SUPPLEMENTARY WEB MATERIALS

This document contains further details of methods and results to accompany the paper *Health effects of adopting low greenhouse gas emission diets in the UK: modelling study*.

Methods

This section contains further details of the methods used in the paper.

Dietary data

The UK National Diet and Nutrition Survey (NDNS) is a rolling programme of cross-sectional surveys using a 4 day food diary.(1) We used data from Waves 1-3 (2008-2011) of the survey, which includes data from 1,571 adults.

The day-level dietary data were used to obtain nutritional information for each food entry on each day of the NDNS. Foods were aggregated into sub-groups according to the NDNS classification (148 groups). The nutritional information for each food entry within a sub-group was then averaged to achieve a nutritional classification for each sub-group, along with the mean g consumed per sitting and the number of sittings for each food group in the dataset.

This information was then used to calculate the average nutritional content for each of the food groups. This was done by calculating proportional weights for each sub-group within a food category (e.g. the weight for cream within the 'milk and milk products' category) using the portion size (in g) and the number of portions of the sub-group that had been eaten. Finally, these weights were applied to all nutritional information in order to calculate weighted averages of nutritional content for each food category.

The individual food-level consumption data were used to obtain the total consumption of each food sub-group over the 4 day diary period among all individuals. These sub-groups were then combined to create 42 food categories, and the total consumption was divided by 4 to give the daily average consumption of each food group. Non-consumers of each food group were included in the averages.

Average intake of nutrients for each individual was taken from the individual-level consumption data. For macronutrients, the recommendations state that intake should be as a proportion of total calories, and we therefore converted grams of macronutrients consumed to calories as a proportion of total calories, using the accepted content figures of 9 kcal per g fat, 4 kcal per g protein, and 4 kcal per g carbohydrate.

Greenhouse gas emissions

Estimates of greenhouse gas (GHG) emissions associated with each of the 42 food groups were calculated using a Life Cycle Inventory (LCI) compiled from the relevant literature in the UK and Europe.(2-6) In some cases a full LCI of emissions was not available,(3-5) so extrapolations from the literature(2, 3, 6-8) were used to extend the estimates across the full life cycle of the food. We also estimated food losses from production, handling and sales, from cooking meals and from consumer waste, extrapolated from estimates of waste in the US.(9) For food groups where specific emissions estimates were not available in the literature, representative items included in the food group for which emissions data were available were used as a reference point for all foods within the group.

Optimization method

To produce the potential future diets, optimizations were performed in the statistical software R(10) using the package Alabama which optimizes smooth nonlinear objective functions with constraints.(11) Optimizations were performed separately for males and females given their different diets.

We modelled potential future diets which achieve nutrition and GHG emission targets but also which minimize deviation from the current average diet for men and women. For a given food group i, the loss of welfare W_i resulting from consumption greater or less than the ideal level for health is proportional to the share of expenditure for that food group s_i and inversely proportional to the price elasticity of demand ε_i

$$\Delta W_i \propto \frac{s_i}{\varepsilon_i}\left(\frac{\Delta X_i}{X_i}\right)^2$$

where X_i is the current consumption for food group i and ΔX_i is the difference between current and ideal consumption for food group i. The analysis therefore seeks to find the combination of foods that minimizes the weighted deviations of squared percentage consumption from the desired levels, where each deviation is weighted by s_i/ε_i. For the 42 food groups identified from the NDNS, we attempted to find the solution of

$$\min_{\{\Delta X_i; i=1..42\}}\left[\sum_{i=1}^{42}\frac{s_i}{\varepsilon_i}\left(\frac{\Delta X_i}{X_i}\right)^2\right]$$

whilst ensuring that the resultant diet complied with WHO recommendations and maintained the total calories and proportion of liquids in the diets. The ideal consumption of food i is given by $X_i^* = X_i + \Delta X_i^*$ where $\Delta X_i^*$is the solution for food i. Initial estimates of future consumption for each food group (i.e. initial estimates of the solution of the above equation) were generated randomly. The values of s_i were determined directly from the NDNS dietary survey. Values of ε_i were obtained from Tiffin et al. (2011).(12) Ideal consumption levels of different nutrients in the diet were determined from WHO nutritional guidelines, shown in Table S1.(13)

