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Evaluation of the proposed application of the new nutrient profiling model to the advertising and promotions restrictions for less healthy food and drink products

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Executive summary

Purpose

The UK Nutrient Profiling Model (NPM) is a tool used in the UK to determine which food and drinks are 'less healthy' by scoring products based on their nutrient content. It was first developed in 2004/5 and is used as part of a two-step process to underpin the existing advertising and promotions restrictions. The legislation specifies that a food or drink product is 'less healthy' and falls into scope of the restrictions if it meets two criteria:

i. it falls within one of the specified food or drink categories in the Schedules of advertising and/ or promotions restrictions and;

ii. it is shown to be high in saturated fat, salt or sugar (HFSS) when applying the NPM 2004/5 using the 2011 Technical Guidance.

In 2015, the UK Scientific Advisory Committee on Nutrition (SACN) updated its dietary advice, particularly around free sugars. The Government accepted these recommendations and commissioned a review and update of the NPM to reflect these updated dietary recommendations. In 2018, an updated version of the 2004/5 model was published with minor adjustments to the fibre and salt thresholds, and a switch from total sugars to free sugars and changes to the scoring thresholds. The new NPM was published in January 2026 and in March, the UK Government launched a consultation on the proposed application of the NPM 2018 to the advertising and promotions restrictions for less healthy food and drink.

This study aimed to assess how the proposed application of the new NPM 2018 to the advertising and promotions restrictions would affect the classification of grocery products sold in UK supermarkets. The aims and research questions were co-developed with members of the Nutrition Evidence, Surveys and Translation Team and Diet and Obesity Policy Analysis Team, Office for Health Improvement and Disparities. The analyses were conducted independently. The project was funded by NIHR Policy Research Programme (NIHR510239).

Approach

The analysis used nutrition composition and ingredients data for products sold in five retailers (Tesco, Sainsbury's, Asda, Ocado and M&S). Products were grouped into one of the thirteen 'in-scope' legislative food and drink categories. An algorithm that estimates the percentage composition of each ingredient was used to estimate the free sugar and fruit, nut and vegetable content of each product. The two NPMs were applied to the dataset, allowing direct comparison of product classifications, scores, identifications of categories most affected by the revised model, assessment of products close to the pass/fail threshold, and comparison with other international metrics including Nutri-Score and the Chilean Warning Label. Data were not weighted by sales or market share.

Summary of key findings

In total, 15,514 unique products fell into one of the thirteen categories that were in-scope of the legislation. Overall, NPM 2018 classified substantially more products as failing (i.e. high in sugar, fat or salt) compared to NPM 2004/5, indicating the new model is stricter. Under NPM 2004/5, 58 % of products failed and were subject to the advertising and promotion restrictions, compared with 72% for NPM 2018. Despite this change, the two models still classified the vast majority (84%) of products the same. Of the 2,498 products that received different classifications, 93% changed from passing NPM 2004/5 to failing NPM 2018, demonstrating the new model is more stringent.

The differences between the two models were primarily driven by the revision to the sugar component of NPM 2018. Replacing total sugars with free sugars, together with stricter scoring thresholds, meant many of the products scored more points for sugar under the new model. The largest reductions in the proportion of products passing were observed for soft drinks (NPM 2004/5 pass rate: 66%, NPM 2018 pass rate: 6%), breakfast cereals (NPM 2004/5 pass rate: 79%, NPM 2018 pass rate: 39%) and yoghurts (NPM 2004/5 pass rate: 78%, NPM 2018 pass rate: 36%), primarily due to this change. Changes to the sugar component could be offset by the increased points attributed by the fibre component (i.e. maximum points possible with fibre went from 5 to 10), with breakfast cereals and savoury snacks in particular, scoring more points for fibre under NPM 2018.

The proportion of products failing each model that were close to the pass/fail border (i.e., scores of 1-3 for drinks and 4-8 for foods) remained stable, from 10% overall for NPM 2004/5 to 13% for NPM 2018. However, categories such as breakfast cereals, savoury snacks and ice cream saw an increase in the proportion of products failing close to the border.

Comparisons with other metrics, including UK multiple traffic light labels (MTL), Nutri-Score and the Chilean Warning Label showed that NPM 2018 is broadly comparable, with the highest agreement observed between NPM 2018 and Nutri-Score (where a pass was considered A or B).

The results of a sensitivity analysis that assumed total sugars is equal to free sugars for the NPM 2018 model showed that this assumption would lead to even stricter classifications across all categories, with much bigger differences for yoghurts, breakfast cereals, pizzas and ready meals in particular. This highlights the importance of correctly estimating the free sugar content for products, particularly in certain categories.

Key limitations

This analysis was based on a large and comprehensive dataset of supermarket products, but has several limitations. It does not consider products sold at discount retailers or in the out of home sector, including restaurants, takeaways and canteens. Products with incomplete nutrition information or poor-quality ingredients data were excluded. Fibre, which is not subject to mandatory labelling requirements, had to be imputed using a category median when missing. As the free sugars and fruit, nut and vegetable content of products are not directly reported, we developed a method to estimate these two variables. This

method was based on the ingredients list data and an existing algorithm that estimates the composition of each ingredient. Results of a sensitivity analysis show that methodological errors in estimating free sugars is unlikely to impact the overall result of this study; estimating the free sugar score of products by +/- 2 points compared to baseline estimates showed the overall proportion of products failing the model would only change by +/- 2.7%, although some categories were more sensitive than others. Although this suggests the method for estimating free sugars had a limited impact on the overall findings, products where an estimated free sugars content lay close to the pass/fail border may be impacted by incorrect estimation.

A further sensitivity analysis assessed the impact of uncertainty surrounding the degree of processing of fruit and vegetable ingredients, which is not always specified on ingredients lists. This is important because sugars in whole or chopped fruit and vegetables are not classed as free sugars, whereas those in purées and juices are. The main analysis assumed that ingredients with an unspecified degree of processing were whole or intact and therefore did not contribute to free sugar content. This was compared with an alternative scenario in which all such ingredients with an unspecified degree of processing were fully processed and did contribute to free sugars. The analysis was conducted for yoghurts, pizzas and ready meals, which are categories which commonly contain fruit and vegetable ingredients and are therefore most likely to be impacted by this degree of uncertainty. Under the alternative scenario, the proportion of products passing NPM 2018 decreased by 3.2% for yoghurts, 2.6% for pizzas and 1.6% for ready meals. These relatively small differences suggest that uncertainty around the degree of processing of fruit and vegetable ingredients had a limited impact on the overall NPM classification for these categories.

Conclusion

These analyses demonstrate that replacing the current UK nutrient profiling model with the updated 2018 version would increase the number of grocery products subject to the advertising and promotions restrictions by around a quarter. The impact would vary by category, with the greatest changes observed in soft drinks, breakfast cereals and yoghurts, reflecting the revised scoring criteria for free sugars in particular. These findings provide an evidence base for understanding the potential implications updating the NPM might have on the scope of existing legislation.

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Introduction

Poor diet, including high sodium intake and low fruit, vegetable and wholegrain intake, is a leading risk factor for chronic disease and mortality globally and in the UK[1]. In the UK, only 17% of adults meet the recommended 5 portions of fruit and vegetables a day and over 80% of adults consume more than the recommended 5% of their total energy intake from free sugars[2]. Two in three adults[3] and one in three children aged 10-11 years[4] are overweight or obese.

What we eat is strongly influenced by the food environment around us. There is evidence that volume-based price promotions are more frequent on unhealthy foods high in saturated fat, sugar and salt (HFSS foods), and that these price promotions lead to their increased purchase and consumption[5]. Exposure to adverts for unhealthy foods has also been shown to lead to increased consumption in children[6].

As part of its strategy to improve the population's diet and health, the Government announced restrictions on the promotion of 'less healthy' food and drinks products in England. Restriction of prominent location-based promotions of 'less healthy' food and drink products in store and their equivalent places online was implemented on 1 October 2022[7]. Restriction of volume-based price promotions (e.g. buy one get one free) on 'less healthy' food and drink products in store and their equivalent places online was implemented on 1 October 2025[7]. UK-wide restrictions on the advertisement of 'less healthy' food and drink products on TV before 9pm and paid for advertising online at any time also came into force on 5 January 2026[8].

Products are defined as being in scope of the legislation by a nutrient profiling model. Nutrient profiling is defined as 'the science of classifying or ranking foods and drinks based on their nutritional composition to promote health and prevent disease'[9]. The UK Nutrient Profiling Model (NPM) was first introduced in 2004/5 (referred to as NPM 2004/5) to support regulation of broadcast advertising of unhealthy foods during children's television hours. It scores foods based on their content of calorie, total sugars, saturated fat and sodium, as well as fibre, protein and fruit and vegetable content[10].

If foods fall within one of the thirteen categories (e.g. soft drinks, pizzas, ice creams) outlined in the legislation, they are considered in scope of the advertising and promotions legislation[8]. If they fail the NPM, they are subject to the restrictions and cannot be advertised or promoted. Foods within the thirteen categories that pass the model can be advertised and promoted.

In 2018, an updated version of NPM 2004/5, with minor adjustments to the thresholds for fibre and sodium and a switch from total sugars to free sugars and adjustment to the scoring thresholds, was drafted and consulted on, but has never been applied to the restrictions[11]. The final NPM 2018 was republished by Department of Health and Social Care in January 2026 and opened for a public consultation[12].

Aims and objectives

The aim of this project was to understand how updating the NPM 2004/5 to NPM 2018 would change which foods were classified as high in sugar, saturated fat and salt (HFSS) and were subject to the promotions and advertising restrictions.

We addressed the following research questions:

1. What is the difference in the number and type of food and beverage products sold in supermarkets that pass and fail the NPM 2004/5 compared to the NPM 2018 overall and by category? What is the level of agreement between the two models?
2. How does the distribution of points for each nutrient vary between the two models, and how does the proportion of products close to the pass/fail border - which have the potential to be reformulated - vary?
3. How do the two versions of the UK NPM compare to other NPMs e.g. UK traffic light labels, Nutri-score, Chile Warning Labels

The aims and research questions were co-developed with members of the Nutrition Evidence, Surveys and Translation Team and Diet and Obesity Policy Analysis Team, Office for Health Improvement and Disparities. Analyses were conducted independently. The project was funded by NIHR Policy Research Programme (PRP) (NIHR510239).

Methods

Data

Composition data was provided by Acuity[13], a private analytics company that collects food product data by scraping websites of UK food retailers. The data corresponded to an extract of the Acuity database on 17th of July 2025 and product data was collected on four retailers: Asda, Ocado, Sainsbury's and Tesco. In addition, Marks and Spencer products sold through Ocado were also included in the extract. In total, the original extract included 74,770 products.

The variables collected by Acuity include product name, barcode, brand name, product size, price, promotional price, promotional description, nutrition information per 100g or 100ml and ingredients list, as declared on the product page (which is assumed to be the same as back-of-pack). The data dictionary includes all variables and their description. All data management and analyses were conducted in RStudio version 4.5.1.

Data management

Foods in scope of advertising policy

In the UK, the advertising restrictions follow a two-step system. First, a product must fall within one of the food or drink categories specified by the regulations (i.e. are must be in one of the thirteen categories that are 'in-scope' of the regulations). Second, it must be classified as "less healthy" under the UK Nutrient Profiling Model (NPM). Only products that satisfy both conditions are subject to the restrictions, and as a result, cannot be advertised on TV before the 9pm watershed or through paid for online advertising at any time. Therefore, to evaluate the impact of the advertising restrictions, products were categorised as either 'in-scope' or 'out of scope' of the policy. Following the government's advertising restriction guidance, products were classified according to whether they belonged to one of the 13 food and drink categories covered by the regulations[8], hereafter referred to as 'in-scope categories'. Products falling within these categories were considered in-scope, while all others were classified as 'out of scope'. Products identified as outliers during this process (i.e. non-food items) were excluded.

Application of granular food groups

In addition to categorising products into one of 13 in-scope food categories, we developed and applied a classification system comprising 120 granular food groups that covered all foods in the dataset. These groups were developed primarily for descriptive purposes and to facilitate the application of the nutrient profiling models (e.g. estimating missing fibre content (see below), in contrast to the Acuity categories, which are based on industry preferences for category names. The granular food groups were only used for analyses of the full dataset presented in the appendices.

Missing data

Products were excluded from the dataset if at least one mandatory nutrient was missing. This includes energy, carbohydrates, total sugars, total fat, saturated fat, salt/sodium and protein content. Checks on nutrients were also applied. We excluded products with an

energy content greater than 3,780 kJ/100g, products containing more than 100g of any nutrient and products with more saturated fat than fat and more total sugars than carbohydrates. As a result, 12,594 products were excluded because of missing nutrient data and 777 products were excluded because of the additional checks.

Missing fibre data were imputed using the median fibre content of products with available fibre information in the same category. We used the most granular category level to impute fibre data (see above). As a result, no product was excluded because of missing fibre data.

Ingredient data

Using the ingredients list variable, we used a disaggregation and estimation method as developed by Clark et al.[14] to estimate the percentage composition of each ingredient. First, individual ingredients were identified from the ingredient list using punctuation (e.g., commas) as delimiters. During the disaggregation process, each ingredient was assigned to a broader ingredient category and subsequently classified as a specific ingredient based on its name. Second, the proportion of each ingredient was estimated using information from similar products belonging to the same Shelf, Aisle and/or Department within the same retailer. The estimation method has been detailed previously[14]. Because the metrics used in our analyses were derived from these estimated ingredient compositions, products with missing, incomplete, or poor-quality ingredient lists were excluded. This resulted in the exclusion of a further 4,930 products.

Reconstitution and unit conversions

For products that required reconstitution before consumption, we used a reconstitution factor to estimate nutrient data after reconstitution. To apply the NPM, it is advised to use the composition after preparation following the methods detailed on pack. As the method advised by the manufacturer was not available, we took a random sample of 10 products in each category subject to reconstitution and manually collected the recipe and derived reconstitution factors. Categories where reconstitution factors were applied include tea, coffee and powdered chocolate drinks, powdered soups and instant noodles. Data in categories in which the form could not be automatically identified was kept as provided (e.g. instant gravy and stock).

In addition, nutrient composition data for ice cream was either declared per 100g or per 100mL. Following guidelines published on the NPM, a conversion factor from 100mL to 100g need to be applied as this category of product is assessed on a per 100g basis. However, the data provided by Acuity did not identify whether the nutrition information were reported ‘per 100g’ or ‘per 100mL’. Observations of ice cream from the targeted supermarket websites suggest that data is mainly (but not exclusively) provided as ‘per 100g’, therefore we used the Acuity data as provided.

Duplicates

Acuity provides a unique identifier based on names, which was used to identify same products sold across the different retailers. We considered duplicates to be products with the same product name and same format and size. For example, a drink sold in a 1L bottle was considered to be distinct from the same product but sold in a 6 can multipack.

For own-label products (i.e. retailers' private-label products), the retailer name was used as the brand name in place of "Own Label". This ensured that own-label products from different retailers were not incorrectly identified as duplicates.

Data management

Free sugars

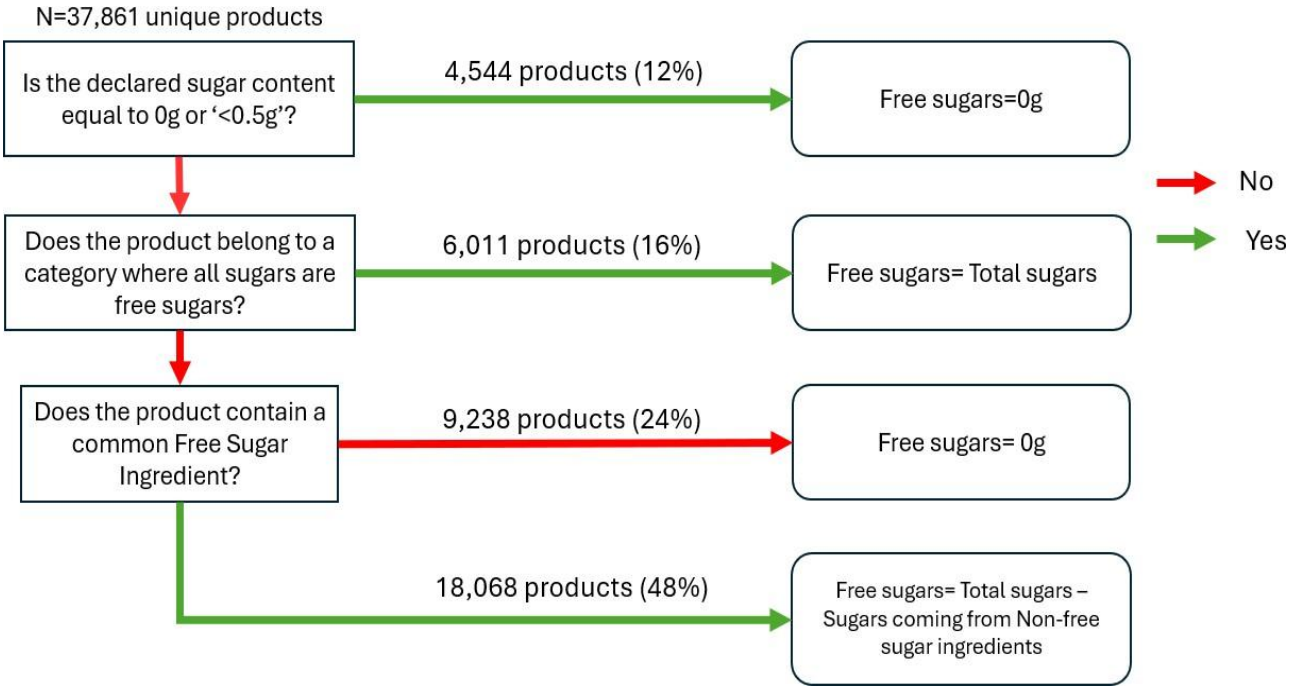
Free sugars were estimated using a multi-step algorithm. First, each ingredient is disaggregated and assigned to an ingredient category. If the declared total sugar content of a product was 0g or <0.5g/100g, the estimated free sugar content was 0 (4,544 products; 12% of the final data). Then, we identified categories for which all sugars would be considered to be free sugars, including soft drinks, fruit juices, milk alternatives, confectionery, sweet bakery, sweet snacks and spreads, cereals bars with added sugar, breakfast cereals with added sugar and no dried fruits, soups and stocks, dips, and sugar and sweeteners (6,011 products; 16% of the final data).

For the remaining products, we identified those with at least one ingredient that is a source of free sugars (hereafter referred to as free sugar ingredients). The list of free sugar ingredients was based on: 1) the technical guidance document provided to apply the NPM 2018[9], 2) a list developed by Zupanic et al[15]. The list was also added to on a case-by-case basis when further free sugar ingredients were identified, with the final list provided in Appendix 1. If no free sugar ingredient was identified, free sugar was estimated at 0g (9,238 products; 24% of the final data).

We then identified ingredients that were sources of non-free sugars (e.g. whole or chopped fruits and vegetables, milk, cereals, where sugars are naturally occurring). Each ingredient was then paired with the USDA FoodCentral Database[16], or alternatively the equivalent French Ciqual[17] database to obtain sugar content of each ingredient. The UK Composition of Foods Integrated Dataset (CoFID) was not used due its use of generic foods that are difficult to link to specific, single ingredients. The sugar content of each ingredient was summed and subtracted from the value for total sugars to estimate free sugar content (18,068 products; 48% of the final data). The estimation process is summarised in the Figure 1 below.

We decided to identify non-free sugar ingredients and subtract these from total sugars, rather than sum free sugar ingredients, because non-free sugar ingredients (e.g. whole or chopped fruits and vegetables, milk, cereals, where sugars are naturally occurring) are a smaller, more discrete number of ingredients to identify compared to sweetener ingredients. These ingredients are also easier to identify in composition of food tables when estimating their free sugar content compared to sweetener ingredients, which can have varying forms and concentrations for example. The study team therefore agreed subtracting the non-free sugar ingredients from total sugars was more reliable than trying to sum the free sugar ingredients.

Figure 1: Decision tree used to estimate free sugar content and number of products



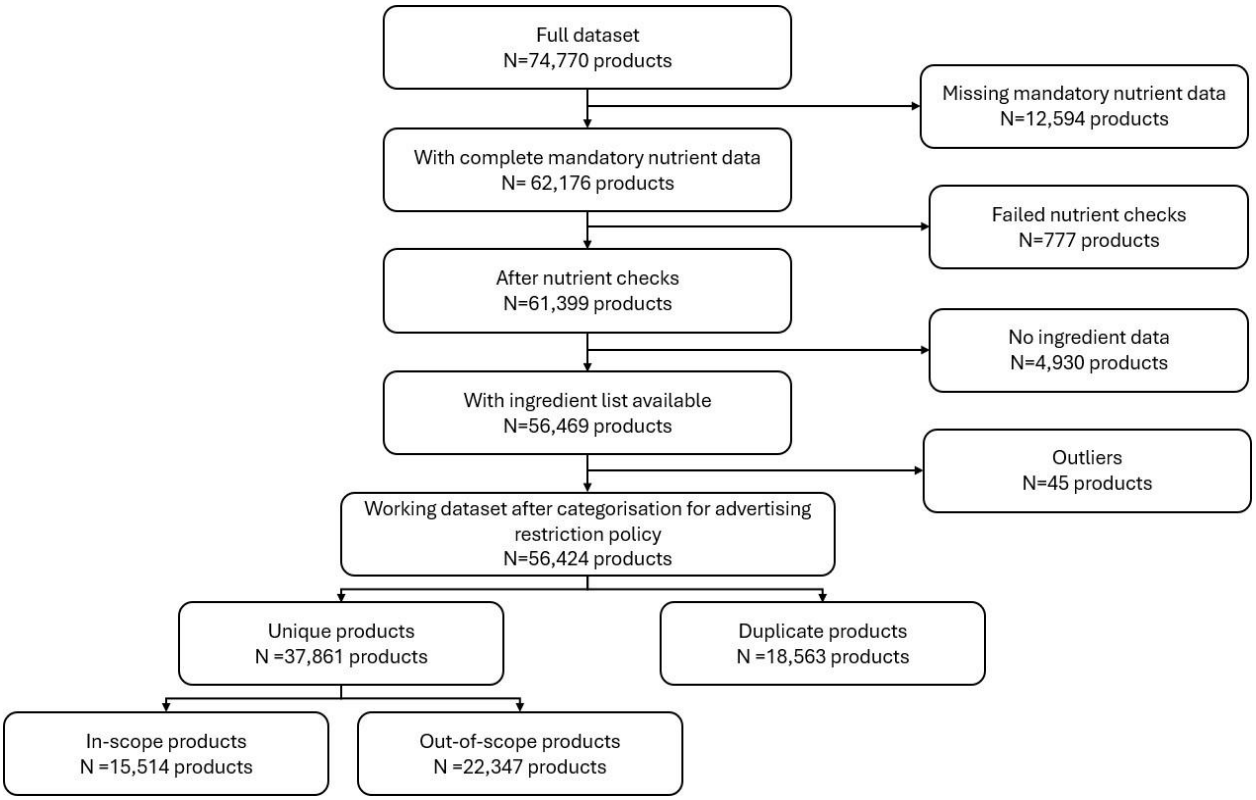
FVN estimates

The content of fruit, vegetables, nuts, seeds and pulses (FVN) was estimated based on the disaggregated ingredient list as described above. Ingredients falling in a list of ingredient categories were considered as contributing to the FVN estimate, these are given in Appendix 2. For the NPM 2018, seeds were added to the FVN estimation. Ingredients were further analysed to assess whether the ingredient is in a fresh or dried form. To compute the final estimate, we used the formula as provided in the guidance documents to compute the UK NPM[10,12].

In total, the estimated fruit, vegetable component was non null for 33,257 products (59%) for the NPM 2004 (34,154 products (61%) for the NPM 2018) and was higher than 40% for 10,957 products (19%) for NPM 2004 (11,386 products (20%) for NPM 2018).

A flowchart summarising the number of products excluded at each stage is given in Figure 2 below.

Figure 2: Total number of products in final dataset and exclusions at each stage of data cleaning



Application of NPMs

NPM 2004/5 and 2018

Products were classified using the UK Nutrient Profiling Models (NPM) 2004/05 and 2018. The appropriate points were awarded based on each product's energy, saturated fat, total or free sugars and salt or sodium content ("A-points") and fibre, protein and FVN content ("C-points") per 100g, as set out by each model's technical guidance documentation[10,12]. Scores were calculated from nutrient composition data per 100 g (or 100 mL for beverages) following the specifications of each model. Products were then classified as healthier or less healthy according to the model-specific scoring thresholds.

Nutri-Score

Nutri-Score was calculated according to the technical guidance published by Santé publique France, using the updated Nutri-Score algorithm[18]. Similar to the UK NPM, Nutri-Score is based on a balance between points awarded for nutrients and components to limit and points awarded for nutrients to promote. However, the scoring thresholds and category-specific rules differ between the two models. The final score was used to assign products to one of five Nutri-Score categories, ranging from A (highest nutritional quality) to E (lowest quality), according to the relevant food and beverage classification rules.

Chilean Warning Labels

Products were assessed against the nutrient thresholds specified under Chile's Warning

Labels[19,20]. Products exceeding the regulatory thresholds for energy, total sugars, saturated fat and/or sodium were classified as requiring a corresponding front-of-pack warning label ("High in"). Thresholds were applied per 100 g for solid foods and per 100 mL for beverages.

Multiple Traffic Light Labels

Products were classified according to the UK Multiple Traffic Light front-of-pack label[21]. Thresholds for total fat, saturated fat, total sugars and salt were applied per 100 g for foods and per 100 mL for beverages to assign a colour-coded rating of green (low), amber (medium) or red (high) for each nutrient. As serving size was not available in the database, only the per 100g/100mL thresholds were applied.

Analysis

Only unique products were included in the descriptive statistics and analyses, except for the tables that included a breakdown by retailer, where duplicate products were used to account for the same product being sold in different retailers.

Descriptive analyses

The number of products and their distribution across the thirteen in-scope categories and by retailer were calculated. Nutrient composition (energy, total fat, saturated fat, total carbohydrate, total sugars, free sugars, protein, fibre, salt and fruit nut and vegetable (FVN) content) were summarised for each category using the mean and selected percentiles (5^{th}, 25^{th}, median, 75^{th} and 95^{th}). The proportion of products with missing fibre data (not reported) was also summarised by category.

Comparison of NPM 2004/5 and NPM 2018

The primary outcome for this project was the proportion of products that pass and fail each of the two NPMs. For each in-scope category, the number and proportion of products passing and failing the two NPMs, and the absolute percentage point difference between the two models, were calculated.

Agreement between the two models

Agreement between NPM 2004/5 and NPM 2018 classifications was assessed using paired cross-tabulations. McNemar's test was used to assess whether the proportion of products that passed differed significantly between the two models within each of the in-scope categories. Agreement was quantified by observed agreement, Cohen's kappa and Gwet's AC1 coefficient, calculated overall and by in-scope category. Gwet's AC1 was included due to Cohen's kappa sensitivity to imbalanced distributions that occur in several of the in-scope categories (i.e., Kappa Paradox).

Distribution of nutrient profiling scores

The distributions of the final NPM scores for each category and model were described graphically using box plots. The distribution of points awarded for each scoring component/nutrient for were summarised to identify which nutrients for each model contributed to the differences in NPM score and classification.

Borderline products and scope for reformulation

To assess their potential for reformulation (in order to pass the model), products failing each model were grouped according to their distance from the pass/fail threshold. Products within a borderline range (4-8 for foods and 1-3 for drinks) were identified and compared to the proportion of products failing for each model and category.

Comparison with other nutrient profiling models

The proportion of products passing and failing NPM 2004/5, NPM 2018, UK multiple traffic lights (MTL), Nutri-Score and Chile Warning Labels (CWL) was compared and assessed. The classifications of MTL, Nutri-Score and CWL and their comparison to pass/fail NPM 2004/5 and NPM 2018 are summarised in Table 1 below:

Table 1: Equivalent classifications for the comparison of UK NPMs to other nutrient profiling models

UK NPM classification	MTL (red only)	MTL (red/amber)	Nutri-Score	Chilean Warning Labels
Fail	One red label or more	One amber or more	C–E	One warning label or more
Pass	Four green and/or amber	Four green	A–B	No warning label

Sensitivity analyses

We conducted further analyses to assess the sensitivity of the results to the methods used to estimate missing nutrient data (i.e. not provided as part of mandatory nutritional declarations on the label):

Sensitivity Analysis 1 (fibre): To understand the impact that imputing fibre values had, we computed the proportion of products and passing an failing the NPM 2004/5 and NPM 2018 when we imputed missing fibre values with the 25th percentile fibre content of the category or 75th percentile fibre content, instead of the median.

Sensitivity Analysis 2 (FVN): To understand what impact estimating the fruit, nut, vegetable and seed (FVN) content might have had on the results, we provided a table describing the proportion of products for each in-scope category with a FVN content close to NPM scoring thresholds (i.e., 40%, 60% and 80%).

Sensitivity Analysis 3 (free sugars): In order to understand what impact using estimated free sugars had compared to total sugars (as declared on the packet) for the revised NPM 2018, we computed the proportion of products passing and failing NPM 2018 using total sugars as a value for free sugars instead (i.e. all sugars are considered free sugars).

Sensitivity Analysis 4 (free sugars): We computed the proportion of products passing and failing the NPM 2018 when the number of points for sugar was modified by +/- 1 or 2 points from the estimate used in main analyses, to account for uncertainty in free sugar estimation.

Sensitivity Analysis 5 (free sugars): We compared the proportion of products that are passing and failing NPM 2018 following the main analyses method, which assumes that all

fruit and vegetable ingredients where the degree of processing is not given are whole/intact (i.e. won't contribute to free sugar content), compared to an alternative, which assumed that they all were non-intact (i.e. will contribute to free sugar content). For example, a strawberry yoghurt may contain both whole and pureed strawberry, which is only declared as 'strawberry' in the ingredients list. This analysis allowed us to test what difference assuming all of this 'strawberry' ingredient was whole/intact and not contributing to free sugar content, compared to if it was all pureed and contributing to free sugar content. We selected three categories which commonly contain fruit and/or vegetable ingredients and that could impact by such lack of information: yoghurts, pizza and ready meals. The other legislative categories either contain all whole fruit (e.g. breakfast cereals) or all processed fruit (e.g. soft drinks), or contain smaller quantities of fruit (e.g. confectionery), therefore this analysis was limited to three categories only.

Results

In total, 15,514 unique products were considered to be in scope of the advertising restriction legislation and were included in the main analyses. Each product was categorised into one of thirteen in-scope categories. A further 22,347 unique products did not fall within any of these 13 categories and were classified as out-of-scope. Descriptive statistics and key results for the full dataset, including out-of-scope products, can be found in Appendix 3 and 4.

Of the 13 categories, ready meals was the category with the largest number of products (n = 3521) followed by confectionery (n = 2146) and savoury snacks (n = 1851). Processed potatoes was the smallest category (n = 262), followed by pizzas (n = 377) and yoghurts (n = 500). The number and proportion of products in each category is given in Table 2 below. The same result broken down by retailer is given in Table 3.

