< Median	99	0.672	1.052
	≥ Median	116	0.556	1.061
Food will to sacrifice	< Median	73	0.879	0.934
	≥ Median	142	0.471	1.090
Open to env. food labels	< Median	91	0.638	1.113
	≥ Median	124	0.588	1.016

Notes: Table shows average baseline WTP for beef meals among Exp. 1 participants, split across different characteristics. Table excludes participants who report never consuming meat. In Exp. 1, Baseline beef consumption is measured as baseline WTP for the beef meal. General willingness to sacrifice for the environment in Exp. 1 is measured as mean agreement to the statements (with the second weighed negatively): Keeping my greenhouse-gas emissions as low as possible is something… I am willing to do even if it involves higher costs and effort.… I am only willing to do if others do it as well.… that aligns with my principles.… I feel personally responsible for.", all of which are measured on a 10-point scale. Food-specific will to sacrifice is measured as self-reported importance of environmental aspects in food choice, pre-intervention, measured on a 10-point scale. Openness to env. food labels is measured as approval to carbon labels being installed in the canteens, measured on a 10-point scale. *N* relates to the number of participants.

Table C.2. Exp. 2 average baseline meat consumption by trait (only non-veg.)

Trait	Split	N	Mean	Std. Dev.
Gen. will to sacrifice	< Median	133	62.832	28.380
	≥ Median	177	53.908	28.841
Food will to sacrifice	< Median	131	66.930	29.247
	≥ Median	181	50.946	26.743
Open to env. food labels	No/Don't know	22	65.708	28.845
	Yes	52	52.531	28.017

Notes: Table shows average pre-intervention meat consumption (percentage of visits in which meat is consumed) among Exp. 2 student canteen guests who responded to the baseline survey and visited the student canteens at least 5 times in the pre-intervention period, split across different characteristics. Table excludes participants who never consume meat in the canteens. In Exp. 2, I measure baseline meat consumption as percentage of pre-intervention meals that contain meat. General will to sacrifice for the environment in Exp. 2 is measured as the mean of agreement to the statement "Flying should be made more expensive since it is bad for the environment" and "It should be forbidden to build new houses that do not adhere to current environmental standards." (survey respondents only, each measured on a 7-point scale). Food-specific will to sacrifice is measured as self-reported importance of environmental aspects in food choice, pre-intervention (survey respondents only, measured on a 7-point scale). Openness to env. food labels is measured as post-intervention approval to the labels being installed permanently (survey respondents in treatment canteen only, measured as Yes/No/Don't Know). *N* relates to the number of survey participants/ canteen guests.

Appendix D Experiments 1 and 3: Details on the experimental set-up

D.1 Pre-registration

I pre-registered Experiment 3 on June 21st 2021 under #AEARCTR-0007858 and Experiment 1 on October 24th 2021 under #AEARCTR-0008435.

D.2 Meals used for elicitation

In the purchasing decisions in experiments 1 and 3, participants make decisions on the same four student canteen meals. These are all meals which are regularly offered in the student canteen. Participants who indicate that they are not vegetarian decide on two vegetarian and two meat meals: Filled courgettes with potato croquettes (1.4 kg of emissions, colored yellow in the labels), Italian vegetable ragout with pasta (0.5 kg of emissions, colored green in the labels), Chicken Schnitzel with rice (1.4 kg of emissions, colored yellow in the labels), and beef ragout with potatoes (3.4 kg of emissions, colored red in the labels). Participants who indicate they are vegetarian decide on four vegetarian meals: Filled courgettes with potato croquettes (1.4 kg of emissions, colored yellow in the labels), Italian vegetable ragout with pasta (0.5 kg of emissions, colored green in the labels), Cheese "Spätzle" with mushrooms (1.2 kg of emissions, colored yellow in the labels), and stir-fried vegetables with rice (0.4 kg of emissions, colored green in the labels). The cheese sandwich is the outside option to every choice and causes 0.7 kg of emissions and is colored green on the labels.

I randomized the order in which meals appear (both in the decision and the emission estimating screens) to avoid order effects. Further, I changed the left-right positioning of the warm meal vs. the cheese roll to right-left for half of the experiment sessions to avoid positioning effects.

D.3 Incentivization of elicitations

The elicitation of participants' **WTP for consuming the meals** is incentivized with an adapted BDM mechanism: There is a 50% probability that the specific meal and a 50% probability that the cheese sandwich is randomly drawn as the default meal. If the default meal and the preferred meal indicated in the first part of the decision (e.g. Figure 2) coincide, the participant is given the preferred meal at zero price. If the two do not coincide, a price is randomly drawn at which the two options can be exchanged. Each value between €0.00 and €3.00 can be drawn with equal probability, in five-cent steps. If the WTP indicated by the participant in the second part of the decision (e.g. Figure 3) is equal to or above the price drawn, the price is deducted from the participants' payment and participants are provided with the preferred option. If WTP is below the price drawn, participants are provided with the less preferred option, and no amount is deducted from participants' payments. The outcome lunch is provided to participants directly after the experiment, together with participants' payment in cash. The pay-out station is shown in Figure D.1. For this purpose, experiment participants are required to travel to the university campus immediately after completing the experiment. Less than 4% did not pick up their cash payment and meal. The incentivization structure was explained to participants and

Figure D.1. Gazebo set-up on University campus

they were required to pass an extensive comprehension check, which less than 4% of participants did not pass.

This **WTP for seeing labels elicitation** is incentivized with a similar BDM mechanism. There is a 50% probability that the default option is that choices are displayed with, and a 50% probability that the default option is that choices are displayed without labels. If the default display option and the preferred display option coincide, the preferred display option is implemented at zero price. If the two do not coincide, a price is randomly drawn at which the display option can be changed. Each value between €0.00 and €3.00 can be drawn with equal probability, in five-cent steps. If the WTP indicated by the participant in the second part of the decision (similar to Figure 3, with display options instead of meals) is equal to or higher than the price drawn, the preferred display option is implemented. The price drawn is only deducted from participants' payment if one of the final three meals is relevant for pay-out. If the WTP is lower than the price drawn, the less-preferred display option is implemented.

D.4 Decisions under carbon offsetting

In the Attention+Offset condition in Experiment 3 and the Offset condition in Experiment 1, participants are informed that, if one of the decisions made in this treatment is implemented, the emissions of the meal provided to them (regardless of whether it is the warm meal or the cheese sandwich) are offset by the experimenter with a donation to Atmosfair. The example screens in Subsection D.5 show how this is communicated to experiment participants.

Towards the end of the experiment, after participants have completed all meal decisions, I elicit participants' attitudes towards the effectiveness of carbon offsetting and ask for participants' prior experiences with carbon offsetting. Tables D.1 and D.2 show descriptives pooled across Experiments 1 and 3. Table D.1 shows that 75% of participants had heard of carbon offsetting previously, while 34% have used carbon offsetting themselves.

Table D.2 shows that participants broadly agree with carbon offsetting being effective (Measured as agreement to the statement "Voluntary carbon offsetting is an effective climate protection measure"). They disagree with them replacing other climate protection measures (Measured as agreement to the statement "If

I offset emissions for a carbon-intensive activity such as a flight, it is okay to book another flight.”). They agree with carbon offsetting not replacing other climate protection activities (Measured as agreement to the statement “Carbon offsetting cannot replace personal efforts to protect the climate.”). Interestingly, having experienced the ATTENTION+OFFSET or the OFFSET condition earlier in the experiment increases support for the second and decreases support for the third statement. Perhaps this is due to the information on carbon offsetting provided to them during the experiment (see section D.5). Carbon offsetting in the experiment occurs through the NGO Atmosfair which does not engage in the often-criticized practice of rewarding credits for planting or protecting forests. Instead, Atmosfair supports the development and deployment of renewable energy in developing countries. See the explanations in the experiment screenshots (section D.5) and https://www.atmosfair.de/en/ for details.

