Supplementary material to the manuscript:

Combined carbon and health taxes outperform single-purpose information or fiscal measures in designing sustainable food policies

Faccioli et al. 2022, accepted for publication by *Nature Food*

Supplementary Table 1. Descriptive statistics of the socio-demographic profile of the sample in each policy stream, compared to the UK population

	POLICY STREAMS [b]			UK POPULATION [a]
	CIT	HIT	UT/CHT	
AGE				
18-29	19.5%	23.1%	22.0%	19.0%
30-44	24.0%	28.9%	24.4%	25.0%
45-64	34.4%	30.5%	32.8%	33.0%
65+	22.2%	17.6%	20.9%	23.0%
GENDER				
Male	43.5%	43.9%	43.5%	49.0%
Female	56.4%	56.1%	56.3%	51.0%
Prefer to self-describe	0.1%	0.0%	0.2%	n.a.
DIET				
Vegetarian or vegan	9.2%	9.9%	10.9%	3.1%
Everything else	90.8%	90.1%	89.1%	96.9%
SOCIO-ECONOMIC GROUP				
AB	33.1%	32.2%	32.6%	27.0%
C1/C2	44.7%	46.8%	44.2%	48.0%
DE	22.1%	21.0%	23.2%	25.0%
REGION OF RESIDENCE				
North East	4.3%	4.9%	5.0%	4.1%
North West	11.1%	11.6%	11.1%	11.0%
Yorkshire and the Humber	8.1%	9.8%	9.1%	8.2%
East Midlands	8.0%	6.8%	7.2%	7.3%
West Midlands	8.7%	8.4%	9.8%	8.8%
East of England	9.2%	8.4%	7.8%	9.3%
London	12.7%	12.2%	12.4%	13.2%
South East	14.1%	14.2%	13.2%	13.7%
South West	9.1%	8.1%	8.6%	8.6%
Wales	4.5%	4.8%	4.5%	4.8%
Scotland	7.8%	7.8%	8.6%	8.4%
Northern Ireland	2.3%	3.0%	2.7%	2.8%
N (respondents)	1,979	1,958	1,975	

[a] Reported figures refer to the quotas of adult population by age group, gender and region of residence in the UK, based on the Office for National Statistics (ONS) mid-2019 population estimates, available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland The reported national shares of UK adults by socio-economic group (social grade) is based on the results of the National Readership Survey (2016), available at: http://www.nrs.co.uk/nrs-print/lifestyle-and-classification-data/social-grade/. In the UK, there is no official data on the share of vegetarians or vegans in the population. Hence we considered the estimated number of vegans provided by the Vegan Society in 2019 (1.1%) based on:
https://www.vegansociety.com/news/media/statistics/worldwide#:~:text=Veganism%20in%20the%20UK&text=The%20number%20of%20vegans%20in,150%2C000%20(0.25%25)%20in%202014
and the results of a 2012 survey by the Vegetarian Society available at:
https://vegsoc.org/info-hub/facts-and-figures/#:~:text=According%20to%20the%20NDNS%20survey,population%20of%2062.3%20million**
which estimates the number of vegetarians in the UK to be around 2%.

[b] Results of the pairwise cross sample tests for proportion equality (based on the z-test for gender and dietary profile and the Chi-square test of distribution equality for age, socio-economic status and region of residence) all consistently indicate that the null hypothesis of equality across samples cannot be rejected, except for the variable age where differences are statistically significant between the Health Information and Tax (HIT) policy stream and the Unlabelled Tax / Carbon + Health Tax (UT/CHT) policy stream (p-value=0.001).

Supplementary Table 2. Comparison between the baseline volume of food purchases in the survey policy streams and the volume of actual food purchases in Great Britain (estimated from the 2017 GB Kantar FMCG panel), using the Wilcoxon sum-rank test for equality.

FOOD GROUP	KANTAR FMCG DATA		SURVEY POLICY STREAMS					
			CIT		HIT		UT/CHT	
	Volume*	Rank	Volume*	Rank	Volume*	Rank	Volume*	Rank
Fruits and vegetables	8.027	1	15.992	1	15.607	1	16.012	1
Bread, pasta, rice and flour	2.184	5	4.402	3	4.394	4	4.416	3
Breakfast cereals	0.650	10	0.929	13	0.968	12	0.997	12
Milk and yoghurt	7.811	2	7.574	2	7.490	2	7.992	2
Plant-based Milk	0.232	19	0.752	15	0.879	14	0.798	14
Cheese	0.549	11	0.757	14	0.758	15	0.771	15
Butter and cream	0.367	15	0.503	18	0.461	18	0.491	18
Eggs	0.463	12	0.982	12	0.946	13	0.996	13
Unprocessed beef	0.359	17	1.432	11	1.403	11	1.420	11
Processed beef	0.263	18	0.364	19	0.376	19	0.399	19
Lamb	0.057	21	0.322	21	0.320	21	0.356	20
Pork	0.428	13	1.668	9	1.691	9	1.692	9
Poultry	1.086	9	1.998	7	2.041	7	1.987	7
Meat alternatives	0.053	22	0.300	22	0.284	22	0.300	22
Fish and seafood	0.422	14	0.717	16	0.695	16	0.687	16
Meat-based ready meals and pizza	1.619	8	1.511	10	1.452	10	1.490	10
Fish- and veg-based ready meals	1.822	7	1.806	8	1.854	8	1.828	8
Unhealthy snacks	0.365	16	0.590	17	0.586	17	0.591	17
Less unhealthy snacks	0.181	20	0.347	20	0.331	20	0.317	21
Tea and coffee	2.014	6	2.630	6	2.972	6	3.015	6
Sugary drinks	4.147	3	4.301	4	4.582	3	4.277	4
Less- and non-sugary drinks	3.455	4	3.287	5	3.432	5	3.377	5
Wilcoxon rank-sum test (each policy stream data against Kantar data)								
z-scores				-1.385		-1.455		-1.479
p-value				0.171		0.150		0.144

*Volume= Average per person per month volume (in kg or litres)

Supplementary Table 3. Average per person per month volume of food purchases (in kg or litres) and expenditure (in GBP(£) 2020) for the baseline scenario in each policy stream of the survey (and results of the ANOVA tests for volume equality)

	CIT		HIT		UT/CHT		ANOVA tests for volume equality	
	Volume	Expend.*	Volume	Expend.*	Volume	Expend.*	Chi-square statistic	p-value
FRUIT AND VEGETABLES	**15.99kg**	**£26.00** *(17.20%)*	**15.61kg**	**£25.66** *(16.99%)*	**16.01kg**	**£25.97** *(17.05%)*		
Fruit and vegetables	15.99kg	£26.00	15.61kg	£25.66	16.01kg	£25.97	0.21	0.38
CARBOHYDRATES	**5.33kg**	**£8.96** *(5.92%)*	**5.36kg**	**£9.10** *(6.03%)*	**5.41kg**	**£9.25** *(6.07%)*		
Bread, pasta, rice and flour	4.40kg	£5.99	4.39kg	£6.01	4.42kg	£6.04	0.29	0.98
Breakfast cereals	0.93kg	£2.97	0.97kg	£3.10	1.00kg	£3.21	5.02	0.19
MILK AND YOGHURT	**8.33l**	**£8.09** *(5.35%)*	**8.37l**	**£8.13** *(5.38%)*	**8.79l**	**£8.40** *(5.51%)*		
Milk and yoghurt	7.57l	£7.20	7.49l	£7.07	7.99l	£7.45	2.52	0.05
Plant-based milk	0.75l	£0.90	0.88l	£1.06	0.80l	£0.95	2.28	0.18
OTHER DAIRY AND EGGS	**2.24kg**	**£10.15** *(6.71%)*	**2.16kg**	**£9.82** *(6.50%)*	**2.26kg**	**£10.22** *(6.71%)*		
Cheese	0.76kg	£5.05	0.76kg	£5.07	0.77kg	£5.18	0.29	0.81
Butter and cream	0.50kg	£2.57	0.46kg	£2.32	0.49kg	£2.48	2.03	0.11
Eggs	0.98kg	£2.52	0.95kg	£2.43	1.00kg	£2.56	0.11	0.27
MEAT	**6.08kg**	**£39.21** *(25.93%)*	**6.12kg**	**£39.52** *(26.17%)*	**6.15kg**	**£39.56** *(25.97%)*		
Unprocessed beef	1.43kg	£12.13	1.40kg	£12.09	1.42kg	£12.21	0.18	0.88
Processed beef	0.30kg	£2.49	0.31kg	£2.57	0.33kg	£2.76	1.26	0.21
Lamb	0.39kg	£3.64	0.39kg	£3.59	0.42kg	£3.94	0.83	0.43
Pork	1.67kg	£10.13	1.69kg	£10.31	1.69kg	£10.11	0.74	0.92
Poultry	2.00kg	£8.91	2.04kg	£9.18	1.99kg	£8.66	1.02	0.78
Meat alternatives	0.30kg	£1.91	0.28kg	£1.78	0.30kg	£1.87	0.27	0.77
FISH AND SEAFOOD	**0.72kg**	**£7.54** *(4.98%)*	**0.69kg**	**£7.22** *(4.78%)*	**0.69kg**	**£7.15** *(4.69%)*		
Fish and seafood	0.72kg	£7.54	0.69kg	£7.22	0.69kg	£7.15	4.16	0.60
READY MEALS	**1.51kg**	**£7.40** *(4.90%)*	**1.45kg**	**£7.17** *(4.75%)*	**1.49kg**	**£7.37** *(4.84%)*		
Meat-based ready meals and pizza	1.04kg	£4.99	0.98kg	£4.73	0.99kg	£4.81	2.61	0.46
Fish- and veg-based ready meals	0.47kg	£2.41	0.47kg	£2.44	0.50kg	£2.56	3.54	0.75
SNACKS	**2.40kg**	**£15.92** *(10.53%)*	**2.44kg**	**£16.19** *(10.72%)*	**2.42kg**	**£16.02** *(10.52%)*		
Unhealthy snacks	1.81kg	£11.68	1.85kg	£11.95	1.83kg	£11.73	1.82	0.80
Less unhealthy snacks	0.59kg	£4.24	0.59kg	£4.24	0.59kg	£4.29	1.13	0.98
BEVERAGES	**10.56l**	**£27.94** *(18.48%)*	**11.32l**	**£28.21** *(18.68%)*	**10.99l**	**£28.39** *(18.64%)*		
Tea and coffee	0.35kg	£4.39	0.33kg	£4.06	0.32kg	£3.85	5.01	0.12
Sugary drinks	2.63l	£2.56	2.97l	£2.96	3.01l	£2.97	4.27	0.09
Less- and non-sugary drinks	4.30l	£3.02	4.58l	£3.15	4.28l	£3.01	2.07	0.38
Alcohol	3.29l	£17.97	3.43l	£18.04	3.38l	£18.56	0.94	0.73
N (respondents)	1,979		1,958		1,975		5,912	

* Expend.= Expenditure (average per person per month). Percentage reported in parenthesis refers to the share of average (per person per month) expenditure on the food category of interest relative to the overall reported average (per person per month) expenditures on food.

Note: ANOVA tests were conducted to test for (per person per month) average volume equality for the different food groups across the three policy streams and the results of these tests are reported on the right-hand column of this table. Similar results (available from the authors upon request) were obtained when testing for equality of average (per person per month) expenditure by food group.

Supplementary Table 4. Average per person monthly baseline emissions ($kgCO_2e$) by food group and for the food basket across the policy streams (and results of the Kruskal-Wallis test for the significance of the differences across CIT, HIT and UT/CHT)

FOOD GROUP	CIT		HIT		UT/CHT		Kruskal-Wallis test	
	$kgCO_2e$	% of total food basket emissions	$kgCO_2e$	% of total food basket emissions	$kgCO_2e$	% of total food basket emissions	Chi-square statistic	p-value
Fruits and vegetables	18.97	7.15	18.74	7.06	19.20	7.24	0.21	0.90
Bread, pasta, rice and flour	7.80	2.94	7.92	2.99	7.90	2.98	0.29	0.87
Breakfast cereals	2.42	0.91	2.52	0.95	2.59	0.98	5.02	0.08
Milk and yoghurt	20.45	7.71	20.22	7.62	21.58	8.13	2.52	0.28
Plant-based milk	0.68	0.25	0.79	0.30	0.72	0.27	2.28	0.32
Cheese	11.98	4.51	11.98	4.52	12.21	4.60	0.29	0.87
Butter and cream	4.04	1.52	3.63	1.37	3.90	1.47	2.03	0.36
Eggs	4.12	1.55	3.97	1.50	4.18	1.58	0.11	0.95
Unprocessed beef	86.48	32.59	84.74	31.93	85.75	32.31	0.18	0.91
Processed beef	18.07	6.81	18.71	7.05	20.03	7.55	1.26	0.53
Lamb	15.71	5.92	15.70	5.92	17.19	6.48	0.83	0.66
Pork	17.68	6.66	17.93	6.76	17.94	6.76	0.74	0.69
Poultry	14.99	5.65	15.31	5.77	14.90	5.61	1.02	0.60
Meat alternatives	0.66	0.25	0.62	0.24	0.66	0.25	0.27	0.87
Fish and seafood	7.96	3.00	7.71	2.91	7.62	2.87	4.16	0.13
Meat-based ready meals and pizza	12.33	4.65	11.62	4.38	11.80	4.44	2.61	0.27
Fish- and veg-based ready meals	3.65	1.38	3.66	1.38	3.84	1.45	3.54	0.17
Unhealthy snacks	6.17	2.33	6.32	2.38	6.22	2.34	1.82	0.40
Less unhealthy snacks	1.78	0.67	1.81	0.68	1.82	0.69	1.13	0.57
Tea and coffee	0.10	0.04	0.09	0.03	0.09	0.03	5.01	0.08
Sugary drinks	1.25	0.47	1.40	0.53	1.43	0.54	4.27	0.12
Less- and non-sugary drinks	2.42	0.91	2.50	0.94	2.40	0.90	2.07	0.36
Alcohol	5.12	1.93	5.27	1.99	5.27	1.99	0.94	0.62
Food basket emissions per person per month	**264.35**		**262.92**		**268.71**		**1.34**	**0.51**

Supplementary Table 5. Average per person monthly emissions ($kgCO_2e$) by food group and for the food basket across the policy streams