Table S1. Nutritional content of current UK diet for males and females compared to WHO guideline values

Food group / nutrient	WHO guideline	Current UK diet	
		Males	Females
Total energy (kcal)	-	2,010	1,560
Total fat (% total energy)	15-30%	29.91%	31.38%
Saturated fat (% total energy)	<10%	11.25%	11.96%
Polyunsaturated fat (% total energy)	6-10%	4.87%	5.09%
N6 polyunsaturated fat (% total energy)	5-8%	4.05%	4.22%
N3 polyunsaturated fat (prop total energy)	1-2%	0.82%	0.88%
Trans fat (% total energy)	<1%	0.68%	0.74%
Monounsaturated fat (prop total energy)	(remaining)	10.60%	10.96%
Carbohydrate (% total energy)	55-75%	50.01%	53.66%
Free sugars (% total energy)	<10%	16.19%	15.57%
Protein (% total energy)	10-15%	14.78%	15.16%
Cholesterol (mg)*	<300 mg	-	-
Sodium (g)	<2 g	2.20	1.69
Fruit and vegetables (g)	≥400 g	236.50	246.20

*Not modelled

In order to find solutions which achieved both nutrition and GHG emission reduction targets, constraints were specified which varied depending on the scenario. Primarily, we explored the effect of 0%, 10%, 20%, 30%, 40%, 50% and 60% reductions in GHG emissions associated with food (with the required minimum reduction specified as a constraint). Further constraints were applied to avoid unrealistic solutions. These included:

- Total calories equal to present day average;
- Total liquids (excluding alcohol) equal to present day;
- Tea, coffee and mineral water cannot more than double;
- Consumption of each food group must be ≥0.

Each simulation was repeated 100 times to increase the probability of finding an overall minimum solution rather than local minima.

Health impact model

The health impact calculations were performed using a version of the life table model, IOMLIFET,(14) implemented in R.(10) The model estimates survival patterns in the population over time based on age-specific mortality rates. To perform an impact assessment, the underlying mortality rates are adjusted (using knowledge of the change in exposure combined with the exposure-response function) and the resulting life table is compared against the baseline life table.

Table S2 maps the modelled health outcomes to WHO International Classification of Diseases (ICD-10) codes. These codes are needed for the disease-specific mortality data used in the model.

Table S2. Underlying cause of death classifications (ICD-10) used for each health outcome

Health outcome	ICD-10 underlying cause of death classification	
	Codes	Underlying causes
Coronary heart disease	I20 – I25	Ischaemic heart diseases
Stroke	I61 – I64	Intracerebral haemorrhage; Other nontraumatic intracranial haemorrhage; Cerebral infarction; Stroke not specified as haemorrhage or infarction
Oral cancer (mouth/pharynx/larynx)	C00 – C10, C12 – C14, C32	Malignant neoplasms of lip, oral cavity and pharynx (excluding Malignant neoplasm of nasopharynx)*; Malignant neoplasm of larynx
Oesophageal cancer	C15	Malignant neoplasm of oesophagus
Lung cancer	C33 – C34	Malignant neoplasm of trachea, bronchus and lung
Stomach cancer	C16	Malignant neoplasm of stomach
Colorectal cancer	C18 – C20, C21.8	Malignant neoplasm of colon; Malignant neoplasm of rectosigmoid junction; Malignant neoplasm of rectum; Overlapping lesion of rectum, anus and anal canal[+]
Type 2 diabetes	E11	Non-insulin-dependent diabetes mellitus

* Malignant neoplasm of nasopharynx (ICD-10 C11) excluded since this was considered separately in Marmot et al. (2007)(15)

[+] Overlapping lesion of rectum, anus and anal canal (ICD-10 C21.8) included for consistency with Cancer Research UK (http://www.cancerresearchuk.org/cancer-info/cancerstats/types/bowel/survival/bowel-cancer-survival-statistics)