These descriptive statistics convey that carbon offsetting likely removes a part of environmental guilt, but may not be removing it entirely. Accordingly, section A.15.6 re-estimates the structural estimation and simulation assuming that only 70% of environmental guilt is removed.

Table D.1. Familiarity with carbon offsetting

	Familiarity with offsetting	
	(1)	(2)
	Heard of	Have used
In offset condition earlier in exp.	-0.04	-0.01
	(0.03)	(0.04)
Constant	0.75***	0.34***
	(0.03)	(0.03)
Observations	731	731

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Table shows participant responses to the binary question whether they have heard of carbon offsetting before, and whether they have used it.

Table D.2. Beliefs on carbon offsetting effectiveness

	Familiarity with offsetting		
	(1)	(2)	(3)
	Effective	Can replace	Cannot replace
In offset condition earlier in exp.	0.15	0.44***	-0.50***
	(0.18)	(0.15)	(0.17)
Constant	5.55***	2.86***	8.14***
	(0.14)	(0.12)	(0.12)
Observations	731	731	731

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Table shows participant responses to survey questions on the effectiveness of carbon offsetting. See text above for wording. Responses are recorded on a 10-point scale.

D.5 Experiment screens (English translation from German)

Survey start screen

Welcome to the BonnEconLab online study. Please note that you may only take part in this study once. Furthermore, you may only take part if you have registered for the study in our participation database. Please complete this survey on your computer. Participation with mobile devices such as smartphones or tablets is not possible. The payout for this experiment will be done using your personal participant code: 12pI2q5vh Please write down your code! You will need approximately 45 minutes to process this survey. After fully completing the survey, you can collect your payout at our location at the Hofgartenwiese (see map below) until 2 p.m. today. You will not be able to receive your payout at any other time! In this experiment, your payout consists of several components:

- You receive exactly one dish (your lunch).
- You receive an expense compensation of €9.00 in cash.
- You may receive an additional payout of up to €1.60 in addition to the expense compensation. This depends on your answers in the marked part of the study.
- In addition, chance determines whether, depending on your answers in another (also clearly marked) part of the study, you will receive another additional payout of up to €1.10.

Payment will be made in the BonnEconLab pavilion on the Hofgartenwiese (Regina-Pacis-Weg). You will find us at the place marked with a blue arrow under a fabric gazebo.

Decision description screen - Screenshot 1/4

Description of upcoming decisions | Comprehension questions

The second part of the study is about to begin. Your decisions in this part of the study will affect your expense compensation and the dish you receive.

On this page you will find explanations and examples. On the following page we will check your understanding of these explanations. By clicking on the tab above you can switch between the two pages.

Once the comprehension questions have been answered correctly, you can proceed with further work on the survey.

How do your decisions affect your payout?

- In this experiment, your payout consists of three components:
  - You receive exactly one dish (your lunch).
  - You receive an expense compensation. At the moment, the expense compensation is €9.00. You will make a total of 15 decisions over the course of this study. For each of these decisions, you have the option of waiving part of the expense compensation (maximum €3.00). For that, you will receive a court you prefer.
  - In two other parts of the study, you may receive an additional amount of up to €1.60 in addition to the expense compensation, depending on your answers. In addition, depending on your answers in a third part of the study, chance will determine whether you will receive an additional amount of up to €1.10. The relevant parts of the study are clearly marked.
- For each of the 15 decisions, indicate which of the two courts you prefer. Then specify the maximum amount of your expense compensation you would like to forgo in order to receive the preferred court.

The decision that is implemented shall be subject to the following:

- Chance decides whether you will receive your favourite dish for free:
  - Case 1 (50% probability): You will receive your favourite dish for free.
  - Case 2 (50% probability): You will be assigned the non-preferred dish first. In this case, specify the maximum amount of your expense compensation you would like to forgo in order to receive your favourite dish instead.

- If case 2 occurs, it is again a matter of chance:
  - A **surcharge** is determined at random. Any value between €0 and €3 (in 5 cent increments) is equally probable.
  - If the amount you have declared is more than the surcharge, you will receive your preferred dish. For this, the surcharge will be deducted from your expense compensation.
  - If the amount you specify is less than the surcharge, you will receive the non-preferred dish free of charge.

For the other 14 decisions which are not being implemented, the following rules apply:

- These decisions have no effect on the dish you receive.
- These decisions have no effect on your compensation.

You will not know which of the 15 decisions will be implemented until the end of the study. It is therefore in your best interest to make every decision carefully.

Example decision

You can receive either a cheese roll or the 'Baked Feta Cheese with Rice' dish.

Which dish do you prefer? Click on one of the two buttons. Try it!

Baked Feta Cheese with Rice	oder	Cheese Roll
vegetarian		Details: vegetarian
[Baked Feta Cheese with Rice]		[Cheese Roll]

Decision description screen - Screenshot 2/4

Example scenario 1

Assuming you made the following decision:

Which dish do you prefer? Click on one of the two buttons.

Baked Feta Cheese with Rice

vegetarian

oder

Cheese Roll

Details: vegetarian

Baked Feta Cheese with Rice

Cheese Roll

If you are given the cheese roll: What is the maximum amount of your expense compensation you would be willing to give up in exchange for stir-fry sweet and sour with rice?

(Click on the grey bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You would like to give up a maximum of **€1.20** of your allowance to receive the dish **Baked Feta Cheese with Rice** instead of the cheese roll.

Here's what happens in this example (which you have no control over):

- You are first assigned your **less preferred dish**, the cheese roll.
- A **surcharge of €0.60** is randomly determined.

This means for you:

The surcharge with the amount of 0,60 € is lower than the maximum amount of 1,20 € you specified. You will receive the dish 'Baked feta cheese with rice'. For this, € 0.60 will be deducted from your expense compensation.

Example scenario 2

Assuming you made the following decision:

Which dish do you prefer? Click on one of the two buttons.

Baked Feta Cheese with Rice		Cheese Roll
vegetarian	oder	Details: vegetarian
Baked Feta Cheese with Rice		Cheese Roll

If you are given the cheese roll: What is the maximum amount of your expense compensation you would be willing to give up in exchange for stir-fry sweet and sour with rice?

(Click on the grey bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You would like to give up a maximum of **€1.20** of your allowance to receive the dish **Baked Feta Cheese with Rice** instead of the cheese roll.

Here's what happens in this example (which you have no control over):

- You are first assigned your **less preferred dish**, the cheese roll.
- A **surcharge of 2.00 €** is randomly determined.

This means for you:

The surcharge with the amount of 2.00 € is higher than the maximum amount of 1,20 € you specified. You will receive the cheese roll. Therefore, nothing will be deducted from your expense compensation.

Decision description screen - Screenshot 4/4

Example scenario 3

Assuming you made the following decision:

Which dish do you prefer? Click on one of the two buttons.

Baked Feta Cheese with Rice vegetarian	oder	Cheese Roll Details: vegetarian
Baked Feta Cheese with Rice		Cheese Roll

If you are given the cheese roll: What is the maximum amount of your expense compensation you would be willing to give up in exchange for stir-fry sweet and sour with rice?

(Click on the grey bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You would like to give up a maximum of **€1.20** of your allowance to receive the dish **Baked Feta Cheese with Rice** instead of the cheese roll. u

Here's what happens in this example (which you have no control over):

- You are assigned your **preferred dish**, 'Baked feta cheese with rice', for free.

This means for you:

You receive the dish 'Baked feta cheese with rice'. Nothing will be deducted from your expense compensation.

Continue to the questions

You can always return to this page while answering the questions.

Comprehension questions - Screenshot 1/3

Description of upcoming decisions | Comprehension questions

Comprehension questions

Please answer the following comprehension questions. If you want to look at the description of the survey again, you can switch back and forth between this page and the previous page by clicking on the tab at the top.