	CIT			HIT			UT/CHT		
		Policy instruments			Policy instruments			Policy instruments	
	Baseline	Carbon Information	Carbon Tax	Baseline	Health Information	Health Tax	Baseline	Unlabelled Tax	Carbon + Health Tax
Fruits and vegetables	18.97	18.92	18.90	18.74	19.26	19.41	19.20	19.16	19.37
Bread, pasta, rice and flour	7.80	7.68	7.65	7.92	7.99	7.98	7.90	7.82	7.90
Breakfast cereals	2.42	2.38	2.41	2.52	2.46	2.43	2.59	2.59	2.55
Milk and yoghurt	20.45	20.22	19.91	20.22	20.10	19.94	21.58	21.33	21.13
Plant-based milk	0.68	0.75	0.77	0.79	0.84	0.80	0.72	0.70	0.72
Cheese	11.98	11.13	10.30	11.98	10.62	9.47	12.21	10.59	9.66
Butter and cream	4.04	3.91	3.66	3.63	3.25	2.87	3.90	3.38	3.17
Eggs	4.12	4.09	4.05	3.97	4.08	4.06	4.18	4.14	4.26
Unprocessed beef	86.48	69.76	55.30	84.74	85.79	85.05	85.75	61.08	58.42
Processed beef	18.07	14.73	11.83	18.71	15.64	13.45	20.03	13.60	11.24
Lamb	15.71	14.09	12.40	15.70	14.95	14.29	17.19	13.67	13.64
Pork	17.68	17.92	16.52	17.93	16.54	15.71	17.94	16.07	15.38
Poultry	14.99	15.26	15.49	15.31	15.82	15.84	14.90	14.98	15.24
Meat alternatives	0.66	0.74	0.78	0.62	0.65	0.66	0.66	0.65	0.68
Fish and seafood	7.96	7.75	7.47	7.71	7.96	8.00	7.62	7.21	7.26
Meat-based ready meals and pizza	12.33	11.76	10.81	11.62	10.71	10.02	11.80	10.39	10.10
Fish- and veg-based ready meals	3.65	3.66	3.65	3.66	3.52	3.46	3.84	3.58	3.55
Unhealthy snacks	6.17	6.10	5.97	6.32	5.47	4.75	6.22	5.34	4.96
Less unhealthy snacks	1.78	1.73	1.70	1.81	1.71	1.69	1.82	1.80	1.74
Tea and coffee	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.08	0.08
Sugary drinks	1.25	1.21	1.19	1.40	1.10	0.90	1.43	1.09	1.00
Less- and non-sugary drinks	2.42	2.39	2.37	2.50	2.63	2.66	2.40	2.42	2.41
Alcohol	5.12	5.06	5.03	5.27	5.02	4.55	5.27	4.39	4.25
Food basket emissions per person per month	**264.35**	**240.89**	**217.84**	**262.92**	**255.71**	**247.61**	**268.71**	**225.66**	**218.31**

Supplementary Table 6. Mean change in average per person monthly emissions ($kgCO_2e$) across the different policy streams and policy instruments

FOOD GROUP	Carbon Information *Minus* Baseline	CIT Carbon Tax *Minus* Carbon Information	Carbon Tax *Minus* Baseline	Health Information *Minus* Baseline	HIT Health Tax *Minus* Health Information	Health Tax *Minus* Baseline	Unlabelled Tax *Minus* Baseline	UT/CHT Carbon + Health Tax *Minus* Unlabelled Tax	Carbon + Health Tax *Minus* Baseline
Fruits and vegetables	-0.06	-0.01	-0.07	0.52	0.15	0.67	-0.04	0.20	0.16
Bread, pasta, rice and flour	-0.12	-0.03	-0.16	0.07	-0.02	0.06	-0.08	0.07	0.00
Breakfast cereals	-0.03	0.03	-0.01	-0.06	-0.03	-0.09	-0.01	-0.04	-0.04
Milk and yoghurt	-0.23	-0.30	-0.54	-0.13	-0.16	-0.29	-0.25	-0.20	-0.45
Plant-based milk	0.08	0.02	0.10	0.05	-0.04	0.01	-0.01	0.02	0.00
Cheese	-0.85	-0.82	-1.68	-1.36	-1.15	-2.52	-1.62	-0.93	-2.55
Butter and cream	-0.13	-0.25	-0.38	-0.38	-0.38	-0.76	-0.51	-0.22	-0.73
Eggs	-0.04	-0.03	-0.07	0.11	-0.02	0.09	-0.04	0.12	0.08
Unprocessed beef	-16.72	-14.47	-31.19	1.05	-0.75	0.31	-24.66	-2.66	-27.33
Processed beef	-3.34	-2.90	-6.24	-3.07	-2.19	-5.26	-6.43	-2.37	-8.79
Lamb	-1.62	-1.69	-3.31	-0.75	-0.65	-1.40	-3.52	-0.04	-3.56
Pork	0.24	-1.40	-1.16	-1.39	-0.83	-2.22	-1.86	-0.69	-2.56
Poultry	0.27	0.23	0.50	0.51	0.03	0.54	0.08	0.26	0.34
Meat alternatives	0.08	0.04	0.12	0.03	0.01	0.04	-0.01	0.03	0.02
Fish and seafood	-0.20	-0.29	-0.49	0.25	0.04	0.29	-0.42	0.05	-0.36
Meat-based ready meals and pizza	-0.57	-0.95	-1.52	-0.91	-0.69	-1.60	-1.40	-0.29	-1.69
Fish- and veg-based ready meals	0.01	-0.01	0.00	-0.14	-0.07	-0.20	-0.26	-0.02	-0.28
Unhealthy snacks	-0.07	-0.13	-0.20	-0.84	-0.72	-1.56	-0.88	-0.37	-1.25
Less unhealthy snacks	-0.05	-0.03	-0.08	-0.11	-0.02	-0.13	-0.02	-0.06	-0.08
Tea and coffee	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sugary drinks	-0.03	-0.02	-0.06	-0.31	-0.19	-0.50	-0.34	-0.09	-0.43
Less- and non-sugary drinks	-0.03	-0.02	-0.04	0.13	0.03	0.16	0.02	-0.01	0.01
Alcohol	-0.06	-0.04	-0.10	-0.26	-0.47	-0.72	-0.89	-0.14	-1.03
Food basket emissions per person per month	**-23.47**	**-23.04**	**-46.51**	**-7.46**	**-8.10**	**-15.31**	**-43.06**	**-7.35**	**-50.41**

Supplementary Table 7. Results of the two-sided t-tests of equality in average per person food basket emissions ($kgCO_2e$) across the different policy instruments

Policy instruments contrasted	Mean difference	95% Confidence Interval		Degrees of freedom	p-value
		Lower Bound	Upper Bound		
Carbon Tax (CT) vs. Carbon Information (CI)	-276.52	-319.12	-233.92	1978	<0.001
Health Tax (HT) vs. Health Information (HI)	-97.19	-114.06	-80.32	1957	<0.001
Carbon + Health Tax (CHT) vs. Unlabelled Tax (UT)	-88.20	-111.11	-65.30	1974	<0.001
Carbon Information (CI) vs. Baseline	-281.61	-329.24	-233.98	1978	<0.001
Health Information (HI) vs. Baseline	-86.49	-115.82	-57.16	1957	<0.001
Unlabelled Tax (UT) vs. Baseline	-516.66	-572.15	-461.15	1974	<0.001
Carbon Tax (CT) vs. Baseline	-558.13	-617.72	-498.55	1978	<0.001
Health Tax (HT) vs. Baseline	-183.67	-219.31	-148.04	1957	<0.001
Carbon + Health Tax (CHT) vs. Baseline	-604.89	-664.25	-545.46	1974	<0.001
Carbon Tax (CT) vs. Carbon + Health Tax (CHT)	46.72	-37.38	130.83	3952	0.276
Carbon Tax (CT) vs. Unlabelled Tax (UT)	-41.48	-122.89	39.93	3952	0.318

Supplementary Table 8. Average per person total emissions ($kgCO_2e$) at food basket level by tax rate group (low, medium, high) in the scenarios applying the CT, UT and CHT policy instruments

	Average per person total emission reductions ($kgCO_2e$) at food basket level by tax rate		
Policy instrument	**Low tax rate**	**Medium tax rate**	**High tax rate**
Carbon Tax (CT)	-374.33 [-546.34; -202.33]	-625.66 [-775.26; -476.05]	-674.46 [-843.20; -505.72]
Unlabelled Tax (UT)	-241.10 [-413.56; -68.63]	-649.67 [-787.71; -511.62]	-668.02 [-821.13; -514.90]
Carbon + Health Tax (CHT)	-346.41 [-515.81; -177.02]	-721.58 [-858.80; -584.37]	-755.57 [-900.01; -611.12]

Note: for each policy instrument, the average level of reductions in emissions at food basket level by tax rate is reported alongside with the 95% Confidence Intervals (in parenthesis); low, medium and high tax rates refer to different tax designs depending on the policy instrument: when the Carbon (Information and) Tax (CT) policy instrument is considered, a low tax rate is assumed to correspond to a carbon price of £30/tCO_2e, a medium tax rate to a carbon price of £60/tCO_2e and a high tax rate to a carbon price of £90/tCO_2e. When the Unlabelled Tax (UT) and Carbon + Health (Information and) Tax (CHT) policy instruments are considered, carbon taxes are additionally combined with a health tax. A low health tax rate is assumed to be a 5% increase in the price of foods with Nutri-Score D (25% if Nutri-Score E), a medium health tax rate is assumed to be equivalent to a 15% increase in the price of Nutri-Score D products (35% if Nutri-Score E) and a high tax rate is considered to be a 25% price increase for foods with Nutri-Score D (45% if Nutri-Score E).

Supplementary Note 1. The UK pathway towards achieving net zero by 2050

This Supplementary Note summarizes the main information and assumptions regarding the 2050 UK net zero targets underlying the calculations reported in Table 1 of the manuscript.

Based on the latest report from the Committee on Climate Change (2019)[1], the UK's ambitious emission reduction plan to achieve net zero will require total UK emissions to be reduced by 100% (compared to 1990 levels) by 2050. The achievement of this target will therefore demand that annual greenhouse gas emissions, equal to 794.4 $MtCO_2e$ in 1990 and to 503 $MtCO_2e$ in 2017 (the latest available estimate of the current levels), will fall to zero by 2050.

To reach this target, the UK will rely on a series of planned policies to decarbonise the various sectors of the economy – including low-cost and low-regret policies (Core options scenario) that will allow to achieve about 214 $MtCO_2e$ by 2050 and some more ambitious interventions (Further ambition scenario) that are expected to lead to the achievement of about 90 $MtCO_2e$ by 2050. A summary of the current (2017) levels of emissions in each sector of the economy, the planned interventions of decarbonisation and each sector's target for 2050 (under the 'core' and 'further ambition' scenarios) is outlined below:

			Emission levels expected to be achieved in 2050	
Sector of the economy	Main mechanisms to reduce emissions	2017 emission levels	**Core options scenario**	**Further ambition scenario**
Power sector	Deployment of renewable energies	73 $MtCO_2e$	7 $MtCO_2e$	3 $MtCO_2e$
Building sector (heating)	Low-carbon and energy efficient solutions	85 $MtCO_2e$	around 20 $MtCO_2e$	4 $MtCO_2e$
Surface transport	Renewable fuels	117 $MtCO_2e$	Approx. 30 $MtCO_2e$	2 $MtCO_2e$
Aviation/shipping transport	Fuel efficiency and constrained demand	50.3 $MtCO_2e$	41.9 $MtCO_2e$	Approx. 32 $MtCO_2e$
Industry sector	Energy efficiency	105 $MtCO_2e$	56 $MtCO_2e$	10 $MtCO_2e$
Agriculture	On-farm emission reductions	45.6 $MtCO_2e$	38.6 $MtCO_2e$	26 $MtCO_2e$
Land use change and forestry	Afforestation	12 $MtCO_2e$	8.2 $MtCO_2e$	-2 $MtCO_2e$

The above interventions will, however, be insufficient to meet the net zero target by 2050. Specific greenhouse gas removal technologies (including DACCS and BECCS) will additionally be required to cut to zero the residual greenhouse gas emissions (about 90 $MtCO_2e$ by 2050).

In our analysis, reported in Table 1, we scaled up the per person yearly emission reductions that can be achieved through the policy instruments examined in the survey, by considering the average number of people in UK households (2.4) and the total number of households in the UK (27.2 million)[2]. Then, we compared these aggregate values with the total emission reductions required to achieve the net zero target by 2050 (503 $MtCO_2e$) and the level of residual emissions that will need to be removed through additional carbon capture and storage technologies (90 $MtCO_2e$). To avoid double-counting, to this latter amount we added an additional 12.4 $MtCO_2e$, which corresponds to the emission reductions expected to result from dietary shifts in the further ambition scenario. This way, in Table 1, we considered 102.4 $MtCO_2e$ as the total UK emission reductions that will need to be removed after implementing planned policies of decarbonisation of the different sectors of the economy.