Age- and sex-specific data on population size, all-cause mortality and disease-specific mortality for ages 0 to 105 were obtained from the Office for National Statistics (England and Wales), the General Register Office for Scotland (Scotland) and the Office for National Statistics/Northern Ireland Statistics and Research Agency (Northern Ireland). These data were added together at each age to create data for the UK. The disease-specific mortality data were not available in single-year-of-age format. Therefore, this was generated from the age-grouped data by linear interpolation. Separate life tables were created for each outcome (to allow quantification of the impact due to that outcome alone).

Changes in risk were applied at all ages in the life tables. For the analysis, the exposure-response functions were assumed to be log-linear. To calculate the change in mortality risk ΔR associated with a modelled change in dietary exposure δE

$$\Delta R = exp\left[\frac{log(RR_{\Delta E})}{\Delta E} \times \delta E\right]$$

where $RR_{\Delta E}$ is the relative risk associated with a change in exposure ΔE (i.e. the relative risk reported in the literature). For example, for a 110.5 g increase in fruit consumption the change in the risk of oeshophageal cancer is

$$\Delta R = exp\left[\frac{log(0.56)}{100} \times 110.5\right] = 0.53$$

Therefore, the age-specific mortality rates in the life table would be multiplied by 0.53. In cases where several dietary exposures affect the same disease risk, the risks were multiplied together. So, the change in oral cancer risk equals the change in oral cancer risk due to changes in fruit consumption multiplied by the change in oral cancer risk due to changes in non-starchy vegetable consumption. For example, for a 110.5 g increase in fruit consumption and a 53.0 g increase in non-starchy vegetable consumption, the change in the risk of oral cancer would be

$$\Delta R = exp\left[\frac{log(0.72)}{100} \times 110.5\right] \times exp\left[\frac{log(0.72)}{50} \times 53.0\right] = 0.49$$

To account for time lags between dietary changes and changes in health outcomes, time-varying functions based on cumulative distribution functions of normally distributed variables (s-shaped or sigmoidal curves) were used in the model. The shapes of the functions were informed by empirical evidence of the effects of dietary interventions on various causes of mortality over time.(16-19) The assumed lags for coronary heart disease, stroke, and type 2 diabetes reach a maximum impact after approximately 10 years (Figure S1) and for cancers after around 30 years, with no change in cancer risk for the first 10 years (Figure S2).

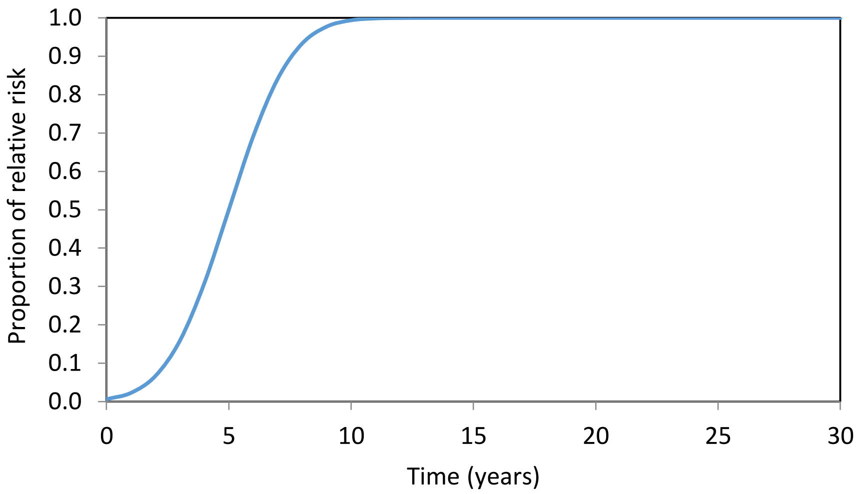

Figure S1. Time lag function used for coronary heart disease, stroke and type 2 diabetes