After correctly answering the comprehension questions, you can continue with the further processing of the survey.

Question 1

Assuming you made the following decision:

Which dish do you prefer? Click on one of the two buttons.

Baked Feta Cheese with Rice	oder	Cheese Roll
vegetarian		Details: vegetarian
Baked Feta Cheese with Rice		Cheese Roll

If you are given the cheese roll: What is the maximum amount of your expense compensation you would be willing to give up in exchange for stir-fry sweet and sour with rice?

(Click on the grey bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You would like to give up a maximum of **€1.30** of your allowance to receive the dish **Cheese Roll** instead of the Baked Feta Cheese with Rice.

Here's what happens in this example (which you have no control over):

- The decision was carried out.
- You are first assigned your **less preferred dish**, the Baked Feta Cheese with Rice.
- A **surcharge of 0.70 €** is randomly determined.

What do you receive?

- ○ The baked feta cheese with rice and your full expense compensation.
- ○ The baked feta cheese with rice and 0.70 euros will be deducted from your expense compensation.
- ○ The cheese roll and 0.70 euros will be deducted from your expense compensation.
- ○ The cheese roll and your full expense compensation.

Question 2

Assuming you made the following decision:

Which dish do you prefer? Click on one of the two buttons.

Baked Feta Cheese with Rice

vegetarian

oder

Cheese Roll

Details: vegetarian

Baked Feta Cheese with Rice

Cheese Roll

If you are given the cheese roll: What is the maximum amount of your expense compensation you would be willing to give up in exchange for stir-fry sweet and sour with rice?

(Click on the grey bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You would like to give up a maximum of **€1.30** of your allowance to receive the dish **Cheese Roll** instead of the Baked Feta Cheese with Rice.

Here's what happens in this example (which you have no control over):

- The decision was carried out.
- You are assigned your **preferred dish**, the cheese roll.

What do you receive?

- The baked feta cheese with rice and your full expense compensation.
- The baked feta cheese with rice and 0.70 euros will be deducted from your expense compensation.
- The cheese roll and 0.70 euros will be deducted from your expense compensation.
- The cheese roll and your full expense compensation.

Comprehension questions - Screenshot 3/3

Question 3

Assuming you made the following decision:

Which dish do you prefer? Click on one of the two buttons.

Baked Feta Cheese with Rice

vegetarian

or

Cheese Roll

Details: vegetarian

Baked Feta Cheese with Rice

Cheese Roll

If you are given the cheese roll: What is the maximum amount of your expense compensation you would be willing to give up in exchange for stir-fry sweet and sour with rice?

(Click on the grey bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You would like to give up a maximum of **€1.30** of your allowance to receive the dish **Cheese Roll** instead of the Baked Feta Cheese with Rice.

Here's what happens in this example (which you have no control over):

- The decision was carried out.
- You are first assigned your **less preferred dish**, the Baked Feta Cheese with Rice.
- A **surcharge of 2.70 €** is randomly determined.

What do you receive?

- The baked feta cheese with rice and your full expense compensation.
- The baked feta cheese with rice and 2.70 euros will be deducted from your expense compensation.
- The cheese roll and 2.70 euros will be deducted from your expense compensation.
- The cheese roll and your full expense compensation.

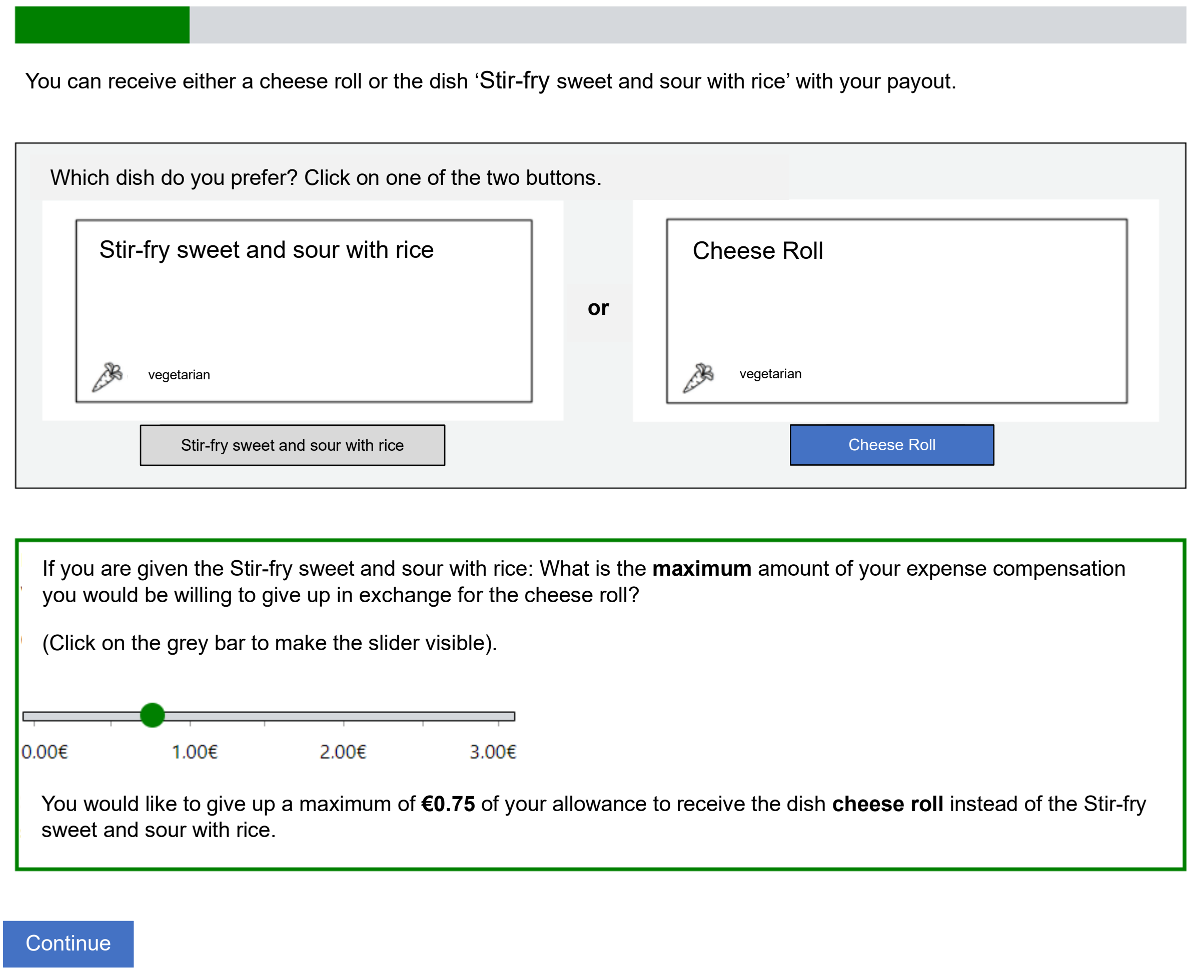
Question 4

How many of the 15 decisions actually have an impact on the dish you are handed and your expense compensation?

- All the 15 decisions have an impact.
- Five of the 15 decisions have an impact.
- One of the 15 decisions has an impact.
- None of the 15 decisions has an influence.

Back to the explanation | Continue with the rest of the survey

Example baseline decision



Introduction carbon footprint estimation

You will now guess for a total of eleven meals how high the CO2 emissions are which are caused by the respective meal.

- You have **60 seconds** to answer each question.
- For each question in which your guess does not deviate from the correct value by more than 30%, **0.10 Euro is added to your payout**.

During each guessing question you will be shown the emissions caused by the meal “Red Thai Curry with Pork and Rice” **as a reference value**.

Your reference value:

Red Thai-Curry with Pork and Rice

CO_2 Causes 1,7 kg CO_2
≈ 8,5 km Car drive

Pork

Which assumptions should be taken for the guessing questions?