[1]Committee on Climate Change (2019). Net zero: the UK's contribution to stopping global warming. May 2019

[2]https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/families/bulletins/familiesandhouseholds/2017#:~:text=The%20number%20of%20households%20has,2.4%20people%20over%20the%20decade

Supplementary Table 9. Average per person per month reported volume (in kg or litres) of each food group by policy stream (with Nutri-Score information)

FOOD GROUP	Nutri-Score	CIT			HIT			UT/CHT		
		Baseline	Policy instruments		Baseline	Policy instruments		Baseline	Policy instruments	
			Carbon Information	Carbon Tax		Health Information	Health Tax		Unlabelled Tax	Carbon + Health Tax
Fruits and vegetables	A	15.99	16.01	16.03	15.61	16.15	16.28	16.01	15.93	16.23
Bread, pasta, rice and flour	A	4.40	4.34	4.32	4.39	4.40	4.40	4.42	4.38	4.41
Breakfast cereals	C	0.93	0.92	0.93	0.97	0.95	0.93	1.00	1.00	0.98
Milk and yoghurt	B	7.57	7.49	7.38	7.49	7.44	7.38	7.99	7.90	7.83
Plant-based milk	B	0.75	0.84	0.86	0.88	0.94	0.89	0.80	0.78	0.80
Cheese	D	0.76	0.70	0.65	0.76	0.67	0.60	0.77	0.67	0.61
Butter and cream	D	0.50	0.49	0.46	0.46	0.40	0.36	0.49	0.43	0.40
Eggs	A	0.98	0.97	0.97	0.95	0.97	0.97	1.00	0.99	1.02
Unprocessed beef	B	1.43	1.16	0.92	1.40	1.42	1.41	1.42	1.01	0.97
Processed beef	D	0.30	0.24	0.20	0.31	0.26	0.22	0.33	0.23	0.19
Lamb	C	0.39	0.35	0.31	0.39	0.37	0.35	0.42	0.34	0.34
Pork	C	1.67	1.69	1.56	1.69	1.56	1.48	1.69	1.52	1.45
Poultry	B	2.00	2.03	2.06	2.04	2.11	2.11	1.99	2.00	2.03
Meat alternatives	A	0.30	0.34	0.36	0.28	0.30	0.30	0.30	0.30	0.31
Fish and seafood	B	0.72	0.70	0.67	0.69	0.72	0.72	0.69	0.65	0.65
Meat-based ready meals and pizza	C	1.04	0.99	0.91	0.98	0.90	0.84	0.99	0.87	0.85
Fish- and veg-based ready meals	C	0.47	0.48	0.47	0.47	0.46	0.45	0.50	0.46	0.46
Unhealthy snacks	E	1.81	1.78	1.73	1.85	1.62	1.42	1.83	1.58	1.49
Less unhealthy snacks	C	0.59	0.58	0.57	0.59	0.56	0.55	0.59	0.58	0.57
Tea and coffee	B	0.35	0.34	0.34	0.33	0.34	0.33	0.32	0.32	0.31
Sugary drinks	E	2.63	2.57	2.52	2.97	2.26	1.85	3.01	2.30	2.11
Less- and non-sugary drinks	C	4.30	4.26	4.24	4.58	4.82	4.88	4.28	4.30	4.29
Alcohol	E	3.29	3.25	3.23	3.43	3.27	3.01	3.38	2.87	2.78

Supplementary Table 10. Summary of per capita volume of purchase and price range (in GBP) for each food category, based on the 2017 GB Kantar FMCG panel

FOOD CATEGORY	Volume (g or ml) per capita per day			Price range (in GBP)								
	Mean	95% Confidence Interval		mean	p50	sd	p1	p5	p25	p75	p95	p99
		Lower Bound	Upper Bound									
Oranges and clementines	14.72	14.59	14.84	1.96	1.79	0.85	0.80	1.07	1.43	2.31	3.33	4.67
Apples and pears	25.40	25.26	25.53	1.99	1.87	0.74	0.75	1.00	1.53	2.28	3.38	4.38
Bananas	30.96	30.64	31.27	0.82	0.75	0.22	0.35	0.56	0.67	0.92	1.11	1.56
Grapes	10.03	9.95	10.11	3.58	3.50	0.73	1.98	2.50	3.18	4.00	4.75	5.88
Strawberries	8.32	8.24	8.39	7.63	7.14	3.76	2.25	3.16	4.30	10.00	13.33	16.60
Peaches, nectarines and plums	6.07	6.02	6.11	1.82	1.58	1.07	0.82	0.90	1.00	2.00	4.00	6.00
Pineapple	2.47	2.45	2.49	0.75	0.79	0.25	0.38	0.41	0.62	0.83	1.25	1.67
Fresh lettuce	4.81	4.77	4.84	1.98	1.60	1.10	0.84	0.98	1.11	2.50	4.00	5.00
Fresh tomatoes	11.80	11.73	11.87	3.03	2.46	1.75	0.92	1.32	1.92	3.53	6.82	8.00
Fresh carrots	15.92	15.76	16.07	0.64	0.48	0.64	0.20	0.29	0.44	0.60	1.50	3.08
Fresh potatoes	56.29	55.85	56.72	0.99	0.82	0.68	0.12	0.40	0.60	1.11	2.22	4.25
Onions	10.14	10.06	10.23	1.01	0.75	0.62	0.39	0.45	0.64	1.28	2.17	3.75
Cauliflower, cabbage and broccoli	13.48	13.40	13.57	1.53	1.16	1.59	0.32	0.73	1.06	1.39	3.45	10.00
Tomato products	9.70	9.61	9.79	1.23	0.85	0.93	0.63	0.70	0.73	1.30	2.64	5.00
Canned pulses	15.90	15.73	16.07	1.45	1.20	0.84	0.55	0.56	0.76	1.85	3.13	3.80
Dried and frozen pulses	8.04	7.94	8.13	3.90	3.26	4.40	0.76	0.85	1.50	5.55	8.00	12.90
Chips and fries	13.54	13.44	13.64	1.66	1.33	1.22	0.50	0.63	0.99	1.92	4.38	7.41
Bread	53.61	53.34	53.89	1.44	1.25	0.81	0.45	0.56	1.05	1.75	2.93	4.50
Muesli, porridge, branflakes and cornflakes	13.89	13.79	13.99	3.38	2.78	2.47	0.75	0.78	2.00	4.00	7.42	14.04
Sugary breakfast cereals and granola	7.51	7.46	7.55	3.35	2.86	1.91	1.15	1.39	2.27	4.00	6.33	8.16
Pasta	6.92	6.87	6.97	1.30	1.10	0.99	0.40	0.40	0.90	1.54	2.62	5.16
Rice	5.30	5.12	5.49	2.52	1.88	14.21	0.40	0.45	1.30	2.76	5.44	8.10
Flour	6.01	5.91	6.12	3.42	0.53	60.94	0.30	0.30	0.37	0.90	1.66	2.23
Whole milk	54.42	53.41	55.43	0.60	0.44	0.28	0.43	0.43	0.44	0.70	1.00	1.43
Skimmed and semi-skimmed milk	173	171	175	0.58	0.44	0.27	0.40	0.43	0.44	0.66	1.00	1.43
Plant-based milk	7.64	7.46	7.82	1.13	1.00	0.41	0.59	0.59	0.85	1.40	1.80	2.00

Supplementary Table 10 - continued

FOOD CATEGORY	Volume (g or ml) per capita per day			Price ranges (in GBP)								
	Mean	95% Confidence Interval		mean	p50	sd	p1	p5	p25	p75	p95	p99
		Lower Bound	Upper Bound									
Yoghurt - low fat and low sugar	24.13	23.96	24.29	2.69	2.27	1.47	0.70	1.14	1.90	3.13	5.00	6.76
Yoghurt - not diet	5.41	5.34	5.49	2.82	2.47	1.37	0.90	1.36	2.00	3.33	5.04	6.75
Hard cheese	14.48	14.39	14.57	7.30	6.00	3.52	3.18	4.13	5.00	8.33	13.89	20.00
Soft and spreadable cheese	3.57	3.55	3.60	6.74	6.00	3.33	2.28	2.45	4.25	8.00	13.21	17.14
Butter	6.65	6.59	6.71	5.29	5.20	1.13	3.50	3.78	4.36	6.00	7.20	8.00
Cream	5.41	5.36	5.46	3.59	3.33	1.52	1.20	1.71	2.82	4.00	6.20	9.68
Eggs	15.24	15.11	15.36	2.58	2.51	1.95	1.25	1.36	1.84	2.87	4.40	6.38
Beef mince and diced	7.62	7.57	7.67	6.07	6.18	2.14	2.90	3.18	4.58	7.23	9.38	10.93
Beef steaks	2.14	2.12	2.16	13.79	13.61	5.68	6.10	6.41	10.00	15.58	24.44	33.70
Beef roasting joints	2.03	2.01	2.05	8.20	7.90	2.97	2.51	3.41	6.23	10.05	12.60	17.18
Processed beef and processed lamb	8.64	8.57	8.70	9.33	7.92	6.12	1.35	2.94	5.00	12.00	20.83	32.71
Raw lamb chops	0.45	0.44	0.47	10.09	9.97	3.38	4.70	5.63	8.72	11.25	15.69	22.45
Raw lamb leg and shoulder	1.41	1.39	1.44	8.13	7.89	2.94	2.05	4.32	6.46	9.44	12.78	17.62
Pork loin, chops and mince	3.08	3.05	3.11	5.05	4.77	1.48	2.56	3.32	3.99	5.93	7.50	10.13
Pork joints	2.43	2.41	2.45	4.48	3.98	2.41	1.48	2.20	2.89	5.22	9.55	12.26
Pork sausages and bacon	2.85	2.82	2.88	6.29	6.36	2.79	1.14	1.20	4.30	8.00	10.87	15.56
Ham	5.73	5.68	5.78	9.32	8.66	4.81	3.48	3.73	5.00	12.00	18.64	24.00
Poultry breast and boneless thighs	14.41	14.21	14.60	5.41	5.79	2.32	1.61	1.90	3.82	6.31	8.75	12.50
Whole chicken	9.68	9.62	9.74	2.58	2.36	1.01	1.31	1.81	2.07	2.75	4.23	6.63
Processed poultry	11.62	11.52	11.72	7.56	6.40	4.16	2.25	2.84	4.43	10.00	15.63	20.83
Meat alternatives	1.76	1.74	1.78	6.60	5.86	3.32	2.66	2.78	4.41	8.33	13.89	17.50
Raw fish and seafood	3.69	3.65	3.73	12.98	12.96	6.20	3.55	4.61	8.33	16.21	22.73	33.33
Processed fish and seafood	9.88	9.81	9.96	7.34	6.00	4.57	2.35	2.87	4.30	9.28	16.00	22.79
Smoked salmon	0.30	0.30	0.31	26.18	25.00	8.46	10.75	15.00	18.95	31.00	40.00	53.00
Ready meals: meat-based, fish-based and vegetarian/vegan ready meals	44.72	44.53	44.91	5.44	4.90	3.24	0.73	1.88	3.33	6.67	11.11	16.31
Pizza	8.52	8.47	8.57	4.81	4.25	2.15	2.13	2.46	3.33	5.65	9.00	12.09
Chocolate	13.42	13.34	13.51	9.27	8.00	6.08	2.71	3.13	6.25	10.00	20.00	33.33
Biscuits	19.50	19.40	19.59	4.28	3.75	2.81	0.78	1.07	2.25	5.62	8.83	13.53

Supplementary Table 10 - continued

FOOD CATEGORY	Volume (g or ml) per capita per day			Price ranges (in GBP)								
	Mean	95% Confidence Interval		mean	p50	sd	p1	p5	p25	p75	p95	p99
		Lower Bound	Upper Bound									
Ice-cream	15.22	15.09	15.35	3.45	2.90	2.14	0.46	0.83	2.00	4.55	7.58	10.81
Cake	8.79	8.72	8.87	5.18	4.39	3.31	1.08	1.67	2.97	6.67	11.29	16.67
Crisps	6.04	5.99	6.09	6.97	6.67	3.06	2.75	3.32	5.67	6.73	11.93	19.70
Nuts and dry fruit	5.96	5.89	6.02	8.86	7.50	11.94	1.76	2.00	4.11	11.50	20.00	28.00
Savoury snacks	10.31	10.25	10.37	7.72	6.67	4.47	2.09	2.86	5.20	9.52	15.63	22.73
Breakfast tea	3.78	3.73	3.84	13.99	7.38	18.36	2.50	2.98	5.00	13.76	50.00	83.28
Instant coffee	2.18	2.15	2.20	17.76	16.67	10.04	5.27	6.71	10.39	22.90	32.50	49.47
Sugary soft drinks	46.38	45.61	47.16	1.14	0.90	0.89	0.18	0.21	0.50	1.49	3.00	3.99
Diet soft drinks	83.38	82.36	84.40	0.67	0.49	0.72	0.09	0.17	0.33	0.80	1.98	3.00
Sugary (fruit) juices and squash	19.86	19.63	20.09	1.40	1.00	2.08	0.43	0.50	0.69	1.49	2.93	6.30
No added sugar (fruit) juices and squash	53.04	52.66	53.42	1.33	0.99	2.52	0.50	0.56	0.67	1.25	2.67	6.00
Beer and cider	65.17	63.56	66.77	2.54	2.50	1.05	1.00	1.14	1.78	3.08	4.34	5.77
Wine	39.38	38.75	40.01	6.62	6.00	3.19	1.79	3.64	5.19	7.50	10.67	16.00
Spirits	9.10	8.97	9.23	17.87	16.00	12.87	5.36	7.13	15.00	19.50	31.43	41.43

Note: p50=percentile 50th; sd= standard deviation; p1=percentile 1st; p5=percentile 5th; p25=percentile 25th; p75=percentile 75th; p95=percentile 95th; p99=percentile 99th. The 2017 GB Kantar FMCG panel didn't allow to separately identify information for processed beef and processed lamb, as well as for the different types of ready meals (i.e. meat-based, fish-based, vegetarian/vegan ready meals) which are therefore reported jointly in the Table, but displayed separately in the survey. In addition, for specific products (peaches, nectarines and plums; raw lamb chops; pork sausages and bacon; wine) we didn't consider the p25-p75 truncation (employed for all other products) to generate prices, but ad hoc truncations that more closely reflected current prices, namely: p50-p95 for peaches, nectarines and plums (mean: 2.29; standard deviation: 0.59); p25-p95 for raw lamb chops (mean: 10.81; standard deviation: 1.45); p5-p95 for pork sausages and bacon (mean: 6.22; standard deviation: 2.07); and p5-p95 for wine (mean: 6.41; standard deviation: 1.58). Before applying the price ranges reported in this Table (and footnote) to the different food products, we adjusted the prices for inflation given that the Kantar FMCG data refer to 2017. To obtain 2020-equivalent prices, which we used in the survey, we applied the GDP deflator to the price data, following the UK Government guidelines outlined at: https://commonslibrary.parliament.uk/research-briefings/sn04962/

Supplementary Table 11. Summary of reviewed Life-Cycle Assessment studies reporting information on the greenhouse gas emissions of each food category

