

Nutritional Analysis software specification for Nutritional Requirements for food and drink in schools in (Scotland) Regulations, 2020

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This software specification is specifically for the use of Scottish Local Authorities, or their contracted caterers, to procure software which will be used to plan and nutritionally analyse food and drink provision in schools in order to meet the *Nutritional Requirements for food and drink in schools (Scotland) Regulations, 2020*.

Essential Criteria of the software

Food and Nutrition Data

1. The software is required to be an online system allowing users to undertake:
 - recipe analysis
 - daily nutritional analysis; and
 - weekly nutritional analysis (4 days or more, but number of days can be specified by the user)
2. The nutritional analysis software (hereafter termed “the software”) must contain a food directory consisting of data on:
 - Food and drinks, including manufactured products
 - Recipes

The food directory should be organised by food groups. The foods, drinks and recipes will be used to plan weekly menus and undertake nutritional analysis.

3. The software must use data from the most up-to-date version of *McCance & Widdowson’s Composition of Foods Integrated Dataset*¹ (CoFID), which holds the composition of all basic foods.
4. The software supplier must ensure that a system is in place to update the database within 90 days of new data from CoFID being published. The supplier must notify the user in advance of any update to ensure account is taken of new data in their menus and subsequent nutritional analysis.
5. For each food, drink, and recipe in the food directory, the software must hold data on the energy and nutrient content per 100g/ml. The data must include:
 - Energy (kcal)
 - Protein (g)
 - Total fat (g)
 - Saturated fat (g)
 - Total carbohydrate (g)
 - Total sugar (g)
 - Free sugar (g) – see point 6 for further detail
 - AOAC fibre (g) – see point 7 for further detail
 - Iron (mg)
 - Calcium (mg)

¹ <https://www.gov.uk/government/publications/composition-of-foods-integrated-dataset-cofid>

- Vitamin A (retinol equivalent) (microgram)
- Vitamin C (mg)
- Folate (microgram)
- Zinc mg
- Sodium (mg)
- Salt equivalents (g) – see point 8 for further detail

6. In 2015, the recommendation for sugar changed significantly and a definition of free sugars replaced non-milk extrinsic sugars (NMES). Free sugars are defined as all monosaccharides and disaccharides added to foods by the manufacturer, cook, or consumer, plus sugars naturally present in honey, syrups and unsweetened fruit juices. The sugars naturally present in milk and milk products (lactose) and the sugars in the cellular structure of foods were excluded. At present, CoFID does not hold data on free sugars. Therefore, the values for free sugars in data held within the software must be calculated using the following classification:

| Free sugar | Non-free sugar |
|--|--|
| All sugars in fruit juice as well as table sugar, honey, sucrose, glucose and glucose syrups and added lactose or galactose added to foods (including whey powder) | All sugars in fresh, frozen, dried, canned or stewed fruit and vegetables. |
| All sugars in drinks including sugars naturally present in fruit and vegetable juices, smoothies and in milk substitutes | Lactose naturally present in milk and milk products |
| All sugar in fruit and vegetable purees and pastes, including jam and preserves, and products made from extruded fruit or veg | |

They key differences between free sugar and non-milk extrinsic sugar (NMES) are:

- Canned, stewed and dried fruit are not classed as free sugars (previously 50% of the sugar from these foods was classed as NMES and the other 50% as intrinsic sugar).
- Lactose and/or galactose (including lactose in whey powder) added as an ingredient and not naturally present in milk or dairy products is also be classed as free sugar. This was not considered as part of NMES.

7. Free sugar data calculated using the approach as described by Amoutzopoulos et al² is available for food and drinks in the National Diet and Nutrition Survey nutrient databank. This is available to commercial companies on request from the UK databank archive (www.data-archive.ac.uk). This data may be of use to

² Amoutzopoulos, B.; Steer, T.; Roberts, C.; Cole, D.; Collins, D.; Yu, D.; Hawes, T.; Abraham, S.; Nicholson, S.; Baker, R.; Page, P. A Disaggregation Methodology to Estimate Intake of Added Sugars and Free Sugars: An Illustration from the UK National Diet and Nutrition Survey. *Nutrients* 2018, 10, 1177.

cross check or to guide estimated data where this is not available elsewhere. This should be used with caution and the following aspects noted:

- The databank contains several thousand food and drink products which are not in a logical order.
- The databank may contain several products that are very similar to each other, but not adjacent to each other in the spreadsheet.