Table 2. Number and proportion of products by in-scope category

In-scope category	N	Proportion
Soft drinks	1352	3.6%
Savoury snacks	1849	4.9%
Breakfast cereals	788	2.1%
Confectionery	2146	5.7%
Ice cream	663	1.8%
Cakes	1098	2.9%
Biscuits	1356	3.6%
Morning goods	529	1.4%
Desserts	1073	2.8%
Yoghurts	500	1.3%
Pizzas	377	1.0%
Processed potatoes	262	0.7%
Ready meals	3521	9.3%
Sub-total in-scope	**15514**	**41.0%**
Out-of-scope	22347	59.0%
Total	**37861**	**100.0%**

Table 3. Number of products by in-scope category and retailer

In-scope category	Total	ASDA	M&S Own Label	Ocado	Sainsburys	Tesco
Soft drinks	1352	131	62	284	225	650
Savoury snacks	1849	168	133	563	320	665
Breakfast cereals	788	81	60	228	117	302
Confectionery	2146	218	226	544	371	787
Ice cream	663	67	42	148	122	284
Cakes	1098	271	134	124	235	334
Biscuits	1356	155	136	319	253	493
Morning goods	529	84	61	55	106	223
Desserts	1073	208	140	111	246	368
Yoghurts	500	78	39	57	114	212
Pizzas	377	96	38	38	83	122
Processed potatoes	262	38	29	28	59	108
Ready meals	3521	608	490	321	823	1279
Sub-total in-scope	**15514**	**2203**	**1590**	**2820**	**3074**	**5827**
Out-of-scope	22347	2922	1668	4989	4499	8269
Total	**37861**	**5125**	**3258**	**7809**	**7573**	**14096**

Table 4. Summary of nutrient composition by in-scope category

Nutrient	In-scope category	N	Mean	5th pct	25th pct	Median	75th pct	95th pct
Energy (kJ/100g)	Soft drinks	1352	158.3	43.5	79.0	116.0	198.0	308.0
	Savoury snacks	1849	1990.1	1570.4	1853.0	2033.0	2152.0	2295.6
	Breakfast cereals	788	1665.9	1481.3	1554.0	1602.0	1773.0	2001.3
	Confectionery	2146	1965.5	1355.0	1643.2	2055.5	2276.0	2499.8
	Ice cream	663	866.8	290.2	586.5	864.0	1132.0	1458.0
	Cakes	1098	1734.0	1392.4	1610.0	1747.5	1880.0	2041.7
	Biscuits	1356	1952.9	1547.8	1805.5	2001.5	2121.0	2267.2
	Morning goods	529	1395.2	895.0	1127.0	1371.0	1662.0	1943.0
	Desserts	1073	1089.5	251.2	586.0	1150.0	1549.0	1865.0
	Yoghurts	500	414.6	249.6	324.0	384.5	502.0	621.1
	Pizzas	377	1073.3	835.0	970.0	1057.0	1133.0	1341.6
	Processed potatoes	262	691.7	376.2	549.0	680.0	799.2	1050.0
	Ready meals	3521	721.6	339.0	511.0	687.0	910.0	1195.0
Fat (g/100g)	Soft drinks	1352	0.6	0.0	0.0	0.0	1.0	2.4
	Savoury snacks	1849	22.2	2.9	15.0	23.4	29.0	35.5
	Breakfast cereals	788	9.2	1.3	3.5	6.5	13.0	23.1
	Confectionery	2146	21.8	0.0	3.9	24.5	34.0	45.8
	Ice cream	663	10.2	0.0	4.5	10.0	15.0	21.0
	Cakes	1098	18.9	6.9	15.5	19.9	23.0	28.0
	Biscuits	1356	21.5	7.1	16.7	22.0	26.3	34.0
	Morning goods	529	12.0	1.1	4.0	10.4	19.0	27.0
	Desserts	1073	12.2	0.0	4.0	11.9	19.0	26.5
	Yoghurts	500	3.4	0.1	1.5	3.1	4.6	8.2
	Pizzas	377	9.4	4.8	7.5	8.9	10.2	13.8
	Processed potatoes	262	5.8	1.4	3.7	5.5	7.5	11.0
	Ready meals	3521	7.3	1.4	3.6	6.3	9.8	16.3
Saturated fat (g/100g)	Soft drinks	1352	0.3	0.0	0.0	0.0	0.6	1.2
	Savoury snacks	1849	4.1	0.5	1.7	2.4	3.7	15.1
	Breakfast cereals	788	2.0	0.3	0.7	1.2	2.2	6.0
	Confectionery	2146	12.2	0.0	1.9	13.0	18.9	28.3
	Ice cream	663	6.8	0.0	3.3	7.0	10.0	14.0
	Cakes	1098	7.5	1.8	3.9	6.8	10.6	15.6
	Biscuits	1356	10.3	1.2	5.8	10.1	14.3	19.5
	Morning goods	529	5.2	0.2	0.7	3.3	9.1	15.0
	Desserts	1073	6.8	0.0	2.3	6.4	11.0	15.3
	Yoghurts	500	2.1	0.0	0.4	1.9	2.9	5.3
	Pizzas	377	3.8	1.6	2.8	3.6	4.3	6.1
	Processed potatoes	262	0.9	0.1	0.5	0.7	1.0	2.4
	Ready meals	3521	2.1	0.2	0.7	1.4	2.7	5.7

Nutrient	In-scope category	N	Mean	5th pct	25th pct	Median	75th pct	95th pct
Carbohydrate (g/100g)	Soft drinks	1352	7.1	2.2	4.3	4.9	8.8	12.2
	Savoury snacks	1849	57.3	32.8	53.0	58.6	65.3	76.0
	Breakfast cereals	788	63.1	40.3	58.0	64.0	69.0	84.0
	Confectionery	2146	61.5	31.0	50.0	59.5	77.0	92.0
	Ice cream	663	25.5	12.0	20.0	25.0	31.0	39.4
	Cakes	1098	55.3	36.1	51.0	55.8	60.7	70.0
	Biscuits	1356	58.4	26.8	55.0	62.0	66.0	75.0
	Morning goods	529	47.9	34.5	42.0	48.0	53.0	62.9
	Desserts	1073	33.2	7.3	17.9	32.2	44.0	66.0
	Yoghurts	500	11.6	4.8	8.5	11.3	13.9	19.4
	Pizzas	377	31.5	24.0	28.0	31.0	33.7	43.1
	Processed potatoes	262	24.3	14.0	19.7	23.0	28.0	38.0
	Ready meals	3521	17.5	4.6	11.3	16.4	22.7	31.5
Total sugars (g/100g)	Soft drinks	1352	6.4	1.9	4.0	4.5	7.8	11.8
	Savoury snacks	1849	3.5	0.2	1.2	2.5	4.0	9.1
	Breakfast cereals	788	13.3	0.9	5.0	14.1	19.0	25.1
	Confectionery	2146	48.5	11.9	39.4	50.0	58.9	76.0
	Ice cream	663	20.6	9.5	17.0	20.9	25.0	29.9
	Cakes	1098	34.4	14.0	27.1	35.0	42.0	50.0
	Biscuits	1356	28.1	7.7	20.0	28.1	36.0	47.7
	Morning goods	529	15.7	2.5	7.2	14.3	21.0	36.1
	Desserts	1073	22.1	4.6	13.7	19.6	27.0	44.9
	Yoghurts	500	9.6	3.7	6.9	9.3	12.0	15.9
	Pizzas	377	3.2	1.6	2.4	3.0	3.7	5.5
	Processed potatoes	262	1.4	0.0	0.0	0.5	1.1	9.4
	Ready meals	3521	2.5	0.1	1.1	1.9	3.1	6.2
Free sugars (g/100g)	Soft drinks	1352	5.9	1.5	3.8	4.5	6.2	11.4
	Savoury snacks	1849	1.7	0.0	0.0	0.0	2.3	7.5
	Breakfast cereals	788	10.3	0.0	0.0	11.0	17.3	22.8
	Confectionery	2146	45.3	7.2	34.9	45.2	56.4	76.0
	Ice cream	663	17.0	4.7	13.0	17.5	21.6	26.1
	Cakes	1098	34.0	12.3	27.0	35.0	41.9	50.0
	Biscuits	1356	26.4	0.0	18.6	27.0	35.0	46.9
	Morning goods	529	15.4	1.6	6.6	14.1	21.0	36.1
	Desserts	1073	19.2	0.0	9.3	16.2	25.0	43.6
	Yoghurts	500	6.0	0.0	3.6	6.0	8.3	12.5
	Pizzas	377	2.0	0.0	1.1	1.7	2.5	3.9
	Processed potatoes	262	0.4	0.0	0.0	0.0	0.0	1.7
	Ready meals	3521	1.3	0.0	0.0	0.6	1.7	5.1
	Soft drinks	1352	0.8	0.0	0.0	0.0	1.1	3.5

Nutrient	In-scope category	N	Mean	5th pct	25th pct	Median	75th pct	95th pct
Protein (g/100g)	Soft drinks	1352	0.8	0.0	0.0	0.0	1.1	3.5
	Savoury snacks	1849	9.2	2.6	6.0	7.1	10.2	20.3
	Breakfast cereals	788	11.3	6.9	8.8	10.8	12.2	20.0
	Confectionery	2146	5.8	0.0	2.5	5.3	7.3	12.4
	Ice cream	663	2.8	0.0	1.6	3.1	3.9	5.0
	Cakes	1098	5.0	2.5	3.7	4.7	5.6	7.6
	Biscuits	1356	7.4	3.3	5.1	6.2	7.5	18.5
	Morning goods	529	7.1	3.7	5.6	6.9	8.4	11.0
	Desserts	1073	3.8	0.4	2.7	3.5	4.7	6.9
	Yoghurts	500	5.2	2.6	3.5	4.3	5.6	10.2
	Pizzas	377	10.2	5.4	9.5	10.8	11.7	13.0
	Processed potatoes	262	2.6	1.5	2.1	2.5	2.9	3.8
	Ready meals	3521	8.4	2.2	5.1	7.5	11.4	17.0
Fibre (g/100g)*	Soft drinks	506	0.3	0.0	0.0	0.1	0.5	1.1
	Savoury snacks	1686	4.9	0.9	2.9	4.0	6.0	12.0
	Breakfast cereals	784	8.4	2.7	6.4	8.0	9.4	15.0
	Confectionery	1180	3.8	0.0	0.5	2.3	5.6	12.0
	Ice cream	458	1.1	0.0	0.1	0.7	1.3	4.2
	Cakes	947	2.0	0.0	1.0	1.5	2.3	4.6
	Biscuits	1136	5.3	0.9	2.0	3.0	6.2	18.2
	Morning goods	500	2.7	0.9	1.7	2.3	3.2	6.0
	Desserts	934	1.2	0.0	0.5	1.0	1.6	3.0
	Yoghurts	243	0.5	0.0	0.0	0.2	0.9	2.0
	Pizzas	372	2.2	1.3	1.7	2.1	2.6	3.3
	Processed potatoes	254	2.7	1.4	2.1	2.6	3.2	4.4
	Ready meals	3317	1.8	0.6	1.1	1.5	2.2	4.5
Salt (g/100g)	Soft drinks	1352	0.1	0.0	0.0	0.0	0.1	0.2
	Savoury snacks	1849	1.5	0.3	1.0	1.3	1.9	2.9
	Breakfast cereals	788	0.3	0.0	0.0	0.1	0.4	0.8
	Confectionery	2146	0.3	0.0	0.0	0.2	0.3	0.8
	Ice cream	663	0.2	0.0	0.1	0.1	0.2	0.4
	Cakes	1098	0.5	0.1	0.3	0.4	0.5	0.9
	Biscuits	1356	0.5	0.0	0.3	0.5	0.7	1.1
	Morning goods	529	0.8	0.3	0.5	0.7	0.9	1.4
	Desserts	1073	0.2	0.0	0.1	0.2	0.3	0.6
	Yoghurts	500	0.1	0.0	0.1	0.1	0.1	0.2
	Pizzas	377	1.1	0.7	0.9	1.0	1.2	1.6
	Processed potatoes	262	0.4	0.1	0.2	0.4	0.5	1.0
	Ready meals	3521	0.8	0.3	0.5	0.7	0.9	1.5

Fruit, vegetables and nuts (FVN) (%)	Soft drinks	1352	6.3	0.0	0.0	0.0	6.0	33.5
	Savoury snacks	1849	6.2	0.0	0.0	0.0	2.2	43.6
	Breakfast cereals	788	10.4	0.0	0.0	0.0	14.5	45.3
	Confectionery	2146	7.2	0.0	0.0	0.0	5.8	39.8
	Ice cream	663	8.3	0.0	0.0	2.5	8.8	40.6
	Cakes	1098	4.3	0.0	0.0	0.0	4.6	21.0
	Biscuits	1356	11.4	0.0	0.0	0.0	9.8	69.0
	Morning goods	529	5.0	0.0	0.0	0.0	8.0	24.3
	Desserts	1073	9.4	0.0	0.0	0.1	11.7	49.0
	Yoghurts	500	11.4	0.0	2.7	7.0	12.8	51.9
	Pizzas	377	18.3	3.0	12.5	17.2	24.7	36.1
	Processed potatoes	262	2.7	0.0	0.0	0.0	1.6	14.1
	Ready meals	3521	20.3	0.0	2.0	15.6	32.0	61.2

* Fibre values calculated using declared data only (i.e., no imputed fibre values)

Savoury snacks, confectionery, biscuits and cakes were the categories had the highest mean energy and mean saturated fat content, with confectionery, cakes, biscuits and desserts having the highest mean content of total sugars, and savoury snacks, pizzas and ready meals having the highest mean salt content (Table 4 below). Breakfast cereals, pizzas and savoury snacks had the highest mean protein content. Breakfast cereals, biscuits and savoury snacks had the highest mean fibre content (excluding products where fibre was missing and imputed) and ready meals and pizzas were the two categories with the highest fruit, nut, veg and seeds content.

There was a large amount of heterogeneity in the proportion of products that did not report fibre content between categories (Table 5). The categories with the highest proportion of missing values were soft drinks (62.6%), yoghurts (51.4%) and confectionery (45.0%), while breakfast cereals (0.5%), pizzas (1.3%) and processed potatoes (3.1%) were the categories with a very small proportion of missing values.

Table 5. Missing values for fibre by in-scope category

In-scope category	N	N missing value	% missing values	Mean fibre (g/100g)	Median fibre (g/100g)
Soft drinks	1352	846	62.6%	0.3	0.1
Savoury snacks	1849	163	8.8%	4.9	4.0
Breakfast cereals	788	4	0.5%	8.4	8.0
Confectionery	2146	966	45.0%	3.8	2.3
Ice cream	663	205	30.9%	1.1	0.7
Cakes	1098	151	13.8%	2.0	1.5
Biscuits	1356	220	16.2%	5.3	3.0
Morning goods	529	29	5.5%	2.7	2.3
Desserts	1073	139	13.0%	1.2	1.0
Yoghurts	500	257	51.4%	0.5	0.2
Pizzas	377	5	1.3%	2.2	2.1
Processed potatoes	262	8	3.1%	2.7	2.6
Ready meals	3521	204	5.8%	1.8	1.5
Total	**15514**	**3197**	**20.6%**	**3.1**	**1.9**

Under NPM 2004/5, the overall proportion of in-scope products passing was 42.2%, with great heterogeneity between the proportion of products passing between categories, from 3.1% for confectionery and cakes, through to 94.3% for processed potatoes and 84.2% for ready meals. Under NPM 2018, the overall proportion of in-scope products passing the model was 28.4%, highlighting the updated model is more stringent. Every category had the same number (processed potatoes) or fewer products passing, with the biggest reductions seen in soft drinks (66.2% for NPM 2004/5 compared to 5.9% for NPM 2018) breakfast cereals (78.9% NPM 2004/5 vs 39.1% NPM 2018), yoghurts (77.8% NPM 2004/5 vs 36.0% NPM 2018) and pizzas (50.7% NPM 2004/5 vs 28.9% NPM 2018). The proportion of products passing and failing each model and the percentage change between each category is given in Table 6 and Figures 3 and 4 below. The distribution of NPM 2004/5 and NPM 2018 continuous scores by in-scope category is presented in Figure 5. The proportion of products passing and failing each in-scope category for each retailer is given in Appendix 5.

Table 6. Number and proportion of products passing NPM 2004/5 and NPM 2018 by in-scope category

In-scope category	N	Pass NPM04	% Pass NPM04	Fail NPM04	% Fail NPM04	Pass NPM18	% Pass NPM18	Fail NPM18	% Fail NPM18
Soft drinks	1352	895	66.2%	457	33.8%	80	5.9%	1272	94.1%
Savoury snacks	1849	483	26.1%	1366	73.9%	447	24.2%	1402	75.8%
Breakfast cereals	788	622	78.9%	166	21.1%	308	39.1%	480	60.9%
Confectionery	2146	66	3.1%	2080	96.9%	32	1.5%	2114	98.5%
Ice cream	663	110	16.6%	553	83.4%	22	3.3%	641	96.7%
Cakes	1098	34	3.1%	1064	96.9%	13	1.2%	1085	98.8%
Biscuits	1356	129	9.5%	1227	90.5%	89	6.6%	1267	93.4%
Morning goods	529	171	32.3%	358	67.7%	70	13.2%	459	86.8%
Desserts	1073	250	23.3%	823	76.7%	87	8.1%	986	91.9%
Yoghurts	500	389	77.8%	111	22.2%	180	36.0%	320	64.0%
Pizzas	377	191	50.7%	186	49.3%	109	28.9%	268	71.1%
Processed potatoes	262	247	94.3%	15	5.7%	247	94.3%	15	5.7%
Ready meals	3521	2965	84.2%	556	15.8%	2726	77.4%	795	22.6%
Total	**15514**	**6552**	**42.2%**	**8962**	**57.8%**	**4410**	**28.4%**	**11104**	**71.6%**

Figure 3. Proportion of products passing NPM 2004/5 and NPM 2018 by in-scope category

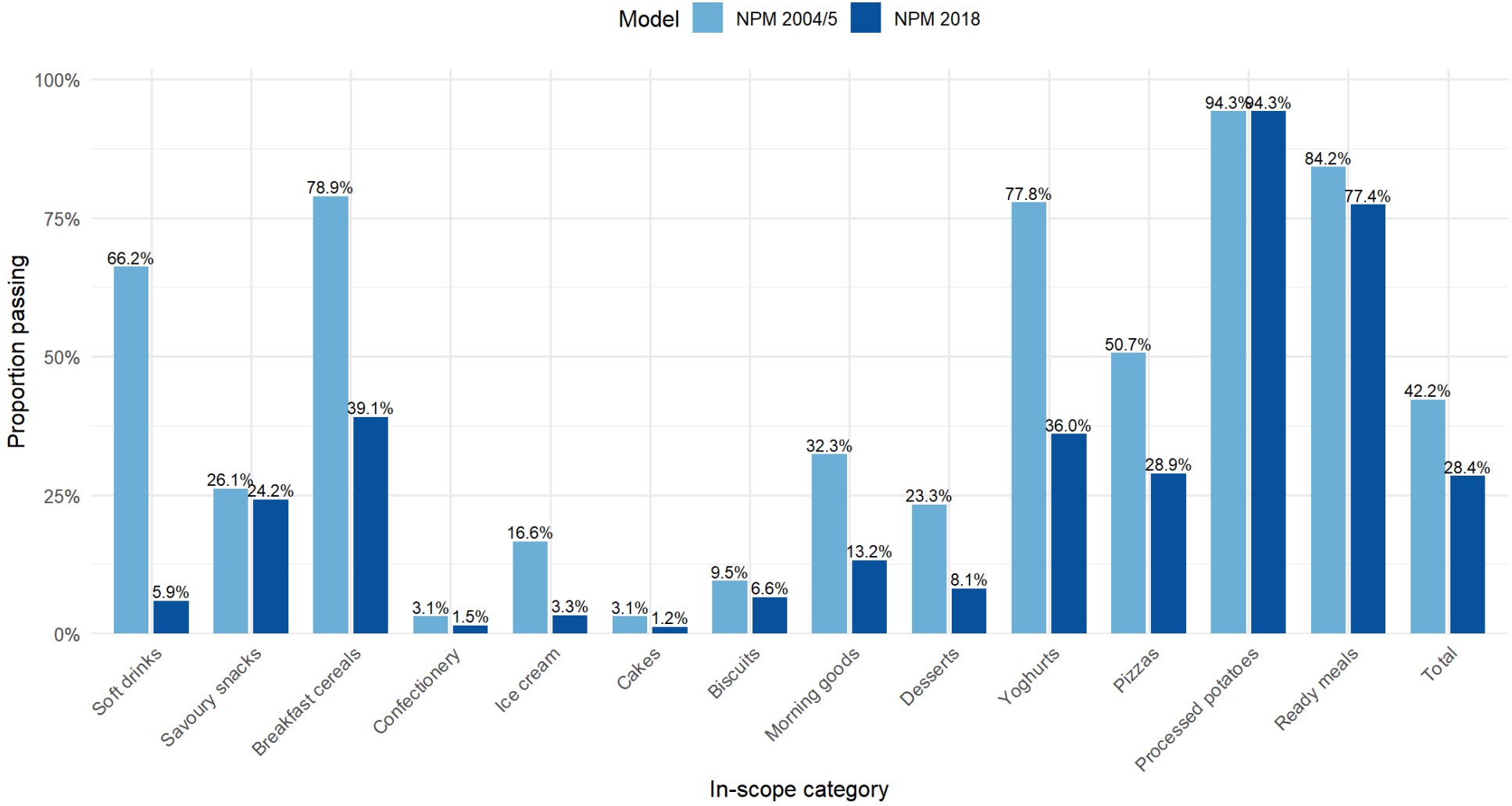


Figure 4. Percentage change in the proportion of product passing NPM 2004/5 and NPM 2018 by in-scope category

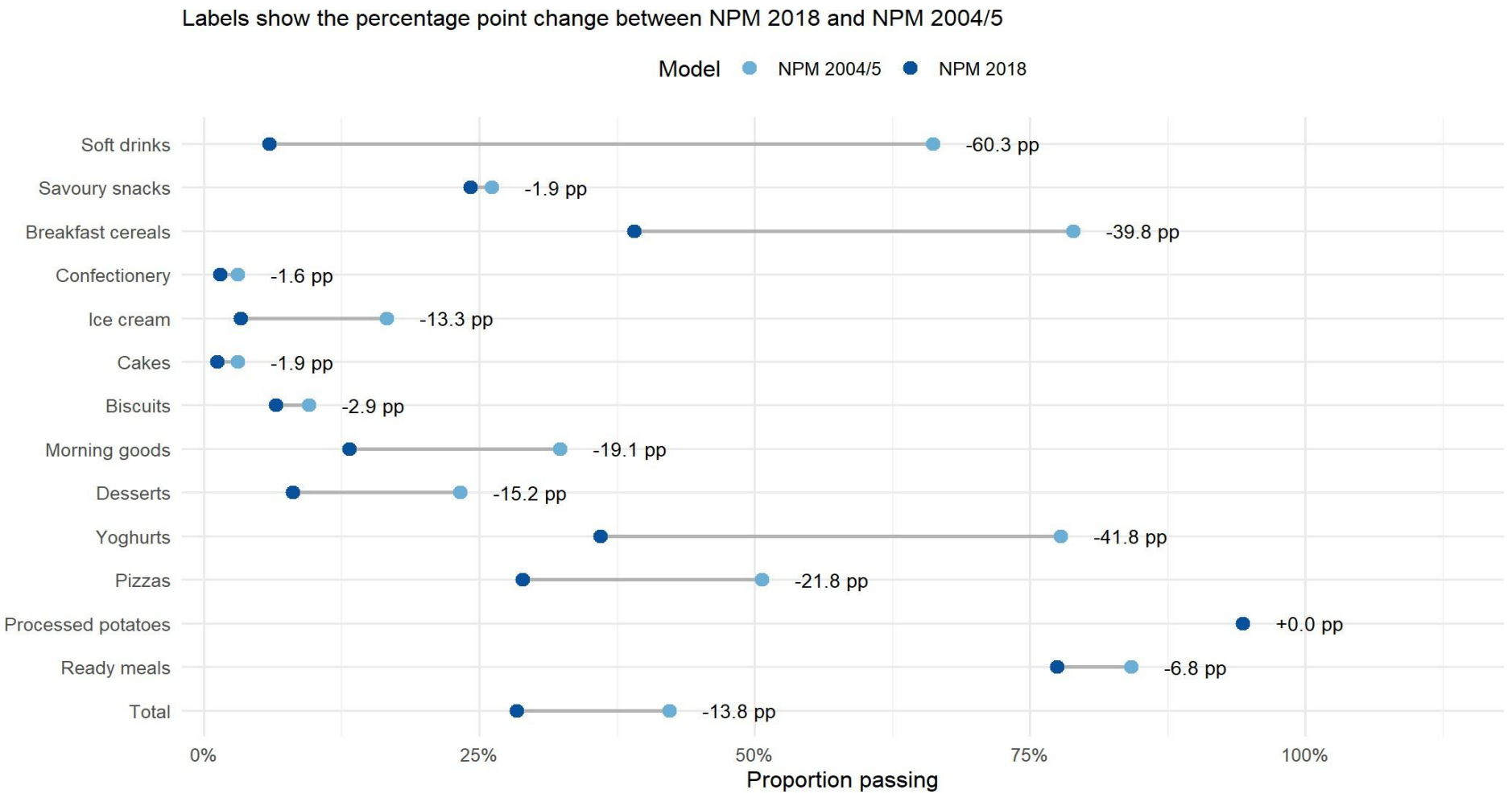


Figure 5. Boxplots of NPM 2004/5 and NPM 2018 scores by in-scope category

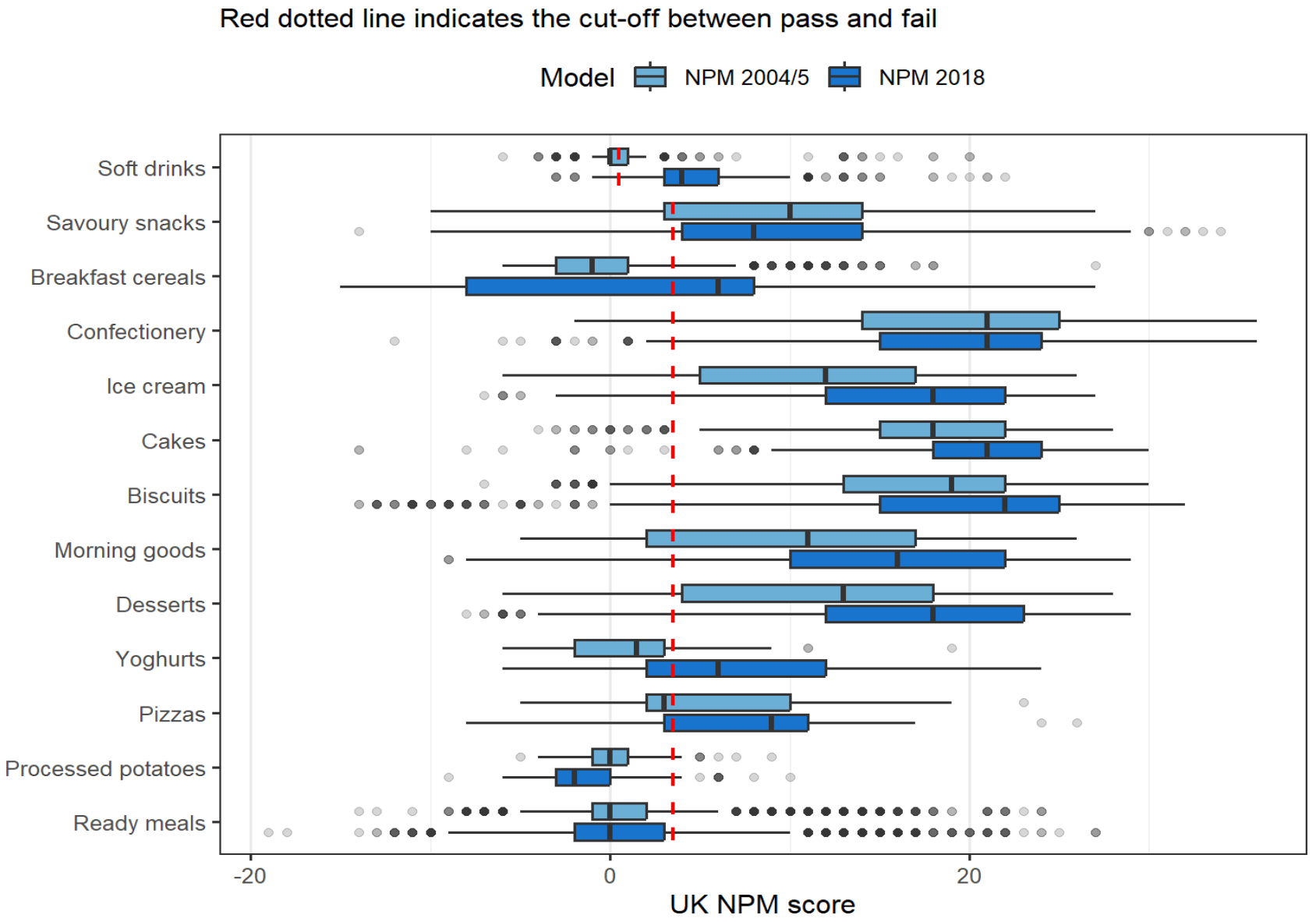
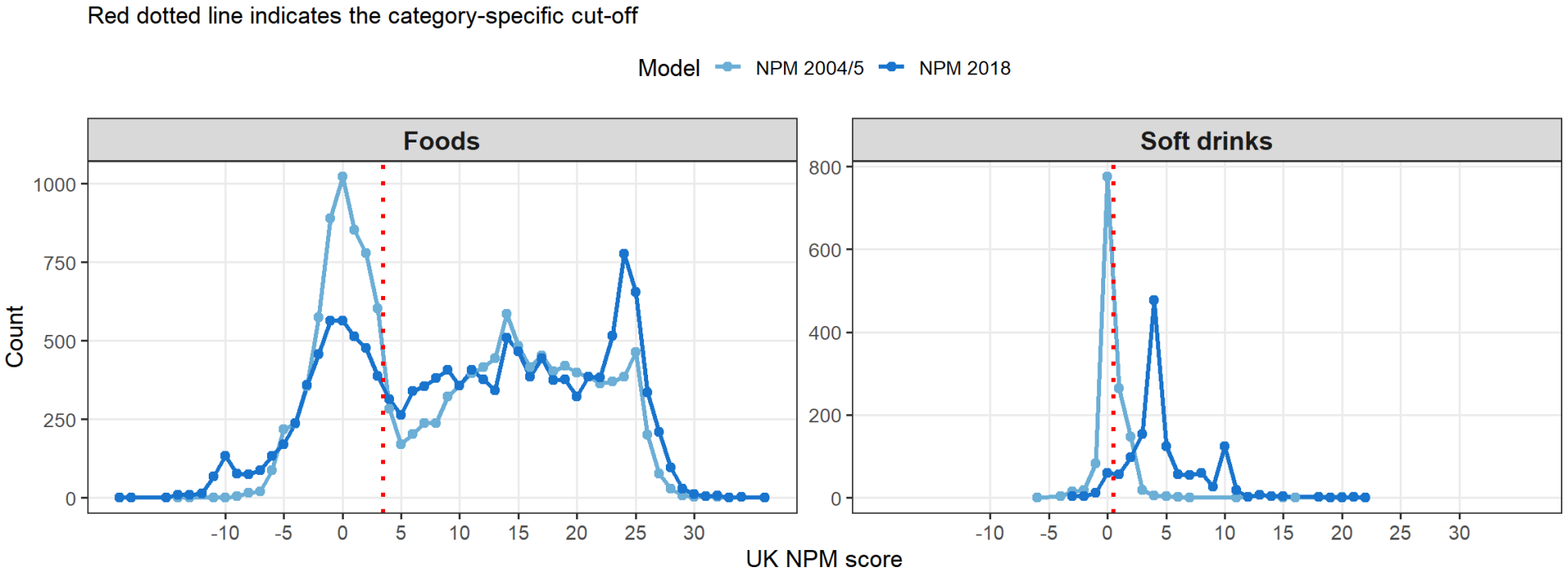


Figure 6. Number of products by NPM score for food and drinks for NPM 2004/5 and NPM 2018



Overall, 84% of products in the in-scope categories received the same classification under the NPM 2004 and NPM 2018 (Table 7). Among the 2,498 products for which the classifications differed, 2,320 (93%) received a less favourable assessment under the NPM 2018 (i.e., changed from passing the NPM 2004 to failing the NPM 2018) (Table 8). McNemar's test was statistically significant, indicating that the NPM 2018 was significantly more stringent than its predecessor. This pattern was observed across all in-scope categories, with the exception of processed potatoes, which were largely unaffected by the revised model.

Agreement between the two models varied considerably across product categories (Table 7). The lowest observed agreement was for soft drinks (40%), breakfast cereals (55%), and yoghurts (58%), whereas the highest agreement was for confectionery (98%), cakes (98%), and processed potatoes (95%). Chance-corrected agreement, assessed using Gwet's AC1, indicated substantial overall agreement (AC1 = 0.70), with 7 categories out of 13 having an AC1 greater than 0.80. However, agreement was poor for soft drinks, breakfast cereals and yoghurts (AC1 < 0.20), while pizza showed moderate agreement (AC1 = 0.54).