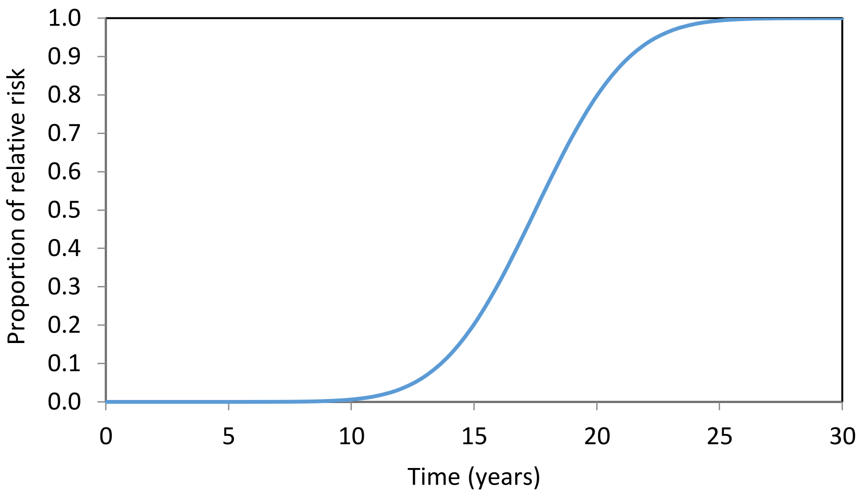

Figure S2. Time lag function used for all cancer outcomes

Results

This sections contains additional results relevant to the paper.

Optimized diets

Tables S3 and S4 show the full optimized diets for each GHG reduction target (42 food groups).

Table S3. Optimized diets in 42 food groups for UK adult males for different levels of GHG reduction

Food group	Average consumption for different GHG reduction targets (g/day)							
	Current diet	0% GHG reduction	10% GHG reduction	20% GHG reduction	30% GHG reduction	40% GHG reduction	50% GHG reduction	60% GHG reduction
Beef	24.2	13.8	14.0	13.6	5.0	0.0	0.0	0.0
Processed beef	25.1	18.2	18.2	18.7	17.7	16.3	3.3	0.0
Pork	9.7	6.0	6.0	4.5	5.5	6.6	0.0	0.0
Processed pork	34.2	3.7	3.0	4.4	3.9	0.0	0.0	0.0
Lamb	7.9	5.8	5.7	6.6	4.3	0.0	0.0	0.0
Other red meat	0.8	0.8	0.7	0.7	0.6	0.4	0.0	0.0
Poultry	37.2	23.3	23.2	23.5	26.8	24.9	1.2	2.7
Processed white meat	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish	24.3	30.0	30.2	28.5	29.2	25.4	20.9	0.0
Milk and milk products	194.8	114.0	125.6	117.0	108.1	58.7	6.5	0.0
Cheese	16.3	2.6	3.4	2.0	2.6	3.4	0.0	0.0
Ice cream	5.1	4.2	4.1	4.6	4.2	4.0	1.4	0.0
Eggs	20.9	4.8	3.8	4.7	10.1	20.5	15.6	3.5
Bread	99	145.4	145.8	145.6	142.7	146.1	154.9	147.9
Pasta and pizza	42.7	45.7	45.6	46.6	47.2	49.7	49.5	40.8
Breakfast cereals	28.6	39.5	37.3	39.7	40.3	42.3	61.8	97.8
Rice	27.1	51.1	51.3	51.4	48.2	33.1	35.5	5.6
Other cereals	6.7	14.4	13.8	14.6	15.4	19.2	29.3	43.8
Unprocessed potatoes	73.9	123.0	121.4	122.6	121.0	115.9	118.7	87.3
Processed potatoes	24.5	31.8	33.5	32.6	32.9	31.2	36.7	41.5
Other vegetables	84.8	132.4	132.0	131.9	134.0	140.7	146.0	164.7
Beans and pulses	14.6	20.3	21.9	21.6	21.7	26.8	32.3	61.6
Tomatoes	45.4	90.6	90.6	90.4	87.7	74.5	49.9	0.0
Fruit	91.7	156.7	155.4	156.1	156.6	158.0	171.7	173.7
Butter	3.7	1.0	0.0	1.3	1.6	1.4	0.0	0.0
Margarine and low fat spread	9.3	21.8	21.7	22.0	20.9	16.4	13.3	0.0
Cooking oil	0.3	0.3	0.4	0.3	0.3	0.4	0.5	0.9
Biscuits	13.6	14.1	16.0	13.4	14.8	18.7	21.9	23.1
Buns and cakes	18.5	20.1	18.4	19.2	21.5	26.4	32.2	37.9
Chocolate and sweets	9.9	8.6	9.0	9.3	9.4	10.8	10.8	11.6
Sugar and sweet spreads	10.7	7.1	8.4	7.4	9.2	11.9	9.3	1.7
Crisps and savoury snacks	7.2	7.2	7.6	6.3	7.5	9.9	13.1	13.8

