Evidence briefing 3 – Technical annex

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May 2026

This report should be read in conjunction with Evidence Briefing 3. This research draws on Nesta's tax model (a category tax using the Nutrient Profiling Model), focusing specifically on calculating the sugar reduction that could be achieved, and the health impacts that could be gained specifically from the salt and sugar reductions that could be achieved from Nesta's model. It has been conducted to provide comparable data to the previously published salt and sugar reductions and health impactions from a salt and sugar levy, as proposed in the National Food Strategy.

Methods

Deriving kcal and salt estimates from Nesta report

Calorie reduction estimates were taken from the Nesta Blueprint report[1], which modelled the impact of a Nutrient Profile Model-based HFSS tax on food purchases and energy intake. The absolute change in calories consumed per adult per day for all in-home food, adjusted for a 23% compensation factor[2], were used as the point of departure for the present estimations of reductions in sugar and kcal from sugar (Table 1). Changes in kcal intake were based on in-home food consumption only, reflecting the scope of the underlying modelling in the Nesta Blueprint report, which did not account for out-of-home food consumption.

For salt, the approach necessarily differed. Rather than providing an absolute reduction in salt intake, the Nesta Blueprint report provides a percentage change in salt consumed per adult per day, reflecting the impact of the tax on both in-home and out-of-home food and drink consumption. This percentage change was applied to a baseline daily salt intake of 8.4g derived from the National Diet and Nutrition Survey (2018/19) [3], representing the current estimated average daily salt intake among adults in the UK. This broader approach for salt was used in order to capture the full scope of the estimated tax impact to the extent the available data allowed.

[1] Modelling the impact of a tax on unhealthy foods, Shyamolie Biyani, Lydia Leon, Ryu Matsuura, Harry Wilde and Lauren Bowes Byatt, NESTA, 2026.
[2] Applied to account for compensatory eating behaviour, whereby individuals partly offset calorie reductions from taxed products by increasing consumption of other foods.
[3] National Diet and Nutrition Survey, 2018/2019.

Calorie and salt reductions from HFSS tax (post-23% compensation) for all in-home and out-of-home food

Source: NESTA Blueprint report. Tax rate: £0.06 per kilo per 1-point increase in NPM score

Metric	Low reformulation	Central scenario	High reformulation
Kcal reduction per adult per day (total)[4]	-37	-45	-75
Salt reduction (%)	-0.7	-0.9	-1.8
Salt reduction per adult per day (g)	-0.06	-0.08	-0.15

Notes:

- Calorie reductions include a 23% compensation factor.
- Salt reductions are based on a baseline of 8.4g/day, this is the daily average in the UK as per NDNS figures.

Estimating share of calorie reduction attributed to reduced sugar intake

To estimate the proportion of calorie reductions from the Nesta report attributable to reduced sugar intake, data on baseline purchases and percentage changes by product category were extracted from Gressier et al.'s modelling study[5] of an NPM-based HFSS tax in the UK.

For each category included in the Gressier et al. study, the absolute reduction in sugar (reported in kg and converted to g) was calculated by multiplying baseline sugar purchases by the percentage change. Sugar reductions were converted to energy units using the conversion factor of 17 kJ per gramme of sugar (equivalent to 4 kcal/g). The absolute reduction in total energy (kJ) for each category was then calculated by multiplying baseline energy purchases by the percentage change. The percentage of energy reductions from sugar was calculated by dividing total sugar-related energy reductions by total energy reductions across all assessed product categories (biscuits, breakfast cereal, cakes, chocolate confectionery, ice cream, morning goods, puddings, spreads and sauces, sweet confectionery, and yogurts). The average percentage of energy reductions from sugar across all considered HFSS categories was 35% (Table 2). The Gressier et al. study does not cover the food categories Crisps and savoury snacks, Pizza, Chips and potato products, and Ready meals, and so a limitation is that these food categories are not captured in the calculated average share of calorie reduction attributed to reduced sugar intake.