Table 7. Observed agreement, Cohen's kappa and Gwet's AC1 comparing NPM 2004/5 and NPM 2018 classifications

In-scope category	N	Agreement	Kappa	AC1
Soft drinks	1352	0.40	0.06	-0.12
Savoury snacks	1849	0.90	0.75	0.85
Breakfast cereals	788	0.55	0.20	0.12
Confectionery	2146	0.98	0.50	0.98
Ice cream	663	0.86	0.28	0.83
Cakes	1098	0.98	0.46	0.98
Biscuits	1356	0.93	0.53	0.92
Morning goods	529	0.81	0.48	0.71
Desserts	1073	0.85	0.44	0.79
Yoghurts	500	0.58	0.28	0.18
Pizzas	377	0.76	0.53	0.54
Processed potatoes	262	0.95	0.50	0.94
Ready meals	3521	0.91	0.71	0.87
Overall	**15514**	**0.84**	**0.65**	**0.70**

Table 8. Cross-classification of products using NPM 2004/5 and NPM 2018 by in-scope category

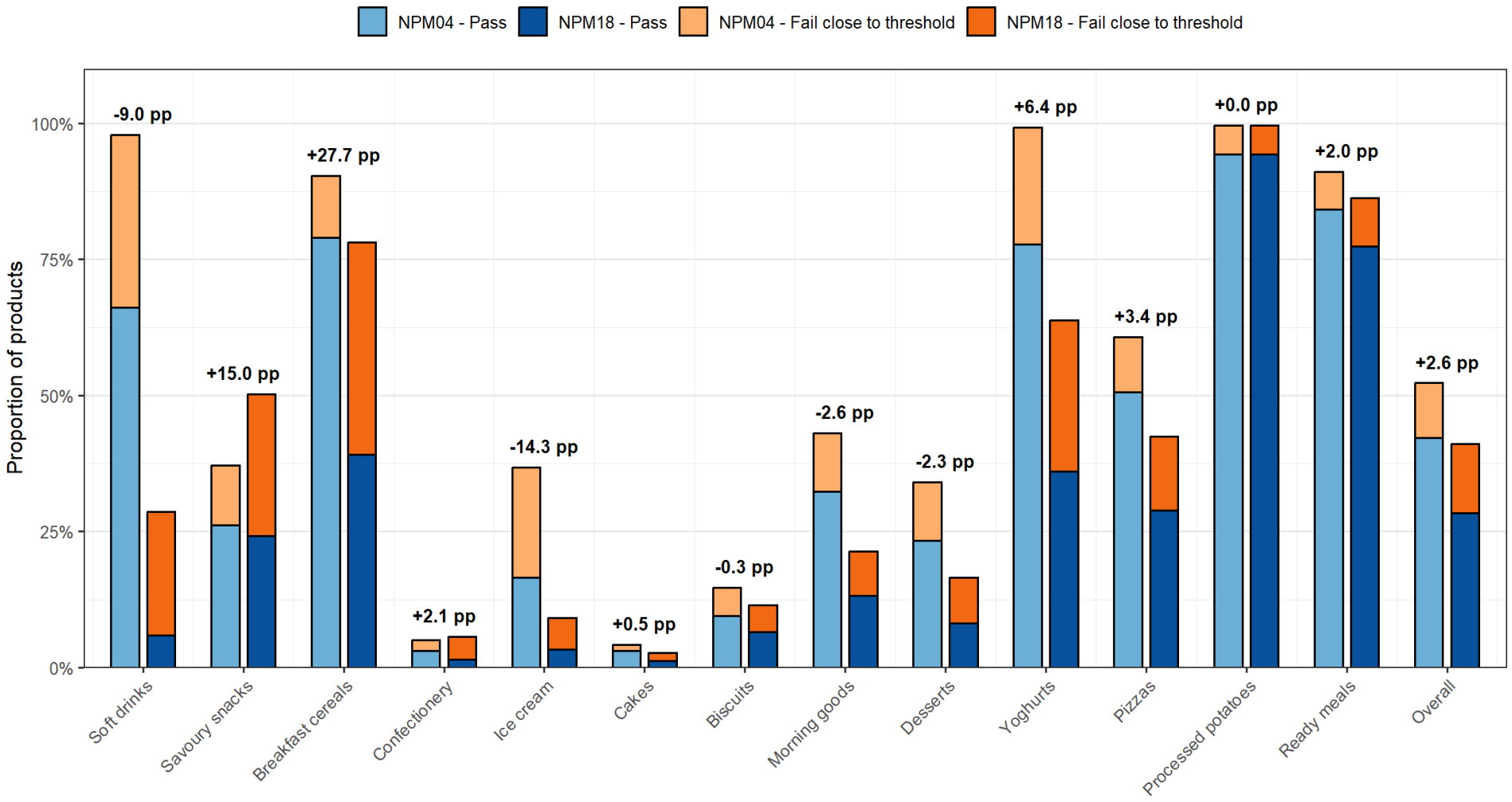
In-scope category	NPM 2004/5	NPM 2018 Fail	NPM 2018 Pass	McNemar p-value
Soft drinks	Fail	457	0	< 0.001
	Pass	815	80	
Savoury snacks	Fail	1296	70	0.00833
	Pass	106	377	
Breakfast cereals	Fail	145	21	< 0.001
	Pass	335	287	
Confectionery	Fail	2073	7	< 0.001
	Pass	41	25	
Ice cream	Fail	552	1	< 0.001
	Pass	89	21	
Cakes	Fail	1062	2	< 0.001
	Pass	23	11	
Biscuits	Fail	1200	27	< 0.001
	Pass	67	62	
Morning goods	Fail	358	0	< 0.001
	Pass	101	70	
Desserts	Fail	822	1	< 0.001
	Pass	164	86	
Yoghurts	Fail	111	0	< 0.001
	Pass	209	180	
Pizzas	Fail	182	4	< 0.001
	Pass	86	105	
Processed potatoes	Fail	8	7	1.00000
	Pass	7	240	
Ready meals	Fail	518	38	< 0.001
	Pass	277	2688	
Out-of-scope	Fail	0	0	NA
	Pass	0	0	
Overall	**Fail**	**8784**	**178**	**<0.001**
	Pass	**2320**	**4232**	

The proportion of products failing close to the cut-off changed only modestly overall, increasing from 10% under the NPM 2004 to 13% under the NPM 2018 (+2.6 percentage points). However, notable differences were observed across categories. Categories containing products of poorer nutritional quality, and therefore higher scores (for example, confectionery, cakes, and biscuits), or of better nutritional quality, and therefore lower scores (for example, processed potatoes), remained far from the threshold. This likely explains why they were largely unaffected by the change in model. Distances to the threshold for these categories are shown in Figure 7.

In contrast, categories such as savoury snacks, breakfast cereals, and ice cream showed marked variation in the proportion of products failing close to the threshold. For ice cream, the use of free sugars with stricter point allocation increased the final score, which was reflected in a 14.3 percentage point decrease in the proportion of products failing close to the threshold. For breakfast cereals, the overall score also increased on average, but many products moved from passing to failing close to the threshold, explaining the sharp rise in the proportion of products in this group. To illustrate this, the median score for breakfast cereals increased from -1 under the NPM 2004 to 6 under the NPM 2018. Finally, savoury snacks were already failing the NPM 2004 for the most part, but changes to the model, particularly the fibre component, appear to have reduced the score of a significant proportion of products. The median score fell from 10 under the NPM 2004/5 to 8 under the NPM 2018. Although the proportion of products failing close to the threshold increased by 15.0 percentage points, from 11% to 26%, the majority of these products still failed the model.

Figure 7. Products passing, and close to passing, the UK NPMs by in-scope category

Labels show the change in the share of products failing close to the threshold for NPM 2004/5 to UK NPM 2018.
Products with scores of 4–8 (foods) and 1–3 (beverages) were considered close to the threshold.



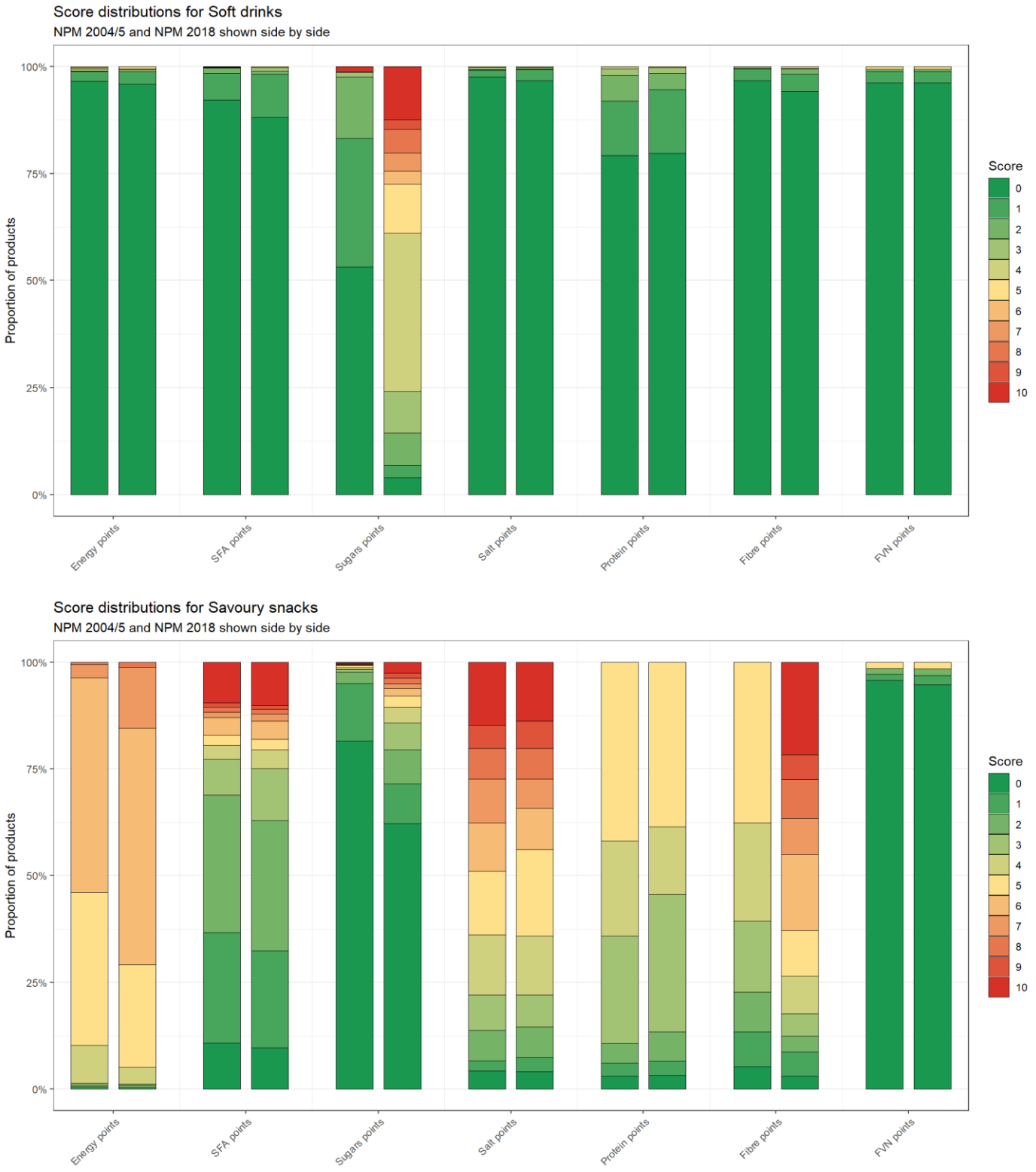
The distribution of points for each nutrient in the model is shown in Figure 8 for each in-scope category. Consistent with the modifications introduced in the NPM 2018, the most notable differences were observed for the sugar and fibre components, although smaller changes were also evident for other components. The same results, but with distributions shown by nutrient instead of category, are given in Appendix 6.

For the sugar component, scores increased markedly under the NPM 2018 in categories such as confectionery, ice cream, cakes, morning goods and desserts, with more modest increases observed for breakfast cereals and yoghurts. For confectionery, cakes and biscuits, the increase in sugar points had only a marginal effect on the proportion of products passing because their overall scores were already well above the cut-off under the NPM 2004/5. In contrast, the impact was greater for ice cream, morning goods and desserts, which generally had lower baseline scores. Among yoghurts and breakfast cereals, where the majority of products passed the NPM 2004/5, the increase in sugar points translated into a substantial reduction in the proportion of products passing, making them the second and third most affected in-scope categories. Finally, although the increase in sugar points for soft drinks was more modest, the lower cut-off applied to beverages compared with solid foods resulted in a pronounced reduction in the proportion of products passing.

Regarding the fibre component, breakfast cereals, and to a lesser extent savoury snacks and biscuits, showed notable increases in the number of fibre points awarded. The impact on breakfast cereals was mixed, reflecting revisions to both the free sugars and fibre recommendations, which influenced scores in opposite directions. Overall, the modification to the sugar component appeared to have the stronger effect, as the proportion of breakfast cereals passing the UK NPM decreased by 39.8 percentage points. At the same time, more than 90% of breakfast cereals without added sugar (plain or containing fruit) received a lower UK NPM score, whereas cereals containing added sugar received a lower score in only around 10% of cases (data not shown).
These findings suggest that the NPM 2018 better discriminates between breakfast cereals according to their added sugar content.

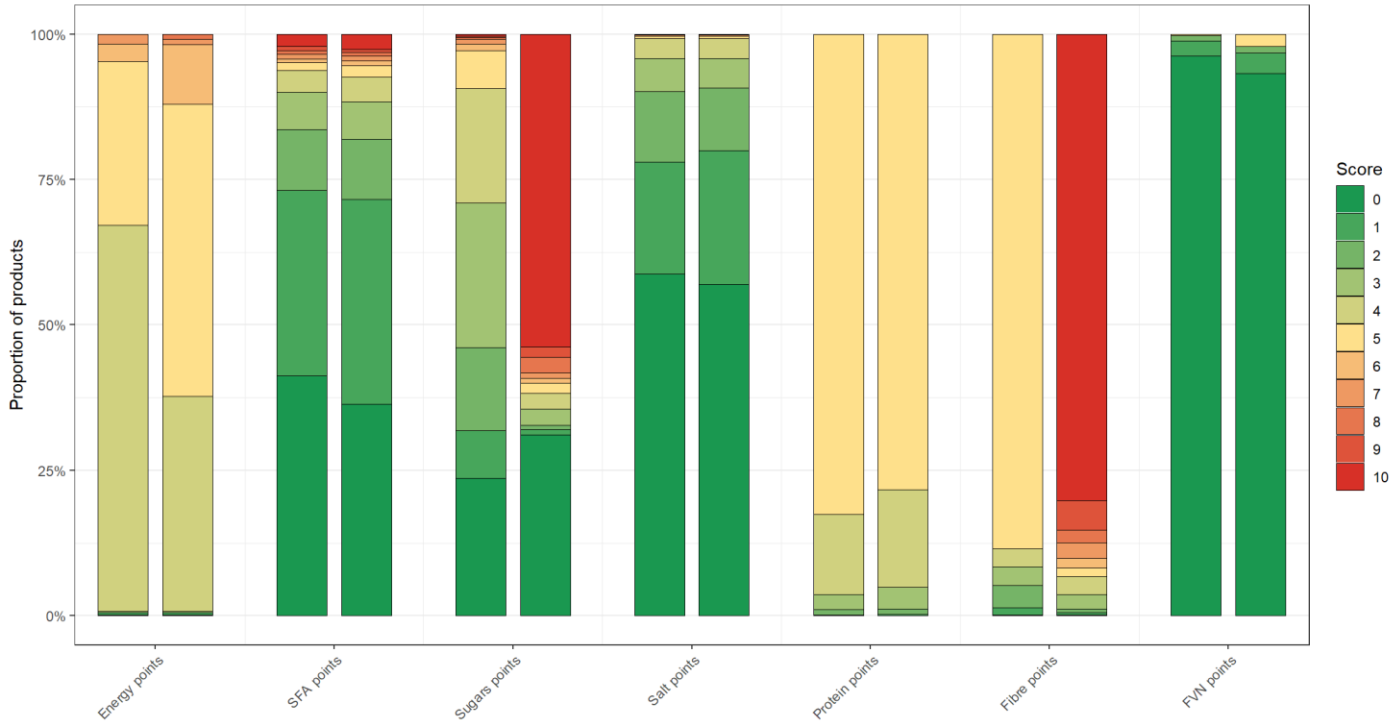
For savoury snacks, which were only minimally affected by the revised sugar component, the additional fibre points reduced the overall NPM 2018 score in 59% of products compared with the NPM 2004/5 (data not shown). However, this improvement was insufficient to increase the proportion of products passing the model. Finally, although biscuits and confectionery also received additional fibre points, these had little practical effect because the increase in sugar points offset any benefit and overall scores remained well above the threshold for passing.

Figure 8. Distribution of points for each nutrient component of NPM 2004/5 and NPM 2018



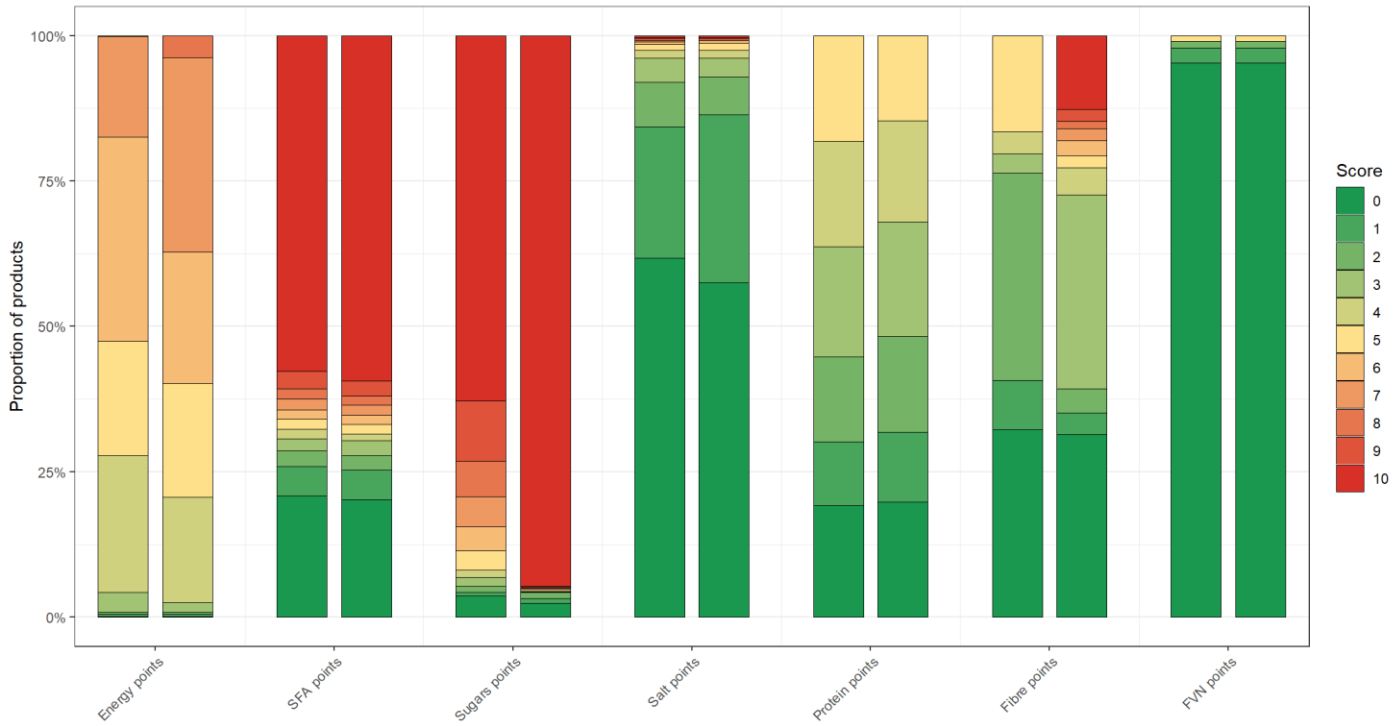
Score distributions for Breakfast cereals

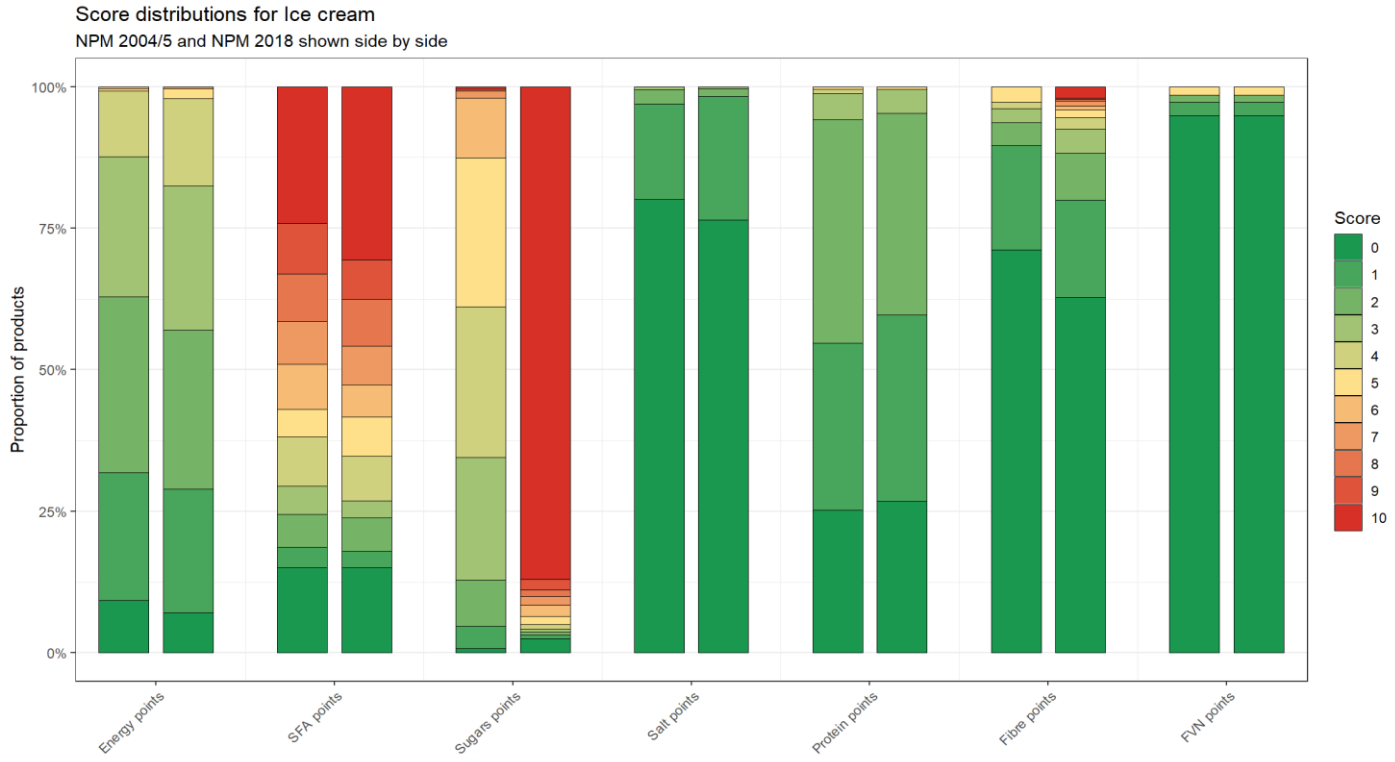
NPM 2004/5 and NPM 2018 shown side by side

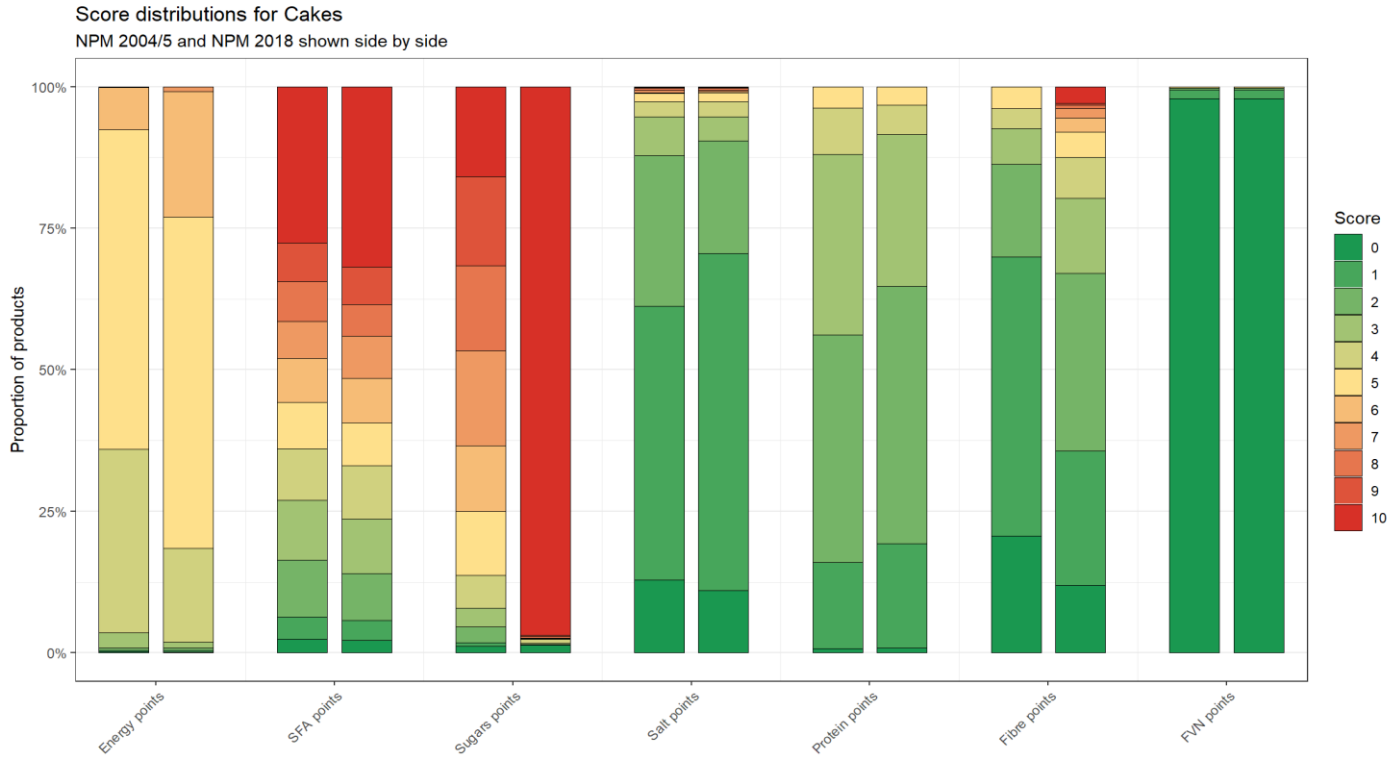


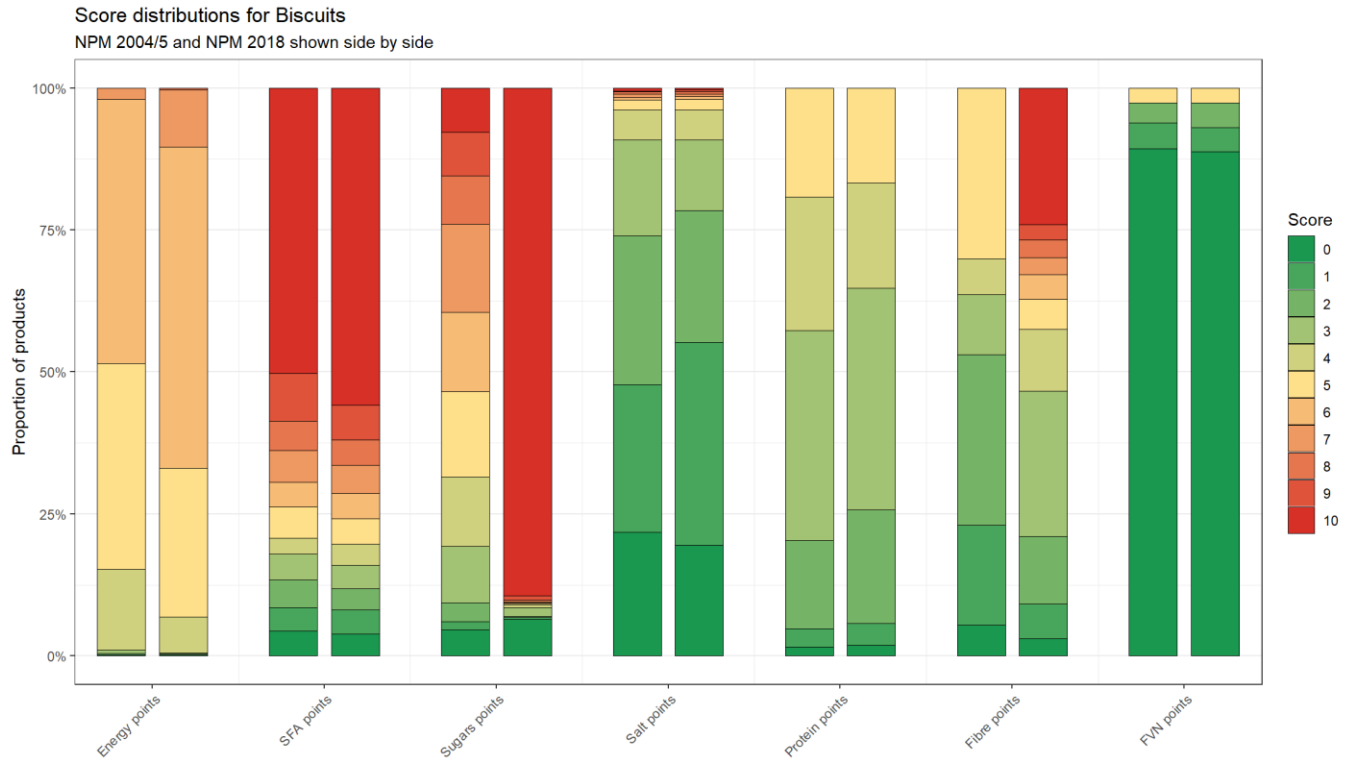
Score distributions for Confectionery

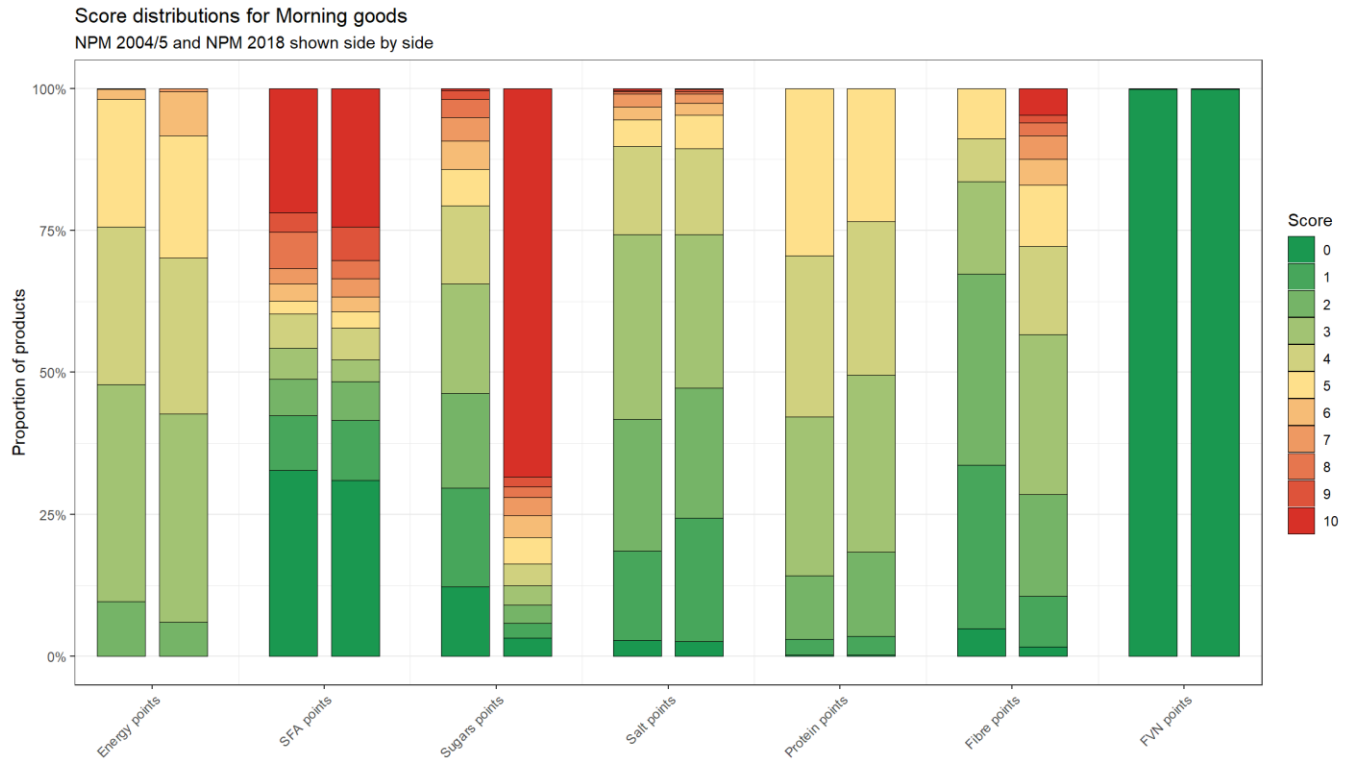
NPM 2004/5 and NPM 2018 shown side by side