Puddings and pies	19.1	12.6	12.2	12.8	16.5	21.2	12.0	0.0
Soups	36.8	0.9	0.3	0.0	0.0	0.0	0.0	0.0
Preserves	27.6	2.6	1.8	4.7	3.2	0.0	0.0	0.0
Soft drinks	246.3	65.9	55.0	42.6	21.7	0.0	0.0	0.0
Alcoholic drinks	426.4	426.4	426.4	426.4	426.4	426.4	426.4	426.4
Fruit juice	62	50.1	45.2	41.2	29.4	0.0	0.0	0.0
Coffee	265.4	25.9	0.0	0.0	0.0	0.8	0.0	0.0
Mineral water	66.2	102.1	1.7	1.2	1.6	6.2	0.0	0.0
Tea	406.8	802.7	944.8	961.7	994.0	1,039.7	1,046.7	1,046.7
Nuts and seeds	2.9	5.7	5.9	6.0	5.5	8.5	12.4	30.4

Table S4. Optimized diets in 42 food groups for UK adult females for different levels of GHG reduction

Food group	Average consumption for different GHG reduction targets (g/day)							
	Current diet	0% GHG reduction	10% GHG reduction	20% GHG reduction	30% GHG reduction	40% GHG reduction	50% GHG reduction	60% GHG reduction
Beef	17.2	13.9	14.4	7.6	0.0	0.0	0.0	0.0
Processed beef	15.6	14.2	16.1	14.9	13.4	11.8	7.8	0.0
Pork	5.3	5.0	5.1	5.1	4.4	3.4	1.1	0.0
Processed pork	20.7	19.0	16.4	15.6	16.9	13.0	5.3	0.0
Lamb	5.6	4.8	5.2	3.7	2.0	0.0	0.0	0.0
Other red meat	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0
Poultry	30.1	30.2	29.9	28.6	25.1	14.9	0.0	0.0
Processed white meat	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish	23.4	26.8	27.8	26.7	25.9	23.2	16.4	1.6
Milk and milk products	182.7	113.2	125.6	115.2	112.2	69.6	0.0	0.0
Cheese	12.9	6.5	4.8	6.7	7.0	2.8	0.0	0.0
Ice cream	5.1	3.8	3.6	4.2	4.3	4.3	2.9	0.0
Eggs	17.3	12.7	12.4	14.7	15.5	15.2	10.3	0.0
Bread	69.4	92.4	92.7	95.3	96.7	112.1	131.9	133.6
Pasta and pizza	31.9	31.9	31.7	33.0	32.7	34.1	31.2	19.9
Breakfast cereals	27	32.0	31.3	31.7	32.4	41.0	48.6	68.8
Rice	23.4	29.3	29.2	26.7	24.8	23.7	14.6	0.0
Other cereals	6.4	8.7	8.3	9.4	12.4	17.0	23.5	40.1
Unprocessed potatoes	98.1	122.1	120.7	119.8	119.2	115.4	122.0	68.3
Processed potatoes	18.2	19.8	17.9	20.0	20.7	21.6	23.5	29.6
Other vegetables	88.6	137.7	139.6	136.0	144.8	150.7	153.7	156.2
Beans and pulses	12.5	20.4	20.5	21.7	24.0	26.6	32.2	53.5
Tomatoes	43.1	83.7	82.8	82.7	72.9	61.3	42.2	28.2
Fruit	102	158.2	157.2	159.5	158.3	161.4	171.8	162.1
Butter	3.6	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Margarine and low fat spread	6.3	11.9	12.2	11.5	10.4	9.2	8.9	3.3
Cooking oil	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4
Biscuits	13.3	11.5	12.7	12.6	15.1	17.8	20.3	27.2
Buns and cakes	16.2	15.0	14.8	18.4	19.2	22.5	26.5	36.6
Chocolate and sweets	8.8	7.7	7.8	8.3	8.6	9.4	10.2	6.9
Sugar and sweet spreads	5.9	4.8	5.0	5.8	6.3	8.0	9.5	5.4
Crisps and savoury snacks	5.6	5.6	5.8	5.7	6.6	7.4	8.8	13.0