FOOD CATEGORY	$kgCO_2e$/FU Mean	$kgCO_2e$/FU Median	Functional Unit (FU)	$kgCO_2e$/ kg or l Mean/Median	Source
FRUIT					
Oranges and clementines	0.4	0.3	1 kg of fresh fruit		This is the figure for citrus fruits reported in Poore and Nemecek (2018)[1]
Apples and pears	0.4	0.4	1 kg of fresh fruit		This is the figure for apples reported in Poore and Nemecek (2018)[1], which can also be applied to pears (the average of UK fresh pears (0.5) and imported pears (0.3) as reported in Frankowska et al. (2019a)[2] is also 0.4).
Bananas	0.9	0.8	1 kg of fresh fruit		This is the figure for bananas reported in Poore and Nemecek (2018)[1]
Grapes	1.5	1.4	1 kg of fresh fruit		This is the figure for grapes and berries reported in Poore and Nemecek (2018)[1]
Strawberries	1.5	1.4	1 kg of fresh fruit		This is the figure for grapes and berries reported in Poore and Nemecek (2018)[1]
Peaches, nectarines and plums	1.1	0.7	1 kg of fresh fruit		This is the figure for "other fruit" reported in Poore and Nemecek (2018)[1]
Pineapple	1.1	0.7	1 kg of fresh fruit		This is the figure for "other fruit" reported in Poore and Nemecek (2018)[1]
VEGETABLES					
Fresh lettuce	1.81		1 kg of lettuce		This is the average of: UK fresh lettuce (1.45), imported fresh lettuce (1.72), UK processed lettuce (1.91) and imported processed lettuce (2.17), based on Frankowska et al. (2019b)[3]
Fresh tomato	2.1	0.7	1 kg of fresh vegetable		This is the figure for tomatoes reported in Poore and Nemecek (2018)[1]
Fresh carrots	1.28		1 kg of fresh carrots		This figure is the average of: UK fresh carrots (1.12) and imported fresh carrots (1.44), based on Frankowska et al. (2019b)[3]
Fresh potatoes	0.5	0.5	1 kg of soil free tuber		This is the figure for potatoes reported in Poore and Nemecek (2018)[1]
Onions	0.5	0.4	1 kg of fresh vegetable		This is the figure for onions and leeks reported in Poore and Nemecek (2018)[1]
Cauliflower, cabbage and broccoli	0.5	0.4	1 kg of fresh vegetable		This is the figure for brassicas reported in Poore and Nemecek (2018)[1]
Tomato products	2.14		1 kg of tomato product		This figure is the average of: UK canned tomatoes (1.95), imported canned tomatoes (1.96), UK bottled tomatoes (2.32) and imported bottled tomatoes (2.33) reported in Frankowska et al. (2019b)[3]
Canned pulses	2.06		1 kg of canned baked beans and canned pulses		This figure is the average of: UK canned baked beans (1.8), imported canned baked beans (2.51), UK canned pulses (1.90) and imported canned pulses (2.03) reported in Frankowska et al. (2019b)[3]
Dried and frozen pulses	1.4	1.1	1 kg of dry pea or pulse without pod		This figure is the average between 'peas' (mean: 1, median: 0.8) and 'other pulses' (mean: 1.8, median: 1.4) reported in Poore and Nemecek (2018)[1]
Chips and fries	3.85		1 kg of potato chips		This figure is an average of: UK chips (3.78) and imported chips (3.92) reported in Frankowska et al. (2019b)[3]

Supplementary Table 11 – continued

FOOD CATEGORY	$kgCO_2e$/FU		Functional Unit (FU)	$kgCO_2e$/ kg or l	Source
	Mean	Median		Mean/Median	
BREAD, CEREALS AND GRAINS					
Bread	1.6	1.3	1 kg of wheat/rye (bread)		This is the figure for wheat and rye (bread) reported in Poore and Nemecek (2018)[1]
Muesli, porridge, branflakes and cornflakes	2.64		1 kg of product		This is the figure for ready-to-eat breakfast cereals and snacks reported in Jeswani et al. (2015)[4]
Sugary breakfast cereals and granola	2.64		1 kg of product		This is the figure for ready-to-eat breakfast cereals and snacks reported in Jeswani et al. (2015)[4]
Pasta	1.6	1.3	1 kg of wheat/rye (bread)		This is the figure for wheat and rye (bread) reported in Poore and Nemecek (2018)[1]
Rice	4.5	3.7	1 kg of product		This is the figure for rice reported in Poore and Nemecek (2018)[1]
Flour	1.6	1.3	1 kg of wheat/rye (bread)		This is the figure for wheat and rye (bread) reported in Poore and Nemecek (2018)[1]
DAIRY PRODUCTS AND EGGS					
Whole milk	3.2	2.7	1 litre of pastorised dairy milk (4% fat, 3.3% protein)		This is the figure for milk reported in Poore and Nemecek (2018)[1]
Skimmed and semi-skimmed milk	3.2	2.7	1 litre of pastorised dairy milk (4% fat, 3.3% protein)		This is the figure for milk reported in Poore and Nemecek (2018)[1]
Plant-based milk	1	0.9	1 litre of soymilk		This is the figure for soymilk reported in Poore and Nemecek (2018)[1]
Yoghurt - low fat and low sugar	3.2	2.7	1 litre of pastorised dairy milk (4 fat, 3.3% protein)		In the absence of specific greenhouse gas emission data on yoghurt, it is assumed that the figure for milk, as reported in Poore and Nemecek (2018)[1], can be applied.
Yoghurt - not diet	3.2	2.7	1 litre of pastorised dairy milk (4% fat, 3.3% protein)		In the absence of specific greenhouse gas emission data on yoghurt, it is assumed that the figure for milk, as reported in Poore and Nemecek (2018)[1], can be applied.
Hard cheese (*)	20.28	16.78	1 kg of cheese		This figure was derived from the Poore and Nemecek (2018)[1] source database (available at https://ora.ox.ac.uk/objects/uuid:a63fb28c-98f8-4313-add6-e9eca99320a5) by adjusting the assumptions on milk concentration. We assumed that 9.5 litres of milk are needed to produce one kg of hard cheese (cheddar) based on a Defra report available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/695327/milkutil-statsnotice-01mar18.pdf.
Soft and spreadable cheese (*)	15.55	12.91	1 kg of cheese		This figure was derived from the Poore and Nemecek (2018)[1] source database (available at https://ora.ox.ac.uk/objects/uuid:a63fb28c-98f8-4313-add6-e9eca99320a5) by adjusting the assumptions on milk concentration. We assumed that 7.13 litres of milk are needed to produce one kg of soft cheese. This milk-to-cheese conversion factor is the average between the amount of milk to produce 1 kg of mozzarella (9.8), cottage cheese (3.6) and soft cheese (8) based on a Defra report available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/695327/milkutil-statsnotice-01mar18.pdf.

Supplementary Table 11 - continued

FOOD CATEGORY	$kgCO_2e$/FU		Functional Unit (FU)	$kgCO_2e$/ kg or l	Source
	Mean	Median		Mean/Median	
Butter (*)	9.6		1 kg of butter		This is the figure for butter reported in Nilsson et al. (2010)[5]
Cream	3.2	2.7	1 litre of pastorised dairy milk (4% fat, 3.3% protein)		In the absence of data on cream, it is assumed that the figure for milk, as reported in Poore and Nemecek (2018)[1], can be applied.
Eggs	4.7	4.2	1 kg of eggs		This is the figure for eggs reported in Poore and Nemecek (2018)[1]
MEAT (AND MEAT ALTERNATIVES)					
Beef mince and diced (*)	99.5	60.4	1 kg of fat, bone-free meat		This is the figure for bovine meat (beef herd) reported in Poore and Nemecek (2018)[1]
Beef steaks (*)	99.5	60.4	1 kg of fat, bone-free meat		This is the figure for bovine meat (beef herd) reported in Poore and Nemecek (2018)[1]
Beef roasting joints (*)	99.5	60.4	1 kg of fat, bone-free meat		This is the figure for bovine meat (beef herd) reported in Poore and Nemecek (2018)[1]
Processed beef (*)	99.5	60.4	1 kg of fat, bone-free meat		Assumed to be the same as unprocessed bovine meat (beef herd) reported in Poore and Nemecek (2018)[1]
Raw lamb (*) chops	39.7	40.6	1 kg of fat, bone-free meat		This is the figure for lamb and mutton reported in Poore and Nemecek (2018)[1]
Raw lamb leg and shoulder (*)	39.7	40.6	1 kg of fat, bone-free meat		This is the figure for lamb and mutton reported in Poore and Nemecek (2018)[1]
Processed lamb (*)	39.7	40.6	1 kg of fat, bone-free meat		Assumed to be the same as unprocessed lamb and mutton reported in Poore and Nemecek (2018)[1]
Pork loin, chops and mince (*)	12.3	10.6	1 kg of fat, bone-free meat		This is the figure for pig meat reported in Poore and Nemecek (2018)[1]
Pork joints (*)	12.3	10.6	1 kg of fat, bone-free meat		This is the figure for pig meat reported in Poore and Nemecek (2018)[1]
Pork sausages and bacon (*)	12.3	10.6	1 kg of fat, bone-free meat		Assumed to be the same as unprocessed pig meat reported in Poore and Nemecek (2018)[1]
Ham (*)	12.3	10.6	1 kg of fat, bone-free meat		Assumed to be the same as unprocessed pig meat reported in Poore and Nemecek (2018)[1]
Poultry breast and boneless thighs	9.9	7.5	1 kg of fat, bone-free meat		This is the figure for poultry meat reported in Poore and Nemecek (2018)[1]
Whole chicken	9.9	7.5	1 kg of fat, bone-free meat		This is the figure for poultry meat reported in Poore and Nemecek (2018)[1]
Processed poultry	9.9	7.5	1 kg of fat, bone-free meat		Assumed to be the same as unprocessed poultry meat reported in Poore and Nemecek (2018)[1]
Meat alternatives	2.2		1 kg of product		The figure is the average of the carbon footprints of all Quorn meat-based substitutes (excluding ready meals), available on the company's website at: https://www.quorn.co.uk/files/content/Carbon_Footprint_Results-UK.pdf.
FISH					
Raw fish and seafood (*)	20.25	11.3	1 kg of edible fish/1 kg of head-free meat		This figure is the average between farmed fish (mean: 13.6, median: 7.9) and farmed crustaceans (mean: 26.9; median: 14.7) reported in Poore and Nemecek (2018)[1]
Processed fish and seafood (*)	20.25	11.3	1 kg of edible fish/1 kg of head-free meat		Assumed to be the same as unprocessed fish and seafood

Supplementary Table 11 - continued

FOOD CATEGORY	$kgCO_2e$/FU Mean	$kgCO_2e$/FU Median	Functional Unit (FU)	$kgCO_2e$/ kg or l Mean/Median	Source
Smoked salmon	13.6	7.9	1 kg of edible fish		This is the figure for farmed fish reported in Poore and Nemecek (2018)[1]
READY MEALS					
Meat-based ready meals (*)	4.26		per meal	11.83	The figure is the average of the emissions from: cottage pie, lasagna, spaghetti Bolognese, chicken korma and lamb masala reported in Schmidt Rivera and Azapagic (2019)[6]
Fish-based ready meals	2.8		per meal	7.78	This is the figure for Fisherman's pie reported in Schmidt Rivera and Azapagic (2019)[6]
Pizza (*)	3.61		per pizza (approx. 300gr of product)	12.03	As no information was available on the carbon footprint of pizzas, this figure was estimated starting from the carbon footprint of the main ingredients of pepperoni and margherita pizzas (most popular pizzas in the UK) and, additionally, by considering the carbon emissions from the cooking process, following the approach used in Schmidt Rivera et al. (2014)[7].
Vegetarian and vegan ready meals	3.4		per meal (i.e. 450gr. of product)	7.56	This figure is the average carbon footprint calculated for different vegetarian/vegan ready meals. As no information was available on the carbon footprint of vegetarian/vegan ready meals, we estimated the carbon footprint of spinach-ricotta cannelloni, macaroni cheese, vegetable curry and rice, and lentils' cottage pie (among the most popular vegetarian ready meals in the UK) based on the carbon footprint of their main ingredients and, additionally, by considering the carbon emissions from the cooking process, following the approach used in Schmidt Rivera et al. (2014)[7].
CONFECTIONERIES AND SNACKS					
Chocolate	46.7	5	1 kg of dark chocolate		This is the figure for dark chocolate reported in Poore and Nemecek (2018)[1]
Biscuits	1.39		1 kg of product		This figure is the average carbon footprint value across six different types of biscuits (amongst the most popular in the UK) as reported in Konstantas et al. (2019a)[8]: crackers (1.31), low fat/sugar biscuits (1.27), semi-sweet biscuits (1.28), chocolate-coated biscuits (1.81), chocolate cream sandwich (1.29) and vanilla cream sandwich (1.36)
Ice cream	2		1 litre of product		This figure is the average carbon footprint value across four different types of ice creams (amongst the most popular in the UK): vanilla ice-cream (regular: 3.75 and premium: 3.94) and chocolate (regular: 3.66 and premium: 3.91), as reported in Konstantas et al. (2019b)[9]. All these figures are per kg of ice-cream. Given that ice cream is usually measured in litres and 1L=0.56kg, we hereby report the equivalent average carbon footprint per litre of product.
Cake	2.48		1 kg of product		This figure is the average carbon footprint value across four different types of packaged cakes (amongst the most popular in the UK), as reported in Konstantas et al. (2019c)[10]: apple pies (i.e. all pies: 1.58), cheesecake (i.e. strawberry cheesecake: 4.83), cake slices (i.e. vanilla-flavoured cake slices with sugar icing: 1.78), whole cakes (i.e. Victoria sponges: 2.04) and cupcakes (2.18)
Crisps	4.43		1 kg of product		This is the average between UK (4.38) and imported crisps (4.48) reported in Frankowska et al. (2019)[3]

Supplementary Table 11 - continued

FOOD CATEGORY	$kgCO_2e$/FU		Functional Unit (FU)	$kgCO_2e$/ kg or l	Source
	Mean	Median		Mean/Median	
Nuts and dry fruit	1.8	1	1 kg of shell free, dry nuts		This is the average between nuts (mean: 0.4, median: -1.3) and groundnuts (mean: 3.2, median: 3.3) reported in Poore and Nemecek (2018)[1]
Savoury snacks	4.43		1 kg of product		No information was available on the carbon footprint of savoury snacks. However, in Green et al. (2015)[11], savoury snacks are grouped together with crisps in terms of greenhouse gas emissions. Therefore, for savoury snacks we use the same carbon footprint figure used for crisps.
BEVERAGES					
Breakfast tea	0.08		1 litre of tea		The carbon footprint of dry tea reported in Azapagic et al. (2016)[12] was used (10.46 kg CO_2e per kg of dry tea). However, to maintain comparability with other beverages, we report the carbon footprint per litre of beverage. It was assumed that 8 grams of dry tea are needed to make a litre of tea.
Instant coffee	1.71	0.5	1 litre of coffee		The carbon footprint of ground coffee reported in Poore and Nemecek (2018)[1] was used (mean 28.5, median 8.2 per kg of ground coffee). However, to maintain comparability with other beverages, we report the carbon footprint per litre of beverage. It was assumed that 60 grams of ground coffee are needed to make 1 litre of coffee.
Sugary soft drinks	0.3		1 litre of product		This is the average value for carbonated drinks reported in Amienyo et al. (2013)[13]
Diet soft drinks	0.3		1 litre of product		This is the average value for carbonated drinks reported in Amienyo et al. (2013)[13]
Sugary (fruit) juices and squash	0.99		1 litre of product		This is the figure for fruit juices and syrups reported in Wallén et al. (2004)[14]
No added sugar (fruit) juices and squash	0.99		1 litre of product		This is the figure for fruit juices and syrups reported in Wallén et al. (2004)[14]
Beer and cider	1.2	1.2	1 litre of beer		This is the figure for barley (beer) reported in Poore and Nemecek (2018)[1]
Wine	1.8	1.6	1 litre of wine		This is the figure for wine reported in Poore and Nemecek (2018)[1]
Spirits	3.40		1 litre of Scotch whiskey		This is the average for Scotch whiskey calculated using different methods as reported in Amienyo (2012)[15]

Note: in the survey we only applied carbon taxes to those products with greenhouse gas emissions above the average across all products (8.75 $kgCO_2e$ per kg or litre of food). The food products subject to a carbon tax are marked with (*) in this table.

