Office for Health Improvement & Disparities

Food Standards Agency
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National Diet and Nutrition Survey 2019 to 2023: Nutrient Databank and Standard Recipes Database

User Guide

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UKRI MRC Epidemiology Unit

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1 Introduction

The National Diet and Nutrition Survey (NDNS) was set up in 2008 as a cross-sectional survey with a continuous programme of fieldwork, designed to assess the diet, nutrient intake and nutritional status of the general population aged 1.5 years and over living in private households in the UK. Fieldwork ran continuously from 2008 to 2023 aside from a 7-month suspension during the COVID-19 global pandemic. NDNS is jointly funded by the Department of Health and Social Care (DHSC) and the UK Food Standards Agency (FSA). The NDNS is currently carried out by a consortium comprising the National Centre for Social Research (NatCen) and the MRC Epidemiology Unit at the University of Cambridge. Interviewer fieldwork in Northern Ireland is carried out by the Northern Ireland Statistics and Research Agency (NISRA).

NDNS provides the only source of nationally representative UK data on the types and quantities of foods consumed by individuals, from which estimates of nutrient intake for the population are derived and on their nutritional status from analysis of blood and urinary biomarkers. Results are used by government to monitor progress toward diet and nutrition objectives of UK Health Departments and develop policy interventions, for example to monitor progress towards a healthy, balanced diet as visually depicted in the Eatwell Guide. NDNS is an important source of evidence underpinning work of the Scientific Advisory Committee on Nutrition (SACN) and their advice to UK governments on nutrition related matters. The food consumption data is also used by the FSA to assess exposure to chemicals in food, as part of the risk assessment and communication process in response to a food emergency or to inform negotiations on setting regulatory limits for contaminants.

2 Nutrient Databank

The UK Nutrient Databank (NDB) contains extensive information on the nutritional content of foods commonly consumed in the UK, including data on nutrients and the disaggregation of foods into specific components. This information enables the calculation of nutrient intakes based on consumption data. The NDB is compiled through various data sources including the UK Composition of Foods Integrated Dataset (CoFID),[1] manufacturers' data gathered through food labels and web information and from the Standard Recipes Database (SRD) (see chapter 6). In order to estimate nutrient intakes, values are assigned for all nutrients in all foods (no missing values). Where reliable information is not available for some nutrients, data is obtained by extrapolating estimates from similar foods. All data is carefully evaluated before being incorporated into the databank.

For Years 1 to 11 of NDNS (2008 to 2019), the NDB had been saved as a survey year specific file i.e. NDNS_Y11_NutrientDatabank. With the change in diet method from a paper diary to the online automated 24-hour recall tool (Intake24) at the start of Year 12 in 2019 and the disruption of fieldwork for some survey years as a result of the COVID-19 pandemic, the NDB datasets are now given a version number and can be cross-referred to the dates of data collection in NDNS. This means a version of the NDB may apply to more than one survey year.

For 2019 to 2023, 2 versions of the NDB were used:

NDB name	Fieldwork years
UK_NDB_1.1	Year 12 (2019 to 2020)
UK_NDB_2.0	Years 13 to 15 (2020 to 2023)

2.1 Updates to the NDB

Each year a programme of updates and revisions are made to the NDB including the addition of new food codes as well as the revision of data for existing food codes so that the databank is up-to-date and, as far as possible, reflects the nutrient composition of the food supply for each survey year reported. These are carried out by the MRC Epidemiology Unit in conjunction with OHID.[i]

In 2008 to 2019 (years 1 to 11) the NDB was updated and applied to the dietary data on an annual basis with priorities based on reported consumed foods for each survey year, and to reflect changes in the UK food system. As a result, at the time of introducing Intake24 in 2019 (year 12), the NDB had grown unsystematically and contained over 5,500 food codes with duplicative and redundant foods. Furthermore, there were differences in the way recipes were reported and coded between the paper diary and Intake24 and the NDB needed to be adapted to accommodate this difference. Therefore, a review and rationalisation was undertaken.[2] This resulted in the UK_NDB_pre1 version of the NDB which had around 2,500 food codes including new generic food codes created to allow a single code to represent a range of similar foods as well as sandwiches and salads which were not required before the introduction of Intake24 as these items were previously coded as individual components. The UK_NDB_pre1 version of the NDB has been archived as part of the National Diet and Nutrition Survey: Diet and Physical Activity – a Follow-up Study during COVID-19.