For the following questions you will not be shown any ingredient lists or a description of the origin of the ingredients. This is because we only want to give you the information which you would normally find in a restaurant. We would like to know how you, based only on the name of the meal on the menu, guess the magnitude of the emissions caused by a meal.

Of course, the emissions of a seemingly identical meal can differ, e.g., depending on the exact ingredients and depending on whether the ingredients were produced in an ecologically sustainable or in a conventional manner. Please assume a conventional production and a conventional meal preparation – just like you would expect it, if you are offered such a meal without any further information in a restaurant.

Please take into account all emissions caused in the agricultural production and in food processing, packaging, conservation and transport of ingredients, up until an ingredient can be purchased in the store. You do not need to take into account emissions which are caused by the transport of ingredients from store to restaurant

Continue

Example carbon footprint estimation

Remaining time on this page. **0:54**

What do you estimate: How high are the greenhouse gas emissions (in CO2-equivalents), which are caused by the meal “Stuffed Zucchini with croquettes”?

Guess the emissions:	As a reference:
Stuffed Zucchini with croquettes	**Red Thai-Curry with Pork and Rice**
CO_2 Causes ? kg CO_2	CO_2 Causes 1,7 kg CO_2 ≈ 8,5 km Car drive
Vegetarian	Pork

I estimate that the meal “Stuffed Zucchini with croquettes” causes emissions of

kg.

Continue

Introduction decisions with labels

You will now make four more of the 15 decisions. One of the 15 decisions will be implemented.

You will be shown the greenhouse gas emissions (in CO2 equivalents) of both dishes for the upcoming decisions.

For those interested: More information on the calculation of greenhouse gas emissions:

<u>What assumptions are made in the calculation?</u>

In the calculation, the emissions attributable to a dish are calculated as the sum of the emissions generated in the production of the ingredients. The emissions of each ingredient are calculated "from farm to gate", i.e. all emissions are included that occur during agricultural production and during further processing, packaging, preservation and transport until the ingredient is available for purchase in shops. Not included are the transport from the shop to the restaurant or end consumer and the emissions that arise from any further refrigeration in the restaurant or at the end consumer, as well as the emissions that arise from cooking the dish.

When calculating the values, conventional (i.e. not specifically organically certified) agriculture is assumed. Otherwise, assumptions are made about production that reflect the production of the average product found on our supermarket shelves.

<u>What data is the calculation based on?</u>

The Eaternity database on which the calculations are based is currently the largest and most comprehensive database for calculating the climate-relevant emissions of meals and food products. It includes more than 550 ingredients and other parameters on organic and greenhouse production as well as production, processing, packaging and preservation. The eaternity database is maintained by scientists from the Zurich University of Applied Sciences (ZHAW), the University of Zurich (UZH), the Swiss Federal Institute of Technology Zurich (ETH Zurich), the Research Institute of Organic Agriculture (FiBL), Quantis and other institutions.

Source: eaternity.

Continue

Example decision with labels

You can either get a cheese roll or the dish 'stir-fry sweet and sour with rice' with your payout.

Which dish do you prefer? Click on one of the two buttons.

Stir-fry sweet and sour with rice	or	Cheese Roll
CO_2 Causes 0,4 kg CO_2 ≈ 2,0 km Car drive		CO_2 Causes 0,7 kg CO_2 ≈ 3,5 km Car drive
vegetarian		vegetarian
Stir-fry sweet and sour with rice		Cheese Roll

If you are given the cheese roll: What is the **maximum** amount of your expense compensation you would be willing to give up in exchange for stir-fry sweet and sour with rice?

(Click on the grey bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You would like to give up a maximum of **€1.10** of your allowance to receive the dish **stir-fry sweet and sour with rice** instead of the cheese roll.

Continue

For those interested: More information on the calculation of greenhouse gas emissions:

What assumptions are made in the calculation?

In the calculation, the emissions attributable to a dish are calculated as the sum of the emissions generated in the production of the ingredients. The emissions of each ingredient are calculated "from farm to gate", i.e. all emissions are included that occur during agricultural production and during further processing, packaging, preservation and transport until the ingredient is available for purchase in shops. Not included are the transport from the shop to the restaurant or end consumer and the emissions that arise from any further refrigeration in the restaurant or at the end consumer, as well as the emissions that arise from cooking the dish.

When calculating the values, conventional (i.e. not specifically organically certified) agriculture is assumed. Otherwise, assumptions are made about production that reflect the production of the average product found on our supermarket shelves.

What data is the calculation based on?

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Source: eaternity.

Introduction decisions with offsetting

You will now make four more of the 15 decisions. One of the 15 decisions will actually be implemented.

If it is one of the now following four choices that is implemented, the greenhouse gas emissions of the dish you have been handed will be offset by a donation to the NGO atmosfair. This happens regardless of whether the dish was originally assigned to you or whether you exchanged it for the other dish by paying a surcharge. Atmosfair uses the donation to support sustainable energy projects so that the emissions are saved elsewhere. In this way, the dish handed out to you becomes emission-neutral / CO2-neutral.

For those interested: Further information on CO2 offsetting:

How does the CO2 offset work?

The donation to atmosfair is used to develop renewable energies in countries where they hardly exist yet, i.e. mainly in developing countries. In this way, atmosfair saves CO2 that would otherwise have been produced by fossil energies in these countries.

Example projects

- Atmosfair uses donations to reduce the selling price of energy-efficient stoves in Nigeria. In Nigeria, 75% of families cook on open fires, and a family of 7 consumes 5 tonnes of wood per year. This enormous consumption of firewood has already led to almost total deforestation and the progressive spread of deserts, especially in the poor north of the country. Energy-efficient stoves use about 80% less wood.
- Atmosfair uses donations to make small-scale biogas plants more affordable in Nepal. This project targets families living in rural areas who previously used wood as an energy source for cooking. In this way, the increasing deforestation of Nepal's forests can be counteracted.
- Atmosfair uses donations to support a small hydropower plant in Honduras. In this way, four villages that previously used wood and diesel generators for energy supply could be connected to the electricity grid for the first time. In addition, electricity can be fed into the national grid, replacing electricity from gas-fired power plants.

Source: atmosfair

Continue

Example decision with offsetting

You can either receive a cheese roll or the dish ‘Italian Vegetable ragout with pasta’ with your payout.

The emissions attributable to each dish are offset by a donation to the NGO atmosfair. Atmosfair supports sustainable energy projects with the donation, so that the emissions are saved elsewhere.

Which dish do you prefer? Click on one of the two buttons.

Italian Vegetable ragout with pasta

CO2 neutral

Emission offset

vegetarian

or

Cheese Roll

CO2 neutral

Emission offset

vegetarian

Italian Vegetable ragout with pasta

Cheese Roll

If you are assigned the cheese roll: What is the **maximum** amount of your expense compensation that you would be willing to give up in exchange for Italian Vegetable ragout with pasta? (Click on the grey bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You would like to give up a maximum of **0.75 €** of your expense compensation to receive the **Italian Vegetable ragout with pasta** instead of the cheese roll.

Continue

For those interested: Further information on CO2 offsetting:

How does the CO2 offset work?

The donation to atmosfair is used to develop renewable energies in countries where they hardly exist yet, i.e. mainly in developing countries. In this way, atmosfair saves CO2 that would otherwise have been produced by fossil energies in these countries.

Example projects

- Atmosfair uses donations to reduce the selling price of energy-efficient stoves in Nigeria. In Nigeria, 75% of families cook on open fires, and a family of 7 consumes 5 tonnes of wood per year. This enormous consumption of firewood has already led to almost total deforestation and the progressive spread of deserts, especially in the poor north of the country. Energy-efficient stoves use about 80% less wood.
- Atmosfair uses donations to make small-scale biogas plants more affordable in Nepal. This project targets families living in rural areas who previously used wood as an energy source for cooking. In this way, the increasing deforestation of Nepal's forests can be counteracted.
- Atmosfair uses donations to support a small hydropower plant in Honduras. In this way, four villages that previously used wood and diesel generators for energy supply could be connected to the electricity grid for the first time. In addition, electricity can be fed into the national grid, replacing electricity from gas-fired power plants.