References for Supplementary Table 11:

1. Poore, J. & Nemecek, T. Reducing food's environmental impacts through producers and consumers. *Science* **360**, 987–992 (2018).
2. Frankowska, A., Jeswani, H. K. & Azapagic, A. Life cycle environmental impacts of fruits consumption in the UK. *Journal of Environmental Management* **248**, 109111 (2019a).
3. Frankowska, A., Jeswani, H. K. & Azapagic, A. Environmental impacts of vegetables consumption in the UK. *Science of The Total Environment* **682**, 80–105 (2019b).
4. Jeswani, H. K., Burkinshaw, R. & Azapagic, A. Environmental sustainability issues in the food–energy–water nexus: Breakfast cereals and snacks. *Sustainable Production and Consumption* **2**, 17–28 (2015).
5. Nilsson, K. *et al.* Comparative life cycle assessment of margarine and butter consumed in the UK, Germany and France. *Int J Life Cycle Assess* **15**, 916–926 (2010).
6. Schmidt Rivera, X. C. & Azapagic, A. Life cycle environmental impacts of ready-made meals considering different cuisines and recipes. *Science of The Total Environment* **660**, 1168–1181 (2019).
7. Schmidt Rivera, X. C., Espinoza Orias, N. & Azapagic, A. Life cycle environmental impacts of convenience food: Comparison of ready and home-made meals. *Journal of Cleaner Production* **73**, 294–309 (2014).
8. Konstantas, A., Stamford, L. & Azapagic, A. Evaluation of environmental sustainability of biscuits at the product and sectoral levels. *Journal of Cleaner Production* **230**, 1217–1228 (2019a).
9. Konstantas, A., Stamford, L. & Azapagic, A. Environmental impacts of ice cream. *Journal of Cleaner Production* **209**, 259–272 (2019b).
10. Konstantas, A., Stamford, L. & Azapagic, A. Evaluating the environmental sustainability of cakes. *Sustainable Production and Consumption* **19**, 169–180 (2019c).
11. Green, R. *et al.* The potential to reduce greenhouse gas emissions in the UK through healthy and realistic dietary change. *Climatic Change* **129**, 253–265 (2015).
12. Azapagic, A., Bore, J., Cheserek, B., Kamunya, S. & Elbehri, A. The global warming potential of production and consumption of Kenyan tea. *Journal of Cleaner Production* **112**, 4031–4040 (2016).
13. Amienyo, D., Gujba, H., Stichnothe, H. & Azapagic, A. Life cycle environmental impacts of carbonated soft drinks. *Int J Life Cycle Assess* **18**, 77–92 (2013).
14. Wallén, A., Brandt, N. & Wennersten, R. Does the Swedish consumer's choice of food influence greenhouse gas emissions? *Environmental Science & Policy* **7**, 525–535 (2004).
15. Amienyo, D. Life Cycle Sustainability Assessment in the UK Beverage Sector. (The University of Manchester, 2012).

Supplementary Table 12. Overview of the Nutri-Score information for each food category displayed in the survey.

For each food category, columns 2-6 report the number of purchased items per Nutri-Score letter (A-E) based on the actual purchases reported in the 2017 GB Kantar FMCG panel (after truncating the data between the 25th and 75th percentiles, to avoid extremes). The last column reports the Nutri-Score displayed in the survey for each food category.

FOOD CATEGORY	Number of purchased items by Nutri-Score letter (based on Kantar data)					Nutri-Score displayed in the survey
	A	B	C	D	E	
Oranges and clementines	**129,002**	0	0	0	0	A
Apples and pears	**255,579**	0	0	0	0	A
Bananas	**242,267**	0	0	0	0	A
Grapes	**198,538**	0	0	0	0	A
Strawberries	**215,750**	0	0	0	0	A
Peaches, nectarines and plums	**86,823**	0	0	0	0	A
Pineapple	**23,093**	0	0	0	0	A
Fresh lettuce	**90,227**	0	0	0	0	A
Fresh tomatoes	**242,258**	0	0	0	0	A
Fresh carrots	**129,320**	0	0	0	0	A
Fresh potatoes	**283,628**	0	0	0	0	A
Onions	**132,184**	0	0	0	0	A
Cauliflower, cabbage and broccoli	**195,050**	0	0	0	0	A
Tomato products	**125,023**	0	61	0	0	A
Canned pulses	**206,581**	0	0	0	0	A
Dried and frozen pulses	**131,518**	98	487	74	4	A
Chips and fries	**99,132**	14,965	8	348	0	A
Bread	**514,322**	9,386	3,441	12,714	0	A
Muesli, porridge, branflakes and cornflakes	**141,563**	33,915	25,201	1,853	0	C
Sugary breakfast cereals and granola	3,144	453	**96,772**	32,040	0	A
Pasta	**84,670**	1,663	0	0	0	A
Rice	**39,225**	10,309	769	0	0	A
Flour	**32,610**	2,931	403	0	0	A
Whole milk	1	**124,040**	979	0	0	B
Skimmed and semi-skimmed milk	**252,513**	251,888	85	0	0	A
Plant-based milk	13,847	**21,351**	1,410	0	0	B
Yoghurt - low fat and low sugar	**180,302**	175,381	31,730	0	0	A
Yoghurt - not diet	0	0	**81,821**	11,073	0	C
Hard cheese	0	465	19,063	**348,021**	11,455	D
Soft and spreadable cheese	1,969	2,321	45,274	**91,735**	1,366	D
Butter	0	0	0	57,334	**78,288**	E
Cream	0	1,674	5,697	**122,429**	4,712	D
Eggs	**224,487**	0	0	0	0	A
Beef mince and diced	**40,600**	34,657	18,214	17,357	0	A
Beef steaks	**20,068**	15,834	4,051	3,077	0	A
Beef roasting joints	**9,680**	4,533	1,065	141	0	A
Processed beef and processed lamb	4,104	17,332	34,983	**198,328**	39,053	D
Raw lamb chops	0	27	302	**5,797**	0	D
Raw lamb leg and shoulder	1	**4,661**	3,068	1,741	0	B
Pork loin, chops and mince	6,723	8,212	**19,752**	5,743	0	C
Pork joints	1,291	5,526	**6,132**	3,179	0	C
Pork sausages and bacon	124	3,260	5,119	**41,537**	15,699	D
Ham	1,593	20,880	**119,766**	73,982	431	C
Poultry breast and boneless thighs	**138,453**	15,480	483	1	0	A
Whole chicken	**27,391**	20,154	35	5,307	0	A
Processed poultry	60,306	**139,041**	67,653	30,114	42	B
Meat alternatives	**45,105**	8,578	3,708	194	0	A
Raw fish and seafood	**49,021**	32,120	1,661	541	219	A
Processed fish and seafood	**106,722**	93,592	32,447	11,221	2,187	A
Smoked salmon	56	4,870	752	**9,588**	0	D

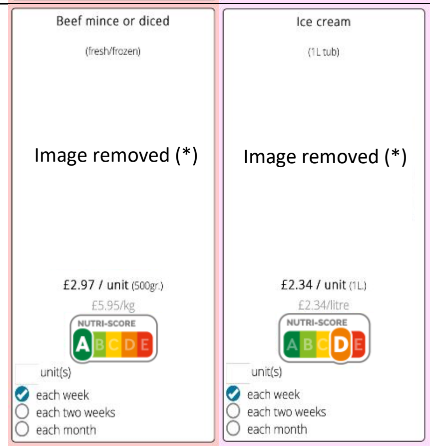
Supplementary Table 12 - continued

FOOD CATEGORY	Number of purchased items by Nutri-Score letter (based on Kantar data)					Nutri-Score displayed in the survey
	A	B	C	D	E	
Ready meals: meat-based, fish-based and vegetarian/vegan ready meals	349,872	160,433	136,525	178,876	2,389	see footnote
Pizza	19,879	**76,585**	58,790	39,030	0	B
Chocolate	6	87	431	15,789	**519,158**	E
Biscuits	114	2,594	37,944	129,980	**399,523**	E
Ice-cream	256	1,146	46,288	**122,206**	28,752	D
Cake	781	5,331	51,523	**142,355**	7,645	D
Crisps	69	4,781	**185,001**	44,768	290	C
Nuts and dry fruit	30,308	25,123	**110,372**	12,157	3,987	C
Savoury snacks	5,118	6,748	122,658	**274,285**	49,002	D
Breakfast tea	0	**88,951**	0	1,144	1,067	B
Instant coffee	14,707	**63,023**	433	5,801	16,003	B
Sugary soft drinks	0	0	2,639	30,230	**115,431**	E
Diet soft drinks	0	**206,682**	83,706	750	2	B
Sugary (fruit) juices and squash	0	17,591	28,771	16,045	**46,964**	E
No added sugar (fruit) juices and squash	0	58,902	**252,257**	26,684	876	C
Beer and cider	0	87	25,520	**99,254**	23,567	D
Wine	0	0	6	282	**204,638**	E
Spirits	0	0	0	0	**47,934**	E

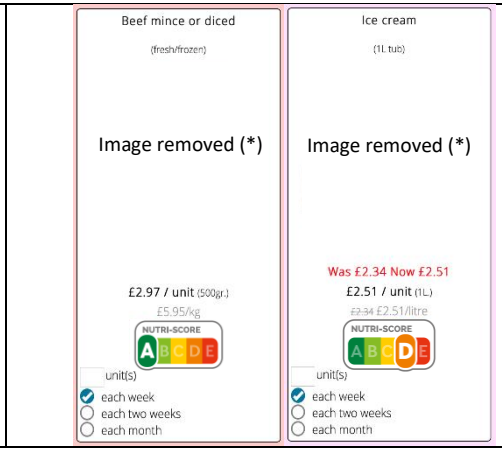
Note: in the 2017 GB Kantar FMCG panel, the different types of ready meals (i.e meat-based, fish-based and vegetarian/vegan ready meals) cannot be separately identified. Hence, given the distribution of purchased items across the different Nutri-Score letters, we relied on the judgement of health experts in the project team to classify meat-based and fish-based ready meals as D and vegetarian/vegan ready meals as A.

Supplementary Table 13. Screenshots from the survey to show how information and/or price variations were presented to respondents in the different policy streams and for each of the associated policy instruments. Two example food categories are reported: beef mince or diced as an example of food with high greenhouse gas emissions and ice cream as an example of unhealthy food.

(*) Please, note that food images that were shown to respondents have been removed from this Supplementary Table for publication due to third party rights restrictions. A copy of the below screenshots as displayed to respondents in the survey can be made available upon request from the authors.

	CIT Policy Stream	HIT Policy Stream	UT/CHT Policy Stream
Baseline			
Policy Instrument 1			

Supplementary Table 13 - continued

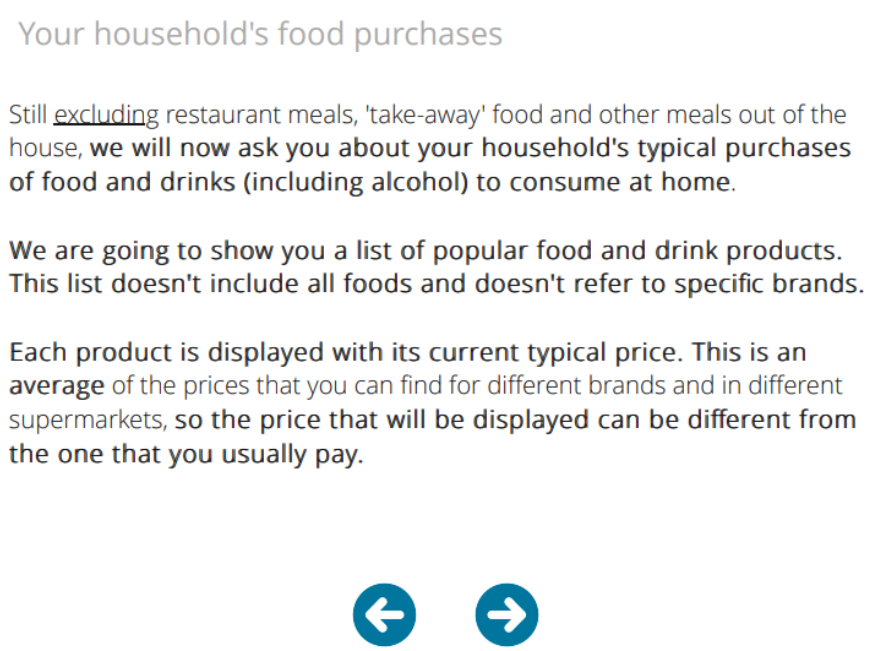
Policy Instrument 2			

Supplementary Note 2: Excerpt of the text presented to respondents in the survey to describe each of the health and/or carbon policy interventions.

(*) Please, note that food images that were shown to respondents have been removed from this Supplementary Note for publication due to third party rights restrictions. A copy of the survey as displayed to respondents can be made available upon request from the authors.