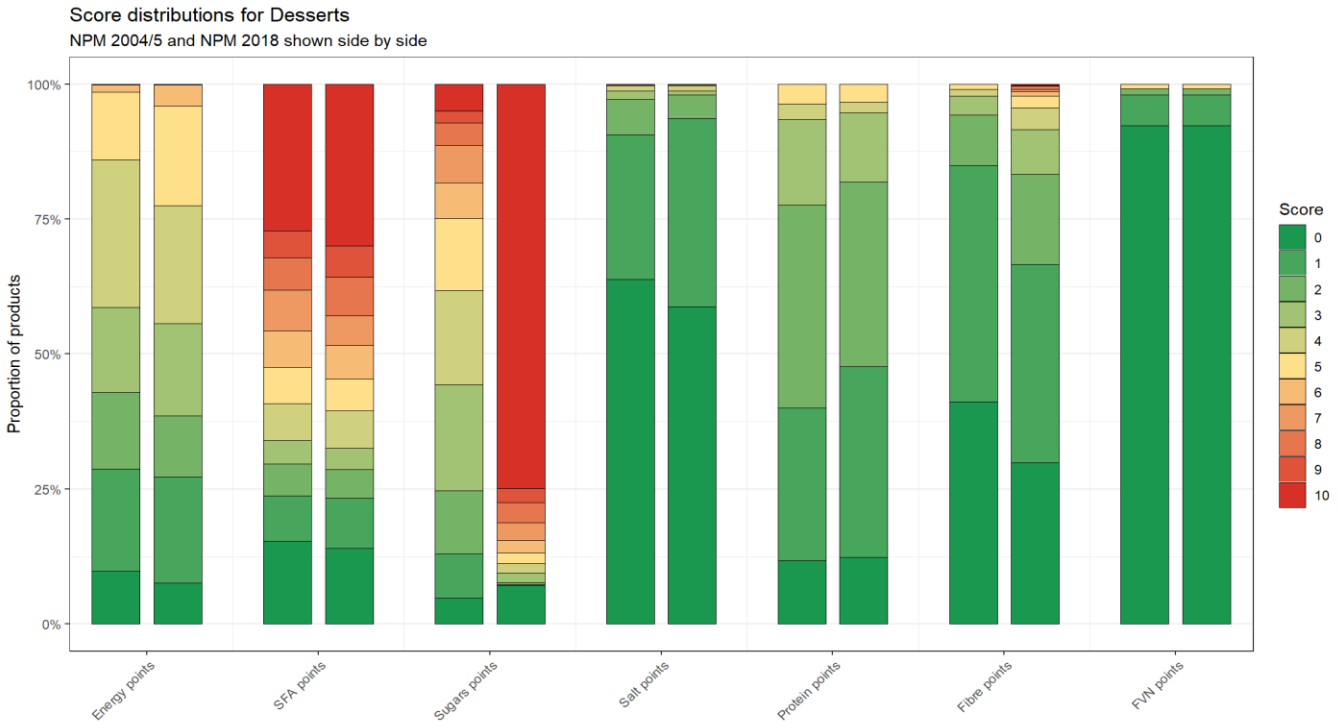


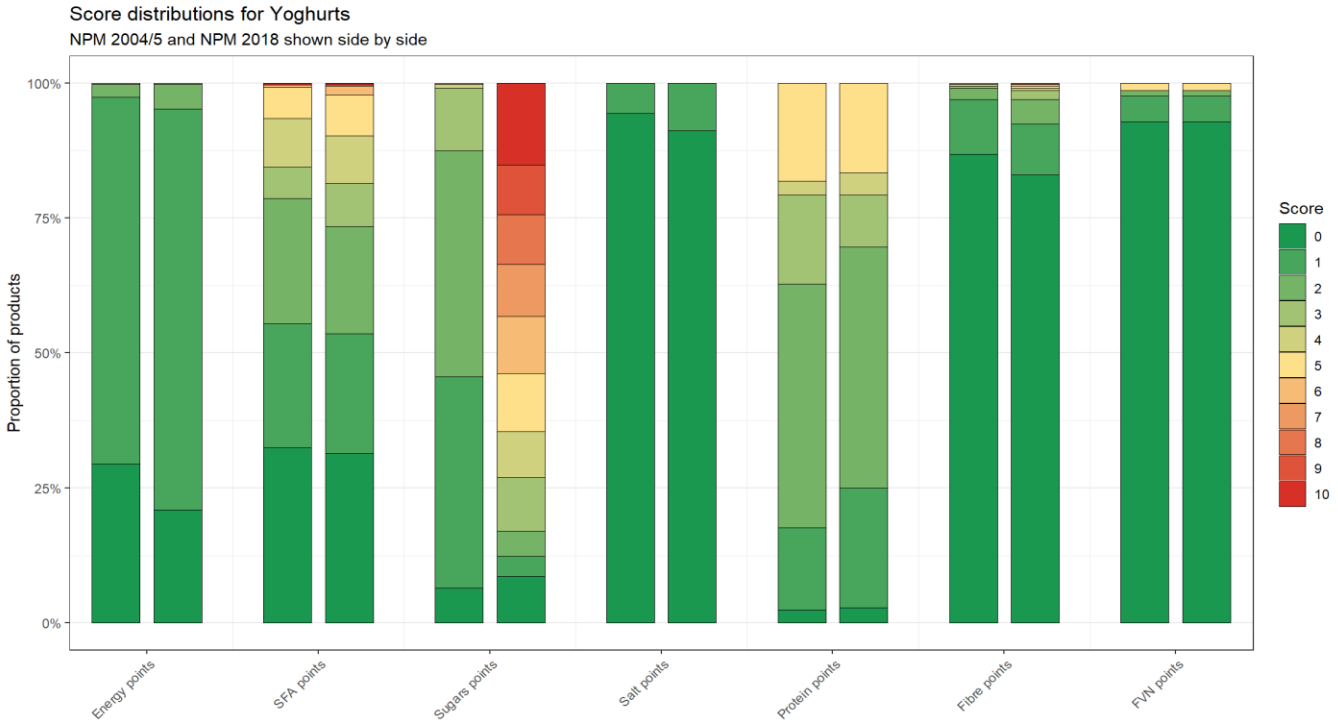

Score distributions for Ice cream
NPM 2004/5 and NPM 2018 shown side by side
Proportion of products
100%
75%
50%
25%
0%
Energy points
SFA points
Sugars points
Salt points
Protein points
Fibre points
FVN points
Score
0
1
2
3
4
5
6
7
8
9
10


Score distributions for Cakes
NPM 2004/5 and NPM 2018 shown side by side
Proportion of products
100%
75%
50%
25%
0%
Energy points
SFA points
Sugars points
Salt points
Protein points
Fibre points
FVN points
Score
0
1
2
3
4
5
6
7
8
9
10


Score distributions for Biscuits
NPM 2004/5 and NPM 2018 shown side by side
Proportion of products
100%
75%
50%
25%
0%
Energy points
SFA points
Sugars points
Salt points
Protein points
Fibre points
FVN points
Score
0
1
2
3
4
5
6
7
8
9
10

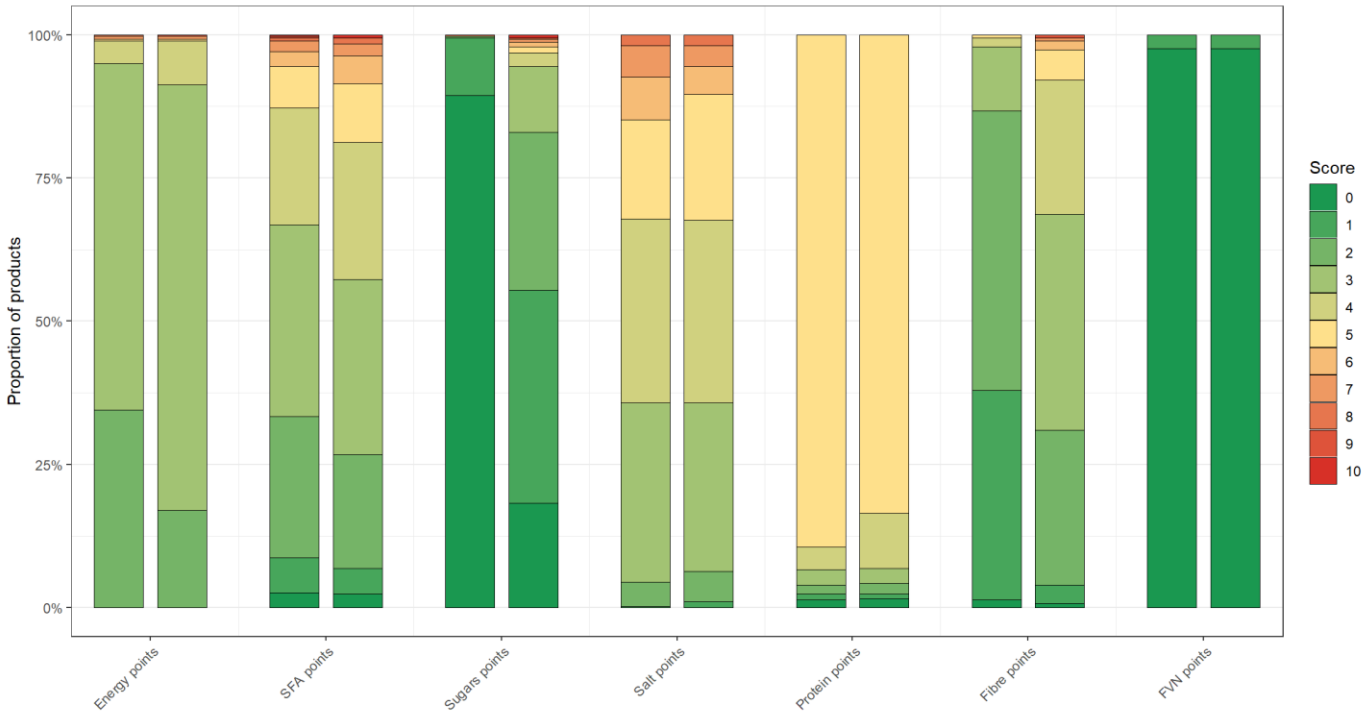

Score distributions for Morning goods
NPM 2004/5 and NPM 2018 shown side by side
Proportion of products
100%
75%
50%
25%
0%
Energy points
SFA points
Sugars points
Salt points
Protein points
Fibre points
FVN points
Score
0
1
2
3
4
5
6
7
8
9
10


Score distributions for Desserts
NPM 2004/5 and NPM 2018 shown side by side
Proportion of products
100%
75%
50%
25%
0%
Energy points
SFA points
Sugars points
Salt points
Protein points
Fibre points
FVN points
Score
0
1
2
3
4
5
6
7
8
9
10


Score distributions for Yoghurts
NPM 2004/5 and NPM 2018 shown side by side
Proportion of products
100%
75%
50%
25%
0%
Energy points
SFA points
Sugars points
Salt points
Protein points
Fibre points
FVN points
Score
0
1
2
3
4
5
6
7
8
9
10

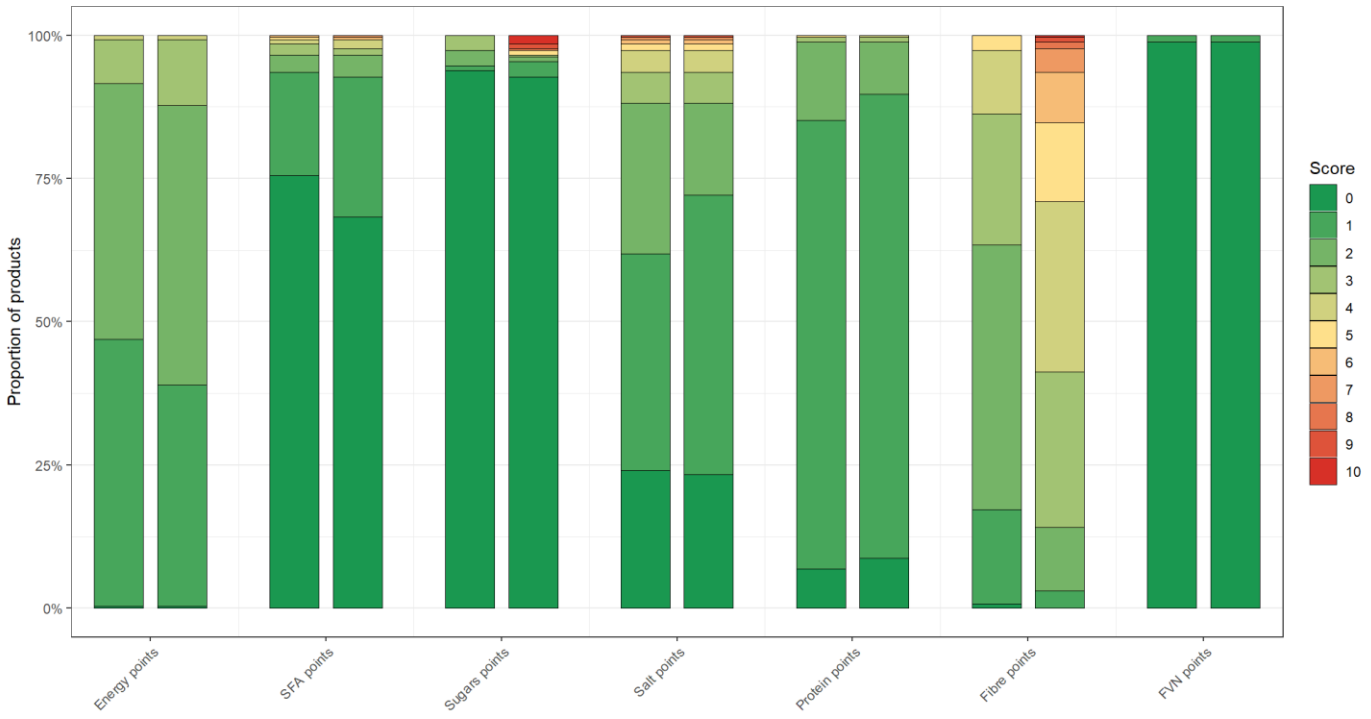
Score distributions for Pizzas

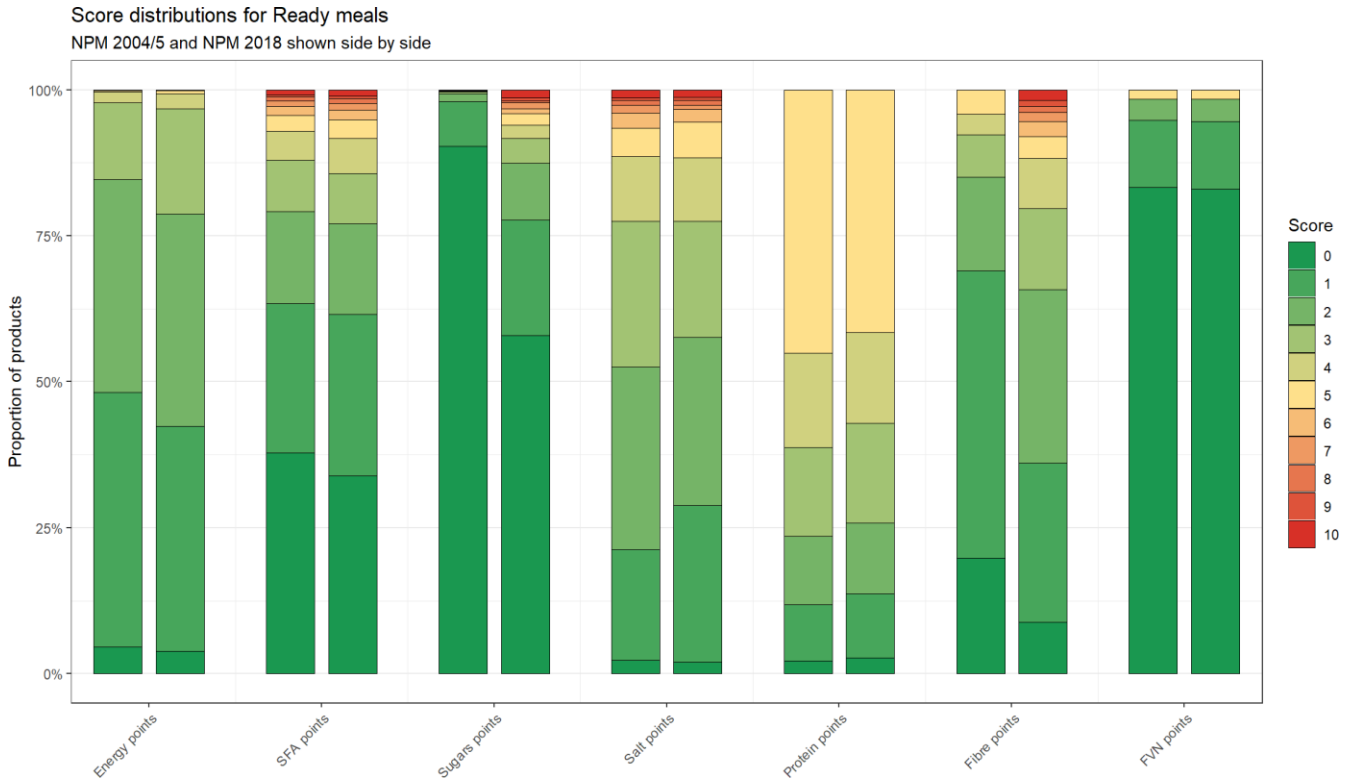
NPM 2004/5 and NPM 2018 shown side by side



Score distributions for Processed potatoes

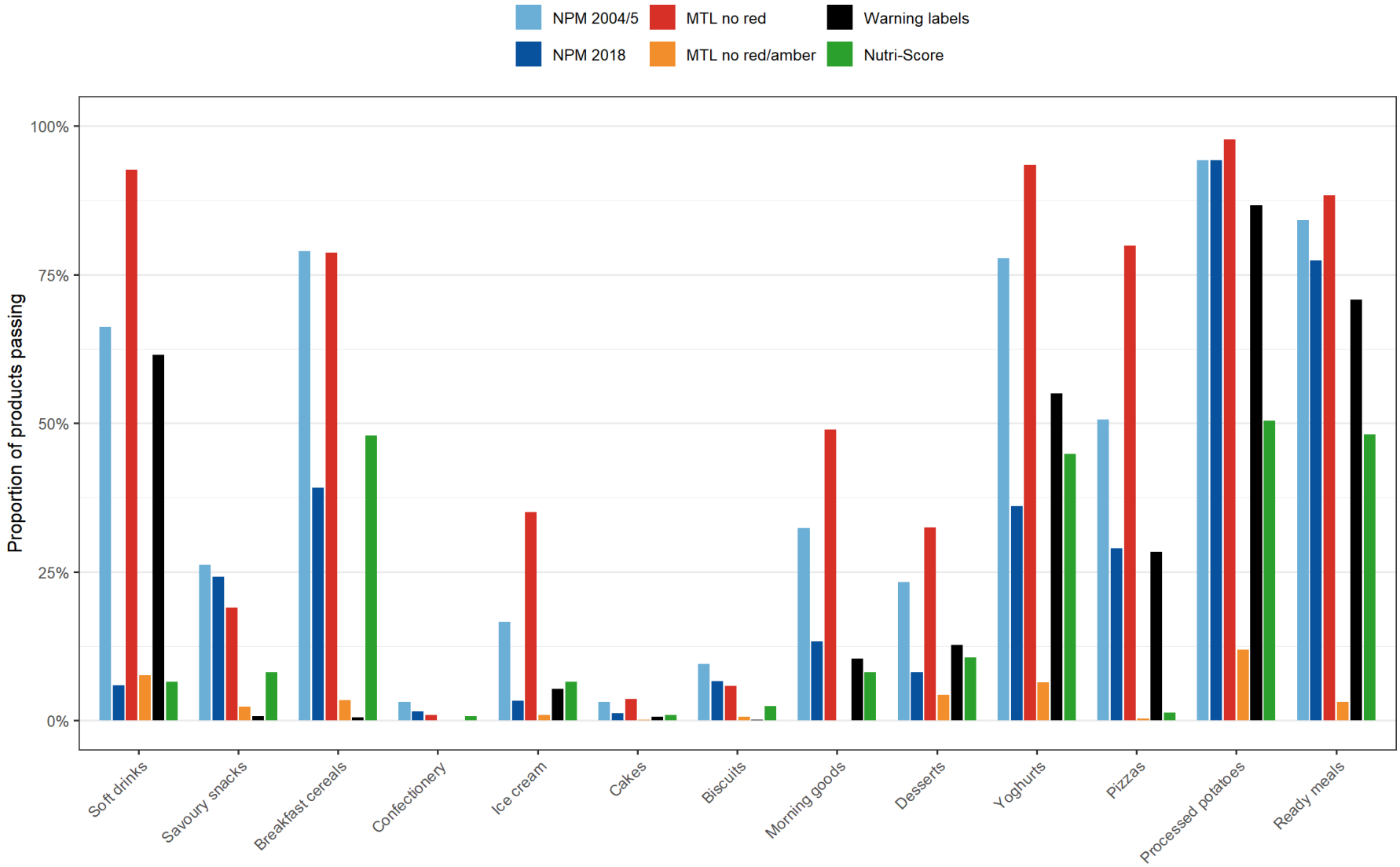
NPM 2004/5 and NPM 2018 shown side by side





Among the different nutrient profiling models or labels tested, MTL (no red or amber) (2.6%) had the lowest proportion of product passing, then Nutri-Score (18.9%), Warning Labels (27.0%) and the NPM 2018 (28.4%) and finally the NPM 2004/5 (42.2%) and the MTL (no red) (47.3%) had the highest proportion of product passing (Figure 9, Appendix 7). The NPM 2004/5 had the highest agreement with the MTL (no red) (AC1=0.78) and the NPM 2018 with the Nutri-Score (AC1=0.77) (Appendix 8). Agreement varied between the different models across in-scope categories (Appendix 9). Very high agreement was observed for categories such as confectionery, ice cream, cakes, biscuits and morning goods, whereas greater discrepancies between models were found for soft drinks, breakfast cereals and, to a lesser extent, ready meals and pizzas.

Figure 9. Proportion of products passing each nutrient profiling or labelling scheme



Strengths, limitations and sensitivity analyses

This analysis used a large, comprehensive dataset of over 15,000 unique products across all thirteen 'in-scope' categories covered by the advertising and promotions legislation. The data represents products from five leading UK retailers: Tesco, Sainsbury's, Asda, Ocado and M&S. While this dataset does not include products from discounters (e.g. Aldi, Lidl, The Food Warehouse) or the out-of-home sector (e.g. restaurants, takeaways, canteens), these retailers represent over 60% of supermarket sales in the UK[22]. The data was provided by third-party company, Acuity Pricing, therefore the research team had limited transparency over data collection methods. The data was extracted on 18th July 2025, meaning new product launches and recent reformulation will not have been captured. The data were not weighted by sales or market share, meaning these analyses reflect the impact updating the model will have on the number of supermarket products subject to restrictions, not what is sold or consumed.

The Acuity data did not indicate whether nutritional information was expressed per 100 g or per 100 mL, nor whether values referred to products as sold or as prepared. Consequently, products with nutrient information declared per 100 mL may have been treated as if reported per 100 g, potentially leading to some misestimation of nutrient content. Although conversion using gravity factors was considered, these factors vary according to product composition and subtype, requiring product-specific density estimates with no guarantee of improving accuracy. This limitation is likely to have had the largest impact for ice cream given products can have very different densities. Likewise, when nutritional values were reported for products as prepared, reconstitution factors were applied only when the reporting basis could be reliably inferred from the nutrient distribution (e.g. instant noodles). However, for some product categories (e.g. cordial), the reporting basis could not be systematically identified, which may have resulted in misestimation of the nutrient values used to calculate the NPM scores.

Each product was either assigned to one of the thirteen in-scope categories, or classified as out-of-scope. Some of the in-scope category definitions were difficult to apply consistently and systematically (for example, distinguishing between sauces and marinades as only ready prepared products with a sauce - not a marinade, glaze, dressing or seasoning - are classified as in-scope for Category 13, Ready Meals) and therefore not all products may have been categorised correctly. A random sample of products from each in-scope category, as well as out-of-scope products, was manually checked by the research team. Miscategorised products were corrected, and any systematic errors were addressed. However, residual classification errors between in-scope and out-of-scope products, as well as among different in-scope categories, cannot be ruled out.

The application of the UK NPMs requires the estimation of several variables that are not reported on food labels. Fibre is not part of mandatory labelling requirements and was not reported for 21% of products, with missing values occurring predominantly in categories where products have a lower fibre content, such as soft drinks, confectionery and yoghurts. The median value for each granular food group category was used to impute missing values and the results of Sensitivity Analysis 1 show that this had a negligible impact on the classification of products according to the UK NPMs and the overall results.

Sensitivity Analysis 1: Effect of imputing alternative fibre values (25th and 75th percentile fibre content instead median) on proportion of products that pass and fail each model

In-scope category	N	% Pass UK NPM 04	% Pass UK NPM 04 with 25th pct	% Pass UK NPM 04 with 75th pct	% Pass UK NPM 18	% Pass UK NPM 18 with 25th pct	% Pass UK NPM 18 with 75th pct
Soft drinks	1352	66.2%	66.2%	66.2%	5.9%	5.9%	5.9%
Savoury snacks	1849	26.1%	26.0%	26.1%	24.2%	24.1%	24.8%
Breakfast cereals	788	78.9%	78.9%	78.9%	39.1%	39.1%	39.1%
Confectionery	2146	3.1%	3.0%	3.1%	1.5%	1.5%	1.6%
Ice cream	663	16.6%	16.6%	16.9%	3.3%	3.3%	3.3%
Cakes	1098	3.1%	3.0%	3.1%	1.2%	1.2%	1.2%
Biscuits	1356	9.5%	9.4%	9.6%	6.6%	6.6%	6.6%
Morning goods	529	32.3%	32.3%	32.7%	13.2%	13.0%	13.4%
Desserts	1073	23.3%	23.1%	23.3%	8.1%	8.1%	8.3%
Yoghurts	500	77.8%	77.6%	77.8%	36.0%	36.0%	36.0%
Pizzas	377	50.7%	50.7%	50.7%	28.9%	28.9%	28.9%
Processed potatoes	262	94.3%	94.3%	94.3%	94.3%	94.3%	94.3%
Ready meals	3521	84.2%	84.2%	84.3%	77.4%	77.3%	77.4%
Overall	**15514**	**42.2%**	**42.2%**	**42.3%**	**28.4%**	**28.4%**	**28.5%**

The percentage fruit, nut, vegetable and seed content of each product was estimated using an algorithm that disaggregates and estimates the percentage composition of each ingredient using the ingredients data. Fruit and vegetable ingredients were identified and summed together to estimate their percentage composition. Inaccuracies in the percentage composition estimates or identification of fruit and veg ingredients could introduce error into this estimate, although the results of Sensitivity Analysis 2 show that only between 5-6% of products contain a FVN content close to the scoring thresholds for the FVN criteria, therefore any errors are unlikely to impact the overall results of this study, although there are a higher proportion of pizzas and ready meals that are closer to the 40% threshold. Formatting errors in the ingredients list - for example addition of symbols, incorrectly placed parentheses – are identified and corrected for in the ingredients algorithm, although it is possible that a small number of products might still have formatting errors that could contribute to incorrect estimation of ingredient composition. It is unlikely that this limitation will be impacting the category-level results presented in this report.

Sensitivity Analysis 2. Proportion of products with fruit, veg and nut content estimates close to the scoring thresholds (40%, 60% and 80% FVN content)

In-scope category	Total	2004/5: 35-45%	2004/5: 55-65%	2004/5: 75-85%	2018: 35-45%	2018: 55-65%	2018: 75-85%
Soft drinks	1352	1.3%	0.4%	0.1%	1.3%	0.4%	0.1%
Savoury snacks	1849	1.0%	0.9%	0.8%	1.2%	1.1%	0.8%
Breakfast cereals	788	3.2%	0.8%	0.5%	3.7%	0.8%	1.1%
Confectionery	2146	2.3%	0.8%	0.3%	2.3%	0.8%	0.2%
Ice cream	663	1.4%	1.2%	0.0%	1.4%	1.2%	0.0%
Cakes	1098	1.2%	0.1%	0.2%	1.2%	0.1%	0.2%
Biscuits	1356	2.7%	2.1%	1.3%	3.0%	1.9%	1.1%
Morning goods	529	0.8%	0.0%	0.0%	0.8%	0.0%	0.0%
Desserts	1073	2.6%	1.0%	0.5%	2.6%	1.1%	0.5%
Yoghurts	500	0.8%	2.6%	0.6%	0.8%	2.6%	0.6%
Pizzas	377	5.3%	0.0%	0.0%	5.3%	0.0%	0.0%
Processed potatoes	262	0.4%	0.4%	0.0%	0.4%	0.4%	0.0%
Ready meals	3521	8.9%	3.0%	0.9%	9.0%	3.0%	0.9%
Overall	**15514**	**3.5%**	**1.4%**	**0.5%**	**3.6%**	**1.4%**	**0.6%**

The main difference between the two models is the shift from total sugars to free sugars, combined with a narrowing of the scoring thresholds from one point per 4.5g of total sugars (NPM 2004/5) to one point per 0.9g free sugars (NPM 2018). Sensitivity Analysis 3 tested the difference in the main outcome (proportion of products passing/failing by category) should free sugars assumed to be equal to total sugars as declared on the label. The results show that this assumption would lead to even stricter classification across all categories, with much bigger differences for some categories (yoghurts, pizza, ready meals, breakfast cereals) compared to others (confectionery, cakes, biscuits, soft drinks). This highlights the importance of correctly estimating the free sugar content for products in certain categories.

Sensitivity analysis 3. Proportion of products passing and failing NPM 2018 if total sugars were assumed to be equal to free sugars

In-scope category	Scenario	Total N	Pass NPM 2018		Fail NPM 2018	
			N	%	N	%
Soft drinks	Base case	1352	80	5.9%	1272	94.1%
	Total sugars as free sugars	1352	63	4.7%	1289	95.3%
Savoury snacks	Base case	1849	447	24.2%	1402	75.8%
	Total sugars as free sugars	1849	284	15.4%	1565	84.6%
Breakfast cereals	Base case	788	308	39.1%	480	60.9%
	Total sugars as free sugars	788	206	26.1%	582	73.9%
Confectionery	Base case	2146	32	1.5%	2114	98.5%
	Total sugars as free sugars	2146	28	1.3%	2118	98.7%
Ice cream	Base case	663	22	3.3%	641	96.7%
	Total sugars as free sugars	663	14	2.1%	649	97.9%
Cakes	Base case	1098	13	1.2%	1085	98.8%
	Total sugars as free sugars	1098	7	0.6%	1091	99.4%
Biscuits	Base case	1356	89	6.6%	1267	93.4%
	Total sugars as free sugars	1356	63	4.6%	1293	95.4%
Morning goods	Base case	529	70	13.2%	459	86.8%
	Total sugars as free sugars	529	57	10.8%	472	89.2%
Desserts	Base case	1073	87	8.1%	986	91.9%
	Total sugars as free sugars	1073	58	5.4%	1015	94.6%
Yoghurts	Base case	500	180	36.0%	320	64.0%
	Total sugars as free sugars	500	89	17.8%	411	82.2%
Pizzas	Base case	377	109	28.9%	268	71.1%
	Total sugars as free sugars	377	37	9.8%	340	90.2%
Processed potatoes	Base case	262	247	94.3%	15	5.7%
	Total sugars as free sugars	262	237	90.5%	25	9.5%
Ready meals	Base case	3521	2726	77.4%	795	22.6%
	Total sugars as free sugars	3521	2463	70.0%	1058	30.0%

The estimation of free sugars was done in two broad steps. First, the percentage composition of each ingredient given in the ingredients data was estimated using an existing algorithm. This method relies on a textual disaggregation of each ingredient declared in the ingredient list, classification of the ingredient and estimation of missing composition percentages based on the type of products as well as similar products. As the disaggregation and classification are based on textual analysis, common formatting errors in the ingredients text were identified and corrected, but it is likely infrequent formatting errors in the ingredients list (e.g. use of symbols or incorrect use of brackets) will be contributing to inaccuracies in either ingredient identification or estimation in composition for some individual products, which may contribute to NPM classification errors.