[i] Previously FSA, Department of Health or Public Health England when ownership of the NDB lay with them and the MRC Elsie Widdowson Laboratory

With the move to Intake24 the programme of updates has moved to biennial. However due to the work to update the NDB for the transition to Intake24, and impact of COVID-19 on survey fieldwork, updates were carried out for year 12 and then for years 13 to 15.

Updating of the NDB may include the addition of new foods as well as revision of nutrient composition of existing foods, either at individual or food group level following a programme of reanalysis, or to take account of reformulation reported by manufacturers and changes in fortification practices. Therefore the same foods may have a different composition for some nutrients in a year of NDNS compared with another year. Table A lists the key updates applied over 2019 to 2023 (years 12 to 15). It should be noted that updates applied in one year apply to future years unless further changes are made.

Table A Updates to the NDB

NDB name	Fieldwork year	Analytical data updates	Reviews of manufacturers' or label data by food group	Other
UK_NDB_1.1	Year 12 (2019 to 2020)	Micronutrients in milk[3]	Bacon and ham[a] Baked beans[a] Bread and rolls[a] Breakfast cereals Butter and fat spreads Cheddar cheese[a] Savoury sauces, pickles, gravies & condiments[a] Crisps and savoury snacks Pizza Sausages Soft drinks, not low calorie/diet Soup[a] Biscuits Yoghurt, fromage frais and other dairy desserts	
UK_NDB_2	Years 13 to 15 (2020 to 2023)		Bread and rolls[a] Breakfast cereals Buns, cakes and pastries Burgers and kebabs (takeaway burgers only) Commercial toddlers foods Dietary supplements Other milk[d] Pork and dishes[b] Ready meals[c] Soft drinks, not low calorie/diet Soup[a] Yoghurt, fromage frais and other dairy desserts	Micronutrients in wheat flour (non-wholemeal)

[a] Only sodium values updated.
[b] Not manufactured pork products or dishes.
[c] Not a specific food group, food codes were identified across all food groups based on name.
[d] Updates made to some plant based and lactose free milks, and flavoured milk drinks.

3 Description of the NDB fields

3.1 Food name and food code

All foods are assigned a food code and a clear name is given to describe the code. The name may include specific qualities of the food, informing the user it is a fortified food, or from a specific brand. The food codes in the NDB cannot be linked directly to foods in McCance and Widdowson's Composition of Foods.[1]

3.2 Food code markers

Each food code is assigned as an 'F' or 'R' code. 'F' indicates that the code exists as a single (individual) food and 'R' denotes a recipe code usually comprising 2 or more food codes (ingredients). Following the NDB rationalisation, a consistent approach was adopted: homemade foods would be a recipe code while manufactured foods would be a single food code. This approach ensured that the nutrient composition of manufactured foods could be easily updated using data from the manufacturer's label. In contrast, the nutrient composition of homemade foods would be updated automatically based on the nutrient composition of individual ingredients. Details of the recipes held in the 'R' codes are not provided in the NDB dataset but are available on request from dietaryassessmentenquiry@mrc-epid.cam.ac.uk.

3.3 Food group name and code

Each food code is assigned to a primary food group (level 1) and sub food groups (level 2 and level 3). The food groups are designated with a numeric code. For example for carrots:

Level	Number	Name
Level 1	26	Vegetables and vegetable products and dishes
Level 2	26.1	Vegetables
Level 3	26.1.2	Carrots

A full breakdown of the NDNS food groups is provided in Appendix R of the 2019 to 2023 NDNS report. These food groups replace those used in 2008 to 2019 (years 1 to 11). The previous food groups have been retained in the NDB labelled as "FoodGroupCode_Old".