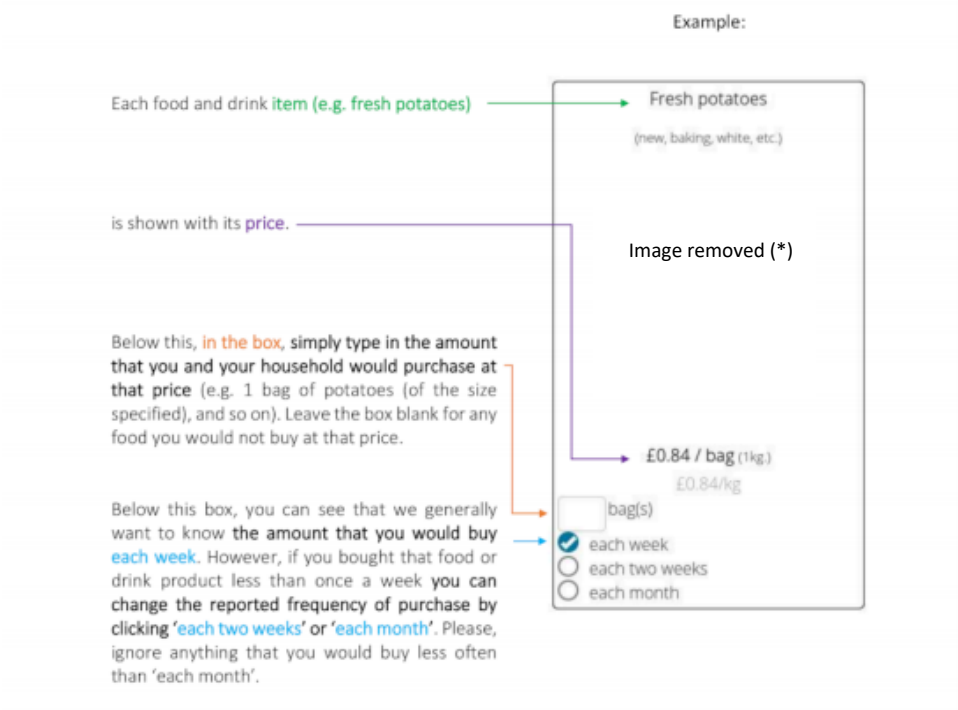
CARBON INFORMATION AND TAX (CIT) POLICY STREAM:

BASELINE:



We want you to please tell us how much of each type of food and drink you and your household would usually purchase to consume at home. *Please, ignore special occasions (e.g. birthdays) and unusual circumstances (e.g. the Corona-virus outbreak) and just focus on your household's typical food shopping.*

To answer this, we have set up an online food shop where we display food and drink products, organised by categories (e.g. fruit, vegetables, meat, etc.).



Based on your responses, the total cost of your household's food shopping will be displayed at the bottom of the screen. A message will appear if your total spending exceeds the amount that your household normally spends on food.

We make food choices every day and these add up to be some of the major spending choices we make.

Therefore, please carefully consider the following questions about food purchase decisions.

These questions are timed to ensure that you take the time needed to consider your responses.

How much of each type of food and beverage would you and your HOUSEHOLD usually purchase to consume at home at the specified prices and given the information provided?

Please consider all of the food and drink products that you would buy to consume at home from e.g. supermarkets in person, online, independent/corner shops, etc. If you would buy any product less often than monthly, or if you wouldn't buy it at all, please leave the box blank.

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

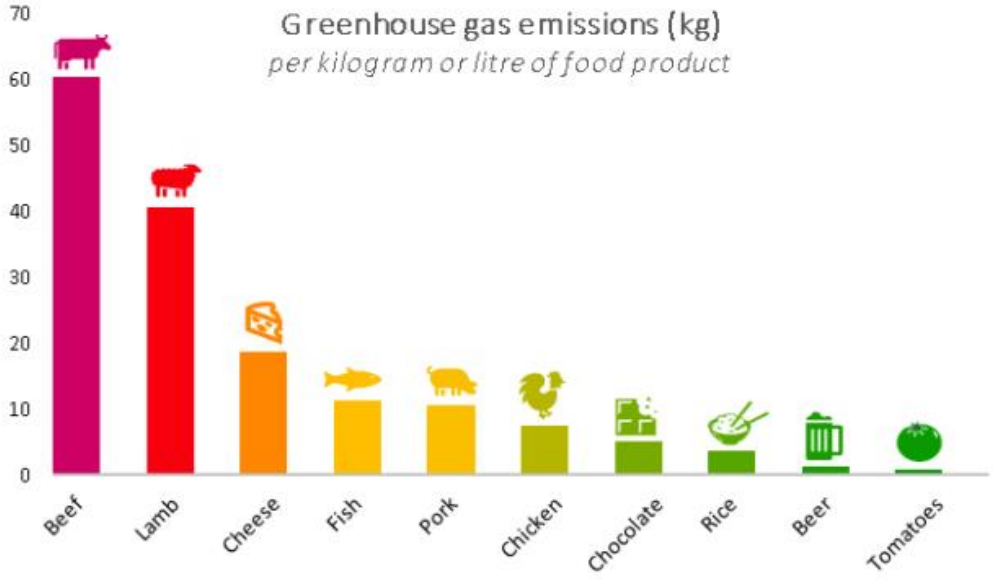
POLICY INSTRUMENT 1: CARBON INFORMATION (CI)

What your household eats can affect the natural environment.

Our food choices can affect the level of greenhouse gases in the atmosphere, like carbon dioxide and methane. These contribute to global warming which causes changes in weather and rainfall patterns including heatwaves, droughts and floods, both locally and globally.

Farming is the second largest source of greenhouse gases in the world, after power stations. Worldwide, agriculture produces more greenhouse gases than the transport sector - including all of the cars, trucks, ships, trains and planes in the world combined.

This picture shows the amount of greenhouse gases emitted when we produce one kilogram or litre of different types of food.



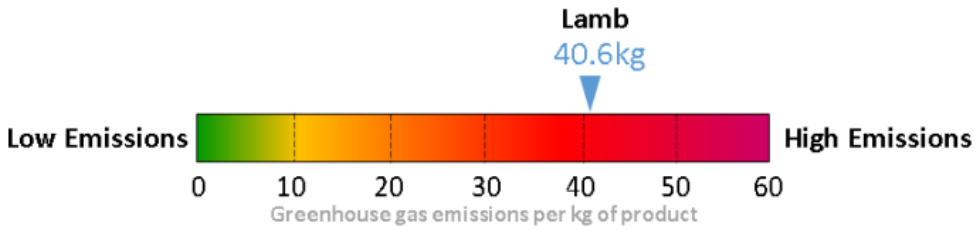
As you can see, **animal products such as beef, lamb and cheese produce by far the highest amount of greenhouse gases.**

Conversely, **plant-based products such as fruit, vegetables and grains are associated with the lowest levels of greenhouse gases.**

So, **if people ate less animal-based products (like red meat and cheese) and more plant-based products this would significantly reduce greenhouse gases and global warming.**

The level of greenhouse gases associated with the production of each type of food ("farm-to-fork" emissions) can be illustrated using this colour-coded indicator.

Here we show an example for lamb:



The blue arrow shows that the production of 1kg of lamb generates 40.6kg of greenhouse gas emissions.

- The closer the blue arrow is to the right hand (red) end of the scale the higher the emissions.
- The closer the blue arrow is to the left hand (green) end of the scale the lower the emissions.

Now we will present you again with the **list of food and drink products**.

Everything is the same as in the previous exercise, except for the fact that now we have also **added information on the greenhouse gas emissions of each product, using the colour-coded indicators**.

For example:

This is how the beef steak question looked previously:

This is how the beef steak question will look now:

Would this information change your choices?
Would you buy the same amount of food as before?
Or might your purchases of some foods reduce while others increase?

To assess this please repeat the food and drink purchase exercise taking into consideration the price displayed for each product and the new information provided.

To help you with this task, in the boxes **we have recorded your previous answers**.

Please look at each box in turn and **change any of the amounts and/or frequency of purchase reported if you think that you and your household would purchase more or less of that food or drink after seeing the information on greenhouse gas emissions**.

Again, the total cost of your purchases will be shown at the bottom of the screen. A message will appear if the total exceeds your household's typical food spending. At the bottom of the page you will also see the total amount of greenhouse gas emissions that would result from your purchases.

How much of each type of food and beverage would you and your HOUSEHOLD purchase to consume at home at the specified prices and given the information provided?

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

POLICY INSTRUMENT 2: CARBON TAX (CT)

Governments are considering the introduction of a **tax to reduce the consumption of those foods and drinks with the highest greenhouse gas emissions**.

This would **increase the price of some products, especially some meats and dairy**.

Such a tax would significantly add to the ongoing UK Government's initiatives (e.g. the Climate Change Levy) to reduce greenhouse gas emissions.

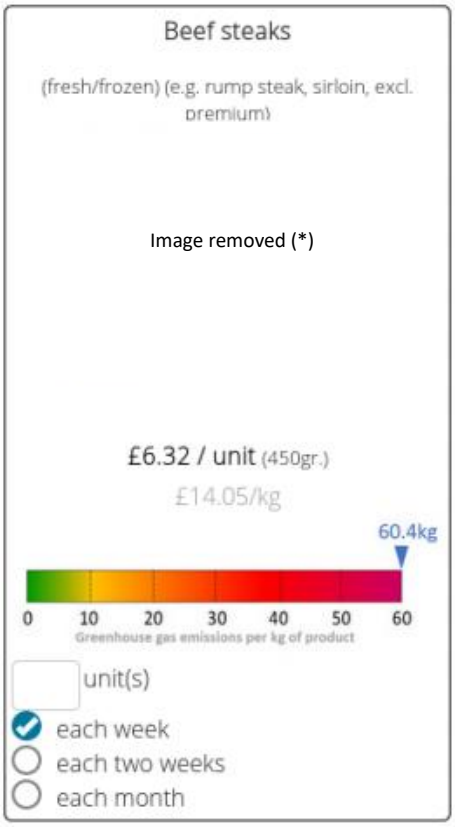
Now we will present you again with the **list of food and drink products**.

As in the last exercise, every product will be displayed with the corresponding information on the level of **greenhouse gas emissions, using the colour-coded indicator**.

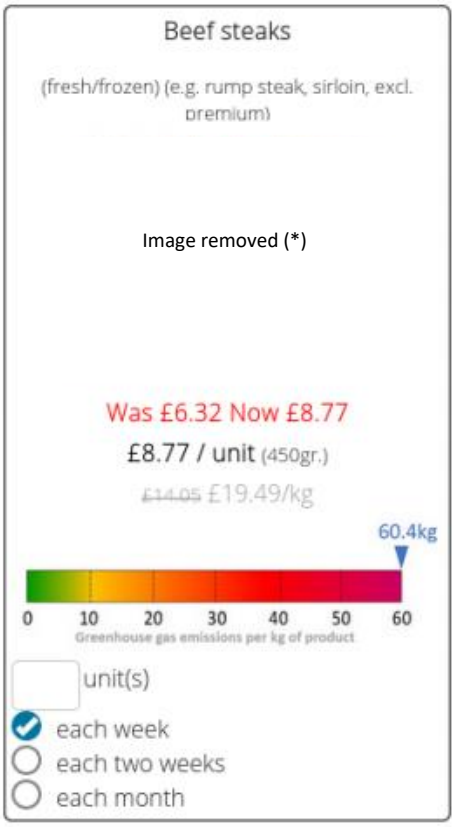
This time, **the prices of some products are higher as a result of a tax on greenhouse gas emissions**. Where prices are higher, these will be clearly marked in red.

For example:

This is how the beef steak question looked previously:



This is how the beef steak question will look now:



Would this information change your choices? Please repeat the food and drink purchase exercise by taking into consideration the new prices displayed for each product and the information provided.

Again, in the boxes **we have recorded your answers from the last exercise.**

Please look at each box in turn and **change any of the amounts and/or frequency of purchase reported if you think that you and your household would purchase more or less of that food or drink because of the new prices.**

Again, the total cost of your purchases will be shown at the bottom of the screen. A message will appear if the total exceeds your household's food spending based on your responses in the last exercise. At the bottom of the page you will also see the total amount of greenhouse gas emissions that would result from your purchases.

How much of each type of food and beverage would you and your HOUSEHOLD purchase to consume at home at the specified prices and given the information provided?

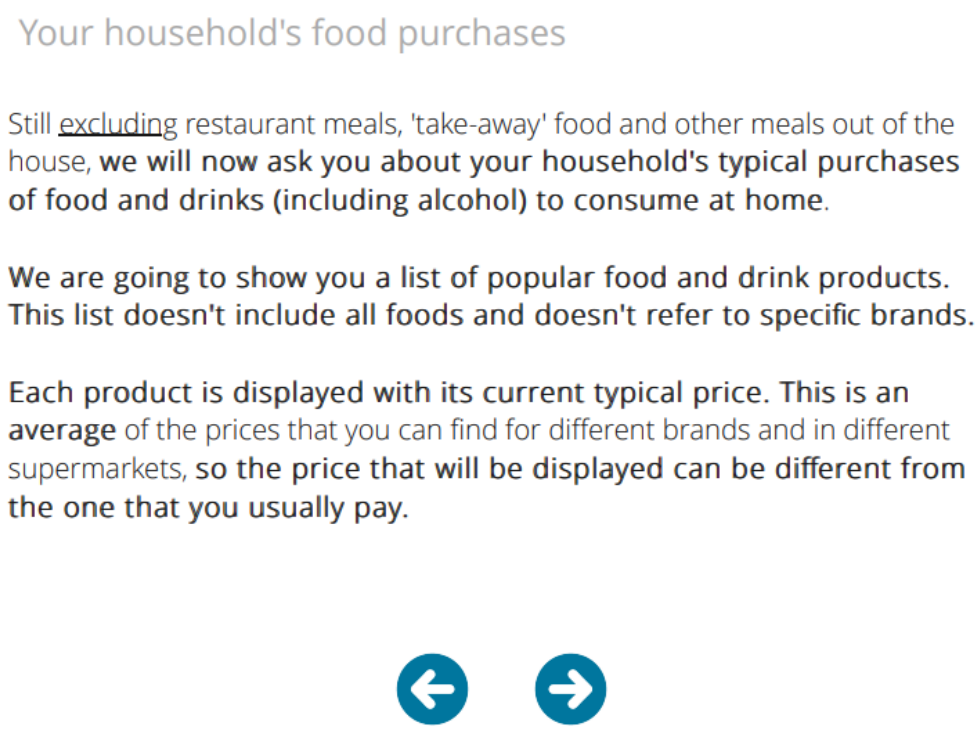
Please, note that price changes will not occur for every product and you may have to scroll down the list of products before seeing the first price change outlined in red.