Puddings and pies	14.2	11.2	10.9	12.4	12.8	12.0	7.5	0.0
Soups	36.1	36.1	35.8	20.5	0.0	0.0	0.0	0.0
Preserves	24.3	6.5	5.7	6.3	6.2	0.0	0.0	0.0
Soft drinks	187	61.2	60.2	31.0	21.4	0.0	0.0	0.0
Alcoholic drinks	117.8	117.8	117.8	117.8	117.8	117.8	117.8	117.8
Fruit juice	46.9	37.6	37.6	28.7	21.3	0.0	0.0	0.0
Coffee	246.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mineral water	81.4	0.0	0.0	0.0	0.1	1.5	0.0	0.0
Tea	445.6	908.7	909.6	947.7	964.6	1,005.9	1,007.4	1,007.4
Nuts and seeds	2.2	3.2	3.2	3.5	4.0	5.0	6.9	14.3

Modelled changes in nutrients

Tables S5 and S6 show the resulting changes in nutrients and food groups (relative to the current diet) used for the health impact assessment.

Table S5. Modelled changes in health-relevant nutrients for UK males for different levels of GHG reduction

Nutrient / food group	Change for different GHG reduction targets						
	0% GHG reduction	10% GHG reduction	20% GHG reduction	30% GHG reduction	40% GHG reduction	50% GHG reduction	60% GHG reduction
Trans fatty acids (% total energy)	-0.18%	-0.18%	-0.18%	-0.19%	-0.22%	-0.33%	-0.42%
Fibre (g)	5.0	5.0	5.1	5.1	5.8	7.7	10.4
Sodium (g)	-0.2	-0.20	-0.2	-0.2	-0.2	-0.2	-0.2
Calcium (mg)	-110.1	-95.8	-112.1	-115.3	-141.4	-187.3	-155.4
Iron (mg)	1.0	0.9	1.0	1.0	1.0	1.9	3.9
Vitamin B12 (µg)	-1.1	-1.1	-1.1	-1.2	-1.5	-2.2	-2.8
Fruit (g)[a]	110.2	109.0	109.4	107.1	95.4	84.6	36.7
Non-starchy vegetables (g)[b]	53.3	54.5	54.2	56.4	68.2	78.9	126.9
Red meat (g)[c]	-16.2	-16.1	-17.1	-27.2	-35.6	-42.6	-42.6
Processed meat (g)[d]	-37.4	-38.0	-36.2	-37.7	-43.0	-56.0	-59.3
Nuts (g)	2.8	3.0	3.1	2.6	5.6	9.5	27.5

[a]Includes food groups: tomatoes, fruit
[b]Includes food groups: other vegetables, beans and pulses
[c]Includes food groups: beef, pork, lamb, other red meat
[d]Includes food groups: processed beef, processed pork, processed white meat

Table S6. Modelled changes in health-relevant nutrients for UK females for different levels of GHG reduction