3.4 Water and vitamin loss

Recipe 'R' food codes may have water and vitamin loss assigned, which provides a correction to the nutrient data for associated cooking losses.

3.5 Base and unit (F codes only)

These fields describe how the nutrient data are expressed. For most foods the nutrients are entered per 100 grams (base = 100, unit = grams). For vitamin and mineral supplements, nutrients are entered per tablet, capsule, teaspoon or drop (base = 1, unit = tablet, capsule, teaspoon or drop). The base and unit of a food code must match the form in which items are recorded in the dietary assessment method.

3.6 Dilution

The majority of food codes have a dilution of 1. Concentrated soft drinks and dried products that are made up have a dilution factor greater than 1. For example, if a concentrated drink is usually made up 1 part concentrate to 4 parts water the dilution factor would be 5. This provides the user with additional detail regarding the food in its unconcentrated form; however this is not used in calculating nutrient intakes.

3.7 Edible portion

The majority of food codes have an edible portion of 1; however this will be less than 1 for foods that include waste, such as meat weighed with bones.

3.8 Comments and descriptions

The comments box provides details on when the food code was created, including any updates and the data source. The description box provides details on the number and brand names of products included in calculating the nutrient information, or the food codes used in collating the recipe. Some food codes (particularly dietary supplements) contain nutritional compounds not measured in the NDB (e.g. vitamin K or lutein).

3.9 Nutrition data

Each food code in the NDB has a value assigned for 56 nutrients, including energy, provided in specific units of measurement (see chapter 4 table B). Nutrient values reported as 'trace' are assumed as zero in the NDB. Some data will have been rounded into the appropriate number of decimal places.

3.10 Disaggregation data

To ensure accurate reporting of specific food types in NDNS, each food code present in the NDB has been disaggregated into 28 specific food components (see chapter 4 table C).[4] Disaggregation values (g amount in per base unit, e.g. 75g 'fruit' in 100g 'fruit pie') are assigned into the NDB.

4 Nutrient fields and disaggregation categories in the NDB

4.1 Nutrient fields

Table B Nutrients in the UK_NDB_1.1 and UK_NDB_2

Nutrient (unit of measure)	
Water (WATER) (g)	Cholesterol (CHOL) (mg)
Total Nitrogen (TOTNIT) (g)	Retinol (RET) (µg)
Nitrogen conversion factor (NCF)	Total carotene (TOTCAR) (µg)
Protein (PROT) (g)	Alpha-carotene (ACAR) (µg)
Fat (FAT) (g)	Beta-carotene (BCAR) (µg)
Carbohydrate (CHO) (g)	Beta cryptoxanthin (BCRYPT) (µg)
Energy (KCALS) (kcal)	Vitamin A (retinol equivalents) (VITA) (µg)
Energy (KJ) (kJ)	Vitamin D (VITD) (µg)
Alcohol (ALCO) (g)	Thiamin (THIA) (mg)
Starch (STAR) (g)	Riboflavin (RIBO) (mg)
Total sugars (TOTSUG) (g)	Niacin equivalent (NIACEQU) (mg)
AOAC fibre (AOAC) (g)	Vitamin C (VITC) (mg)
Glucose (GLUC) (g)	Vitamin E (VITE) (mg)
Fructose (FRUCT) (g)	Vitamin B6 (VITB6) (mg)
Sucrose (SUCR) (g)	Vitamin B12 (VITB12) (µg)
Maltose (MALT) (g)	Folate (FOLT) (µg)
Lactose (LACT) (g)	Pantothenic acid (PANTO) (mg)
Other sugars (OSUG) (g)	Biotin (BIOT) (µg)
Free sugars (FREESUG) (g)	Sodium (NA) (mg)
FS Table sugar (FSTABLESUGAR) (g)	Potassium (K) (mg)
FS Other added sugar (FSOTHERADDEDSUGAR) (g)	Calcium (CA) (mg)
FS Honey (FSHONEY) (g)	Magnesium (MG) (mg)
FS Fruit juice (FSFRUITJUICE) (g)	Phosphorus (K) (mg)
FS Dried fruit (FSDRIEDFRUIT) (g)	Iron (FE) (mg)
FS Fruit puree (FSFRUITPUREE) (g)	Haem iron (HFE) (mg)
FS Stewed fruit (FSSTEWEDFRUIT) (g)	Non-haem iron (NHFE) (mg)
FS Vegetable puree FSVEGPUREE (g)	Copper (CU) (mg)
Saturated fatty acids (SATFA) (g)	Zinc (ZN) (mg)
Cis-monounsaturated fatty acids (CMON) (g)	Chloride (CL) (mg)
Cis-n3 fatty acids (CN3) (g)	Iodine (I) (µg)
Cis-n6 fatty acids (CN6) (g)	Manganese (MN) (mg)
Total trans fatty acids (TRANS) (g)	Selenium (SE) (µg)