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

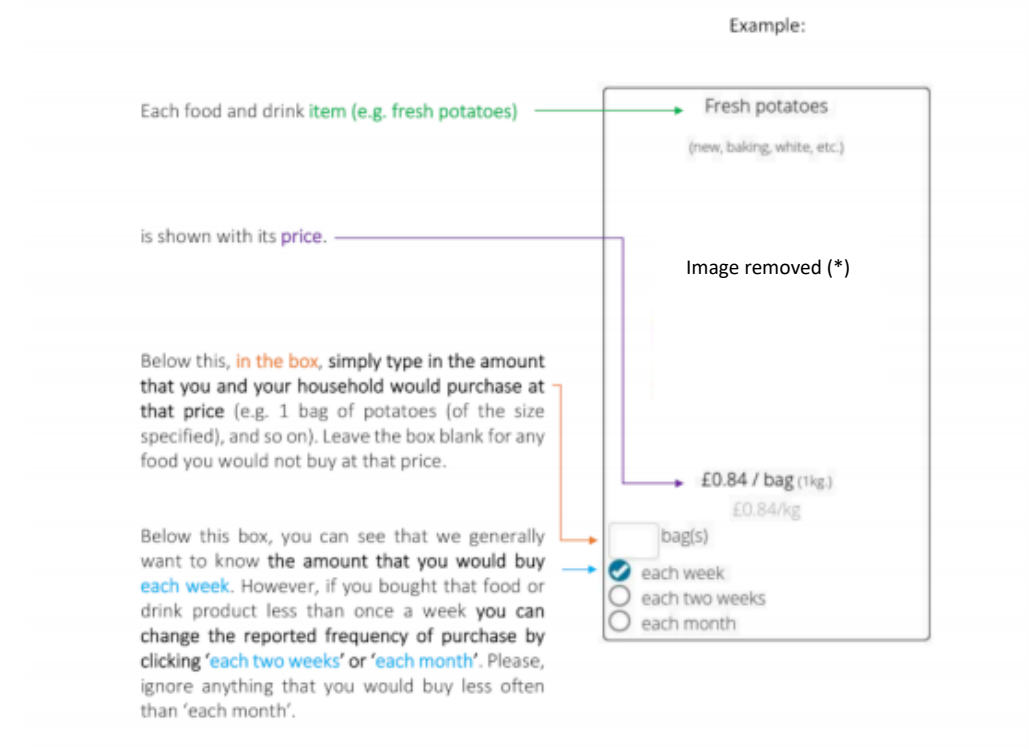
HEALTH INFORMATION AND TAX (HIT) POLICY STREAM:

BASELINE:



We want you to please tell us how much of each type of food and drink you and your household would usually purchase to consume at home. *Please, ignore special occasions (e.g. birthdays) and unusual circumstances (e.g. the Corona-virus outbreak) and just focus on your household's typical food shopping.*

To answer this, we have set up an online food shop where we display food and drink products, organised by categories (e.g. fruit, vegetables, meat, etc.).



Based on your responses, the total cost of your household's food shopping will be displayed at the bottom of the screen. A message will appear if your total spending exceeds the amount that your household normally spends on food.

We make food choices every day and these add up to be some of the major spending choices we make.

Therefore, please carefully consider the following questions about food purchase decisions.

These questions are timed to ensure that you take the time needed to consider your responses.

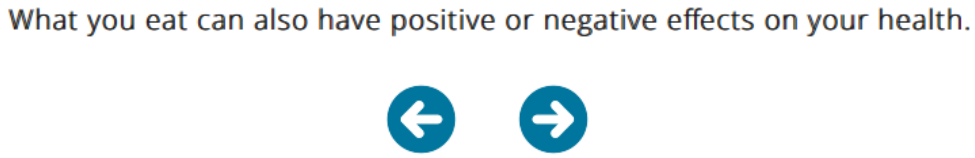
How much of each type of food and beverage would you and your HOUSEHOLD usually purchase to consume at home at the specified prices and given the information provided?

Please consider all of the food and drink products that you would buy to consume at home from e.g. supermarkets in person, online, independent/corner shops, etc. If you would buy any product less often than monthly, or if you wouldn't buy it at all, please leave the box blank.

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

POLICY INSTRUMENT 1: HEALTH INFORMATION (HI)



Following the recommended dietary guidelines can reduce the risk of obesity, heart disease, stroke and some cancers.

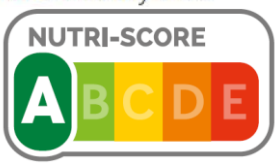
According to the NHS Eatwell Guide, a healthy diet should consist of: **1/3 fruit and vegetables** (at least **5 portions a day**); **1/3 potatoes, bread, pasta and rice;** and the remaining **1/3** split into **dairy, eggs, fish and meat**, all consumed in moderation. **Snacks, foods and drinks high in fat, salt and sugar and processed products should be eaten less often and in small amounts.**

NHS guidelines for a healthy diet

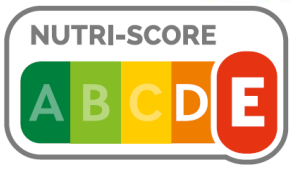
Eating too much of some foods is therefore not good for your health.

The following 'traffic light' indicator (called the "Nutriscore") is a simple way to show the level of healthiness of different foods which we will use in this survey

Foods shown with a Green A or B (below) are those generally recommended for a healthy diet.



Foods labelled with an Orange D or Red E (below) are those that should be eaten less often and in small amounts in order to have a healthy diet.



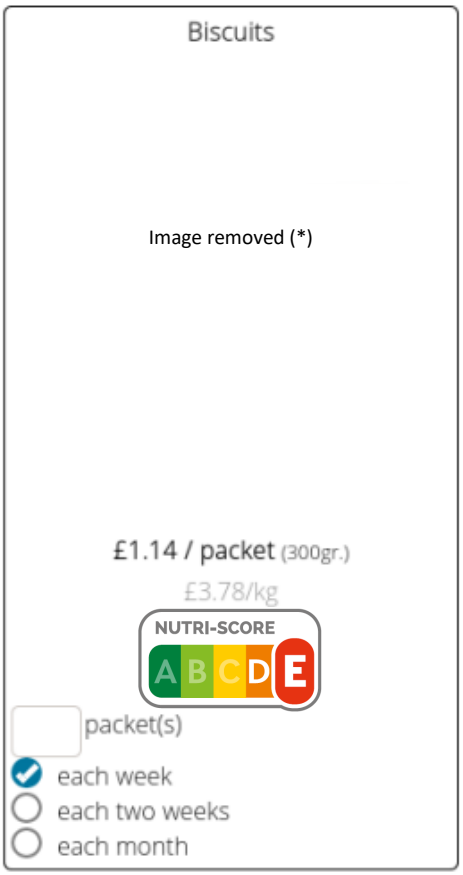
Now we will present you again with the **list of food and drink products.**

Everything is the same as in the previous exercise, except for the fact that now we have also **added information on the level of healthiness of each product, using the traffic light indicator.**

For example:

This is how the biscuits' question looked previously:

This is how the biscuits' question will look now:



Would this information change your choices?
Would you buy the same amount of food as before?
Or might your purchases of some foods reduce while others increase?

To assess this please repeat the food and drink purchase exercise by taking into consideration the price displayed for each product and the new information provided.

To help with this task, in the boxes **we have recorded your previous answers.**

Please look at each box in turn and **change any of the amounts and/or frequency of purchase reported if you think that you and your household would purchase more or less of that food or drink after seeing the Nutriscore information.**

Again, the total cost of your purchases will be shown at the bottom of the screen. A message will appear if the total exceeds your household's typical food spending .

How much of each type of food and beverage would you and your HOUSEHOLD purchase to consume at home at the specified prices and given the information provided?

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

POLICY INSTRUMENT 2: HEALTH TAX (HT)

Governments are considering the introduction of a **tax to reduce the consumption of less healthy foods and drinks.**

This would **increase the price of foods and drinks that are high in fat, salt and/or sugar.**

A tax on unhealthy food and drinks would significantly add to other ongoing initiatives in place in the UK, which aim to improve people's health (such as the sugar tax).

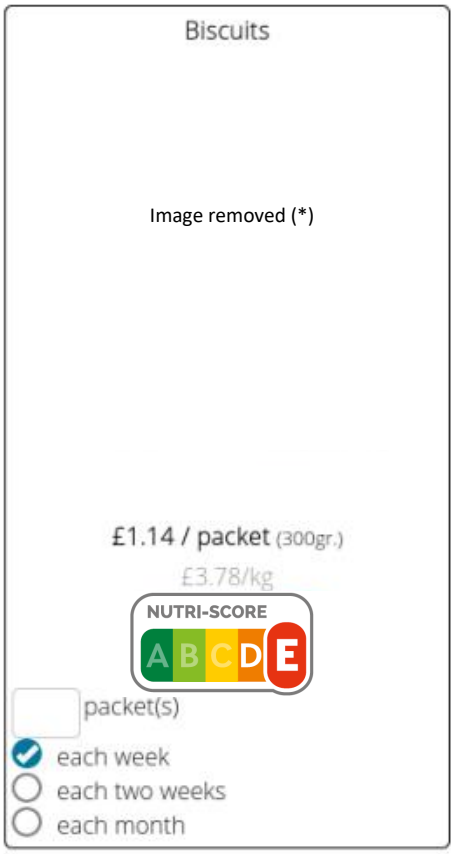
Now we will present you again with the **list of food and drink products.**

As in the last exercise, every product will be displayed with the corresponding information on its **level of healthiness, using the traffic light indicator.**

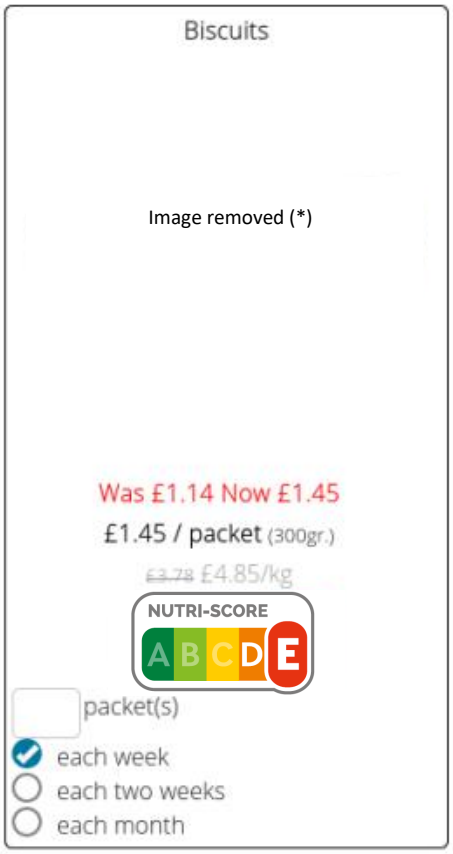
This time, **the prices of some products are higher as a result of a tax on unhealthy food and drinks**. Where prices are higher, these will be clearly marked in red.

For example:

This is how the biscuits' question looked previously:



This is how the biscuits' question will look now:



Would this information change your choices? Please repeat the food and drink purchase exercise by taking into consideration the new prices displayed for each product and the information provided.

Again, in the boxes **we have recorded your answers from the last exercise.**

Please look at each box in turn and **change any of the amounts and/or frequency of purchase reported if you think that you and your household would purchase more or less of that food or drink because of the new prices.**

Again, the total cost of your purchases will be shown at the bottom of the screen. A message will appear if the total exceeds your household's food spending based on your responses in the last exercise.

How much of each type of food and beverage would you and your HOUSEHOLD purchase to consume at home at the specified prices and given the information provided?

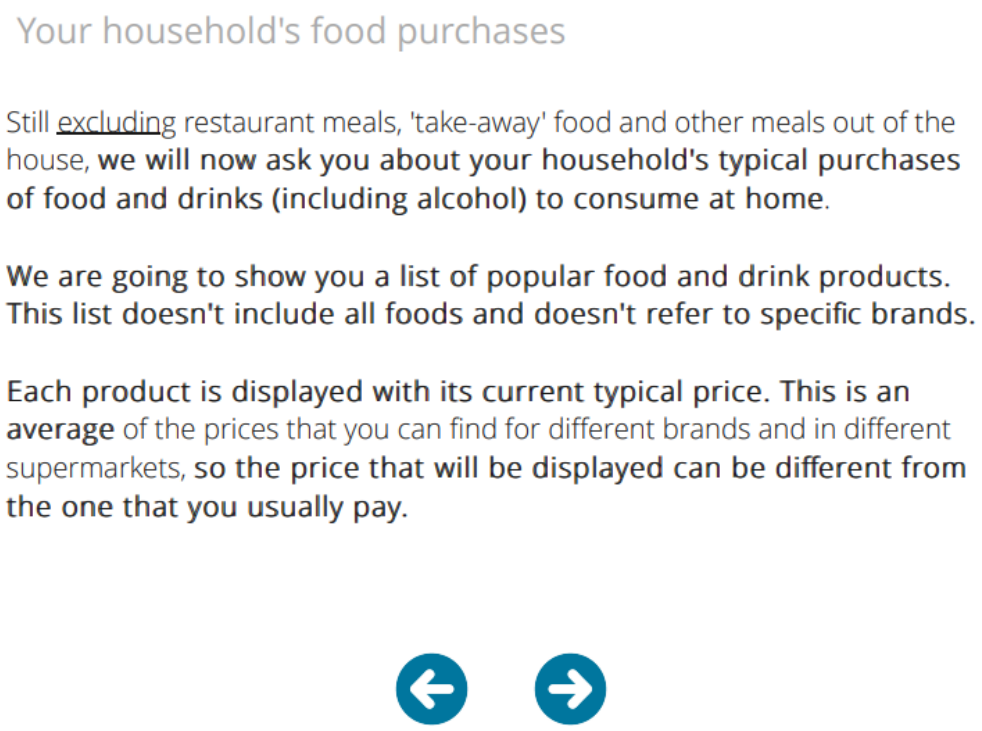
Please, note that price changes will not occur for every product and you may have to scroll down the list of products before seeing the first price change outlined in red.