The second step was to identify ingredients that contain naturally occurring sugars (e.g. dairy and fruit), and subtract the sugar content of these ingredients from the declared total sugars value, giving an estimate of free sugars. This estimation method is subject to uncertainty arising from inaccuracies in the disaggregation method and estimated percentage composition of each ingredient (as mentioned above), incomplete information on level of ingredients processing and the use of generic food composition data to estimate the sugar content of ingredients, that may differ from data used by manufacturers.

Furthermore, because NPM 2018 uses relatively narrow scoring thresholds (one point per 0.9g of free sugars), small errors in estimation may result in different points being awarded for some products which could lead do misclassification. The results of Sensitivity Analysis 4 show that any methodological errors in estimating the free sugars is unlikely to impact the overall result of this study and have a minimal impact on most categories. Overall, the total proportion of in-scope products failing the new model would change by +/- 2.7% if products were awarded +/-2 points for free sugars compared to baseline. However, certain categories are more sensitive to miscalculation of free sugars, particularly yoghurts, where a two-point difference in free sugar points could lead to 11% more yoghurt products passing or failing the model, and pizzas, where a two-point difference could lead to 16% more products passing or failing the model. This supports the finding that certain categories are more impacts by NPM 2018's switch from total to free sugars than others.

Sensitivity analysis 4. Proportion of products passing and failing NPM 2018 under +/- 2 free sugar points, by in-scope category

In-scope category	Scenario	N	N passing NPM 2018	% passing NPM 2018	N failing NPM 2018	% failing NPM 2018
Soft drinks	−2 sugar points	1352	104	7.7%	1248	92.3%
	−1 sugar point	1352	91	6.7%	1261	93.3%
	Base case	1352	80	5.9%	1272	94.1%
	+1 sugar point	1352	73	5.4%	1279	94.6%
	+2 sugar points	1352	68	5.0%	1284	95.0%

In-scope category	Scenario	N	N passing NPM 2018	% passing NPM 2018	N failing NPM 2018	% failing NPM 2018
Savoury snacks	−2 sugar points	1849	489	26.4%	1360	73.6%
	−1 sugar point	1849	474	25.6%	1375	74.4%
	Base case	1849	447	24.2%	1402	75.8%
	+1 sugar point	1849	417	22.6%	1432	77.4%
	+2 sugar points	1849	401	21.7%	1448	78.3%
Breakfast cereals	−2 sugar points	788	317	40.2%	471	59.8%
	−1 sugar point	788	314	39.8%	474	60.2%
	Base case	788	308	39.1%	480	60.9%
	+1 sugar point	788	300	38.1%	488	61.9%
	+2 sugar points	788	295	37.4%	493	62.6%
Confectionery	−2 sugar points	2146	38	1.8%	2108	98.2%
	−1 sugar point	2146	37	1.7%	2109	98.3%
	Base case	2146	32	1.5%	2114	98.5%
	+1 sugar point	2146	32	1.5%	2114	98.5%
	+2 sugar points	2146	32	1.5%	2114	98.5%
Ice cream	−2 sugar points	663	26	3.9%	637	96.1%
	−1 sugar point	663	22	3.3%	641	96.7%
	Base case	663	22	3.3%	641	96.7%
	+1 sugar point	663	20	3.0%	643	97.0%
	+2 sugar points	663	18	2.7%	645	97.3%
Cakes	−2 sugar points	1098	13	1.2%	1085	98.8%
	−1 sugar point	1098	13	1.2%	1085	98.8%
	Base case	1098	13	1.2%	1085	98.8%
	+1 sugar point	1098	13	1.2%	1085	98.8%
	+2 sugar points	1098	13	1.2%	1085	98.8%
Biscuits	−2 sugar points	1356	90	6.6%	1266	93.4%
	−1 sugar point	1356	89	6.6%	1267	93.4%
	Base case	1356	89	6.6%	1267	93.4%
	+1 sugar point	1356	88	6.5%	1268	93.5%
	+2 sugar points	1356	88	6.5%	1268	93.5%
Morning goods	−2 sugar points	529	85	16.1%	444	83.9%
	−1 sugar point	529	78	14.7%	451	85.3%
	Base case	529	70	13.2%	459	86.8%
	+1 sugar point	529	64	12.1%	465	87.9%
	+2 sugar points	529	60	11.3%	469	88.7%
Desserts	−2 sugar points	1073	105	9.8%	968	90.2%
	−1 sugar point	1073	99	9.2%	974	90.8%
	Base case	1073	87	8.1%	986	91.9%
	+1 sugar point	1073	83	7.7%	990	92.3%
	+2 sugar points	1073	77	7.2%	996	92.8%

In-scope category	Scenario	N	N passing NPM 2018	% passing NPM 2018	N failing NPM 2018	% failing NPM 2018
Yoghurts	−2 sugar points	500	236	47.2%	264	52.8%
	−1 sugar point	500	208	41.6%	292	58.4%
	Base case	500	180	36.0%	320	64.0%
	+1 sugar point	500	149	29.8%	351	70.2%
	+2 sugar points	500	121	24.2%	379	75.8%
Pizzas	−2 sugar points	377	171	45.4%	206	54.6%
	−1 sugar point	377	139	36.9%	238	63.1%
	Base case	377	109	28.9%	268	71.1%
	+1 sugar point	377	52	13.8%	325	86.2%
	+2 sugar points	377	46	12.2%	331	87.8%
Processed potatoes	−2 sugar points	262	248	94.7%	14	5.3%
	−1 sugar point	262	247	94.3%	15	5.7%
	Base case	262	247	94.3%	15	5.7%
	+1 sugar point	262	246	93.9%	16	6.1%
	+2 sugar points	262	246	93.9%	16	6.1%
Ready meals	−2 sugar points	3521	2897	82.3%	624	17.7%
	−1 sugar point	3521	2837	80.6%	684	19.4%
	Base case	3521	2726	77.4%	795	22.6%
	+1 sugar point	3521	2574	73.1%	947	26.9%
	+2 sugar points	3521	2521	71.6%	1000	28.4%
Overall	−2 sugar points	15514	4819	31.1%	10695	68.9%
	−1 sugar point	15514	4648	30.0%	10866	70.0%
	Base case	15514	4410	28.4%	11104	71.6%
	+1 sugar point	15514	4111	26.5%	11403	73.5%
	+2 sugar points	15514	3986	25.7%	11528	74.3%

The degree of processing of each ingredient was not always given in ingredients list, which is a limitation when identifying sources of free sugars, e.g. whole or chopped fruit does not count towards a product's free sugar content, but fruit juice or puree does. In Sensitivity Analysis 5, we compared the proportion of products that are passing and failing NPM 2018 following the baseline method, which assumes that all fruit and vegetable ingredients where the degree of processing is not known are whole/intact (i.e. don't contribute to free sugar content), compared to an alternative, worst-case scenario, whereby it was assumed they were all processed (i.e. do contribute to free sugar content). This was done for three categories, yoghurts, pizzas and ready meals, which are the three legislative categories that are likely to contain fruit and vegetable ingredients with varying descriptions of processing. The other categories either don't contain high levels of fruits and vegetables, or in the case of breakfast cereals, contain predominantly whole, unprocessed fruits and in the case of soft drinks, contain only fruit juice. The results show that there are minimal differences between the two scenarios, with a 3.3% (n = 16), 2.2% (n = 10) and 1.6% (n = 56) fewer products passing between the two methods for the yoghurt, pizza and ready meal categories respectively. The relatively small impact on the proportion of products passing can be explained by several factors. First, processing methods that may alter the fruit or vegetable matrix were already reported and identified for a number of ingredients (e.g. tomato or fruit purées). Consequently, these ingredients were already classified appropriately under both approaches. Second, many other fruit or vegetable ingredients are present in relatively small quantities and contain low concentrations of sugar, meaning that their contribution to the overall free sugar content is limited. Third, because the outcome was assessed as a binary pass/fail classification, only products close to this boundary and for which changes in sugar-related points were sufficient to alter the final score and classification.

Sensitivity Analysis 5. Proportion of products that pass NPM 2018 when fruit and vegetable ingredients with an unknown degree of processing are assumed to all be whole/intact (baseline method, no free sugars) compared to non-intact (pessimistic scenario, all free sugars), selected categories only

In-scope category	N	Baseline method (FVN whole)		Pessimistic scenario (FVN processed)	
		N passing	% passing	N passing	Proportion passing
Yoghurts	500	180	36.0%	164	32.8%
Pizzas	377	109	28.9%	99	26.3%
Ready meals	3521	2726	77.4%	2670	75.8%

Overall, the sensitivity analyses of the free sugar estimates suggest that the results were only marginally affected by the estimation method. Nevertheless, although inaccuracies are unlikely to affect the overall conclusions of the assessment at the aggregate level, we acknowledge that, at the individual product level, differences in the estimated free sugar content could influence the classification outcome.

Conclusion

Updating the advertising and promotions legislation to use the NPM 2018 is likely to lead to more products failing the model and being subject to restrictions. In this dataset, 72% of products failed under NPM 2018, compared to 58% of products under NPM 2004/5. 2498 products were classified differently between the two models, with 93% of these moving from pass to fail.

There was heterogeneity between categories, with the largest changes in the proportion of products passing and failing the updated model observed in soft drinks, (66.2% to 5.9% passing for NPM 2004/5 and NPM 2018 respectively), yoghurts (77.8% to 36.0%) and pizzas (50.7% to 28.9%). In contrast, confectionery, cakes and processed potatoes remained relatively unchanged.

The most important drivers for the change are the differences in sugars and fibre between the two models. The switch from total sugars to free sugars and narrowing of the scoring thresholds meant that soft drinks and yoghurts in particular, received a higher score for sugars and were more likely to fail NPM 2018. The adjustment to the fibre score worked in the opposite direction, with breakfast cereals and savoury snacks scoring higher for fibre.

Despite the large increase in proportion of products failing the updated model, the proportion of products close to the pass/fail border did not substantially change. 10% of products under NPM 2004/5 that scored between 1-3 for drinks and 4-8 for foods, compared to 13% for NPM 2018. This indicates that while more products failed overall, a similar proportion of products could be reformulated to improve their score and pass the model.

One limitation of this study is that the dataset only represents grocery products sold in Tesco, Sainsbury's, Asda and Ocado (including M&S). While these four retailers represent 60% of supermarket sales in the UK, it does not cover discounters such as Aldi or Lidl, or food sold out of the home in restaurants, cafes and takeaways. The second limitation is that the free sugar content of products had to be estimated as it is not given on the product label. This was done using an existing algorithm that disaggregates the proportion of each ingredient using the ingredients list. However, errors in the free sugar content could arise from errors in the estimate of ingredient content, incomplete information on ingredients processing, or uncertainty in the sugar content of ingredients, However, sensitivity analyses showed that uncertainty in the free sugar estimates was unlikely to change the overall findings at the category level. For example, increasing or decreasing the score for free sugars by two points changed the overall products passing the NPM 2018 by +/- 2.7%. Some categories may be more sensitive to uncertainty in free sugar estimates, and the classification of individual products close to the pass/fail threshold may be affected.

Overall, updating the advertising and promotions legislation to use NPM 2018 would increase the proportion of supermarket products that fail the model and are therefore subject to restrictions. The magnitude of this change varies by category and is principally driven by revisions to the switch from total to free sugars.

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Appendix 1. List of strings used to identify free-sugar ingredients

Any ingredient containing one of the following strings was classified as a **free-sugar ingredient**:

- **Sugar**
- **Sucrose**, **fructose**, **glucose**, **lactose**, **galactose**
- **Dextrin**, **dextrose**
- **Maltose, barley malt, corn malt, wheat malt**
- **Honey**, **syrup**, **nectar**, **molasses**, **treacle**, **caramel**
- **Juice** (excluding *lime juice* and *lemon juice*)
- **Purée** or **puree** (excluding *garlic purée*)
- **Tomato pulp, tomato sauce, crushed tomato, blended tomato, tomato passata**
- **Grape must**, **balsamic vinegar**
- **Concentrate** (excluding *butter*, *wine*, *rice*, *protein*, *milk*, *potato*, *garlic*, *lemon*, *lime*, and *onion* concentrates)

Garlic, onion, lemon, and lime ingredients were excluded because they systematically contribute only negligible amounts of free sugars.

Appendix 2. List of categories used to estimate the fruit, vegetable and nut (FVN) content

Any ingredient belonging to one of the following categories was included in the computation of the **fruit, vegetable, and nut proportion estimate**:

- **Fruit:** Apples, Bananas, Berries & Grapes, Citrus Fruit, Other Fruit
- **Vegetables:** Brassicas, Olives, Onions & Leeks, Root Vegetables, Tomatoes, Other Vegetables
- **Pulses:** Peas, Other Pulses
- **Nuts:** Groundnuts, Nuts

For NPM 2018, the following categories were added as Seeds were added to the list of ingredients qualifying for the fruit, vegetable, and nut component:

- **Seeds:** Cereals & Oilcrops Misc., Sunflower seeds

For the seed category, ingredients with one of the following strings were manually removed: Rapeseed, Safflower, Buckwheat, Quinoa, Amaranth, Fonio.

In addition, included ingredients were manually checked to ensure no outlier was included. Additional text filters were developed to exclude or include any mistake identified. Around 19% of all ingredients in the dataset were classified as FVN.

Appendix 3. Summary nutrient composition statistics for full dataset by granular food group

Energy (kJ/100g) content per granular food group

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	1782.5	1400.9	1603.0	1755.0	1960.0	2257.7
Bread	Bread	1188	1095.0	876.3	1003.0	1078.5	1173.0	1327.6
Breakfast cereals	Breakfast_cereals_sweet	624	1675.6	1476.8	1569.8	1623.5	1801.5	1992.3
	Breakfast_cereals_unsweet	164	1629.0	1488.6	1537.2	1557.0	1581.2	2154.2
Cheese	Cheese_alternatives	38	1259.2	954.0	1184.0	1251.5	1360.0	1440.3
	Dairy_cheese	946	1386.7	596.5	1166.2	1508.5	1714.0	1752.2
	Pasta	640	597.9	271.7	436.5	574.7	741.0	975.8
	Pizzas	445	1106.5	836.8	982.0	1072.0	1177.0	1469.0
	RTE_salads	255	586.0	114.1	411.5	557.0	774.0	1053.6
Composite foods	Ready_To_Go_Other	165	947.1	542.2	690.0	923.0	1085.0	1617.4
	Ready_meals	2191	651.0	325.0	458.5	586.0	761.0	1227.2
	Rice	260	621.2	471.0	556.8	610.5	665.5	780.0
	Sandwiches	212	937.9	723.0	828.0	930.5	1022.5	1184.4
	Savoury_pastries_pies	712	1172.0	864.5	1039.8	1145.0	1299.0	1583.3
Confectionery	Ice_creams_and_lollies	663	866.8	290.2	586.5	864.0	1132.0	1458.0
	Chocolate	1167	2218.5	1805.0	2104.0	2239.0	2364.0	2560.7
	Gum_mints	141	976.4	0.0	624.0	758.0	1634.0	1752.0
	Sugar_sweets	660	1491.3	909.0	1392.0	1500.0	1663.0	1926.1
	Sweet_snacks	127	1942.8	1487.4	1872.5	2000.3	2080.5	2229.1
	Sweet_spreads	427	1332.6	643.8	1024.0	1143.0	1450.0	2391.1
Dairy_beverages	Milk	184	286.6	140.9	220.0	270.5	301.0	445.0
	Milk_alternatives	197	185.7	73.0	132.0	185.0	243.0	272.2
	Drinking_yogurts_milkshakes	132	248.1	125.7	201.5	251.5	293.0	339.3
	Puddings	106	1073.5	250.2	586.0	1144.0	1531.0	1805.0

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Dairy_desserts	Yoghurts	629	402.2	230.0	312.0	371.0	481.0	615.6
Eggs	Eggs	20	503.9	201.4	547.0	595.0	595.0	595.0
Fats_and_oils	Cream	67	1146.1	526.6	766.5	1144.0	1471.5	1921.0
	Solid_fat	222	2563.1	1418.7	2121.0	2793.5	3031.8	3088.5
	Vegetable_oils	267	3420.1	3154.0	3382.0	3404.0	3692.0	3760.0
Fish_and_seafood	Lean_fish	566	718.0	374.5	492.8	757.0	866.0	1030.0
	Oily_fish	480	884.1	549.0	752.5	864.0	987.2	1281.1
	Seafood	269	575.7	260.0	333.0	424.0	860.0	1188.2
Fruit_juices_drinks	Coconut_water	36	88.9	57.5	77.0	91.0	104.0	120.8
	Fruit_drinks	295	96.2	10.7	50.0	81.0	116.0	232.3
	Fruit_juices_nectars	380	173.2	79.0	143.5	178.0	204.0	255.2
	Smoothies	80	219.1	174.8	200.0	217.0	236.5	270.0
Fruit_vegetables	Fruits	849	688.4	137.0	204.0	285.0	1257.0	1756.6
	Vegetables	1570	344.5	65.0	112.0	208.0	495.8	983.6
Hot_drinks	Chocolate_drink	86	202.4	145.6	161.0	171.4	234.5	340.8
	Coffee	76	14.5	5.0	7.0	14.5	15.0	36.0
Meat_products	Meat_alternatives	361	817.1	394.0	637.0	833.0	963.0	1243.0
	Poultry	1059	786.7	461.8	592.0	771.0	956.5	1135.1
	Red_meat	2319	989.6	459.0	707.0	985.0	1178.0	1741.2
Nuts_seeds	Nuts_seeds	817	2404.4	1802.0	2287.0	2470.0	2589.0	2848.0
Pulses_potatoes_cereals	Dry_pasta	364	1494.6	1423.5	1481.0	1489.0	1516.0	1574.0
	Dry_rice	128	1504.4	1449.3	1476.0	1491.0	1518.2	1593.0
	Other_cereals	31	1517.3	1382.0	1470.0	1492.0	1576.5	1668.0
	Potatoes	306	650.5	337.5	491.2	646.5	771.0	1016.8
	Pulses	335	499.4	242.0	339.0	397.0	465.0	1415.7
	Cold_sauces	858	963.2	176.9	434.0	704.0	1169.0	2787.5
Sauces_condiments	Dips	392	941.4	257.6	635.8	868.4	1170.2	1823.0
	Pickles	53	736.4	344.6	599.0	709.0	828.0	1349.8
	Salad_dressing	128	1395.9	315.0	924.0	1483.5	1872.0	2405.3

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Vinegars	122	515.8	31.0	88.2	409.0	820.5	1407.6
	Warm_sauces	1387	617.8	147.0	281.0	436.0	747.0	1722.6
Savoury_snacks	Crisps	1012	2058.2	1770.6	1993.0	2096.0	2177.0	2259.0
	Other_savoury_snacks	383	1979.8	1412.0	1798.0	1997.0	2154.0	2495.2
	Savoury_biscuits	463	1844.0	1482.2	1685.5	1845.0	2004.5	2228.8
Soft_drinks	Coffee	266	194.5	89.2	143.2	171.2	218.8	293.0
	Colas	194	38.3	1.3	1.6	2.1	75.0	180.0
	Energy_drinks	205	75.7	8.0	12.0	50.0	96.0	197.4
	Flavoured_water Fruit_sodas	212	22.0	2.0	3.0	5.0	34.0	85.7
	Flavoured_water Fruit_sodas	226	71.6	9.0	18.2	78.5	84.0	169.5
	Lemonades_and_others	399	61.0	2.3	7.0	73.0	83.0	163.1
	Squash	157	29.0	5.0	7.0	10.0	37.0	86.0
	Tea	114	176.4	6.3	43.0	64.0	91.5	1154.0
Soups_and_stocks	Gravy_stock	35	172.3	46.7	83.0	153.0	222.0	331.0
	Soup	459	223.9	110.9	165.5	205.0	249.0	425.0
Sweet_bakery	Cakes_and_cookies	1156	1805.8	1458.2	1673.0	1820.0	1945.0	2122.5
	Morning_goods	475	1488.8	1019.6	1194.0	1502.0	1751.0	1975.0
	Sweet_biscuits	732	2033.9	1675.6	1940.8	2066.0	2160.0	2271.4
Water	Water	22	0.6	0.0	0.0	0.0	0.0	5.7

Fat (g/100g) content per granular food group

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	18.9	4.7	12.0	17.4	25.0	40.0
Bread	Bread	1188	4.0	0.8	1.7	3.1	5.5	9.0
Breakfast_cereals	Breakfast_cereals_sweet	624	9.1	1.2	2.9	6.1	13.3	23.0
	Breakfast_cereals_unsweet	164	9.6	2.3	5.8	7.2	8.0	32.8
Cheese	Cheese_alternatives	38	24.4	19.5	21.4	24.0	25.8	30.1
	Dairy_cheese	946	26.9	7.8	22.1	29.0	34.4	35.3
Composite_food	Pasta	640	4.5	0.0	1.0	3.2	6.3	14.0
	Pizzas	445	9.9	4.8	7.7	9.0	11.0	17.0
	RTE_salads	255	9.1	0.2	3.9	6.8	14.0	23.1

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Ready_To_Go_Other	165	12.9	2.2	5.3	13.0	18.2	29.3
	Ready_meals	2191	6.6	1.4	3.2	5.4	8.3	16.0
	Rice	260	2.0	0.0	0.9	1.9	2.5	5.0
	Sandwiches	212	8.4	3.7	5.9	8.1	10.1	14.6
	Savoury_pastries_pies	712	16.2	9.4	13.0	15.5	19.0	25.6
Confectionery	Chocolate	1167	32.2	16.2	26.8	32.0	38.0	47.1
	Gum_mints	141	0.9	0.0	0.0	0.0	0.6	5.5
	Ice_creams_and_lollies	663	10.2	0.0	4.5	10.0	15.0	21.0
	Sugar_sweets	660	3.7	0.0	0.0	0.3	3.8	19.6
	Sweet_snacks	127	20.8	5.2	18.0	21.9	25.0	32.8
	Sweet_spreads	427	7.9	0.0	0.0	0.1	3.2	37.4
	Drinking_yogurts_milkshakes	132	1.8	0.1	1.2	1.6	2.6	3.6
Dairy_beverages	Milk	184	1.9	0.1	1.1	1.6	2.7	4.5
	Milk_alternatives	197	2.0	0.8	1.3	1.6	2.6	3.2
Dairy_desserts	Puddings	1063	12.4	0.0	4.0	11.8	20.0	27.0
	Yogurts	629	3.6	0.0	1.5	3.3	5.0	8.6
Eggs	Eggs	20	7.6	0.0	9.0	9.6	9.6	9.6
Fats_and_oils	Cream	67	27.3	10.5	17.5	25.2	35.1	50.8
	Solid_fat	222	68.4	38.0	57.0	75.0	81.0	82.2
	Vegetable_oils	267	92.8	90.8	91.4	92.0	99.9	100.0
Fish_and_seafood	Lean_fish	566	7.3	0.3	1.8	7.2	9.9	15.1
	Oily_fish	480	13.3	4.8	9.5	12.2	16.0	24.6
	Seafood	269	5.8	0.0	0.6	2.6	9.4	19.2
Fruit_juices_drinks	Coconut_water	36	0.1	0.0	0.0	0.0	0.1	0.5
	Fruit_drinks	295	0.1	0.0	0.0	0.0	0.0	0.1
	Fruit_juices_nectars	380	0.1	0.0	0.0	0.0	0.0	0.5
	Smoothies	80	0.2	0.0	0.0	0.0	0.2	0.9
Fruit_vegetables	Fruits	849	2.7	0.0	0.0	0.3	0.7	19.5
	Vegetables	1570	4.9	0.0	0.1	0.6	6.3	21.6
Hot_drinks	Chocolate_drink	86	1.5	0.3	0.7	0.9	2.0	3.9
	Coffee	76	0.0	0.0	0.0	0.0	0.0	0.0

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Meat_products	Meat_alternatives	361	9.8	2.3	6.3	9.4	13.0	18.0
	Poultry	1059	8.5	1.3	3.6	8.6	12.0	17.0
	Red_meat	2319	15.5	2.2	7.0	15.0	21.1	35.0
Nuts_seeds	Nuts_seeds	817	45.5	19.5	39.8	47.5	52.7	66.2
Pulses_potatoes_cereals	Dry_pasta	364	1.9	1.0	1.2	1.5	2.0	4.2
	Dry_rice	128	1.3	0.0	0.6	1.0	1.7	3.1
	Other_cereals	31	3.6	0.9	1.5	3.0	5.6	7.3
	Potatoes	306	5.2	0.1	3.2	5.0	7.2	11.0
	Pulses	335	1.1	0.0	0.4	0.6	1.4	3.9
Sauces_condiments	Cold_sauces	858	14.7	0.0	0.0	0.8	23.5	73.2
	Dips	392	18.6	0.5	10.6	15.9	24.0	43.5
	Pickles	53	10.0	0.0	0.8	11.0	16.9	25.0
	Salad_dressing	128	31.4	1.3	18.2	32.2	44.2	58.8
	Vinegars	122	0.0	0.0	0.0	0.0	0.0	0.3
	Warm_sauces	1387	9.2	0.0	0.9	4.3	10.0	40.0
Savoury_snacks	Crisps	1012	25.3	13.0	21.0	26.4	30.0	34.0
	Other_savoury_snacks	383	22.7	2.5	13.0	22.0	30.0	48.2
	Savoury_biscuits	463	14.8	1.5	6.2	14.0	21.0	32.1
Soft_drinks	Coffee	266	1.2	0.0	0.9	1.1	1.5	2.4
	Colas	194	0.0	0.0	0.0	0.0	0.0	0.0
	Energy_drinks	205	0.0	0.0	0.0	0.0	0.0	0.0
	Flavoured_water	212	0.0	0.0	0.0	0.0	0.0	0.0
	Fruit_sodas	226	0.1	0.0	0.0	0.0	0.0	0.0
	Lemonades_and_others	399	0.0	0.0	0.0	0.0	0.0	0.0
	Squash	157	0.0	0.0	0.0	0.0	0.0	0.0
	Tea	114	0.3	0.0	0.0	0.0	0.0	1.4
Soups_and_stocks	Gravy_stock	35	1.4	0.0	0.3	1.0	2.0	4.1
	Soup	459	1.8	0.0	0.7	1.4	2.5	4.9
Sweet_bakery	Cakes_and_cookies	1156	20.1	9.4	16.9	20.6	24.0	29.0
	Morning_goods	475	14.5	3.0	7.2	14.1	21.1	28.0
	Sweet_biscuits	732	22.3	8.9	19.0	23.4	27.0	33.0
Water	Water	22	0.0	0.0	0.0	0.0	0.0	0.0

Saturated fat (g/100g) content per granular food group

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	6.0	0.7	2.2	5.1	8.5	14.0
Bread	Bread	1188	0.8	0.2	0.4	0.6	0.9	2.3
Breakfast_cereals	Breakfast_cereals_sweet	624	2.1	0.3	0.7	1.2	2.4	6.0
	Breakfast_cereals_unsweet	164	2.0	0.5	0.9	1.2	1.5	6.8
Cheese	Cheese_alternatives	38	18.9	8.4	17.1	20.1	22.2	26.0
	Dairy_cheese	946	17.4	4.5	14.0	19.0	21.7	23.6
Composite_food	Pasta	640	1.6	0.0	0.2	0.8	2.2	6.5
	Pizzas	445	3.9	1.5	2.8	3.7	4.6	6.7
	RTE_salads	255	1.3	0.0	0.5	1.1	1.7	3.5
	Ready_To_Go_Other	165	4.2	0.4	0.9	3.4	5.6	12.9
	Ready_meals	2191	2.2	0.3	0.8	1.5	2.8	6.0
	Rice	260	0.5	0.0	0.2	0.2	0.4	1.8
	Sandwiches	212	2.5	0.5	1.3	2.0	3.1	5.9
	Savoury_pastries_pies	712	7.3	3.6	5.7	7.2	9.0	11.8
Confectionery	Chocolate	1167	18.5	8.0	14.1	18.0	21.7	33.0
	Gum_mints	141	0.6	0.0	0.0	0.0	0.5	4.1
	Ice_creams_and_lollies	663	6.8	0.0	3.3	7.0	10.0	14.0
	Sugar_sweets	660	2.3	0.0	0.0	0.2	2.4	12.0
	Sweet_snacks	127	7.8	1.1	1.8	4.9	13.7	18.8
	Sweet_spreads	427	2.1	0.0	0.0	0.0	0.6	10.6
Dairy_beverages	Drinking_yogurts_milkshakes	132	1.1	0.0	0.5	1.0	1.7	2.4
	Milk	184	1.1	0.0	0.7	1.0	1.4	2.7
	Milk_alternatives	197	0.4	0.1	0.2	0.3	0.3	1.2
Dairy_desserts	Puddings	1063	7.0	0.0	2.3	6.6	11.0	15.5
	Yogurts	629	2.3	0.0	0.4	1.9	3.0	5.6

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Eggs	Eggs	20	2.1	0.0	2.5	2.7	2.7	2.7
Fats_and_oils	Cream	67	17.5	4.2	11.0	17.2	24.0	31.0
	Solid_fat	222	33.3	10.0	17.8	32.9	52.0	56.5
	Vegetable_oils	267	22.0	5.8	10.1	13.3	15.0	87.0
Fish_and_seafood	Lean_fish	566	1.1	0.0	0.4	0.8	1.2	4.0
	Oily_fish	480	2.9	0.9	1.7	2.4	3.7	6.4
	Seafood	269	1.1	0.0	0.2	0.6	1.2	4.0
Fruit_juices_drinks	Coconut_water	36	0.1	0.0	0.0	0.0	0.0	0.5
	Fruit_drinks	295	0.0	0.0	0.0	0.0	0.0	0.0
	Fruit_juices_nectars	380	0.0	0.0	0.0	0.0	0.0	0.1
	Smoothies	80	0.1	0.0	0.0	0.0	0.0	0.5
Fruit_vegetables	Fruits	849	1.6	0.0	0.0	0.0	0.2	7.9
	Vegetables	1570	0.8	0.0	0.0	0.1	1.3	3.7
Hot_drinks	Chocolate_drink	86	1.0	0.2	0.5	0.7	1.3	2.5
	Coffee	76	0.0	0.0	0.0	0.0	0.0	0.0
Meat_products	Meat_alternatives	361	2.2	0.4	0.8	1.2	2.1	7.2
	Poultry	1059	2.0	0.4	0.8	1.7	2.7	4.9
	Red_meat	2319	6.0	0.8	2.5	5.7	8.4	14.0
Nuts_seeds	Nuts_seeds	817	6.8	2.8	4.5	6.2	8.0	14.1
Pulses_potatoes_cereals	Dry_pasta	364	0.4	0.2	0.3	0.3	0.5	1.0
	Dry_rice	128	0.3	0.0	0.2	0.2	0.5	0.8
	Other_cereals	31	0.7	0.0	0.2	0.4	0.6	2.5
	Potatoes	306	0.9	0.0	0.4	0.7	1.0	2.4
	Pulses	335	0.2	0.0	0.0	0.1	0.2	0.8
Sauces_condiments	Cold_sauces	858	1.5	0.0	0.0	0.2	2.1	6.5
	Dips	392	3.2	0.1	1.5	2.5	4.0	8.0
	Pickles	53	1.1	0.0	0.3	1.0	1.5	2.7
	Salad_dressing	128	3.1	0.3	1.7	3.0	4.3	6.5

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Vinegars	122	0.0	0.0	0.0	0.0	0.0	0.1
	Warm_sauces	1387	2.2	0.0	0.1	0.7	2.8	7.8
Savoury_snacks	Crisps	1012	3.0	1.3	2.0	2.4	2.9	6.5
	Other_savoury_snacks	383	5.4	0.3	1.4	2.5	6.1	18.8
	Savoury_biscuits	463	5.2	0.3	1.1	2.7	7.0	17.8
Soft_drinks	Coffee	266	0.8	0.0	0.6	0.8	1.0	1.6
	Colas	194	0.0	0.0	0.0	0.0	0.0	0.0
	Energy_drinks	205	0.0	0.0	0.0	0.0	0.0	0.0
	Flavoured_water	212	0.0	0.0	0.0	0.0	0.0	0.0
	Fruit_sodas	226	0.0	0.0	0.0	0.0	0.0	0.0
	Lemonades_and_others	399	0.0	0.0	0.0	0.0	0.0	0.0
	Squash	157	0.0	0.0	0.0	0.0	0.0	0.0
	Tea	114	0.2	0.0	0.0	0.0	0.0	0.9
Soups_and_stocks	Gravy_stock	35	0.4	0.0	0.1	0.2	0.5	1.8
	Soup	459	0.6	0.0	0.1	0.4	0.8	2.4
Sweet_bakery	Cakes_and_cookies	1156	8.5	2.2	4.7	8.0	11.5	16.7
	Morning_goods	475	6.1	0.5	1.5	4.8	10.0	15.3
	Sweet_biscuits	732	11.8	2.5	8.1	12.2	15.6	20.1
Water	Water	22	0.0	0.0	0.0	0.0	0.0	0.0