Source: atmosfair

Introduction calorie estimation

You will now estimate the energy value of each dish in kilocalories (kcal) for a total of five dishes. For each estimation question, the completion time is **limited to 60 seconds**. For each estimation question where your estimate does not deviate from the correct value by more than 30%, **your payout increases by 0.10 euros**.

What assumptions should be made for the estimation?

You will not be presented with ingredient lists for the following estimation questions. This is because we want to give you, as much as possible, only the information that you would find in the restaurant. We want to know how you estimate the energy value of a dish, based solely on the name of the dish in the menu.

Continue

Example calorie estimation

Remaining time on this page. **0:54**

What do you estimate: What is the energy value in kilocalories (kcal) of the dish ‘Beef ragout with potatoes’?

Beef ragout with potatoes

Beef

I estimate that the dish ‘Beef ragout with potatoes’ has

kcal.

Continue

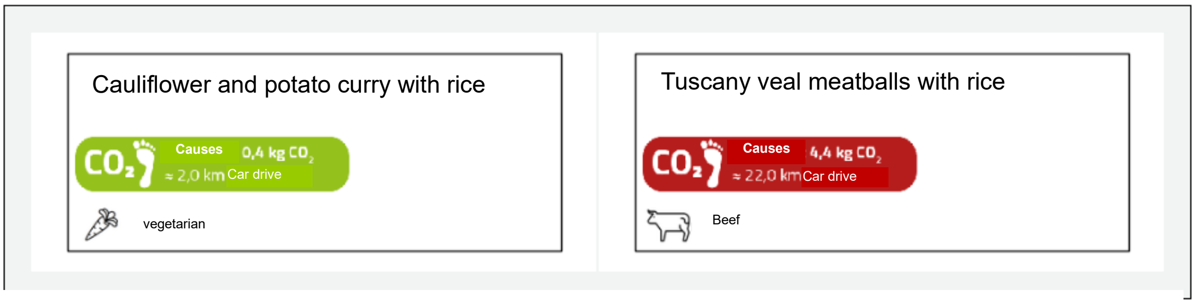
WTP for label presence

You are about to make the last three of the 15 decisions. One of the 15 decisions will actually be implemented.

But now there are two differences:

5. There are now three **new dishes** that you have not seen in your previous decisions.
6. You can see **emission labels** for these three dishes. These labels show the greenhouse gas emissions of the dishes in CO2 equivalents.

For example, two of the labels might look like this:



The display of the labels can either be preset so that:

- The labels are also displayed to you, or that
- The labels are not displayed to you.

Chance decides whether the display setting of the labels corresponds to your wishes without charge.

- Case 1 (probability 50%): We (do not) display the labels according to your wishes.
- Case 2 (probability 50%): The labels are initially preset so that it does not correspond to your wishes. For this case, you specify the **maximum** amount of your expense compensation you would like to give up in order to get your preferred display setting instead.

If **case 2** occurs, chance decides again:

- A **price** is determined randomly. Every value between 0€ and 3€ (in 5 cent steps) is equally probable.
- If the given amount is **higher** than the price, you will still get your **preferred display setting**. For this**, the charge will be deducted from your expense compensation**. However, this will only happen if one of the three dishes shown actually determines your payout.
- If the specified amount is **less** than the price, you will receive your **non-preferred display setting for free**.

Which display settings do you prefer? Click on one of the two buttons.

Labels should be **shown** | Labels should **not be shown**

If the display of labels is **not** preset and one of the three choices, you make now actually determines your payout: What is the **maximum** amount of your expense compensation you would like to give up in order to have the labels displayed?

(Click on the gray bar to make the slider visible).

0.00€ 1.00€ 2.00€ 3.00€

You want to give up a maximum of **1.70 €** of your expense compensation to **unlock the display of labels**.

Continue

Appendix E Experiment 2: Details on the experimental set-up

E.1 Pre-registration

I pre-registered Experiment 2 on the 25th of April 2022 on aspredicted #95108.

E.2 Canteen set-up in Bonn

The natural field experiment was conducted in the student canteens of the University of Bonn from April 2022 to July 2022. The whole of April (four weeks) served as a pre-intervention phase in which baseline consumption decisions were observed. Emission labels were introduced in the treatment student canteen from the beginning of May to mid-June 2022 (seven weeks). From mid-June to mid-July 2022 (three weeks, which ended with the summer closing of the treated student canteen), I continue to observe consumption decisions to examine post-intervention behavior.

There are three student canteens in Bonn: The treatment student canteen, the first control restaurant (located 1.7 km from the treatment restaurant), and the second control restaurant (located 4.7 km from the treatment restaurant and frequented much less than the other two restaurants). Menu planning is centralized among the three student canteens, and there is thus a large overlap in the daily offering. All three student canteens offer two main meal components, which differ daily but are mostly the same across student canteens. In addition, each of the student canteens might offer additional options, which are student-restaurant-specific. The larger control restaurant sometimes offers pizza or pasta in addition, and all student canteens might serve leftover main meal components from the previous day, soup, and side dishes. In the treatment restaurant, only the main meal components were equipped with carbon labels, and sides and leftover main meal components were not labeled. [5] Correspondingly, the dependent variable in my main regression is whether the main meal component a restaurant guest chooses contains meat or is vegetarian.

The price of the main meat meal offered in the sample period ranged from €1.85 to €2.5, while that of the main vegetarian meal ranges from €1.35 to €2.4. The student canteen in Bonn is a non-profit organization aimed at serving the students. Prices are thus fixed to reflect the cost of the ingredients plus a part of the canteens' fixed costs (Studierendenwerk Bonn, 2025). The remaining fixed costs are financed through subsidies. In fast food restaurants located in the surrounding area, meals were priced at €4.00 upward during the sample period.

5. The main reason for this was that I wanted to test carbon labeling in a manner that was feasible for the student canteen to implement long-term. While main meal components are planned and known beforehand, sides and leftover dishes are decided spontaneously. Further, leftover main meal components only make up a smaller part of daily sales and the emissions caused by side dishes are almost negligible compared to those of the main meal components. Sales of all products are tracked, and label effects in the main sample are conservatively calculated over all main meal components offered, i.e. including main meal components spontaneously added to the menu but not labeled.

E.3 Canteen visiting patterns

An average student canteen guest visited the student canteen 10 times from April to mid-July. Around 34% visit 10 times or more, and around 15% visit 20 times or more. 92% of guests visited the same student canteen at least 80% of the time. In the pre-intervention survey (described in section E) over 40% of respondents report that they would have difficulty finding an affordable meal if the student canteens did not exist. This suggests that switching between student canteens and other gastronomic offers is not frequent. The labeling intervention does not seem to have led to a decrease in student canteen sales, relative to the control restaurant (see Figure B.1). Section E.1 analyzes in a difference-in-difference approach whether the intervention influenced the likelihood of regular canteen guests (i.e. those forming part of the ITT sample) of frequenting the canteen, and does not find a significant effect.

Do canteen guests regularly frequent multiple canteens? Figure E.1 includes an analysis based on the trackable personal card payments. I classify restaurant guests as "Treatment" or "Control" visitors based on their consumption behavior in the first two weeks. 91% of those regularly frequenting canteens during these two weeks (i.e. at least twice) visit the same canteen at least 80% of the time. I classify guests as "Control" or "Treatment" guests based on these two weeks. Around 2% of purchases made by "Control" visitors are made in the treated restaurant in the remaining 12-week period, while around 4% of the canteen visits of those classified as "Treatment" guests are to one of the Control canteens. Figure E.1 calculates weekly statistics on switching and shows time trends. The proportion of control-canteen purchases made by guests classified as "Treatment" fluctuates betweeen 3% and 7% across weeks, while the proportion of treatment-canteen purchases made by guests classified as "Control" fluctuates between 2% and 3%. Thus, switching between canteens overall does not seem very prevalent. While switching seems to fluctuate a bit around weeks 5 and 6 of the intervention period, this pattern does not correlate with any increase or decrease in meat consumption when eating at the "non-home" canteen, as shown in Figure E.2. It thus seems unlikely that these small fluctuations are driven by guests wanting to consume higher-emission meals without seeing carbon labels.