Nutrient / food group	Change for different GHG reduction targets						
	0% GHG reduction	10% GHG reduction	20% GHG reduction	30% GHG reduction	40% GHG reduction	50% GHG reduction	60% GHG reduction
Trans fatty acids (% total energy)	-0.15%	-0.16%	-0.17%	-0.19%	-0.27%	-0.36%	-0.44%
Fibre (g)	3.7	3.6	3.8	4.0	5.1	6.5	7.9
Sodium (g)	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Calcium (mg)	-76.2	-72.1	-66.6	-59.7	-97.6	-161.6	-133.9
Iron (mg)	0.6	0.7	0.7	0.8	1.2	1.4	2.6
Vitamin B12 (µg)	-0.6	-0.5	-0.6	-0.7	-1.1	-1.9	-2.4
Fruit (g)[a]	96.8	94.9	97.2	86.1	77.6	68.9	45.2
Non-starchy vegetables (g)[b]	57.0	58.9	56.6	67.8	76.2	84.9	108.6
Red meat (g)[c]	-4.5	-3.4	-11.7	-21.7	-24.8	-27.0	-28.3
Processed meat (g)[d]	-3.2	-3.8	-5.9	-5.9	-11.5	-23.2	-36.3
Nuts (g)	1.0	1.0	1.4	1.8	2.8	4.7	12.1

[a]Includes food groups: tomatoes, fruit
[b]Includes food groups: other vegetables, beans and pulses
[c]Includes food groups: beef, pork, lamb, other red meat
[d]Includes food groups: processed beef, processed pork, processed white meat

Modelled health impacts

Tables S7 and S8 show the modelled health impacts for each outcome over 20 and 30 years.

Table S7. Modelled health impacts for each outcome over 20 years for different levels of GHG reduction

Health outcome	Cumulative reduction in years of life lost						
	0% GHG reduction	10% GHG reduction	20% GHG reduction	30% GHG reduction	40% GHG reduction	50% GHG reduction	60% GHG reduction
Coronary heart disease	2,098,236	2,125,063	2,114,439	2,164,704	2,379,812	2,806,775	3,126,928
Stroke	428,000	419,593	447,662	467,631	457,648	444,234	328,723
Oral cancer	14,573	14,639	14,596	14,819	15,306	15,747	17,373
Oesophageal cancer	33,927	33,588	33,824	32,598	29,956	27,313	15,067
Lung cancer	26,617	26,242	26,540	25,045	22,487	20,035	10,545
Stomach cancer	22,074	22,058	22,070	22,009	21,887	21,773	21,321
Colorectal cancer	15,893	16,041	17,522	21,341	25,892	33,113	36,786
Type 2 diabetes	18,903	19,196	20,930	24,648	30,262	40,049	45,872
Total	2,658,223	2,676,420	2,697,582	2,772,795	2,983,249	3,409,039	3,602,615

Table S8. Modelled health impacts for each outcome over 30 years for different levels of GHG reduction

Health outcome	Cumulative reduction in years of life lost						
	0% GHG reduction	10% GHG reduction	20% GHG reduction	30% GHG reduction	40% GHG reduction	50% GHG reduction	60% GHG reduction
Coronary heart disease	4,810,412	4,871,642	4,844,374	4,959,769	5,451,598	6,429,843	7,158,336
Stroke	947,731	929,254	990,689	1,035,374	1,013,498	984,054	727,100
Oral cancer	136,385	137,007	136,597	138,684	143,243	147,376	162,606
Oesophageal cancer	313,053	309,924	312,096	300,811	276,416	252,014	138,895
Lung cancer	247,577	244,069	246,871	232,816	209,038	186,238	98,262
Stomach cancer	200,587	200,434	200,546	199,988	198,883	197,843	193,740
Colorectal cancer	144,639	145,992	159,517	194,330	235,816	301,671	335,203
Type 2 diabetes	42,391	43,046	46,833	55,108	67,596	89,365	102,220
Total	6,842,776	6,881,367	6,937,522	7,116,879	7,596,088	8,588,404	8,916,362

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