Carbohydrate content (g/100g) of granular food groups

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	46.4	17.0	32.5	48.5	62.0	71.8
Bread	Bread	1188	45.3	33.7	41.0	45.8	49.4	56.0
Breakfast_cereals	Breakfast_cereals_sweet	624	64.6	43.1	59.0	65.4	71.0	84.0
	Breakfast_cereals_unsweet	164	57.3	20.2	57.0	60.0	62.0	73.0
Cheese	Cheese_alternatives	38	17.4	5.9	12.1	19.0	21.1	25.6
	Dairy_cheese	946	2.7	0.0	0.0	1.1	3.5	10.8
Composite_food	Pasta	640	25.9	10.6	17.0	23.0	29.2	64.0
	Pizzas	445	32.8	24.4	28.6	31.6	35.2	45.1
	RTE_salads	255	10.3	2.7	5.1	9.2	13.8	22.9
	Ready_To_Go_Other	165	17.5	1.2	8.7	16.0	25.0	33.7

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Ready_meals	2191	16.1	4.2	10.0	14.3	20.1	32.0
	Rice	260	28.0	17.7	25.1	28.7	31.0	36.0
	Sandwiches	212	25.1	16.3	23.0	25.4	28.0	31.0
	Savoury_pastries_pies	712	24.3	16.5	21.1	24.2	27.3	32.7
Confectionery	Chocolate	1167	52.6	31.9	45.0	54.5	60.0	71.0
	Gum_mints	141	78.7	60.0	65.0	73.0	94.0	98.1
	Ice_creams_and_lollies	663	25.5	12.0	20.0	25.0	31.0	39.4
	Sugar_sweets	660	77.7	45.2	75.6	81.2	86.9	95.2
	Sweet_snacks	127	61.3	43.9	56.2	62.0	66.1	81.7
	Sweet_spreads	427	59.2	32.0	52.0	60.0	66.9	80.7
Dairy_beverages	Drinking_yogurts_milkshakes	132	7.1	2.9	4.6	6.8	9.5	13.5
	Milk	184	8.9	2.6	4.7	8.2	10.0	13.5
	Milk_alternatives	197	5.0	0.0	2.0	5.9	7.2	10.4
Dairy_desserts	Puddings	1063	31.8	7.2	17.9	31.3	41.8	61.3
	Yoghurts	629	10.3	3.5	6.9	9.9	13.0	18.6
Eggs	Eggs	20	0.3	0.0	0.0	0.0	0.0	1.0
Fats_and_oils	Cream	67	5.1	1.6	2.6	3.9	6.9	11.7
	Solid_fat	222	1.2	0.0	0.3	0.6	1.0	3.3
	Vegetable_oils	267	0.4	0.0	0.0	0.0	0.0	1.1
Fish_and_seafood	Lean_fish	566	9.0	0.0	0.0	9.5	17.5	21.3
	Oily_fish	480	3.2	0.0	0.0	0.9	3.7	18.0
	Seafood	269	6.7	0.0	0.1	1.8	7.8	25.0
Fruit_juices_drinks	Coconut_water	36	4.8	2.8	4.5	4.6	5.8	7.2
	Fruit_drinks	295	5.0	0.5	2.8	4.5	6.0	13.0
	Fruit_juices_nectars	380	9.1	2.8	7.8	9.6	11.0	13.1
	Smoothies	80	11.5	9.6	11.0	11.2	12.4	14.0
Fruit_vegetables	Fruits	849	31.3	5.1	9.6	14.0	62.6	78.4
	Vegetables	1570	6.3	0.0	2.1	4.2	7.9	17.1
Hot_drinks	Chocolate_drink	86	6.9	3.2	5.3	7.0	8.1	11.0
	Coffee	76	0.5	0.0	0.1	0.5	0.7	1.5
Meat_products	Meat_alternatives	361	11.6	1.4	5.0	8.5	18.0	27.7
	Poultry	1059	8.0	0.0	1.5	5.1	14.2	21.0
	Red_meat	2319	4.2	0.0	0.9	2.2	5.6	13.9

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Nuts_seeds	Nuts_seeds	817	18.9	3.3	7.3	13.7	27.8	49.7
Pulses_potatoes_cereals	Dry_pasta	364	69.0	55.3	67.4	70.0	72.0	78.0
	Dry_rice	128	77.3	70.2	75.0	77.6	80.0	84.0
	Other_cereals	31	68.2	56.0	64.5	69.0	74.0	79.0
	Potatoes	306	23.3	13.0	19.0	22.4	27.0	37.0
	Pulses	335	16.9	6.0	11.0	13.0	15.3	51.0
Sauces_condiments	Cold_sauces	858	22.2	1.4	7.1	17.0	32.0	60.6
	Dips	392	8.1	2.1	4.7	6.9	10.1	16.2
	Pickles	53	19.0	2.5	8.2	13.0	33.0	42.4
	Salad_dressing	128	11.2	2.6	6.5	10.1	14.1	23.3
	Vinegars	122	26.6	0.0	0.7	19.0	45.8	76.9
	Warm_sauces	1387	12.9	3.1	6.0	8.2	15.4	39.0
Savoury_snacks	Crisps	1012	57.2	46.6	53.0	57.0	63.0	70.0
	Other_savoury_snacks	383	50.6	0.6	43.3	54.0	66.0	76.0
	Savoury_biscuits	463	63.5	41.3	57.0	64.7	71.6	82.3
Soft_drinks	Coffee	266	6.8	1.9	4.3	5.7	7.8	9.9
	Colas	194	2.1	0.0	0.0	0.0	4.4	10.6
	Energy_drinks	205	4.1	0.0	0.0	3.5	5.3	11.0
	Flavoured_water	212	1.0	0.0	0.0	0.0	0.8	4.9
	Fruit_sodas	226	3.9	0.0	0.6	4.4	4.6	9.2
	Lemonades_and_others	399	3.3	0.0	0.0	4.1	4.6	9.2
	Squash	157	1.4	0.0	0.0	0.3	1.4	4.9
	Tea	114	9.6	0.0	2.4	3.1	4.6	66.2
Soups_and_stocks	Gravy_stock	35	3.7	0.0	0.8	2.1	5.8	7.3
	Soup	459	7.0	3.2	5.1	6.2	7.5	15.6
Sweet_bakery	Cakes_and_cookies	1156	57.1	43.6	52.9	57.7	62.2	69.0
	Morning_goods	475	48.6	36.0	43.0	48.6	53.2	62.0
	Sweet_biscuits	732	64.0	52.2	60.7	63.6	67.0	77.0
Water	Water	22	0.0	0.0	0.0	0.0	0.0	0.0

Total sugar content (g/100g) of granular food groups

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	24.0	3.3	15.8	23.0	32.0	47.0
Bread	Bread	1188	3.5	1.0	2.3	3.0	4.0	8.3

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Breakfast_cereals	Breakfast_cereals_sweet	624	16.0	4.2	12.0	16.1	21.0	26.0
	Breakfast_cereals_unsweet	164	2.8	0.7	1.0	1.1	2.0	12.1
Cheese	Cheese_alternatives	38	0.6	0.0	0.0	0.2	0.5	2.6
	Dairy_cheese	946	1.4	0.0	0.0	0.1	1.7	6.3
Composite_food	Pasta	640	2.1	0.0	0.6	1.5	3.1	5.2
	Pizzas	445	3.2	1.5	2.3	3.0	3.6	5.3
	RTE_salads	255	3.7	1.0	1.9	3.0	4.7	8.7
	Ready_To_Go_Other	165	3.7	0.0	0.8	2.7	5.5	9.9
	Ready_meals	2191	2.8	0.3	1.4	2.2	3.3	6.8
	Rice	260	1.1	0.0	0.0	0.4	1.3	3.2
	Sandwiches	212	3.1	1.2	1.9	2.6	4.0	6.2
	Savoury_pastries_pies	712	2.1	0.7	1.3	1.9	2.5	4.5
Confectionery	Chocolate	1167	44.9	20.7	38.3	47.0	54.0	61.5
	Gum_mints	141	23.1	0.0	0.0	0.0	56.0	94.5
	Ice_creams_and_lollies	663	20.6	9.5	17.0	20.9	25.0	29.9
	Sugar_sweets	660	56.4	3.0	50.0	59.0	68.0	82.0
	Sweet_snacks	127	30.0	2.9	21.0	29.6	38.7	57.4
	Sweet_spreads	427	55.2	24.2	47.5	58.1	65.0	78.0
	Drinking_yogurts_milkshakes	132	6.1	2.4	4.0	5.2	8.1	11.0
Dairy_beverages	Milk	184	8.1	2.6	4.7	7.4	8.9	11.6
	Milk_alternatives	197	2.8	0.0	1.5	2.7	3.8	6.5
Dairy_desserts	Puddings	1063	21.6	4.6	13.2	19.0	25.8	45.4
	Yogurts	629	8.5	3.0	5.7	8.1	11.0	15.7

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Eggs	Eggs	20	0.1	0.0	0.0	0.0	0.0	0.4
Fats_and_oils	Cream	67	4.2	1.3	2.3	3.0	4.1	11.0
	Solid_fat	222	0.7	0.0	0.0	0.5	0.6	1.1
	Vegetable_oils	267	0.1	0.0	0.0	0.0	0.0	0.0
Fish_and_seafood	Lean_fish	566	0.8	0.0	0.0	0.4	1.0	2.9
	Oily_fish	480	1.4	0.0	0.0	0.1	1.7	5.6
	Seafood	269	0.8	0.0	0.0	0.1	1.1	3.0
Fruit_juices_drinks	Coconut_water	36	4.2	2.0	4.0	4.0	5.0	6.4
	Fruit_drinks	295	4.6	0.0	2.2	4.4	5.0	12.0
	Fruit_juices_nectars	380	8.4	2.6	7.0	8.9	10.0	12.3
	Smoothies	80	10.2	8.4	9.5	10.0	11.0	12.9
Fruit_vegetables	Fruits	849	26.3	3.8	8.8	12.0	51.6	69.2
	Vegetables	1570	3.6	0.0	0.5	2.7	4.5	11.6
Hot_drinks	Chocolate_drink	86	5.6	2.0	4.1	5.4	7.0	10.4
	Coffee	76	0.0	0.0	0.0	0.0	0.0	0.1
Meat_products	Meat_alternatives	361	1.7	0.0	0.5	1.2	2.5	6.0
	Poultry	1059	1.4	0.0	0.1	0.9	1.8	5.5
	Red_meat	2319	1.5	0.0	0.0	0.7	1.7	5.7
Nuts_seeds	Nuts_seeds	817	9.4	1.0	3.9	5.3	8.2	35.0
Pulses_potatoes_cereals	Dry_pasta	364	2.6	0.4	1.6	3.0	3.3	4.1
	Dry_rice	128	0.6	0.0	0.0	0.5	0.8	1.6
	Other_cereals	31	3.0	0.0	0.6	1.6	3.5	11.2
	Potatoes	306	1.5	0.0	0.0	0.6	1.4	9.9
	Pulses	335	1.7	0.0	0.4	1.0	3.0	4.7
	Cold_sauces	858	18.6	0.4	3.8	13.0	28.0	55.0
Sauces_condiments	Dips	392	2.9	0.0	0.6	2.0	3.7	7.6
	Pickles	53	12.8	0.0	0.5	3.3	28.8	38.0
	Salad_dressing	128	8.4	1.1	3.5	7.3	12.0	18.8
	Vinegars	122	24.9	0.0	0.2	19.0	42.5	76.9
	Warm_sauces	1387	8.3	0.7	3.4	5.0	8.9	27.0
Savoury_snacks	Crisps	1012	3.3	0.3	1.3	2.6	3.7	7.5
	Other_savoury_snacks	383	4.6	0.0	0.8	2.1	5.0	18.0
	Savoury_biscuits	463	3.1	0.5	1.2	2.6	4.0	9.0
Soft_drinks	Coffee	266	5.6	1.3	3.5	4.3	6.6	9.4
	Colas	194	2.1	0.0	0.0	0.0	4.4	10.6

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Energy_drinks	205	3.6	0.0	0.0	2.4	4.7	11.0
	Flavoured_water	212	0.9	0.0	0.0	0.0	0.2	4.9
	Fruit_sodas	226	3.7	0.0	0.6	4.3	4.5	7.9
	Lemonades_and_others	399	3.2	0.0	0.0	4.1	4.5	8.0
	Squash	157	1.3	0.0	0.0	0.2	1.4	4.8
	Tea	114	7.9	0.0	2.1	3.0	4.3	58.5
Soups_and_stocks	Gravy_stock	35	1.4	0.0	0.3	0.8	1.6	3.5
	Soup	459	2.5	0.3	1.1	1.9	3.0	5.4
Sweet_bakery	Cakes_and_cookies	1156	35.2	19.7	29.0	35.0	41.4	50.0
	Morning_goods	475	17.6	4.0	11.6	16.3	22.9	36.0
	Sweet_biscuits	732	29.2	14.3	21.0	29.0	37.0	47.8
Water	Water	22	0.0	0.0	0.0	0.0	0.0	0.0

Free sugar content (g/100g) of granular food groups

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	17.7	0.0	4.0	18.8	26.8	38.0
Bread	Bread	1188	1.7	0.0	0.0	1.1	2.7	6.2
Breakfast_cereals	Breakfast_cereals_sweet	624	12.9	0.0	6.1	14.0	18.1	24.7
	Breakfast_cereals_unsweet	164	0.3	0.0	0.0	0.0	0.0	0.0
Cheese	Cheese_alternatives	38	0.3	0.0	0.0	0.0	0.3	1.5
	Dairy_cheese	946	0.5	0.0	0.0	0.0	0.0	2.7
Composite_food	Pasta	640	1.4	0.0	0.0	0.6	2.1	4.6
	Pizzas	445	1.8	0.0	1.0	1.6	2.4	3.9
	RTE_salads	255	1.8	0.0	0.0	1.2	2.5	6.2
	Ready_To_Go_Other	165	2.6	0.0	0.0	1.0	3.9	8.7
	Ready_meals	2191	1.4	0.0	0.0	0.6	1.8	5.6
	Rice	260	0.8	0.0	0.0	0.0	0.8	2.6
	Sandwiches	212	2.2	0.0	1.1	1.7	2.8	5.0
	Savoury_pastries_pies	712	0.8	0.0	0.0	0.5	1.2	2.8
Confectionery	Chocolate	1167	39.8	13.2	33.7	41.0	48.3	57.2
	Gum_mints	141	23.1	0.0	0.0	0.0	56.0	94.5
	Ice_creams_and_lollies	663	17.0	4.7	13.0	17.5	21.6	26.1

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Sugar_sweets	660	56.4	3.0	50.0	59.0	68.0	82.0
	Sweet_snacks	127	30.0	2.9	21.0	29.6	38.7	57.4
	Sweet_spreads	427	50.7	0.0	41.0	55.7	63.0	78.0
Dairy_beverages	Drinking_yogurts_milkshakes	132	2.7	0.0	0.0	1.4	4.9	7.2
	Milk	184	4.3	0.0	0.0	3.4	4.8	9.3
	Milk_alternatives	197	2.8	0.0	1.5	2.7	3.8	6.5
Dairy_desserts	Puddings	1063	18.5	0.0	9.0	15.5	23.4	44.5
	Yoghurts	629	4.8	0.0	0.0	4.9	7.6	11.7
Eggs	Eggs	20	0.0	0.0	0.0	0.0	0.0	0.0
Fats_and_oils	Cream	67	1.8	0.0	0.0	0.0	1.4	9.5
	Solid_fat	222	0.3	0.0	0.0	0.0	0.0	0.0
	Vegetable_oils	267	0.0	0.0	0.0	0.0	0.0	0.0
Fish_and_seafood	Lean_fish	566	0.4	0.0	0.0	0.0	0.2	1.9
	Oily_fish	480	1.1	0.0	0.0	0.0	1.0	5.2
	Seafood	269	0.6	0.0	0.0	0.0	0.4	2.7
Fruit_juices_drinks	Coconut_water	36	4.2	2.0	4.0	4.0	5.0	6.4
	Fruit_drinks	295	4.6	0.0	2.2	4.4	5.0	12.0
	Fruit_juices_nectars	380	8.4	2.6	7.0	8.9	10.0	12.3
	Smoothies	80	10.2	8.4	9.5	10.0	11.0	12.9
Fruit_vegetables	Fruits	849	5.7	0.0	0.0	0.0	3.0	46.2
	Vegetables	1570	1.3	0.0	0.0	0.0	0.0	7.8
Hot_drinks	Chocolate_drink	86	4.6	0.0	2.2	4.7	6.5	10.4
	Coffee	76	0.0	0.0	0.0	0.0	0.0	0.0
Meat_products	Meat_alternatives	361	0.9	0.0	0.0	0.2	1.3	3.7
	Poultry	1059	1.2	0.0	0.0	0.6	1.5	4.9
	Red_meat	2319	1.3	0.0	0.0	0.5	1.4	5.0

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Nuts_seeds	Nuts_seeds	817	3.9	0.0	0.0	0.0	2.5	25.0
Pulses_potatoes_cereals	Dry_pasta	364	0.0	0.0	0.0	0.0	0.0	0.0
	Dry_rice	128	0.1	0.0	0.0	0.0	0.0	0.7
	Other_cereals	31	0.0	0.0	0.0	0.0	0.0	0.0
	Potatoes	306	0.3	0.0	0.0	0.0	0.0	1.5
	Pulses	335	1.0	0.0	0.0	0.0	1.8	4.0
Sauces_condiments	Cold_sauces	858	17.3	0.0	3.1	12.0	26.0	52.2
	Dips	392	1.7	0.0	0.0	0.1	2.1	5.1
	Pickles	53	10.6	0.0	0.0	0.0	25.1	36.4
	Salad_dressing	128	8.1	0.0	3.1	7.1	12.0	18.8
	Vinegars	122	24.6	0.0	0.0	18.5	42.5	76.9
	Warm_sauces	1387	7.0	0.0	1.8	4.1	7.4	25.9
Savoury_snacks	Crisps	1012	1.3	0.0	0.0	0.0	2.0	5.5
	Other_savoury_snacks	383	3.1	0.0	0.0	0.0	3.3	16.1
	Savoury_biscuits	463	1.7	0.0	0.0	0.0	2.6	7.5
Soft_drinks	Coffee	266	5.6	1.3	3.5	4.3	6.6	9.4
	Colas	194	2.1	0.0	0.0	0.0	4.4	10.6
	Energy_drinks	205	3.6	0.0	0.0	2.4	4.7	11.0
	Flavoured_water	212	0.9	0.0	0.0	0.0	0.2	4.9
	Fruit_sodas	226	3.7	0.0	0.6	4.3	4.5	7.9
	Lemonades_and_others	399	3.2	0.0	0.0	4.1	4.5	8.0
	Squash	157	1.3	0.0	0.0	0.2	1.4	4.8
	Tea	114	7.9	0.0	2.1	3.0	4.3	58.5
Soups_and_stocks	Gravy_stock	35	0.9	0.0	0.0	0.1	0.8	2.7
	Soup	459	2.2	0.0	0.8	1.6	2.8	5.1
Sweet_bakery	Cakes_and_cookies	1156	35.2	19.7	29.0	35.0	41.4	50.0
	Morning_goods	475	17.6	4.0	11.6	16.3	22.9	36.0
	Sweet_biscuits	732	29.2	14.3	21.0	29.0	37.0	47.8
Water	Water	22	0.0	0.0	0.0	0.0	0.0	0.0

Protein content (g/100g) of granular food groups

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	11.3	3.0	5.8	8.0	17.0	26.8
Bread	Bread	1188	8.8	3.8	7.9	8.9	10.0	12.0
Breakfast_cereals	Breakfast_cereals_sweet	624	10.9	6.5	8.5	10.0	12.0	19.9
	Breakfast_cereals_unsweet	164	12.9	10.3	11.0	12.0	13.0	20.1
Cheese	Cheese_alternatives	38	2.8	0.0	0.0	0.2	1.7	20.0
	Dairy_cheese	946	20.3	6.7	16.0	23.0	25.0	28.9
Composite_food	Pasta	640	5.1	1.6	2.8	4.8	7.0	9.6
	Pizzas	445	9.9	5.2	8.7	10.1	11.4	13.0
	RTE_salads	255	3.4	0.9	1.1	2.9	5.0	8.2
	Ready_To_Go_Other	165	9.4	2.3	5.1	8.0	12.0	22.2
	Ready_meals	2191	7.3	2.1	4.6	6.5	8.7	16.0
	Rice	260	3.3	2.3	2.8	3.1	3.5	5.2
	Sandwiches	212	10.9	7.1	9.5	11.0	12.3	14.7
	Savoury_pastries_pies	712	8.7	5.5	7.3	8.7	9.9	11.8
Confectionery	Chocolate	1167	6.5	2.2	4.8	6.4	7.8	10.1
	Gum_mints	141	0.1	0.0	0.0	0.0	0.0	0.7
	Ice_creams_and_lollies	663	2.8	0.0	1.6	3.1	3.9	5.0
	Sugar_sweets	660	2.2	0.0	0.0	1.2	3.4	6.2
	Sweet_snacks	127	6.9	2.3	4.3	6.3	7.6	13.7
	Sweet_spreads	427	1.7	0.0	0.1	0.4	1.1	7.2
Dairy_beverages	Drinking_yogurts_milkshakes	132	3.2	1.3	2.6	3.0	3.5	6.5
	Milk	184	3.7	1.7	3.3	3.5	3.7	7.0
	Milk_alternatives	197	1.3	0.0	0.6	0.9	1.8	3.3
Dairy_desserts	Puddings	1063	3.9	0.4	2.8	3.6	4.8	7.3
	Yogurts	629	5.3	2.5	3.6	4.4	5.9	10.3

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Eggs	Eggs	20	12.7	10.3	12.6	14.1	14.1	14.1
Fats_and_oils	Cream	67	2.1	0.7	1.7	2.2	2.7	3.3
	Solid_fat	222	0.5	0.0	0.0	0.4	0.6	1.0
	Vegetable_oils	267	0.1	0.0	0.0	0.0	0.0	0.0
Fish_and_seafood	Lean_fish	566	17.2	8.6	12.0	14.6	23.5	27.9
	Oily_fish	480	19.7	9.6	17.0	21.0	23.1	26.0
	Seafood	269	14.3	7.9	10.8	14.4	17.2	22.3
Fruit_juices_drinks	Coconut_water	36	0.0	0.0	0.0	0.0	0.0	0.4
	Fruit_drinks	295	0.1	0.0	0.0	0.0	0.0	0.8
	Fruit_juices_nectars	380	0.4	0.0	0.0	0.3	0.7	1.0
	Smoothies	80	0.5	0.0	0.0	0.4	0.6	1.3
Fruit_vegetables	Fruits	849	1.7	0.0	0.5	0.9	2.2	5.6
	Vegetables	1570	2.1	0.5	1.0	1.5	2.6	5.6
Hot_drinks	Chocolate_drink	86	1.3	0.4	0.6	0.8	1.3	3.8
	Coffee	76	0.2	0.0	0.1	0.2	0.2	0.6
Meat_products	Meat_alternatives	361	13.1	4.1	8.2	12.1	16.2	24.0
	Poultry	1059	19.4	11.7	15.0	18.9	23.4	28.0
	Red_meat	2319	20.1	10.1	15.2	19.4	24.0	31.0
Nuts_seeds	Nuts_seeds	817	20.4	9.0	15.9	21.0	25.1	30.0
Pulses_potatoes_cereals	Dry_pasta	364	13.0	7.0	12.0	13.0	14.0	19.7
	Dry_rice	128	7.8	5.9	6.8	7.7	8.1	9.1
	Other_cereals	31	12.2	7.0	8.4	12.0	13.0	15.1
	Potatoes	306	2.5	1.4	2.0	2.4	2.9	3.7
	Pulses	335	7.7	4.0	4.7	5.9	7.3	24.0
Sauces_condiments	Cold_sauces	858	1.9	0.0	0.7	1.1	1.8	7.1
	Dips	392	5.4	1.0	2.0	5.3	7.0	13.0
	Pickles	53	1.8	0.5	0.9	1.9	2.4	3.9
	Salad_dressing	128	1.5	0.0	0.6	1.0	1.8	3.8

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Vinegars	122	0.6	0.0	0.0	0.1	0.6	2.0
	Warm_sauces	1387	2.5	0.3	1.2	1.7	2.9	6.9
Savoury_snacks	Crisps	1012	7.4	3.0	5.6	6.4	7.1	13.0
	Other_savoury_snacks	383	12.1	1.3	6.5	9.2	14.9	32.0
	Savoury_biscuits	463	10.9	4.7	8.7	10.1	12.4	18.7
Soft_drinks	Coffee	266	1.8	0.2	0.8	1.6	2.8	3.4
	Colas	194	0.0	0.0	0.0	0.0	0.0	0.0
	Energy_drinks	205	0.0	0.0	0.0	0.0	0.0	0.0
	Flavoured_water	212	0.1	0.0	0.0	0.0	0.0	0.1
	Fruit_sodas	226	0.0	0.0	0.0	0.0	0.0	0.1
	Lemonades_and_others	399	0.0	0.0	0.0	0.0	0.0	0.0
	Squash	157	0.0	0.0	0.0	0.0	0.0	0.0
	Tea	114	0.3	0.0	0.0	0.0	0.1	0.9
Soups_and_stocks	Gravy_stock	35	3.0	0.9	1.3	2.1	3.4	8.3
	Soup	459	1.8	0.2	0.8	1.5	2.5	4.2
Sweet_bakery	Cakes_and_cookies	1156	4.7	2.4	3.6	4.6	5.5	7.3
	Morning_goods	475	6.6	3.7	5.3	6.5	7.8	9.8
	Sweet_biscuits	732	6.1	3.5	5.1	6.0	7.0	8.8
Water	Water	22	0.0	0.0	0.0	0.0	0.0	0.0

Fibre content (g/100g) of granular food groups – note that only declared values were included in descriptive statistics (i.e. imputed values were excluded)

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	322	11.2	2.6	5.8	9.4	14.9	28.0
Bread	Bread	1147	4.4	1.9	2.6	3.6	5.5	9.2
Breakfast_cereals	Breakfast_cereals_sweet	623	7.8	2.5	6.1	7.5	9.2	15.0
	Breakfast_cereals_unsweet	161	10.4	7.0	8.3	9.0	11.0	19.0
Cheese	Cheese_alternatives	23	3.0	0.0	1.1	3.2	5.0	6.0
	Dairy_cheese	589	0.3	0.0	0.0	0.0	0.0	1.6

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Composite_food	Pasta	550	1.7	0.3	0.9	1.5	2.2	4.0
	Pizzas	438	2.2	1.3	1.7	2.1	2.6	3.4
	RTE_salads	240	1.9	0.8	1.3	1.6	2.1	3.9
	Ready_To_Go_Other	147	1.9	0.4	1.0	1.4	2.1	4.4
	Ready_meals	2066	2.0	0.6	1.1	1.5	2.3	4.9
	Rice	252	1.7	0.0	0.9	1.5	2.2	4.1
	Sandwiches	199	2.0	1.0	1.5	1.8	2.2	3.6
	Savoury_pastries_pies	630	1.6	0.8	1.2	1.5	1.9	2.7
Confectionery	Chocolate	600	4.2	0.0	1.5	2.4	5.9	12.0
	Gum_mints	27	0.3	0.0	0.0	0.0	0.2	1.8
	Ice_creams_and_lollies	458	1.1	0.0	0.1	0.7	1.3	4.2
	Sugar_sweets	314	1.9	0.0	0.0	0.0	1.1	10.0
	Sweet_snacks	110	6.4	1.4	3.7	5.8	8.4	13.0
	Sweet_spreads	281	1.6	0.0	0.4	1.2	2.1	5.9
Dairy_beverages	Drinking_yogurts_milkshakes	60	0.8	0.0	0.2	0.5	1.0	2.4
	Milk	80	0.3	0.0	0.0	0.0	0.5	1.1
	Milk_alternatives	174	0.5	0.0	0.0	0.5	0.8	1.2
Dairy_desserts	Puddings	930	1.1	0.0	0.5	1.0	1.5	3.0
	Yogurts	314	0.5	0.0	0.0	0.0	0.8	2.0
Eggs	Eggs	15	0.1	0.0	0.0	0.0	0.0	0.2
Fats_and_oils	Cream	42	0.3	0.0	0.0	0.0	0.0	1.3
	Solid_fat	88	0.2	0.0	0.0	0.0	0.5	0.9
	Vegetable_oils	188	0.1	0.0	0.0	0.0	0.0	0.0
Fish_and_seafood	Lean_fish	496	0.7	0.0	0.0	0.7	1.1	2.0
	Oily_fish	382	0.3	0.0	0.0	0.0	0.5	1.3
	Seafood	247	0.6	0.0	0.0	0.3	0.9	2.4
Fruit_juices_drinks	Coconut_water	9	0.0	0.0	0.0	0.0	0.0	0.1
	Fruit_drinks	126	0.3	0.0	0.0	0.0	0.0	2.8
	Fruit_juices_nectars	270	0.4	0.0	0.0	0.0	0.6	1.7
	Smoothies	78	0.7	0.0	0.5	0.6	1.0	1.4
Fruit_vegetables	Fruits	799	3.5	0.0	1.0	2.0	4.9	10.0
	Vegetables	1369	2.6	0.7	1.5	2.3	3.2	5.6

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Hot_drinks	Chocolate_drink	44	0.5	0.0	0.2	0.5	0.7	1.2
	Coffee	40	0.2	0.0	0.0	0.3	0.4	0.5
Meat_products	Meat_alternatives	345	4.8	0.8	3.0	4.8	6.3	8.7
	Poultry	891	0.9	0.0	0.0	0.8	1.3	2.1
	Red_meat	1774	0.7	0.0	0.0	0.6	1.0	2.1
Nuts_seeds	Nuts_seeds	764	8.4	3.0	5.3	7.2	9.3	20.9
Pulses_potatoes_cereals	Dry_pasta	348	3.9	1.4	2.9	3.0	4.2	8.8
	Dry_rice	89	2.2	0.8	1.0	1.4	2.5	6.3
	Other_cereals	22	7.5	2.4	5.9	7.0	9.4	12.6
	Potatoes	296	2.6	1.4	2.0	2.5	3.1	4.4
	Pulses	322	6.1	2.8	4.2	5.4	7.0	11.0
Sauces_condiments	Cold_sauces	493	1.2	0.0	0.1	0.9	1.7	3.8
	Dips	344	2.6	0.0	0.6	1.6	4.2	6.8
	Pickles	33	1.7	0.0	0.9	1.3	2.0	5.3
	Salad_dressing	101	0.7	0.0	0.0	0.5	0.9	1.6
	Vinegars	66	0.3	0.0	0.0	0.0	0.2	1.0
	Warm_sauces	1090	1.9	0.0	0.7	1.4	2.3	5.1
Savoury_snacks	Crisps	965	4.1	0.8	2.9	3.9	5.2	7.5
	Other_savoury_snacks	305	6.6	0.8	2.7	5.0	9.4	18.4
	Savoury_biscuits	424	5.4	1.1	2.9	4.0	7.2	14.0
Soft_drinks	Coffee	158	0.4	0.0	0.2	0.3	0.5	1.3
	Colas	20	0.0	0.0	0.0	0.0	0.0	0.0
	Energy_drinks	33	0.2	0.0	0.0	0.0	0.0	1.0
	Flavoured_water	65	0.0	0.0	0.0	0.0	0.0	0.0
	Fruit_sodas	75	0.3	0.0	0.0	0.0	0.0	2.0
	Lemonades_and_others	130	0.0	0.0	0.0	0.0	0.0	0.2
	Squash	105	0.0	0.0	0.0	0.0	0.0	0.0
	Tea	48	0.1	0.0	0.0	0.0	0.0	0.6
Soups_and_stocks	Gravy_stock	32	0.4	0.0	0.0	0.4	0.5	0.8
	Soup	428	1.1	0.0	0.5	0.8	1.3	3.3
Sweet_bakery	Cakes_and_cookies	979	2.1	0.0	1.0	1.6	2.5	4.5
	Morning_goods	444	2.5	1.0	1.6	2.1	2.9	5.0
	Sweet_biscuits	585	2.9	0.9	1.8	2.4	3.5	6.7
Water	Water	6	0.0	0.0	0.0	0.0	0.0	0.0