FS: Free sugar

The following should be noted:

- Energy does not include the contribution from fibre. In calculating energy intakes for the 2019 to 2023 NDNS report, a factor of 2.0 kcal per gram of fibre was applied retrospectively to the dietary data.
- Carbohydrate is expressed as monosaccharide equivalents.
- AOAC fibre includes resistant starch, lignin and non-starch polysaccharides
- Other sugars do not include oligosaccharides. From 2008 to 2019 (years 1 to 11), oligosaccharides present in foods were included in the other sugar values, contributing to the total sugar and carbohydrate values. However, since oligosaccharides are carbohydrates and not sugars, the other sugar values have been updated by subtracting the weight of oligosaccharides. This adjustment may lead to a small decrease in total sugar values, while carbohydrate values remain unchanged compared to the NDNS years 1 to 11.
- Free sugars includes all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups, unsweetened fruit juices, unsweetened vegetables juices, fruit purees and vegetable purees.[5] Free sugars are calculated from the sum of individual sugars using the formula below:

  Free sugars= 'FS Table sugar' + 'FS Other added sugar' + 'FS Honey' + 'FS Fruit juice' + 'FS Fruit puree' + 'FS Vegetable puree'

  Other definitions of free sugars can be calculated using the relevant individual free sugar values.[6]
- Vitamin A retinol equivalent is calculated as Retinol + (total carotene/6) where, Total carotene is β-carotene + (½ α-carotene) + (½ β-cryptoxanthin). Fortified sources of vitamin A are entered as retinol in the NDB
- Haem iron is calculated as 40% of the iron in fish and meat.

4.2 Disaggregation categories

Table C Disaggregation categories in the UK_NDB_1.1 and UK_NDB_2

Fruit (Fresh and canned fruit)
Dried Fruit
Fruit Juice
Smoothie Fruit
Tomatoes
Tomato puree
Brassicaceae
Yellow red Green (Yellow, Red & Dark Green Leafy Vegetables)
Other Vegetables
Beans (Beans and pulses)
Nuts
Beef (red meat)
Lamb (red meat)
Pork (red meat)
Processed Red Meat
Other Red Meat
Burgers (Burgers and grill steaks)

Sausages
Offal
Poultry (white meat)
Processed Poultry
Game Birds
White Fish
Oily Fish
Canned Tuna
Shellfish
Cottage cheese
Cheddar Cheese
Other Cheese

5 Quality assurance

The NDB is designed to perform automated quality assurance checks to nutrient data, when food codes are added or updated. Results from these calculations may not match the final values exactly (especially when comparing against analytical data) as a small margin of difference is acceptable in food composition). Energy does not include the contribution from fibre.

kcal	(protein x 4) + (fat x 9) + (carbohydrate x 3.75) + (alcohol x 7)
kJ	(protein x 17) + (fat x 37) + (carbohydrate x 16) + (alcohol x 29)
Carbohydrate	total sugars + starch
Total sugars	sum of all individual sugars
Total iron	haem iron + non haem iron
Total carotene	β-carotene + (α-carotene x 0.5) + (β-cryptoxanthin x 0.5)
Vitamin A	Retinol + (total carotene/6)
Total N	Protein/Nitrogen Conversion Factor (NCF)
Total fat	should be ≥ the sum of fatty acids
Fatty acids	0.6 X total fat is ≤ the sum of the fatty acids.