Note that the ITT specification shown in the main results in Table 2 by design controls for any change in canteen frequenting behavior induced by the intervention. Since I use an intent-to-treat specification, effect sizes are not impacted by possible increased switching between canteens. While I base classification as a "Treatment" or "Control" guest on only two weeks of data in the descriptive analysis shown here (to be able to show a two-week pre-trend), I base classification on the entire 4-week pre-intervention period in the main text, reducing noise. In the specifications additionally including guest fixed effects, changes in average consumption behavior due to a mere change in the composition of canteen guests are controlled for.

The introduction of carbon labels in the treatment restaurant was displayed as a measure taken by the student canteens themselves, with no connection presented to the University of Bonn or me specifically as the researcher. The introduction of the emission labels was explained on billboards and leaflets available inside the student canteen, as shown in Figure E.3. I conducted two surveys accompanying the measure, one before the intervention period and one after the intervention period. The surveys and the labeling measures were advertised through different channels, and the survey was advertised as a chance to voice one's opinion on the offer of the student canteen. It is thus unlikely that restaurant guests drew a connection between the initiative and the survey.

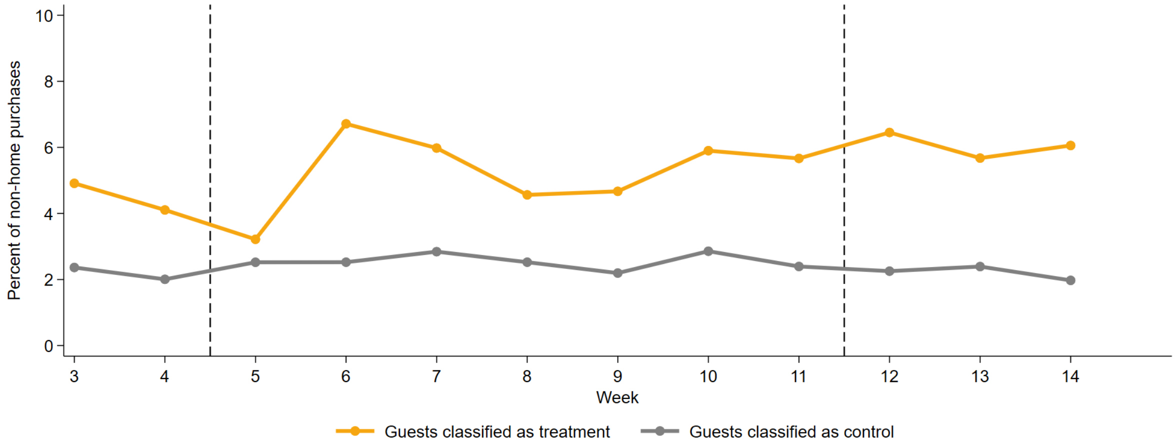


Figure E.1. Visits to the "non-home" canteen

Notes: In percentage points relative to total canteen visits. Classification as the "home" canteen based on behavior in the first two weeks. The sample is similar to that in spec. (4) in Table 2, but the classification as treatment is calculated based entirely on the first two weeks, based on a minimum of two visits during this period. Based on $N = 44,816$ observations in week 3 to 14.

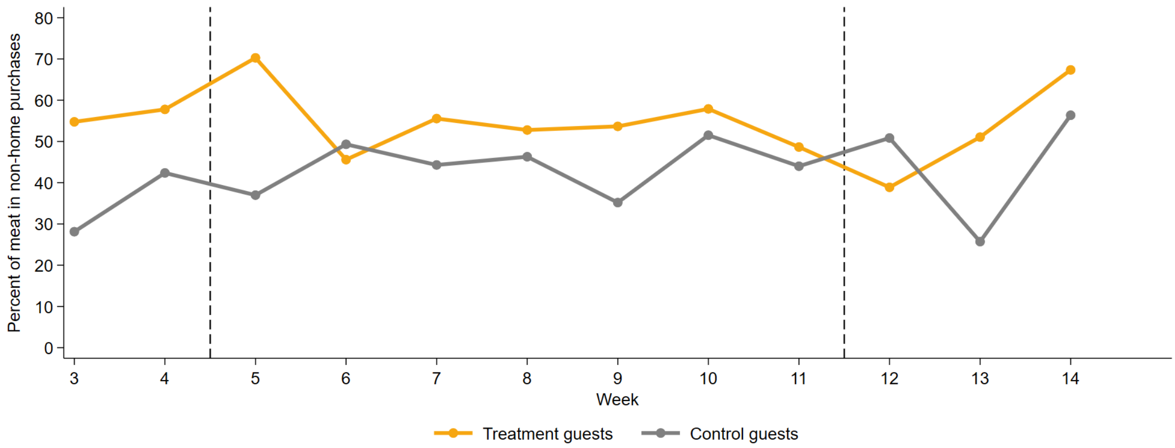


Figure E.2. Meat consumption in the "non-home" canteen

Notes: Graph shows average meat consumption at the non-home canteen. Classification as the "home" canteen based on behavior in the first two weeks. The sample is similar to that in spec. (4) in Table 2, but the classification as treatment is calculated based entirely on the first two weeks, based on a minimum of two visits during this period. Based on $N = 1,274$ observations of guests dining in a canteen not in line with their classification of treated or control, in week 3 to 14.

E.4 Carbon label calculation

For the carbon labels, I calculated emission values with the application Eaternity Institute (2020), using ingredient lists provided by the student canteen. The design of the carbon labels was proposed by the student canteen, based on what is technically feasible and possibly implementable as a long-run measure. Examples are shown in Figure 7. They were coded in a traffic-light system, with thresholds determined such that approximately a third of the main components offered by the student canteen during the study period would be classified as green, one-third as yellow, and one-third as red. This corresponded to thresholds of 0.5 kg and 1 kg. [6]

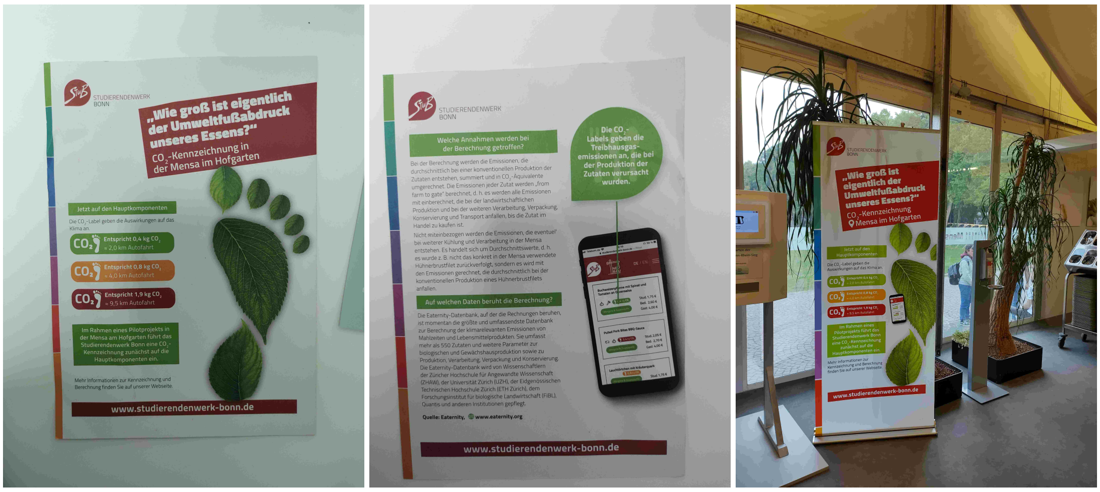


Figure E.3. Explanation of the carbon labeling initiative in the canteen

Notes: Leaflets (left and center) and billboards at the entrance of the student canteen (right).