Salt content (g/100g) of granular food groups

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	0.4	0.0	0.1	0.4	0.6	1.0
Bread	Bread	1188	0.9	0.6	0.8	0.9	1.0	1.4
Breakfast_cereals	Breakfast_cereals_sweet	624	0.3	0.0	0.0	0.2	0.5	0.9
	Breakfast_cereals_unsweet	164	0.1	0.0	0.0	0.0	0.0	0.2
Cheese	Cheese_alternatives	38	1.9	1.2	1.5	1.9	2.2	2.8
	Dairy_cheese	946	1.6	0.4	1.3	1.7	1.8	2.6
Composite_food	Pasta	640	1.0	0.0	0.4	0.6	0.9	3.9
	Pizzas	445	1.0	0.7	0.8	1.0	1.2	1.7
	RTE_salads	255	0.6	0.1	0.4	0.5	0.7	1.1
	Ready_To_Go_Other	165	1.3	0.4	0.8	1.1	1.6	3.2
	Ready_meals	2191	0.8	0.3	0.4	0.6	0.8	1.5
	Rice	260	0.6	0.0	0.0	0.3	0.5	1.0
	Sandwiches	212	0.9	0.5	0.7	0.9	1.0	1.3
	Savoury_pastries_pies	712	0.8	0.4	0.6	0.8	1.0	1.4
	Chocolate	1167	0.3	0.0	0.1	0.2	0.3	0.6
	Gum_mints	141	0.1	0.0	0.0	0.0	0.0	0.4
Confectionery	Ice_creams_and_lollies	663	0.2	0.0	0.1	0.1	0.2	0.4
	Sugar_sweets	660	0.2	0.0	0.0	0.1	0.2	0.9
	Sweet_snacks	127	0.7	0.0	0.2	0.6	1.0	2.0
	Sweet_spreads	427	0.1	0.0	0.0	0.0	0.1	0.4
Dairy_beverages	Drinking_yogurts_milkshakes	132	0.1	0.0	0.1	0.1	0.1	0.3
	Milk	184	0.1	0.1	0.1	0.1	0.1	0.2
	Milk_alternatives	197	0.1	0.0	0.1	0.1	0.1	0.2
Dairy_desserts	Puddings	1063	0.2	0.0	0.1	0.2	0.3	0.6
	Yogurts	629	0.1	0.0	0.1	0.1	0.1	0.2

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Eggs	Eggs	20	0.4	0.4	0.4	0.4	0.4	0.4
Fats_and_oils	Cream	67	0.1	0.0	0.1	0.1	0.1	0.2
	Solid_fat	222	1.2	0.0	1.0	1.3	1.5	2.3
	Vegetable_oils	267	0.0	0.0	0.0	0.0	0.0	0.0
Fish_and_seafood	Lean_fish	566	1.0	0.2	0.6	0.8	0.9	1.2
	Oily_fish	480	2.1	0.2	0.7	1.0	2.3	12.0
	Seafood	269	1.2	0.5	0.8	1.1	1.4	1.9
	Coconut_water	36	0.1	0.0	0.0	0.1	0.1	0.1
Fruit_juices_drinks	Fruit_drinks	295	0.0	0.0	0.0	0.0	0.0	0.1
	Fruit_juices_nectars	380	0.1	0.0	0.0	0.0	0.0	0.2
	Smoothies	80	0.0	0.0	0.0	0.0	0.0	0.1
Fruit_vegetables	Fruits	849	0.1	0.0	0.0	0.0	0.0	0.3
	Vegetables	1570	1.0	0.0	0.0	0.3	1.8	3.7
Hot_drinks	Chocolate_drink	86	0.1	0.0	0.0	0.1	0.1	0.3
	Coffee	76	0.0	0.0	0.0	0.0	0.0	0.0
Meat_products	Meat_alternatives	361	1.1	0.0	0.8	1.0	1.3	1.9
	Poultry	1059	0.8	0.2	0.5	0.7	1.0	1.6
	Red_meat	2319	2.0	0.3	1.0	1.6	2.5	4.2
Nuts_seeds	Nuts_seeds	817	0.5	0.0	0.0	0.1	0.9	1.6
Pulses_potatoes_cereals	Dry_pasta	364	0.0	0.0	0.0	0.0	0.0	0.1
	Dry_rice	128	0.2	0.0	0.0	0.0	0.0	2.2
	Other_cereals	31	0.3	0.0	0.0	0.0	0.1	2.5
	Potatoes	306	0.4	0.0	0.2	0.4	0.5	0.9
	Pulses	335	0.4	0.0	0.0	0.3	0.6	0.9
Sauces_condiments	Cold_sauces	858	2.7	0.1	1.0	1.5	2.8	9.7
	Dips	392	1.0	0.4	0.7	0.9	1.1	1.8
	Pickles	53	5.9	0.7	1.8	5.1	9.3	12.6
	Salad_dressing	128	1.4	0.7	1.1	1.2	1.5	2.5
	Vinegars	122	0.5	0.0	0.0	0.0	0.1	0.9
	Warm_sauces	1387	2.1	0.1	0.7	1.0	2.1	8.0
Savoury_snacks	Crisps	1012	1.4	0.5	0.9	1.2	1.7	2.8
	Other_savoury_snacks	383	1.8	0.0	1.1	1.8	2.5	3.9
	Savoury_biscuits	463	1.4	0.2	1.1	1.4	1.8	2.5
Soft_drinks	Coffee	266	0.1	0.0	0.1	0.1	0.1	0.2
	Colas	194	0.0	0.0	0.0	0.0	0.0	0.0
	Energy_drinks	205	0.1	0.0	0.0	0.1	0.1	0.2

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Flavoured_water	212	0.0	0.0	0.0	0.0	0.0	0.0
	Fruit_sodas	226	0.2	0.0	0.0	0.0	0.0	0.1
	Lemonades_and_others	399	0.0	0.0	0.0	0.0	0.0	0.0
	Squash	157	0.0	0.0	0.0	0.0	0.0	0.1
	Tea	114	0.0	0.0	0.0	0.0	0.0	0.1
Soups_and_stocks	Gravy_stock	35	1.3	0.3	0.7	0.9	1.0	2.4
	Soup	459	0.8	0.3	0.5	0.5	0.6	1.8
Sweet_bakery	Cakes_and_cookies	1156	0.4	0.1	0.3	0.4	0.6	0.9
	Morning_goods	475	0.7	0.3	0.4	0.7	0.9	1.4
	Sweet_biscuits	732	0.6	0.1	0.4	0.5	0.7	1.1
Water	Water	22	0.0	0.0	0.0	0.0	0.0	0.1

Fruit, vegetable, nut and seed (FVN) content (%) of granular food groups

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
Bars	Bars	359	30.8	0.0	0.1	16.1	60.2	98.9
Bread	Bread	1188	2.2	0.0	0.0	0.0	0.4	12.8
Breakfast_cereals	Breakfast_cereals_sweet	624	11.4	0.0	0.0	3.1	17.2	44.7
	Breakfast_cereals_unsweet	164	6.7	0.0	0.0	0.0	0.0	64.4
Cheese	Cheese_alternatives	38	3.0	0.0	0.0	0.0	0.0	5.0
	Dairy_cheese	946	2.5	0.0	0.0	0.0	0.0	12.8
Composite_food	Pasta	640	10.6	0.0	0.0	2.5	15.9	43.1
	Pizzas	445	17.2	2.4	10.9	16.2	23.2	36.0
	RTE_salads	255	52.4	8.2	30.4	55.0	69.8	99.0
	Ready_To_Go_Other	165	23.3	0.0	3.8	14.4	32.2	77.7
	Ready_meals	2191	26.9	0.0	9.4	24.0	39.4	67.5
	Rice	260	9.0	0.0	0.0	3.3	15.7	35.2
	Sandwiches	212	13.0	0.0	2.8	12.2	20.2	33.1
	Savoury_pastries_pies	712	9.8	0.0	3.0	7.5	13.2	31.3
Confectionery	Chocolate	1167	7.6	0.0	0.0	0.0	11.0	33.9
	Gum_mints	141	0.0	0.0	0.0	0.0	0.0	0.2
	Ice_creams_and_lollies	663	8.3	0.0	0.0	2.5	8.8	40.6
	Sugar_sweets	660	3.7	0.0	0.0	0.1	1.0	15.2

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Sweet_snacks	127	7.9	0.0	0.0	0.0	0.2	54.7
	Sweet_spreads	427	31.9	0.0	0.1	29.7	51.2	89.7
Dairy_beverages	Drinking_yogurts_milkshakes	132	5.2	0.0	0.0	1.0	5.0	29.4
	Milk	184	1.0	0.0	0.0	0.0	0.0	3.1
	Milk_alternatives	197	4.3	0.0	0.0	0.1	6.3	15.4
Dairy_desserts	Puddings	1063	9.0	0.0	0.0	0.0	10.4	49.0
	Yoghurts	629	10.4	0.0	0.0	5.2	11.2	51.9
Eggs	Eggs	20	0.0	0.0	0.0	0.0	0.0	0.0
Fats_and_oils	Cream	67	1.3	0.0	0.0	0.0	0.0	10.4
	Solid_fat	222	2.4	0.0	0.0	0.0	0.0	19.2
	Vegetable_oils	267	1.0	0.0	0.0	0.0	0.0	0.0
Fish_and_seafood	Lean_fish	566	2.7	0.0	0.0	0.0	0.7	13.0
	Oily_fish	480	4.5	0.0	0.0	0.0	5.0	24.1
	Seafood	269	3.4	0.0	0.0	0.0	2.9	21.8
Fruit_juices_drinks	Coconut_water	36	92.1	45.0	99.0	99.2	100.0	100.0
	Fruit_drinks	295	20.0	0.0	4.9	17.0	30.0	50.4
	Fruit_juices_nectars	380	90.8	49.0	95.2	99.9	100.0	100.0
	Smoothies	80	97.6	86.5	99.0	100.0	100.0	100.0
Fruit_vegetables	Fruits	849	89.5	40.5	94.7	99.9	100.0	100.0
	Vegetables	1570	75.1	6.5	57.0	86.8	100.0	100.0
Hot_drinks	Chocolate_drink	86	3.5	0.0	0.0	0.0	0.0	8.8
	Coffee	76	1.3	0.0	0.0	0.0	0.0	0.0
Meat_products	Meat_alternatives	361	19.3	0.0	0.3	8.2	34.0	65.9
	Poultry	1059	3.8	0.0	0.0	0.7	4.1	17.8
	Red_meat	2319	2.8	0.0	0.0	0.1	2.6	13.8
Nuts_seeds	Nuts_seeds	817	86.6	39.0	81.9	98.5	100.0	100.0
Pulses_potatoes_cereals	Dry_pasta	364	0.8	0.0	0.0	0.0	0.0	3.0
	Dry_rice	128	0.7	0.0	0.0	0.0	0.0	4.3
	Other_cereals	31	3.0	0.0	0.0	0.0	0.0	19.2
	Potatoes	306	2.7	0.0	0.0	0.0	1.1	14.6
	Pulses	335	77.5	51.5	66.4	73.8	98.9	100.0
Sauces_condiments	Cold_sauces	858	28.6	0.0	4.7	23.3	48.8	72.4
	Dips	392	42.4	0.0	11.4	40.9	70.2	95.4
	Pickles	53	63.3	32.9	56.0	68.5	75.5	81.5
	Salad_dressing	128	10.8	1.2	2.9	7.1	13.2	28.5

Group	Sub-group	N	Mean	5th	25th	Median	75th	95th
	Vinegars	122	35.3	0.0	0.0	4.0	80.8	99.4
	Warm_sauces	1387	49.4	0.2	20.0	46.4	80.5	99.0
Savoury_snacks	Crisps	1012	4.3	0.0	0.0	0.0	0.4	30.2
	Other_savoury_snacks	383	13.7	0.0	0.0	0.2	14.7	74.6
	Savoury_biscuits	463	4.7	0.0	0.0	0.0	4.3	26.7
Soft_drinks	Coffee	266	0.7	0.0	0.0	0.0	0.0	0.0
	Colas	194	0.0	0.0	0.0	0.0	0.0	0.0
	Energy_drinks	205	2.1	0.0	0.0	0.0	0.1	11.5
	Flavoured_water	212	4.3	0.0	0.0	0.0	0.2	28.3
	Fruit_sodas	226	14.5	0.1	3.0	5.0	16.2	62.4
	Lemonades_and_others	399	3.0	0.0	0.0	0.0	2.2	16.0
	Squash	157	29.0	3.4	10.3	25.0	40.0	60.7
	Tea	114	6.0	0.0	0.0	0.1	2.9	37.4
Soups_and_stocks	Gravy_stock	35	22.0	0.9	12.8	22.3	27.4	44.5
	Soup	459	37.0	0.9	17.4	36.2	54.3	84.4
Sweet_bakery	Cakes_and_cookies	1156	4.8	0.0	0.0	0.1	5.7	24.7
	Morning_goods	475	5.4	0.0	0.0	0.0	8.1	24.8
	Sweet_biscuits	732	4.0	0.0	0.0	0.0	2.6	27.3
Water	Water	22	0.0	0.0	0.0	0.0	0.0	0.0

Appendix 4. Number and proportion of products passing NPM 2004/5 and NPM 2018 by granular food category

			NPM 2004/5				NPM 2018			
Group	**Sub-group**	**N**	**N pass**	**% pass**	**N fail**	**% fail**	**N pass**	**% pass**	**N fail**	**% fail**
Bars	Bars	359	89	24.8%	270	75.2%	77	21.4%	282	78.6%
Bread	Bread	1188	1131	95.2%	57	4.8%	1008	84.8%	180	15.2%
Breakfast_cereals	Breakfast_cereals_sweet	624	470	75.3%	154	24.7%	151	24.2%	473	75.8%
	Breakfast_cereals_unsweet	164	152	92.7%	12	7.3%	157	95.7%	7	4.3%
Cheese	Cheese_alternatives	38	1	2.6%	37	97.4%	1	2.6%	37	97.4%
	Dairy_cheese	946	43	4.5%	903	95.5%	44	4.7%	902	95.3%
	Pasta	640	509	79.5%	131	20.5%	466	72.8%	174	27.2%
	Pizzas	445	207	46.5%	238	53.5%	121	27.2%	324	72.8%
	RTE_salads	255	211	82.7%	44	17.3%	204	80.0%	51	20.0%
Composite_food	Ready_To_Go_Other	165	61	37.0%	104	63.0%	47	28.5%	118	71.5%
	Ready_meals	2191	1847	84.3%	344	15.7%	1716	78.3%	475	21.7%
	Rice	260	249	95.8%	11	4.2%	246	94.6%	14	5.4%
	Sandwiches	212	168	79.2%	44	20.8%	124	58.5%	88	41.5%
	Savoury_pastries_pies	712	80	11.2%	632	88.8%	68	9.6%	644	90.4%
	Chocolate	1167	8	0.7%	1159	99.3%	4	0.3%	1163	99.7%
	Gum_mints	141	94	66.7%	47	33.3%	89	63.1%	52	36.9%
Confectionery	Ice_creams_and_lollies	663	110	16.6%	553	83.4%	22	3.3%	641	96.7%
	Sugar_sweets	660	47	7.1%	613	92.9%	31	4.7%	629	95.3%
	Sweet_snacks	127	17	13.4%	110	86.6%	6	4.7%	121	95.3%
	Sweet_spreads	427	20	4.7%	407	95.3%	29	6.8%	398	93.2%
Dairy_beverages	Drinking_yogurts_milkshakes	132	96	72.7%	36	27.3%	61	46.2%	71	53.8%
	Milk	184	130	70.7%	54	29.3%	70	38.0%	114	62.0%
	Milk_alternatives	197	163	82.7%	34	17.3%	54	27.4%	143	72.6%
Dairy_desserts	Puddings	1063	248	23.3%	815	76.7%	86	8.1%	977	91.9%
	Yoghurts	629	490	77.9%	139	22.1%	275	43.7%	354	56.3%

			NPM 2004/5				NPM 2018			
Group	**Sub-group**	**N**	**N pass**	**% pass**	**N fail**	**% fail**	**N pass**	**% pass**	**N fail**	**% fail**
Eggs	Eggs	20	20	100.0%	0	0.0%	20	100.0%	0	0.0%
Fats_and_oils	Cream	67	4	6.0%	63	94.0%	3	4.5%	64	95.5%
	Solid_fat	222	0	0.0%	222	100.0 %	0	0.0%	222	100.0%
	Vegetable_oils	267	0	0.0%	267	100.0 %	0	0.0%	267	100.0%
Fish_and_seafood	Lean_fish	566	525	92.8%	41	7.2%	507	89.6%	59	10.4%
	Oily_fish	480	220	45.8%	260	54.2%	168	35.0%	312	65.0%
	Seafood	269	222	82.5%	47	17.5%	212	78.8%	57	21.2%
Fruit_juices_drinks	Coconut_water	36	36	100.0%	0	0.0%	29	80.6%	7	19.4%
	Fruit_drinks	295	197	66.8%	98	33.2%	52	17.6%	243	82.4%
	Fruit_juices_nectars	380	370	97.4%	10	2.6%	54	14.2%	326	85.8%
	Smoothies	80	80	100.0%	0	0.0%	3	3.8%	77	96.2%
Fruit_vegetables	Fruits	849	678	79.9%	171	20.1%	727	85.6%	122	14.4%
	Vegetables	1570	1109	70.6%	461	29.4%	1100	70.1%	470	29.9%
Hot_drinks	Chocolate_drink	86	22	25.6%	64	74.4%	5	5.8%	81	94.2%
	Coffee	76	76	100.0%	0	0.0%	76	100.0%	0	0.0%
Meat_products	Meat_alternatives	361	284	78.7%	77	21.3%	281	77.8%	80	22.2%
	Poultry	1059	875	82.6%	184	17.4%	788	74.4%	271	25.6%
	Red_meat	2319	383	16.5%	1936	83.5%	301	13.0%	2018	87.0%

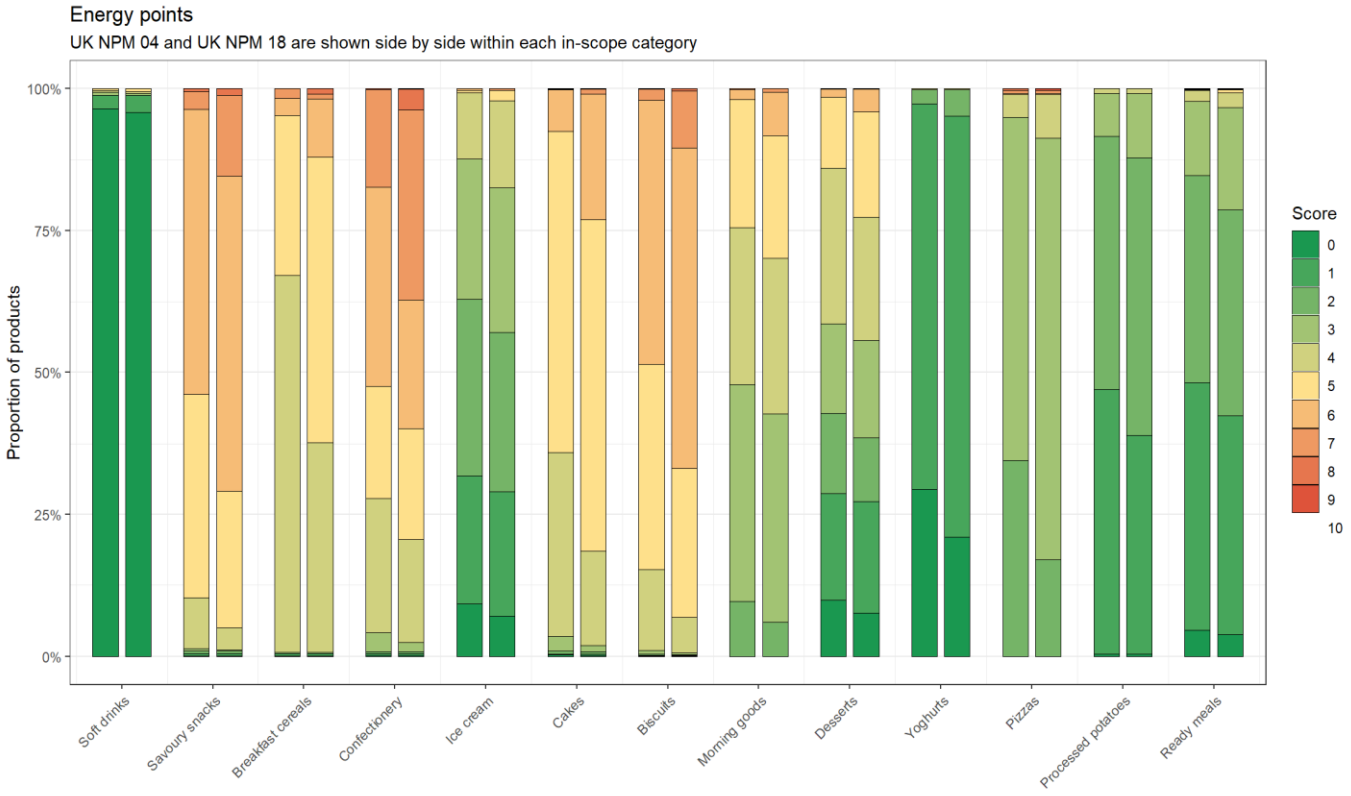
			NPM 2004/5				NPM 2018			
Group	**Sub-group**	**N**	**N pass**	**% pass**	**N fail**	**% fail**	**N pass**	**% pass**	**N fail**	**% fail**
Nuts_seeds	Nuts_seeds	817	417	51.0%	400	49.0%	574	70.3%	243	29.7%
Pulses_potatoes_cereals	Dry_pasta	364	361	99.2%	3	0.8%	362	99.5%	2	0.5%
	Dry_rice	128	115	89.8%	13	10.2%	115	89.8%	13	10.2%
	Other_cereals	31	28	90.3%	3	9.7%	29	93.5%	2	6.5%
	Potatoes	306	290	94.8%	16	5.2%	290	94.8%	16	5.2%
	Pulses	335	334	99.7%	1	0.3%	334	99.7%	1	0.3%
Sauces_condiments	Cold_sauces	858	44	5.1%	814	94.9%	25	2.9%	833	97.1%
	Dips	392	226	57.7%	166	42.3%	209	53.3%	183	46.7%
	Pickles	53	3	5.7%	50	94.3%	4	7.5%	49	92.5%
	Salad_dressing	128	1	0.8%	127	99.2%	1	0.8%	127	99.2%
	Vinegars	122	55	45.1%	67	54.9%	53	43.4%	69	56.6%
	Warm_sauces	1387	549	39.6%	838	60.4%	459	33.1%	928	66.9%
Savoury_snacks	Crisps	1012	279	27.6%	733	72.4%	233	23.0%	779	77.0%
	Other_savoury_snacks	383	73	19.1%	310	80.9%	86	22.5%	297	77.5%
	Savoury_biscuits	463	127	27.4%	336	72.6%	127	27.4%	336	72.6%
Soft_drinks	Coffee	266	194	72.9%	72	27.1%	13	4.9%	253	95.1%
	Colas	194	163	84.0%	31	16.0%	139	71.6%	55	28.4%
	Energy_drinks	205	151	73.7%	54	26.3%	94	45.9%	111	54.1%
	Flavoured_water	212	201	94.8%	11	5.2%	160	75.5%	52	24.5%
	Fruit_sodas	226	199	88.1%	27	11.9%	70	31.0%	156	69.0%
	Lemonades_and_others	399	319	79.9%	80	20.1%	155	38.8%	244	61.2%
	Squash	157	148	94.3%	9	5.7%	114	72.6%	43	27.4%
	Tea	114	94	82.5%	20	17.5%	27	23.7%	87	76.3%
Soups_and_stocks	Gravy_stock	35	25	71.4%	10	28.6%	23	65.7%	12	34.3%
	Soup	459	413	90.0%	46	10.0%	364	79.3%	95	20.7%
	Cakes_and_cookies	1156	29	2.5%	1127	97.5%	4	0.3%	1152	99.7%
Sweet_bakery	Morning_goods	475	85	17.9%	390	82.1%	10	2.1%	465	97.9%
	Sweet_biscuits	732	19	2.6%	713	97.4%	10	1.4%	722	98.6%
Water	Water	22	22	100.0%	0	0.0%	22	100.0%	0	0.0%

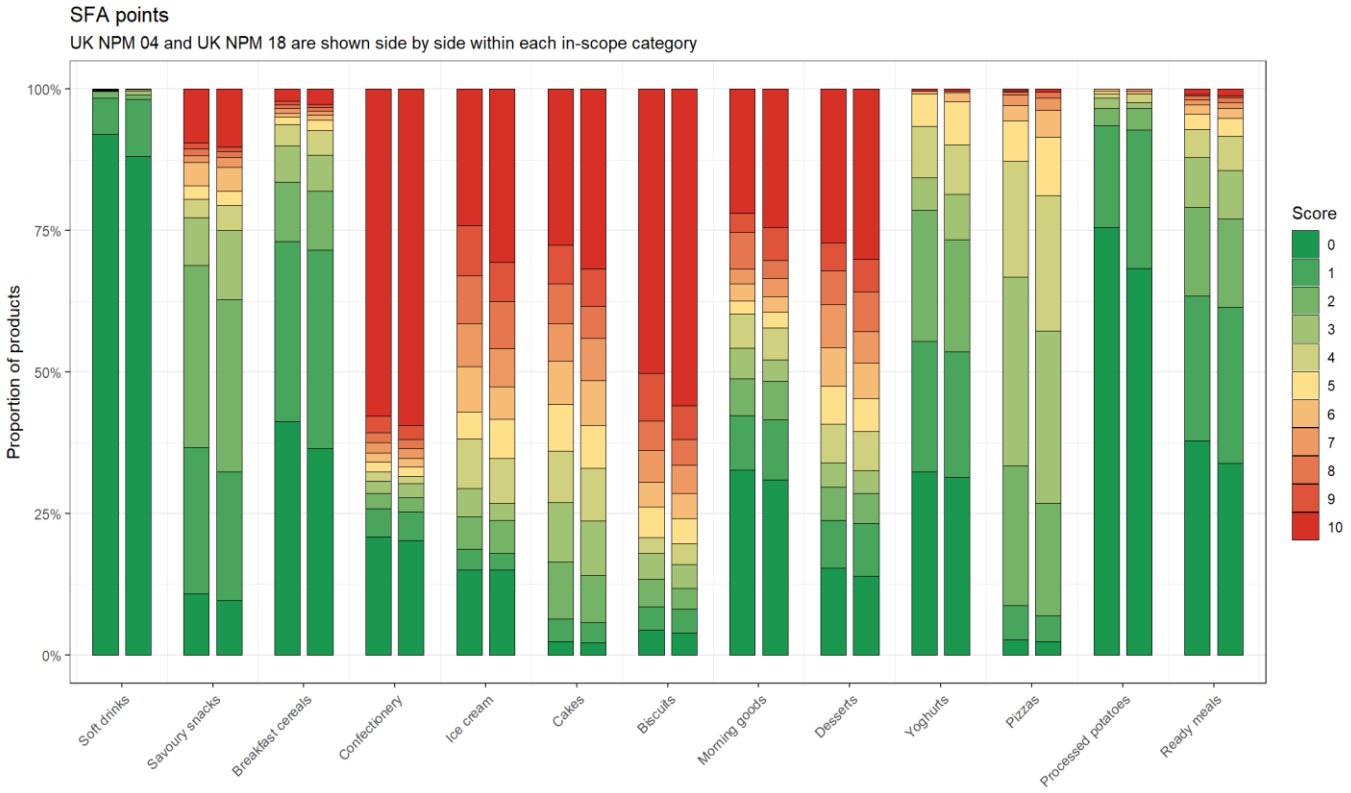
Appendix 5. Number and proportion of products passing and failing NPM 2004/5 and NPM 2018 by retailer and in-scope category

In-scope category	Retailer	NPM 2004/5					NPM 2018			
			Pass		Fail		Pass		Fail	
		Total	N	%	N	%	N	%	N	%
Soft drinks	ASDA	131	89	67.9%	42	32.1%	5	3.8%	126	96.2%
	M&S Own Label	62	42	67.7%	20	32.3%	0	0.0%	62	100.0%
	Ocado	284	174	61.3%	110	38.7%	23	8.1%	261	91.9%
	Sainsburys	225	158	70.2%	67	29.8%	11	4.9%	214	95.1%
	Tesco	650	432	66.5%	218	33.5%	41	6.3%	609	93.7%
Savoury snacks	ASDA	168	24	14.3%	144	85.7%	23	13.7%	145	86.3%
	M&S Own Label	133	35	26.3%	98	73.7%	20	15.0%	113	85.0%
	Ocado	563	187	33.2%	376	66.8%	174	30.9%	389	69.1%
	Sainsburys	320	62	19.4%	258	80.6%	73	22.8%	247	77.2%
	Tesco	665	175	26.3%	490	73.7%	157	23.6%	508	76.4%
Breakfast cereals	ASDA	81	67	82.7%	14	17.3%	27	33.3%	54	66.7%
	M&S Own Label	60	48	80.0%	12	20.0%	26	43.3%	34	56.7%
	Ocado	228	171	75.0%	57	25.0%	115	50.4%	113	49.6%
	Sainsburys	117	90	76.9%	27	23.1%	48	41.0%	69	59.0%
	Tesco	302	246	81.5%	56	18.5%	92	30.5%	210	69.5%
Confectionery	ASDA	218	4	1.8%	214	98.2%	1	0.5%	217	99.5%
	M&S Own Label	226	6	2.7%	220	97.3%	2	0.9%	224	99.1%
	Ocado	544	13	2.4%	531	97.6%	7	1.3%	537	98.7%
	Sainsburys	371	5	1.3%	366	98.7%	2	0.5%	369	99.5%
	Tesco	787	38	4.8%	749	95.2%	20	2.5%	767	97.5%
Ice cream	ASDA	67	18	26.9%	49	73.1%	2	3.0%	65	97.0%
	M&S Own Label	42	4	9.5%	38	90.5%	0	0.0%	42	100.0%
	Ocado	148	33	22.3%	115	77.7%	12	8.1%	136	91.9%
	Sainsburys	122	21	17.2%	101	82.8%	4	3.3%	118	96.7%
	Tesco	284	34	12.0%	250	88.0%	4	1.4%	280	98.6%
Cakes	ASDA	271	2	0.7%	269	99.3%	1	0.4%	270	99.6%
	M&S Own Label	134	0	0.0%	134	100.0%	0	0.0%	134	100.0%
	Ocado	124	8	6.5%	116	93.5%	3	2.4%	121	97.6%
	Sainsburys	235	8	3.4%	227	96.6%	5	2.1%	230	97.9%
	Tesco	334	16	4.8%	318	95.2%	4	1.2%	330	98.8%
Biscuits	ASDA	155	15	9.7%	140	90.3%	12	7.7%	143	92.3%
	M&S Own Label	136	3	2.2%	133	97.8%	4	2.9%	132	97.1%
	Ocado	319	35	11.0%	284	89.0%	24	7.5%	295	92.5%
	Sainsburys	253	16	6.3%	237	93.7%	17	6.7%	236	93.3%
	Tesco	493	60	12.2%	433	87.8%	32	6.5%	461	93.5%