6 Standard Recipes Database

The Standard Recipes Database (SRD) is used to populate micronutrient values (for example vitamin C) and disaggregation values (for example vegetable content) for foods with multiple ingredients in the NDB. The SRD and NDB are linked via food codes.

The SRD, maintained by the MRC Epidemiology Unit for NDNS, was first developed in 2015 by the MRC Human Nutrition Research for dietary exposure assessments conducted by the FSA.[7] This dataset is used to break down the consumption of foods recorded in dietary surveys into their individual ingredients, ensuring that foods consumed as ingredients in other dishes are accurately accounted for in dietary exposure assessments. The SRD provides standardised recipes and food ingredient information. The protocol describing the development of recipes and related information can be found in Appendix A of the FSA SRD 1992-2012: Final Report, which is accessible through the UK Data Service.[7]

The SRD contains all food codes recorded in UK nutrition surveys from 1992 to 2023. The SRD is available as 3 files:

Name	**Format**
SRD_Hierarchy_2025.xlsx	Details the recipe structure. This file contains foods that are active or inactive in the database.
SRD_Ingredient_Level_2025.xlsx	Shows the most detailed (or base-level) ingredients for recipes. This file contains foods that are active or inactive in the database.
SRD_Food_List_2025.xlsx	Food list along with relevant information such as food type (see below). This list only includes foods that are currently active in the database.

In the SRD_Food_List_2025.xlsx, each food code is assigned to one of these food types:

- RCI: Raw commodity ingredients, refers to food codes in their raw agricultural and/or unprocessed state, for example raw chicken meat and uncooked vegetables.
- RHM: Recipe homemade – refers to food codes where the recipe is homemade, comprising of two or more ingredients, for example chicken and vegetable soup.
- RPB: Recipe purchased brand – refers to food codes where the recipe is a retail item specific to one brand, for example Kellogg's Fibre Plus cereal bar.
- RPC: Recipe purchased composite – refers to food codes representing generic manufactured retail items for which the recipe is based on a composite of data from multiple branded products, for example cereal bar with fruit, chicken and vegetable soup (retail).

- SIC: Simple ingredient commodity – refers to food codes that are commodity items which have undergone some processing to derive an ingredient and may originate from a recipe commodity ingredient, for example flour, boiled or roasted chicken meat, boiled vegetables, sugar.
- Supplement - refers to nutrient and non-nutrient supplements, for example iron tablets and ginkgo biloba extract.
- MC: Marker Code (see section 6.1)

To create standard recipes of RHM codes; recipes obtained from different sources were explored. To create standard recipes for RPB and RPC codes, manufacturers' ingredient and nutrient information from product labels were used, and the nutrient composition of ingredients was sourced from the NDB.

Nutrient composition data for recipes in the SRD are not published here, as the focus of the SRD is on ingredient proportions. This data is available on request.

6.1 Marker codes

Marker codes were introduced to indicate the presence of non-nutrient ingredients in recipes, that is components which do not contribute to the nutritional value. Each marker code is added only once per recipe and assigned a nominal quantity of 0.01 grams to indicate their presence. The marker codes cover the following categories;

1. Vitamins and minerals
2. Flavourings
3. Food additives (stabilisers, thickeners, emulsifiers)
4. Colourings
5. Sweeteners (not sugar derivatives)
6. Preservatives (food additives not covered by marker codes 1 to 5)

References

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