[4] Values taken directly from Table 12, row 3 in the NESTA report referenced in footnote 1.
[5] Li D, Gressier M, Hill Z, et al. Modelling the potential impact of food taxes based on nutrient and energy content in the UK: a simulation study. British Journal of Nutrition. 2025;133(6):751-762. doi:10.1017/S000711452400182X.

Table 2. The percentage of energy reductions from the sugar across sugar-heavy HFSS categories used in Gressier et al.

Product category	% energy from sugar
Biscuits	27%
Breakfast cereal	25%
Cakes	33%
Chocolate confectionery	43%
Ice cream	40%
Morning goods	19%
Puddings	34%
Spreads and sauces	21%
Sweet confectionery	65%
Yogurts	43%
AVERAGE	**35%**

The 35% average will be multiplied with the Nesta kcal reductions and used in the LSHTM health impact model, together with salt reductions in grams (Table 1) and sugar reductions in grams (= kcal reduction divided by 4).

Estimating health impacts

Health impacts were quantified following a previously established methodology[6]. Briefly, the IOMLIFET model was used to quantify changes in life expectancy, years of life gained and incidence of chronic diseases from changes in dietary risk exposures according to the three different reformulation scenarios (low, central, high). Briefly, the IOMLIFET model estimates survival patterns in the population over time based on age-specific mortality rates. Based on the information of a hypothetical change in diet (risk–exposure) and a known exposure–response function (i.e. Relative Risks), changes in survival rates can be quantified as, for example, years of life gained or changes to life expectancy.

Estimating quality adjusted life years

Quality Adjusted Life Years (QALYs) capture both the quality and quantity of life lived. QALYs were calculated by combining years of life gained from reduced risk exposure (assuming one additional year of life equals one QALY) with QALYs from reduced disease cases. The latter used health-related quality of life values from the DHSC model[7], assigning 0.16, 0.18, 0.11, and 0.16 QALYs per avoided case of heart disease, stroke, diabetes, and cancer respectively. Respiratory disease was not included in the DHSC model and was assigned the lowest value in the existing range (0.11). Changes in QALYs can be converted into monetised QALYs using a representation of how much society values a QALY QALYs were monetised at £25,000 per QALY[8], and a discount rate of 1.5% was applied to future monetary gains to account for time preference and diminishing marginal utility of income, in line with DHSC and UK Treasury guidance.

[6] Eustachio Colombo P, Milner J, Pastorino S, Green R. Population health impacts from the taxation of salt and sugar in the United Kingdom. Public Health Nutr. 2025 Aug 27;28(1):e153. doi: 10.1017/S1368980025100967. PMID: 40859903; PMCID: PMC12516617.

[7] Department of Health and Social Care (DHSC) Calorie Model. 2018. Global and Public 409 Health Group/ Obesity Branch/Childhood Obesity Team/10800.

[8]Methods for the development of NICE public health guidance, Third edition. 2012. National Institute for Health and Care Excellence, London.

Results

Metric	Low reformulation	Central scenario	High reformulation
Kcal reduction per adult per day (total)	-37	-45	-75
Kcal reduction from sugar per adult and day	-13	-16	-26
Sugar reduction based on kcal reduction	-3.24	-3.94	-6.56
Weight reduction based on kcal reduction	-0.54	-0.66	-1.10
BMI reduction based on weight reduction - males	-0.12	-0.15	-0.25
BMI reduction based on weight reduction - females	-0.11	-0.14	-0.23
Salt reduction (%)	-0.7	-0.9	-1.8
Salt reduction per adult per day (g)	-0.06	-0.08	-0.15
Changes in YLG	532,155	679,019	1,185,115
Changes in LE (months)	0.8	1	1.7
Changes in incidence of CVD	-159,155	-203,110	-354,332
Changes in incidence of Diabetes	-135,133	-169,785	-278,398
Changes in incidence of Cancers	-3,635	-4,030	-4,936
Changes in incidence of Respiratory	-61,521	-77,582	-127,335
Total QALY gained	580,441	740,150	1,288,558
Total monetary gain	£12,215,357,033	£15,574,710,972	£27,102,978,761