		NPM 2004/5					NPM 2018			
In-scope category	**Retailer**		**Pass**		**Fail**		**Pass**		**Fail**	
		Total	**N**	%	**N**	**%**	**N**	**%**	**N**	**%**
Morning goods	ASDA	84	19	22.6%	65	77.4%	8	9.5%	76	90.5%
	M&S Own Label	61	15	24.6%	46	75.4%	5	8.2%	56	91.8%
	Ocado	55	25	45.5%	30	54.5%	12	21.8%	43	78.2%
	Sainsburys	106	32	30.2%	74	69.8%	11	10.4%	95	89.6%
	Tesco	223	80	35.9%	143	64.1%	34	15.2%	189	84.8%
Desserts	ASDA	208	30	14.4%	178	85.6%	8	3.8%	200	96.2%
	M&S Own Label	140	11	7.9%	129	92.1%	1	0.7%	139	99.3%
	Ocado	111	28	25.2%	83	74.8%	15	13.5%	96	86.5%
	Sainsburys	246	53	21.5%	193	78.5%	26	10.6%	220	89.4%
	Tesco	368	128	34.8%	240	65.2%	37	10.1%	331	89.9%
Yoghurts	ASDA	78	50	64.1%	28	35.9%	25	32.1%	53	67.9%
	M&S Own Label	39	23	59.0%	16	41.0%	14	35.9%	25	64.1%
	Ocado	57	49	86.0%	8	14.0%	16	28.1%	41	71.9%
	Sainsburys	114	86	75.4%	28	24.6%	34	29.8%	80	70.2%
	Tesco	212	181	85.4%	31	14.6%	91	42.9%	121	57.1%
Pizzas	ASDA	96	48	50.0%	48	50.0%	24	25.0%	72	75.0%
	M&S Own Label	38	17	44.7%	21	55.3%	9	23.7%	29	76.3%
	Ocado	38	8	21.1%	30	78.9%	6	15.8%	32	84.2%
	Sainsburys	83	47	56.6%	36	43.4%	29	34.9%	54	65.1%
	Tesco	122	71	58.2%	51	41.8%	41	33.6%	81	66.4%
Processed potatoes	ASDA	38	36	94.7%	2	5.3%	34	89.5%	4	10.5%
	M&S Own Label	29	25	86.2%	4	13.8%	26	89.7%	3	10.3%
	Ocado	28	25	89.3%	3	10.7%	27	96.4%	1	3.6%
	Sainsburys	59	55	93.2%	4	6.8%	58	98.3%	1	1.7%
	Tesco	108	106	98.1%	2	1.9%	102	94.4%	6	5.6%
Ready meals	ASDA	608	526	86.5%	82	13.5%	473	77.8%	135	22.2%
	M&S Own Label	490	414	84.5%	76	15.5%	379	77.3%	111	22.7%
	Ocado	321	244	76.0%	77	24.0%	238	74.1%	83	25.9%
	Sainsburys	823	713	86.6%	110	13.4%	667	81.0%	156	19.0%
	Tesco	1279	1068	83.5%	211	16.5%	969	75.8%	310	24.2%

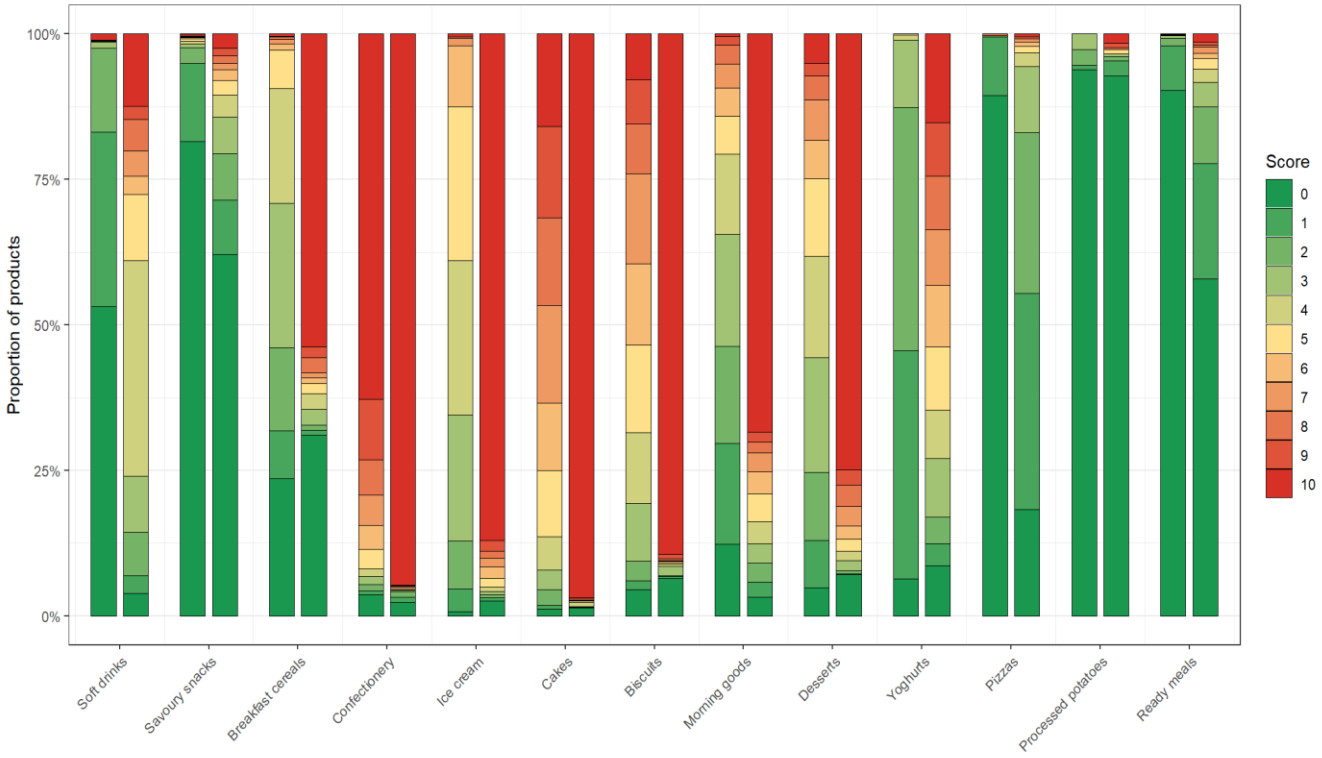
Appendix 6. Score distributions for all nutrients by in-scope category for NPM 2004/5 and NPM 2018





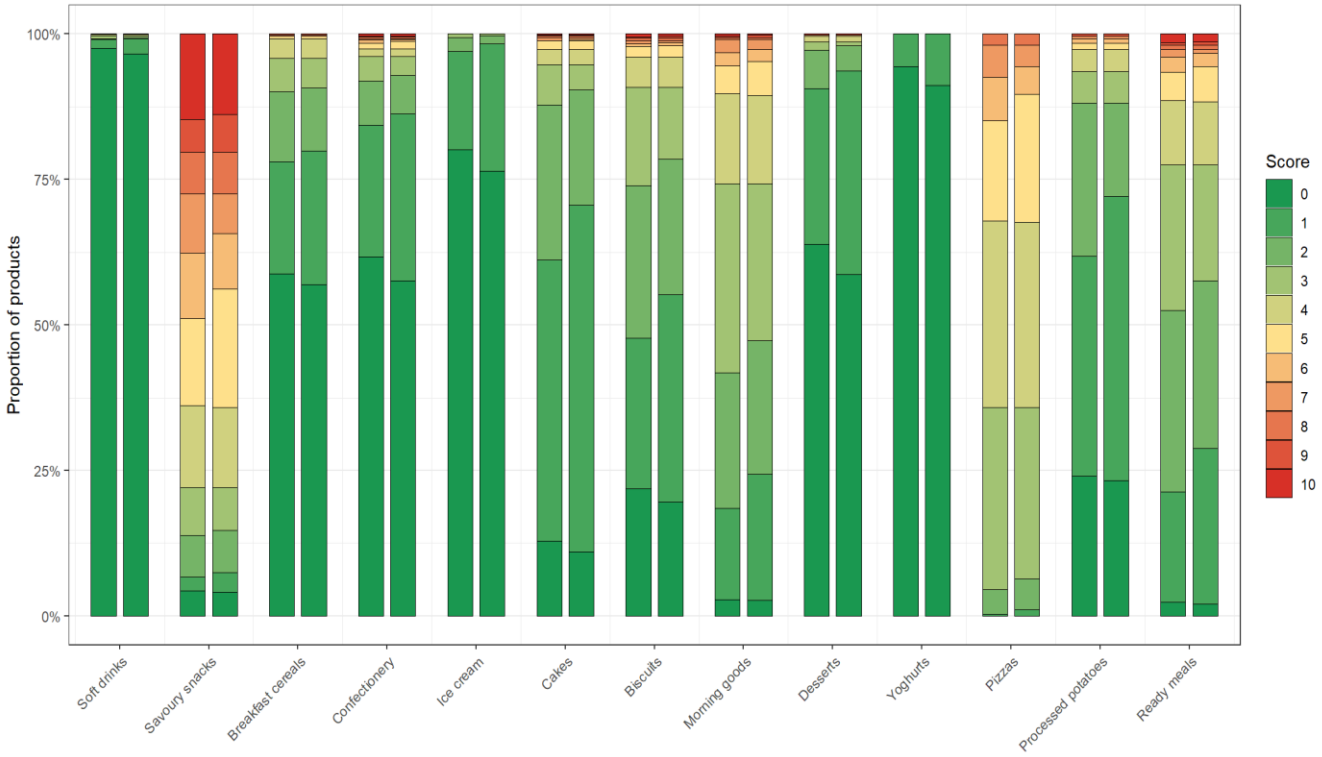
Sugars points

UK NPM 04 and UK NPM 18 are shown side by side within each in-scope category



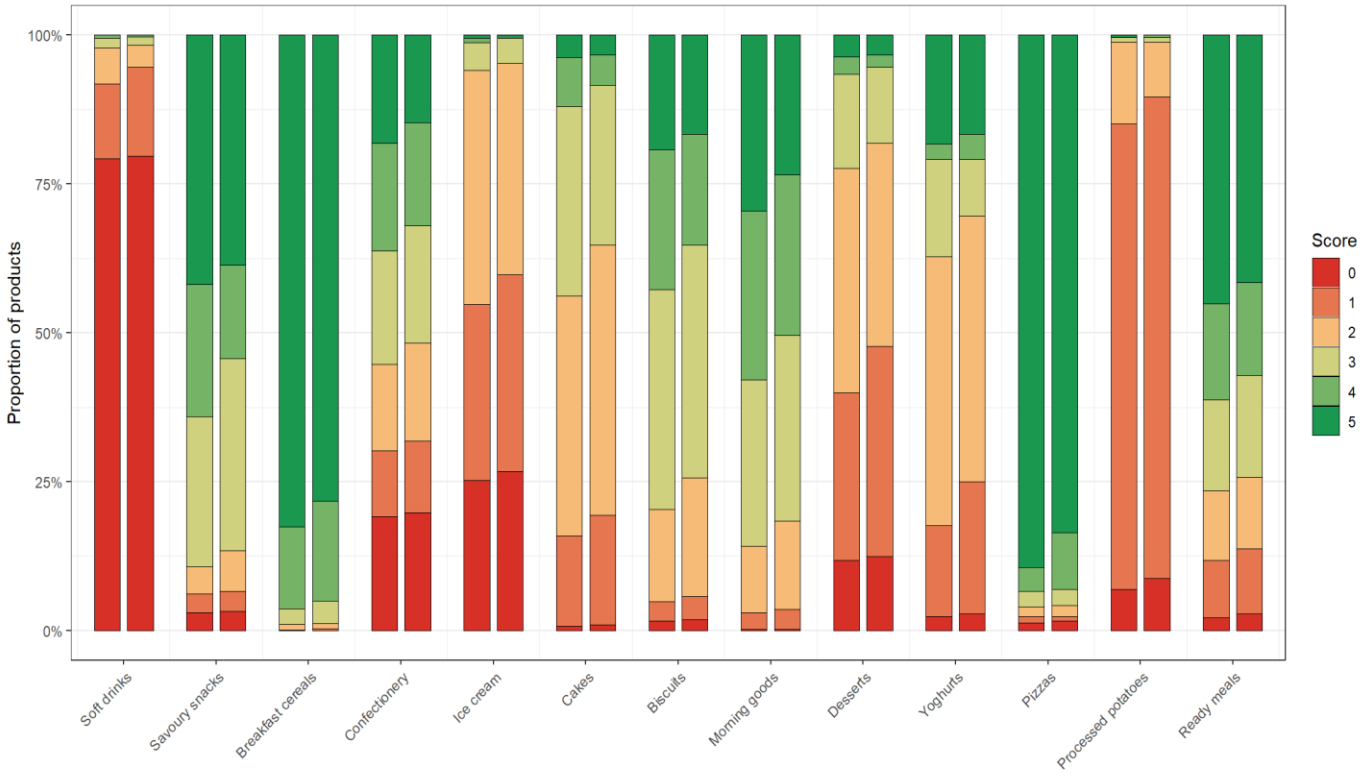
Salt points

UK NPM 04 and UK NPM 18 are shown side by side within each in-scope category



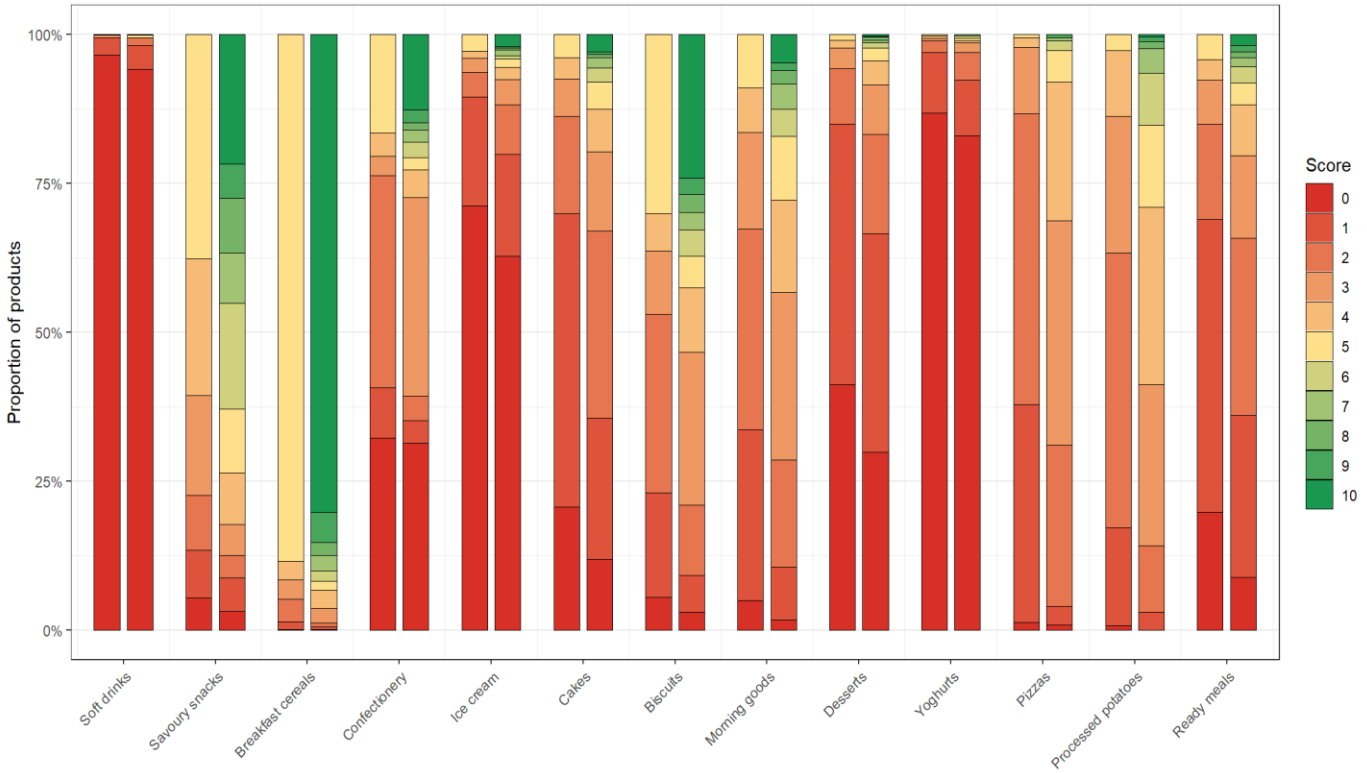
Protein points

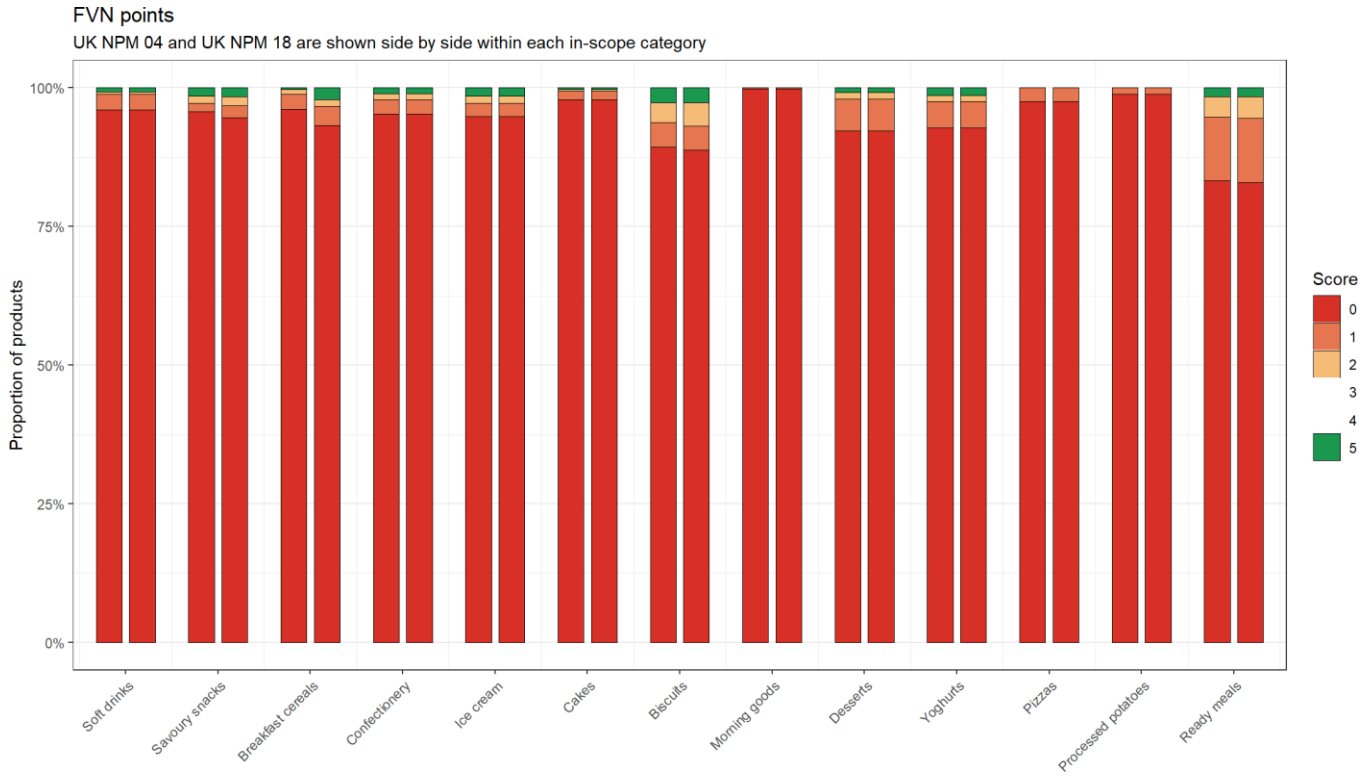
UK NPM 04 and UK NPM 18 are shown side by side within each in-scope category



Fibre points

UK NPM 04 and UK NPM 18 are shown side by side within each in-scope category




FVN points
UK NPM 04 and UK NPM 18 are shown side by side within each in-scope category
Proportion of products
100%
75%
50%
25%
0%
Score
0
1
2
3
4
5
Soft drinks
Savoury snacks
Breakfast cereals
Confectionery
Ice cream
Cakes
Biscuits
Morning goods
Desserts
Yoghurts
Pizzas
Processed potatoes
Ready meals

Appendix 7. Proportion of products failing each nutrient profiling model or front of pack labelling scheme by in-scope category

In-scope category	Model	N	Number passing	Proportion passing	Number failing	Proportion failing
Soft drinks	NPM 2004/5	1352	895	66.2%	457	33.8%
	NPM 2018	1352	80	5.9%	1272	94.1%
	MTL red	1352	1252	92.6%	100	7.4%
	MTL red/amber	1352	102	7.5%	1250	92.5%
	Warning labels	1352	831	61.5%	521	38.5%
	Nutri-Score	1352	88	6.5%	1264	93.5%
Savoury snacks	NPM 2004/5	1849	483	26.1%	1366	73.9%
	NPM 2018	1849	447	24.2%	1402	75.8%
	MTL red	1849	350	18.9%	1499	81.1%
	MTL red/amber	1849	42	2.3%	1807	97.7%
	Warning labels	1849	13	0.7%	1836	99.3%
	Nutri-Score	1849	150	8.1%	1699	91.9%
Breakfast cereals	NPM 2004/5	788	622	78.9%	166	21.1%
	NPM 2018	788	308	39.1%	480	60.9%
	MTL red	788	620	78.7%	168	21.3%
	MTL red/amber	788	27	3.4%	761	96.6%
	Warning labels	788	4	0.5%	784	99.5%
	Nutri-Score	788	378	48.0%	410	52.0%
Confectionery	NPM 2004/5	2146	66	3.1%	2080	96.9%
	NPM 2018	2146	32	1.5%	2114	98.5%
	MTL red	2146	19	0.9%	2127	99.1%
	MTL red/amber	2146	0	0.0%	2146	100.0%
	Warning labels	2146	1	0.0%	2145	100.0%
	Nutri-Score	2146	16	0.7%	2130	99.3%
Ice cream	UK NPM04	663	110	16.6%	553	83.4%
	UK NPM18	663	22	3.3%	641	96.7%
	MTL red	663	232	35.0%	431	65.0%
	MTL red/amber	663	6	0.9%	657	99.1%
	Warning labels	663	35	5.3%	628	94.7%
	Nutri-Score	663	43	6.5%	620	93.5%
Cakes	NPM 2004/5	1098	34	3.1%	1064	96.9%
	NPM 2018	1098	13	1.2%	1085	98.8%
	MTL red	1098	39	3.6%	1059	96.4%
	MTL red/amber	1098	1	0.1%	1097	99.9%
	Warning labels	1098	7	0.6%	1091	99.4%
	Nutri-Score	1098	10	0.9%	1088	99.1%
Biscuits	NPM 2004/5	1356	129	9.5%	1227	90.5%
	NPM 2018	1356	89	6.6%	1267	93.4%
	MTL red	1356	78	5.8%	1278	94.2%
	MTL red/amber	1356	8	0.6%	1348	99.4%
	Warning labels	1356	1	0.1%	1355	99.9%
	Nutri-Score	1356	33	2.4%	1323	97.6%

In-scope category	Model	N	Number passing	Proportion passing	Number failing	Proportion failing
Morning goods	NPM 2004/5	529	171	32.3%	358	67.7%
	NPM 2018	529	70	13.2%	459	86.8%
	MTL red	529	259	49.0%	270	51.0%
	MTL red/amber	529	0	0.0%	529	100%
	Warning labels	529	55	10.4%	474	89.6%
	Nutri-Score	529	43	8.1%	486	91.9%
Desserts	NPM 2004/5	1073	250	23.3%	823	76.7%
	NPM 2018	1073	87	8.1%	986	91.9%
	MTL red	1073	348	32.4%	725	67.6%
	MTL red/amber	1073	46	4.3%	1027	95.7%
	Warning labels	1073	136	12.7%	937	87.3%
	Nutri-Score	1073	113	10.5%	960	89.5%
Yoghurts	NPM 2004/5	500	389	77.8%	111	22.2%
	NPM 2018	500	180	36.0%	320	64.0%
	MTL red	500	467	93.4%	33	6.6%
	MTL red/amber	500	32	6.4%	468	93.6%
	Warning labels	500	275	55.0%	225	45.0%
	Nutri-Score	500	224	44.8%	276	55.2%
Pizzas	NPM 2004/5	377	191	50.7%	186	49.3%
	NPM 2018	377	109	28.9%	268	71.1%
	MTL red	377	301	79.8%	76	20.2%
	MTL red/amber	377	1	0.3%	376	99.7%
	Warning labels	377	107	28.4%	270	71.6%
	Nutri-Score	377	5	1.3%	372	98.7%
Processed potatoes	NPM 2004/5	262	247	94.3%	15	5.7%
	NPM 2018	262	247	94.3%	15	5.7%
	MTL red	262	256	97.7%	6	3.3%
	MTL red/amber	262	31	11.8%	231	88.2%
	Warning labels	262	227	86.6%	35	13.4%
	Nutri-Score	262	132	50.4%	130	49.6%
Ready meals	UK NPM04	3521	2965	84.2%	556	15.8%
	UK NPM18	3521	2726	77.4%	795	22.6%
	MTL red	3521	3110	88.3%	411	11.7
	MTL red/amber	3521	108	3.1%	3413	96.9%
	Warning labels	3521	2494	70.8%	1027	29.2%
	Nutri-Score	3521	1694	48.1%	1827	51.9%
Overall	UK NPM04	15514	6552	42.2%	8962	57.8%
	UK NPM18	15514	4410	28.4%	11104	71.6%
	MTL red	15514	7331	47.3%	8183	52.7%
	MTL red/amber	15514	404	2.6%	15110	97.4%
	Warning labels	15514	4186	27.0%	11328	73.0%
	Nutri-Score	15514	2929	18.9%	12585	81.1%

Appendix 8. Overall levels of agreement between each NPM and FOPL scheme

Model/ Scheme	NPM 2004/5	NPM 2018	MTL (no red)	MTL (no red or amber)	Warning labels	Nutri-Score
NPM 2004/5	1.00	0.70	0.78	0.39	0.68	0.59
NPM 2018	0.70	1.00	0.55	0.64	0.72	0.77
MTL (no red)	0.78	0.55	1.00	0.29	0.62	0.47
MTL (no red or amber)	0.39	0.64	0.29	1.00	0.66	0.78
Warning labels	0.68	0.72	0.62	0.66	1.00	0.72
Nutri-Score	0.59	0.77	0.47	0.78	0.72	1.00

Appendix 9. Gwet's AC1 agreement by in-scope category for each NPM and FOPL scheme

In-scope category	Model/ Scheme	NPM 2004/5	NPM 2018	MTL no red	MTL no red or amber	Warning labels	Nutri-Score
Soft drinks	NPM 2004/5	1.00	-0.12	0.59	-0.10	0.62	-0.11
	NPM 2018	-0.12	1.00	-0.73	0.93	-0.04	0.90
	MTL (no red)	0.59	-0.73	1.00	-0.70	0.52	-0.72
	MTL (no red or amber)	-0.10	0.93	-0.70	1.00	0.02	0.87
	Warning labels	0.62	-0.04	0.52	0.02	1.00	-0.05
	Nutri-Score	-0.11	0.90	-0.72	0.87	-0.05	1.00
Savoury snacks	NPM 2004/5	1.00	0.85	0.77	0.68	0.67	0.75
	NPM 2018	0.85	1.00	0.75	0.72	0.70	0.77
	MTL (no red)	0.77	0.75	1.00	0.79	0.78	0.82
	MTL (no red or amber)	0.68	0.72	0.79	1.00	0.97	0.93
	Warning labels	0.67	0.70	0.78	0.97	1.00	0.91
	Nutri-Score	0.75	0.77	0.82	0.93	0.91	1.00
Breakfast cereals	NPM 2004/5	1.00	0.12	0.81	-0.46	-0.50	0.42
	NPM 2018	0.12	1.00	0.05	0.46	0.43	0.59
	MTL (no red)	0.81	0.05	1.00	-0.46	-0.50	0.32
	MTL (no red or amber)	-0.46	0.46	-0.46	1.00	0.96	0.28
	Warning labels	-0.50	0.43	-0.50	0.96	1.00	0.25
	Nutri-Score	0.42	0.59	0.32	0.28	0.25	1.00
Confectionery	NPM 2004/5	1.00	0.98	0.97	0.97	0.97	0.98
	NPM 2018	0.98	1.00	0.98	0.98	0.98	0.98
	MTL (no red)	0.97	0.98	1.00	0.99	0.99	0.99
	MTL (no red or amber)	0.97	0.98	0.99	1.00	1.00	0.99
	Warning labels	0.97	0.98	0.99	1.00	1.00	0.99
	Nutri-Score	0.98	0.98	0.99	0.99	0.99	1.00
Ice cream	NPM 2004/5	1.00	0.83	0.68	0.81	0.84	0.87
	NPM 2018	0.83	1.00	0.54	0.97	0.95	0.96
	MTL (no red)	0.68	0.54	1.00	0.52	0.56	0.58
	MTL (no red or amber)	0.81	0.97	0.52	1.00	0.95	0.94
	Warning labels	0.84	0.95	0.56	0.95	1.00	0.96
	Nutri-Score	0.87	0.96	0.58	0.94	0.96	1.00
Cakes	NPM 2004/5	1.00	0.98	0.98	0.97	0.97	0.98
	NPM 2018	0.98	1.00	0.96	0.99	0.99	0.99
	MTL (no red)	0.98	0.96	1.00	0.96	0.97	0.97
	MTL (no red or amber)	0.97	0.99	0.96	1.00	0.99	0.99
	Warning labels	0.97	0.99	0.97	0.99	1.00	0.99
	Nutri-Score	0.98	0.99	0.97	0.99	0.99	1.00

In-scope category	Model/Scheme	NPM 2004/5	NPM 2018	MTL no red	MTL no red or amber	Warning labels	Nutri-Score
Biscuits	NPM 2004/5	1.00	0.92	0.93	0.90	0.90	0.92
	NPM 2018	0.92	1.00	0.90	0.94	0.93	0.94
	MTL (no red)	0.93	0.90	1.00	0.94	0.94	0.94
	MTL (no red or amber)	0.90	0.94	0.94	1.00	0.99	0.98
	Warning labels	0.90	0.93	0.94	0.99	1.00	0.97
	Nutri-Score	0.92	0.94	0.94	0.98	0.97	1.00
Morning goods	NPM 2004/5	1.00	0.71	0.63	0.56	0.66	0.64
	NPM 2018	0.71	1.00	0.37	0.85	0.88	0.91
	MTL (no red)	0.63	0.37	1.00	0.22	0.34	0.31
	MTL (no red or amber)	0.56	0.85	0.22	1.00	0.88	0.91
	Warning labels	0.66	0.88	0.34	0.88	1.00	0.91
	Nutri-Score	0.64	0.91	0.31	0.91	0.91	1.00
Desserts	NPM 2004/5	1.00	0.79	0.84	0.75	0.85	0.82
	NPM 2018	0.79	1.00	0.64	0.95	0.90	0.94
	MTL (no red)	0.84	0.64	1.00	0.60	0.70	0.67
	MTL (no red or amber)	0.75	0.95	0.60	1.00	0.90	0.93
	Warning labels	0.85	0.90	0.70	0.90	1.00	0.93
	Nutri-Score	0.82	0.94	0.67	0.93	0.93	1.00
Yoghurts	NPM 2004/5	1.00	0.18	0.79	-0.39	0.57	0.37
	NPM 2018	0.18	1.00	-0.06	0.56	0.51	0.76
	MTL (no red)	0.79	-0.06	1.00	-0.74	0.38	0.15
	MTL (no red or amber)	-0.39	0.56	-0.74	1.00	0.15	0.38
	Warning labels	0.57	0.51	0.38	0.15	1.00	0.60
	Nutri-Score	0.37	0.76	0.15	0.38	0.60	1.00
Pizzas	NPM 2004/5	1.00	0.54	0.47	0.19	0.47	0.20
	NPM 2018	0.54	1.00	-0.01	0.62	0.63	0.63
	MTL (no red)	0.47	-0.01	1.00	-0.53	-0.02	-0.52
	MTL (no red or amber)	0.19	0.62	-0.53	1.00	0.63	0.99
	Warning labels	0.47	0.63	-0.02	0.63	1.00	0.64
	Nutri-Score	0.20	0.63	-0.52	0.99	0.64	1.00
Processed potatoes	NPM 2004/5	1.00	0.94	0.95	-0.64	0.89	0.27
	NPM 2018	0.94	1.00	0.95	-0.64	0.89	0.27
	MTL (no red)	0.95	0.95	1.00	-0.70	0.86	0.23
	MTL (no red or amber)	-0.64	-0.64	-0.70	1.00	-0.50	0.33
	Warning labels	0.89	0.89	0.86	-0.50	1.00	0.35
	Nutri-Score	0.27	0.27	0.23	0.33	0.35	1.00
Ready meals	NPM 2004/5	1.00	0.87	0.90	-0.60	0.77	0.34
	NPM 2018	0.87	1.00	0.81	-0.43	0.73	0.40
	MTL (no red)	0.90	0.81	1.00	-0.69	0.74	0.28

MTL (no red or amber)	-0.60	-0.43	-0.69	1.00	-0.27	0.27
Warning labels	0.77	0.73	0.74	-0.27	1.00	0.44
Nutri-Score	0.34	0.40	0.28	0.27	0.44	1.00