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

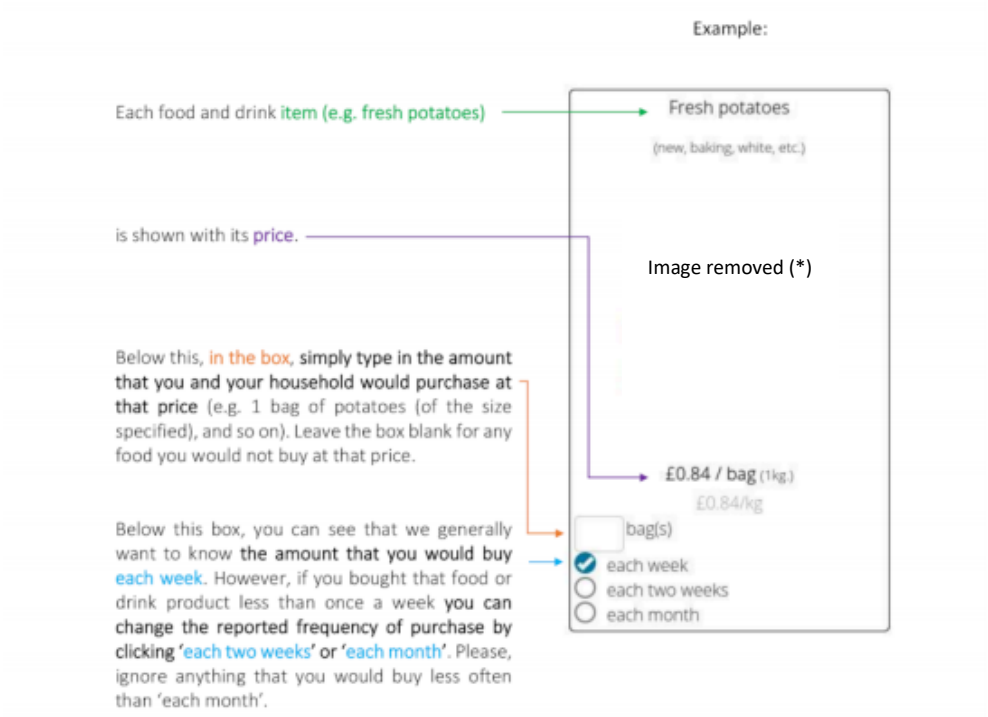
UNLABELLED TAX / CARBON AND HEALTH TAX (UT/CHT) POLICY STREAM:

BASELINE:



We want you to please tell us how much of each type of food and drink you and your household would usually purchase to consume at home. *Please, ignore special occasions (e.g. birthdays) and unusual circumstances (e.g. the Corona-virus outbreak) and just focus on your household's typical food shopping.*

To answer this, we have set up an online food shop where we display food and drink products, organised by categories (e.g. fruit, vegetables, meat, etc.).



Based on your responses, the total cost of your household's food shopping will be displayed at the bottom of the screen. A message will appear if your total spending exceeds the amount that your household normally spends on food.

We make food choices every day and these add up to be some of the major spending choices we make.

Therefore, please carefully consider the following questions about food purchase decisions.

These questions are timed to ensure that you take the time needed to consider your responses.

How much of each type of food and beverage would you and your HOUSEHOLD usually purchase to consume at home at the specified prices and given the information provided?

Please consider all of the food and drink products that you would buy to consume at home from e.g. supermarkets in person, online, independent/corner shops, etc. If you would buy any product less often than monthly, or if you wouldn't buy it at all, please leave the box blank.

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

POLICY INSTRUMENT 1: UNLABELLED TAX (UT)

Now we will present you again with the **list of food and drink products.**

This time, **the prices of some products are higher**. Where prices are higher, these will be clearly marked in red.

For example:

This is how the beef steak question looked previously:

This is how the beef steak question will look now:

Would this information change your choices?
Would you buy the same amount of each food as before?
Or might your purchases of some foods reduce while others increase?

To assess this please repeat the food and drink purchase exercise by taking into consideration the new prices displayed for each product.

To help you with this task, in the boxes **we have recorded your previous answers.**

Please look at each box in turn and **change any of the amounts and/or frequency of purchase reported if you think that you and your household would purchase more or less of that food or drink because of the new prices.**

Again, the total cost of your purchases will be shown at the bottom of the screen. A message will appear if the total exceeds your household's typical food spending.

How much of each type of food and beverage would you and your HOUSEHOLD purchase to consume at home at the specified prices and given the information provided?

Please, note that price changes will not occur for every product and you may have to scroll down the list of products before seeing the first price change outlined in red.

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

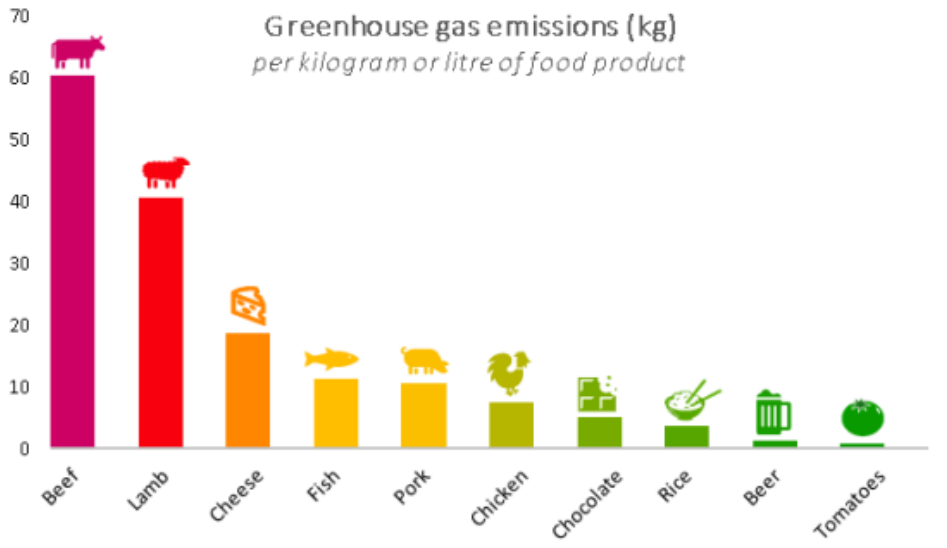
POLICY INSTRUMENT 2: CARBON AND HEALTH TAX (CHT)

What your household eats can affect the natural environment.

Our food choices can affect the level of greenhouse gases in the **atmosphere**, like carbon dioxide and methane. These **contribute to global warming** which causes changes in weather and rainfall patterns including heatwaves, droughts and floods, both locally and globally.

Farming is the second largest source of greenhouse gases in the world, **after power stations. Worldwide, agriculture produces more greenhouse gases than the transport sector** - including all of the cars, trucks, ships, trains and planes in the world combined.

This picture shows the amount of greenhouse gases emitted when we produce one kilogram (or litre) of different types of food.



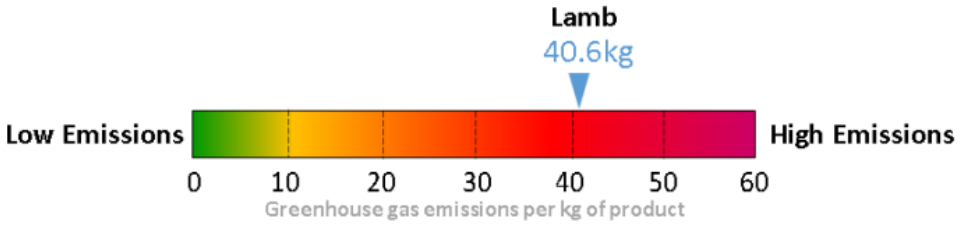
As you can see, **animal products such as beef, lamb and cheese produce by far the highest amount of greenhouse gases.**

Conversely, **plant-based products such as fruit, vegetables and grains are associated with the lowest levels of greenhouse gases.**

So, **if people ate less animal-based products (like red meat and cheese) and more plant-based products this would significantly reduce greenhouse gases and global warming.**

The level of greenhouse gases associated with the production of each type of food ("farm-to-fork" emissions) can be illustrated using this colour-coded indicator.

Here we show an example for lamb:



The blue arrow shows that the production of 1kg of lamb generates 40.6kg of greenhouse gas emissions.

- The closer the blue arrow is to the right hand (red) end of the scale the higher the emissions.
- The closer the blue arrow is to the left hand (green) end of the scale the lower the emissions.

What you eat can also have positive or negative effects on your health.

Following the recommended dietary guidelines can reduce the risk of obesity, heart disease, stroke and some cancers.

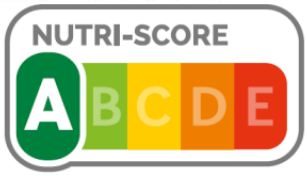
According to the NHS Eatwell Guide, a healthy diet should consist of: **1/3 fruit and vegetables** (at least **5 portions a day**); **1/3 potatoes, bread, pasta and rice;** and the remaining **1/3** split into **dairy, eggs, fish and meat**, all consumed in moderation. **Snacks, foods and drinks high in fat, salt and sugar and processed products should be eaten less often and in small amounts.**

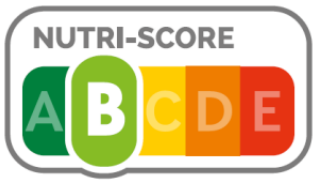
NHS guidelines for a healthy diet

Eating too much of some foods is therefore not good for your health.

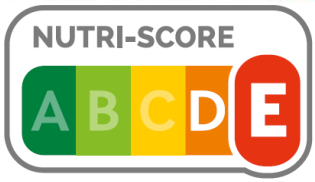
The following 'traffic light' indicator (called the "Nutriscore") is a simple way to show the level of healthiness of different foods which we will use in this survey

Foods shown with a Green A or B (below) are those generally recommended for a healthy diet.





Foods labelled with an Orange D or Red E (below) are those that should be eaten less often and in small amounts in order to have a healthy diet.



The reduction of greenhouse gas emissions and the improvement of people's health are among the main priorities of Governments around the world.

Governments are therefore considering the introduction of a **tax to reduce the consumption of those foods and drinks with the highest greenhouse gas emissions. This would increase the price of some products, especially some meats and dairy.**

Equally, Governments are also considering the introduction of a **tax to reduce the consumption of less healthy foods and drinks. This would increase the price of foods and drinks that are high in fat, salt and/or sugar.**

Such taxes would significantly add to other ongoing initiatives in place in the UK, which aim to reduce greenhouse gas emissions (e.g. the Climate Change Levy) and improve people's health (e.g. the sugar tax).

Now we will present you again with the **list of food and drink products.**

Everything is the same as in the last exercise, except for the fact that now we have also **added information on the level of greenhouse gas emissions and healthiness for each product, using the colour-coded indicators described previously.**

The prices are the same as in the last exercise and they include a tax on products that have high greenhouse gas emissions and/or are unhealthy.

For example:

This is how the beef steak question looked previously:

This is how the beef steak question will look now:

Would this new information change your choices? Please repeat the food and drink purchase exercise by taking into consideration the prices displayed and the new information provided.

Again, in the boxes **we have recorded your answers from the last exercise.**

Please look at each box in turn and **change any of the amounts and/or frequency of purchase reported if you think that you and your household would purchase more or less of that food or drink because of the new information provided.**

Again, the total cost of your purchases will be shown at the bottom of the screen. A message will appear if the total exceeds your household's food spending based on your responses in the last exercise. At the bottom of the page you will also see the total amount of greenhouse gas emissions that would result from your purchases.

How much of each type of food and beverage would you and your HOUSEHOLD purchase to consume at home at the specified prices and given the information provided?

Please use the zoom function of your browser or handset to zoom in and out of this screen if necessary.

[LIST OF FOOD PRODUCTS DISPLAYED]

Supplementary Note 3. Screening criteria

Based on the results of focus groups and survey piloting, as well as the 2017 GB Kantar FMCG panel food purchase data, the survey company used the following cleaning criteria to screen out unreasonable responses:

1. Completion time is less than 12 minutes

2. Over 30 units weekly purchase of any given food category.

3. Total weekly expenditure per person is over £180.

4. Total weekly expenditure per person is less than £10.

Survey respondents meeting one or more of the above criteria were replaced by the research company administering the survey with new respondents sharing a similar socio-demographic profile.

Supplementary Table 14. Food categories included in each food group

Food group	Food categories included
Fruits and vegetables	Oranges and clementines; apples and pears; bananas; grapes; strawberries; peaches, nectarines and plums; pineapples; fresh lettuce; fresh tomatoes; fresh carrots; fresh potatoes; onions; cauliflower, cabbage and broccoli; tomato products; canned pulses; dried and frozen pulses; chips and fries.
Bread, pasta, rice and flour	Bread, pasta, rice and flour
Breakfast cereals	Muesli, porridge, bran-and cornflakes; sugary breakfast cereals and granola
Milk and yoghurt	Whole milk; skimmed and semi-skimmed milk; low fat and low sugar yoghurt; yoghurt (not diet)
Plant-based milk	Plant-based milk
Cheese	Hard cheese; soft and spreadable cheese
Butter and cream	Butter; cream
Eggs	Eggs
Unprocessed beef	Beef mince and diced; beef steaks; beef roasting joints
Processed beef	Processed beef
Lamb	Raw lamb chops; raw lamb leg and shoulder; processed lamb
Pork	Pork loin, chops and mince; pork joints; pork sausages and bacon; ham
Poultry	Poultry breast and boneless thighs; whole chicken; processed poultry
Meat alternatives	Meat alternatives
Fish and seafood	Raw fish and seafood; processed fish and seafood; smoked salmon
Meat-based ready meals and pizza	Meat-based ready meals; pizza
Fish- and veg-based ready meals	Fish-based ready meals; vegetarian/vegan ready meals
Unhealthy snacks	Chocolate; biscuits; ice cream; cake; savoury snacks
Less unhealthy snacks	Nuts and dry fruits; crisps
Tea and coffee	Breakfast tea; instant coffee
Sugary drinks	Sugary soft drinks; sugary (fruit) juices and squash
Less- and non-sugary drinks	Diet soft drinks; no added sugar (fruit) juices and squash
Alcohol	Beer and cider; wine; spirits