E.5 Data set construction: Full sample

The main data set covers purchase data from April 1st, 2022 to July 8th, 2022. Spec. (1) in Table E.1 performs the basic analysis shown in the main text in Table 2 in Col.(1) on all data before any exclusions.

- Starting from week 9 of the treatment period (May 30th to June 3rd), Ukrainian refugees received free meals in the treated student canteen and the larger control restaurant, using specific student canteen cards. I thus identify these sales and exclude them from all analyses. For the treated restaurant, they make up 12% of total sales in week 9,25% in week 10, and between 13% and 18% for the rest of the

6. Carbon emission labels for a given meal are calculated as the sum of the emissions caused by each of the ingredients. For each ingredient, emission values are calculated “from farm to gate”. Hereby, it is assumed that the production process mirrors the average conventional production, e.g. I do not track the specific chicken breast bought by the student canteen but assume average conventional production. Emissions caused by the student canteen cooling, freezing, and cooking ingredients on-site are not included. These calculation details are explained to students on the student canteen website and on leaflets lying out on-site in the student canteen.

observation period. For the control restaurant, they make up between 2% and 4% of total sales during this time period. Spec. (2) in Table E.1 shows how this exclusion affects results.

- During the first week of the label period (May 2nd to May 6th), the display was irregular, as the student canteen needed some "trial and error" to get the system running. On some days, the labels were only displayed in the student canteen or online. Further, the student canteens (i.e. all three) had a special "Healthy Campus" week during the first week of May. The Healthy Campus" week featured an additional, rarely chosen ($\approx$ 10% of sales) premium-priced meal and light promotional activities (e.g., nutrition quizzes). Since the event week affected all canteens, it should not confound the treatment effect unless its impact differed across locations. To be conservative, I omit this week in the main analysis. Spec. (3) in Table E.1 additionally excludes week 5 from the sample.
- I also exclude week 14 from the main sample, since it is the last week before an irregular two-week closure of the treatment student canteen, which was followed by a two-week closure of the control canteens. The canteens usually do not close at this point of year, and it might have affected consumption behavior. Spec. (4) in Table E.1 additionally excludes week 7, yielding the sample I refer to as the "full sample" and analyze in the main paper.

For each purchase, I have data on the mode of purchase (student canteen card or debit card), meal category (combined with daily menus, this provides the specific meal name), student canteen card ID (if the purchase is made with the student canteen card), cash register number, date of purchase, time of purchase (exact to the minute), and purchase value.

Table E.1. Field estimates of the effect of carbon labels on meat consumption, testing robustness to different data exclusion criteria

	Likelihood of consuming meat			
	(1)	(2)	(3)	(4)
	Full data	Excl. Ukr.	+Excl. W5	+Excl. W14
Treatment × Label period	-0.02***	-0.03***	-0.02***	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
Treatment × Post period	-0.01	-0.07***	-0.07***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)
Treatment	-0.10***	-0.10***	-0.10***	-0.10***
	(0.01)	(0.01)	(0.01)	(0.01)
Label period	0.01***	0.01**	0.01**	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)
Post period	0.02***	0.01	0.01	-0.01
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.51***	0.51***	0.51***	0.51***
	(0.00)	(0.00)	(0.00)	(0.00)
Date effects	No	No	No	No
Fixed effects	No	No	No	No
Observations	155,223	150,187	137,819	124,830

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Spec. (1) includes all data from weeks 1 to week 14. Spec. (2) excludes consumption by Ukrainian refugees. Spec. (3) additionally excludes the first week of the label period (week 5). Spec. (4) additionally excludes seven days on which the offer of the treatment and control canteens strongly differed, resulting in the final sample analyzed in Table 2. Specification follows 3.

E.6 Data set construction: ITT sample

From the full sample data set detailed above, I construct the ITT sample data set:

- I restrict the sample to purchases made with a personal payment card (69% of purchases).
- Using the individual payment data, I can identify guests who purchased several meal components on a single day. These are 7% of the remaining sample. I drop these purchases since it is not clear whether the guest is purchasing the meal for themselves or for a friend. This allows me to shift gears in the ITT analysis. Instead of analyzing the data at the level of the individual purchase (does the purchase contain meat?), I analyze the behavior at the guest level (does the guest eat meat on a given day?).

- Further, I restrict the analysis to regular canteen guests, which I define as individuals who visited one of the student canteens at least four times during the pre-intervention period (51% of the remaining sample). Results are robust to different cut-off values, as Table E.2 shows.
- Finally, I restrict the sample to canteen guests visiting the same canteen in 80% of their visits (89% of the remaining sample). Results are robust to different percentage cutoff values, as Table E.3 shows.

Table E.2. Field estimates of the effect of carbon labels on meat consumption, testing robustness to different data exclusion criteria

	Meat choice (pp.)				
	> 4 visits	> 2 visits	> 3 visits	> 5 visits	> 6 visits
Treatment × Label period	-0.02**	-0.02**	-0.02**	-0.02**	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Treatment × Post period	-0.04***	-0.02**	-0.04***	-0.04**	-0.04**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Sec. veg. offered	-0.01	-0.02**	-0.01*	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Sec. meat offered	0.03***	0.04***	0.04***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.65***	0.64***	0.66***	0.66***	0.70***
	(0.04)	(0.03)	(0.04)	(0.04)	(0.05)
Week fixed effects	Yes	Yes	Yes	Yes	Yes
Control for offer	Yes	Yes	Yes	Yes	Yes
Guest fixed effects	No	No	No	No	No
Guests control	1,383	2,381	1,807	1,074	786
Guests treated	474	836	628	368	259
Observations	36,380	49,696	42,719	30,675	24,391

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Spec. (1) conducts the ITT analysis following the above described data preparation procedure, i.e. guests are classified as regular student canteen guests if they visit the treatment canteen at least five times during the pre-intervention period. Col. (2) instead requires at least 2 visits, Col. (3) requires at least three visits, Col. (4) at least 5, and Col. (5) at least 6 visits. All specifications include guest fixed effects.

Table E.3. Field estimates of the effect of carbon labels on meat consumption, testing robustness to different data exclusion criteria

	Meat choice (pp.)			
	80	60	70	90
Treatment × Label period	-0.02**	-0.02**	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)
Treatment × Post period	-0.04***	-0.04***	-0.04***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)
Sec. veg. offered	-0.01	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Sec. meat offered	0.03***	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.65***	0.65***	0.65***	0.66***
	(0.04)	(0.04)	(0.04)	(0.04)
Week fixed effects	Yes	Yes	Yes	Yes
Control for offer	Yes	Yes	Yes	Yes
Guest fixed effects	No	No	No	No
Guests control	1,383	1,487	1,454	1,275
Guests treated	474	525	514	437
Observations	36,380	39,361	38,413	33,648

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Spec. (1) conducts the ITT analysis following the above described data preparation procedure, i.e. assigning guests as ITT if they visit the treatment canteen in at least 80% of their canteen visits pre-intervention. . Col. (2) instead uses a 60% assignment rule, Col. (3) uses a 70% assignment rule, and Col. (4) uses a 90% assignment rule. All specifications include guest fixed effects.

E.7 Descriptive statistics on meat consumption and average emissions

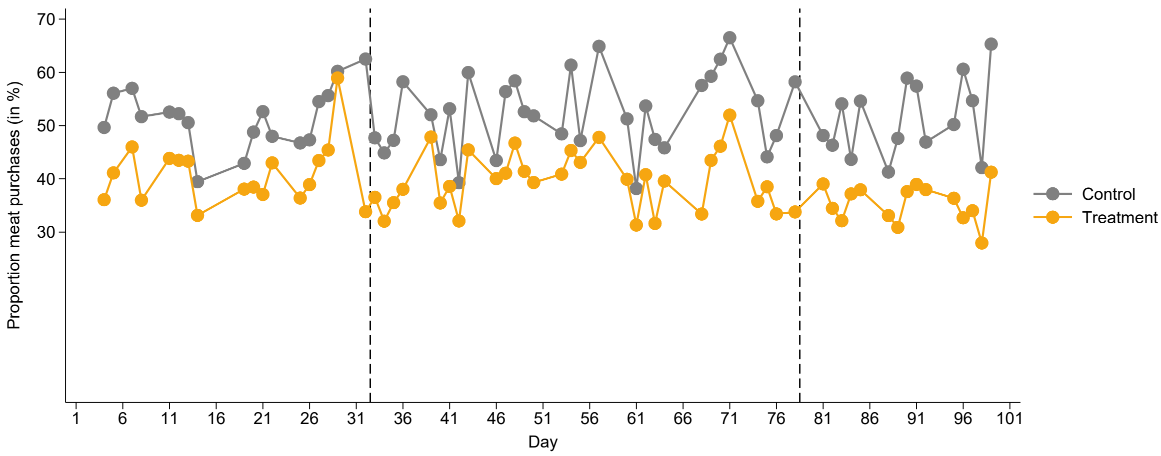


Figure E.4. Proportion of meat meals sold in the canteen

Notes: using the final sample but including week 5 and week 14. $N = 150, 187$

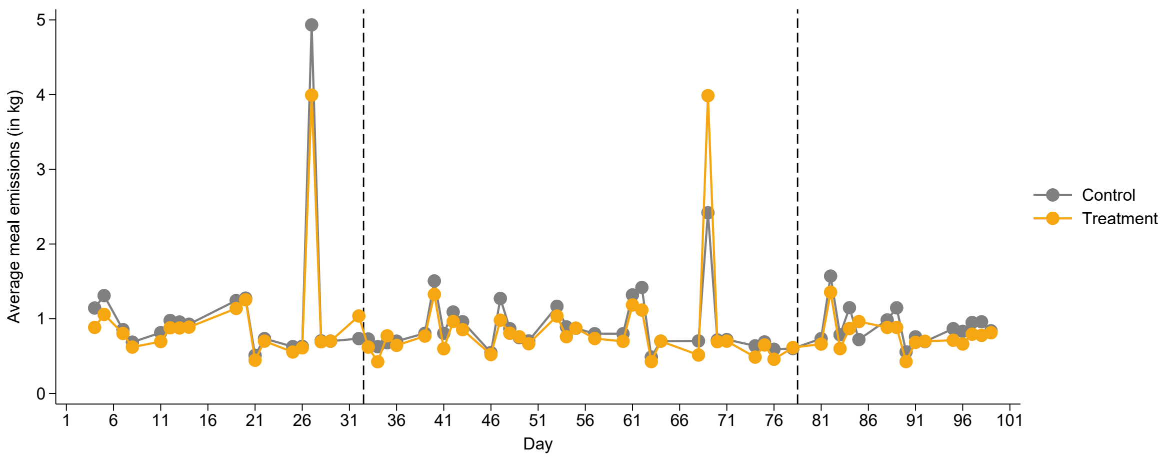


Figure E.5. Average emissions per meal sold in the canteen

Notes: using the final sample but including week 5 and week 14. $N = 150, 187$

E.8 Survey accompanying natural field experiment

Pre-intervention survey: During the second week of April, I conducted a survey among student canteen guests at the treatment student canteen and the first, larger, control restaurant. The survey was advertised as an opportunity to voice one's opinion on the offer of the student canteen, took participants around five minutes, and motivated potential participants with the chance to win one of ten €50 coupons for the student canteen. The survey was advertised through multiple channels. First, I put up posters advertising the survey in many faculties throughout the University of Bonn. Second, I distributed leaflets in front of the treatment restaurant and the larger control restaurant, together with research assistants (see Figure E.6). It is common for students and student groups to advertise surveys, projects, and events in this manner. Finally, the experimental lab at the University of Bonn sent out an e-mail to its entire participant pool advertising participation.

Figure E.6. Leaflet advertising participation in the survey

Notes: Leaflet was distributed in front of the student canteen.

In the survey, respondents indicated their student canteen card number and consented to their survey responses being connected to their consumption decisions from April to July. They filled out questions on demographics, environmental attitudes, political preferences, and preferences towards the student canteen offer. Responses to the questions on student canteen offer and participant comments were analyzed, summarized, and presented to the gastronomic manager of the student canteens. 1,700 respondents participated in this first survey, 94% of these students.

Post-intervention survey: From the 22nd of June, I started sending out invitations to participate in a second survey. These were sent out by e-mail to those participants of the first survey who indicated their e-mail addresses and consented to be contacted for a second survey. This was the case for 93% of participants in survey 1. Of the 1,558 I invited to the survey, 940 filled out survey 2. I invited participants in a staggered fashion over two weeks and sent a reminder on the 7th of July. Again, survey respondents had the opportunity to win one of ten 50 €coupons for the student canteen.

In survey 2, I repeated some of the questions from survey 1, to assess whether attitudes changed differentially in the treatment student canteen. The survey further included some questions of interest to the student canteen following the outcome of the first survey. At the end of the survey, participants could indicate whether and how they had perceived the emission labels, as well as voice their opinion on the initiative.

Table E.4. Socio-economic summary statistics for student canteen guests - survey data

Variable	Explanation	Mean	Std. Dev.
Age	Age of participant	23.04	3.88
Male	Dummy: 1 if participant is a man	0.42	0.49
Student	Dummy: 1 if guest is a student	0.95	0.23
Non-vegetarian	Dummy: 1 if guest eats meat	0.67	0.47
N	1,703		

Notes: Statistics are based on the surveys I conducted among student canteen guests in April and June. I include only survey respondents who visited a student canteen at least once in the 14-week study period and paid with their individual payment cards. See E.8 for details on the survey design. To preserve anonymity (since I also asked these survey participants about their study field), I elicited age in intervals. To reach an estimation of the mean age, I set the age equal to the midpoint of each interval. For 13% of respondents, I have the information that they are below 20. For the calculation, I estimate their age at 18. For 54% of respondents, I have the information that they are between 20 and 23 (which I set to 21.5 for the estimation), 21% of respondents are between 24 and 27 (set to 25.5), 6% of respondents are between 28 and 31 (set to 30), and 4% of respondents are 32 or older (set to 35). I did not directly elicit vegetarianism, but I elicited how much of a role animal rights play in participants' consumption decisions. I code participants reporting the highest degree of importance as vegetarians.$N = 1,669$ for gender since 34 respondents either did not want to provide their gender or identified as non-binary.

Table E.5. Socio-economic summary statistics for student canteen guests - consumption data

Variable	Explanation	Mean	Std. Dev.
Student	Dummy: 1 if guest is a student	0.86	0.34
Non-vegetarian	Dummy: 1 if guest eats meat	0.66	0.47
N	10,155		

Notes: Statistics are based on guests making at least one purchase with their individual payment cards in the 14-week study period, excluding Ukrainian refugees receiving meals for free as an interim solution for part of the study period.

E.9 Post-experiment label installation

Building on the experience from this research project, the student canteens in Bonn initiated the development of a technical system enabling the permanent display of carbon labels on all canteen menus. This system was completed in early 2025. The installed labels resemble those tested in the project and are visible on the canteens' online menu: https://www.studierendenwerk-bonn.de/en/food-drink/canteens-and-cafes/mensa-am-hofgarten (as of August 2025).

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