8. It should be assumed that nutrition data from manufactured products provides fibre values using AOAC methodology. If however, the NSP value is provided, the following approach must be adopted in order to estimate a reasonable AOAC fibre value:

- fibre values given as NSP should be multiplied by 1.33 to give the AOAC fibre value.

Where this calculation has taken place, the software must have the function to flag up these fibre values as estimated values in the nutrient analysis report.

9. As some food labels contain salt and others contain sodium, it is necessary to include both values to ensure the user does not confuse these two values, particularly as they are often listed using different units (mg vs g). To convert mg of sodium to g of salt equivalents, you need to multiply the mg sodium amount by 2.5 and divide by 1000.

| |
|--|
| Sodium to Salt |
| $200\text{mg of sodium} \times 2.5 = 500\text{mg of salt}$ |
| $500\text{mg} / 1000 = 0.5\text{g of salt}$ |

10. To convert g of salt equivalents to mg of sodium, you need to multiply by 1000 then divide by 2.5.

| |
|--|
| Salt to Sodium |
| $0.5\text{g of salt} \times 1000 = 500\text{mg of salt}$ |
| $500\text{mg} / 2.5 = 200\text{mg of sodium}$ |

11. For each food, drink or recipe in the food directory, the software must hold data on:

- The ingredients
- Item name and/or code
- Quantity of each ingredient used (g/ml)
- Cooking method
- Total weight of all ingredients
- Total weight of finished dish
- Number of portions/servings from the recipe/product
- Suggested portion size (g/ml)
- Nutritional values of the nutrients listed in section 5 per 100g and per portion

12. A tracing/tagging facility should be in place to identify which source of data has been used for a food, drink or recipe to identify whether this has come from the manufacturer, CoFID (including date of update), or is estimated data entered by the user. The data coming from CoFID should not be able to be edited by the user.
13. If, for any reason, data for any nutrient listed above is not available for a particular food or drink, the software must have the ability to flag these up as missing values in the nutritional analysis report, and to distinguish this from a zero nutrient content in the database.
14. For cooked recipes or products, the software must provide the facility to estimate weight changes and nutrient losses as a result of cooking if this is not measured directly. Values in appendix 4.3 of 7th edition of 'McCance & Widdowson's Composition of Foods'³ must be applied.
15. The software must provide the facility to add new food and drink products and recipes not included in the CoFID data. This data would include:
 - Product or recipe name
 - Manufacturer (if applicable)
 - Nutrient data of the food per 100g as listed above, and indicate whether the data is 'as purchased' or 'as served'.
 - Details (name, contact details and date) about the user who added the product and accompanying data to the software
16. If there are missing nutrient values for the products or recipe, these should be sought from the manufacturer (where applicable), or substituted with the nutrient value of the most similar food source from CoFID. The source of the value used to fill in the missing nutrient must be able to be traced/tagged, along with the user who has entered the value. These estimated values must be clearly identified as part of the output of the nutrient analysis report.

Functioning of the Software

17. The software must be flexible to allow variations to requirements, for example:
 - increase or decrease in the number of children having lunch each day
 - portion size
 - the number of servings of each food
 - drink or recipe
 - changes to menus.
18. The software must be able to host a library of food, drinks and recipes which can be searched by food, drink, recipe or ingredient.
19. The software must allow the user to undertake a weighted analysis by specifying the number of servings of each different food, drink or recipe which will then be

³ Finglas et al. (2015) McCance and Widdowson's The Composition of Foods. 7th Summary Edition. Cambridge: Royal Society of Chemistry.

used to calculate the average nutrient content per meal per day (for energy) and per week (for energy and all other nutrients) using the formula described in 21 and 22 below.

20. The software must allow the user to perform nutritional analysis of a menu using either primary or secondary nutrient standards. The particular standards used must be clearly marked on the analysis output.
21. The **energy (kcal)** contained within the average school lunch **per day** must be calculated in accordance with the following formula;

$$A/B$$

Where 'A' is the total **energy (kcal)** provided in all school lunches **in a day**.
Where 'B' is the estimated number of school lunches served to pupils during **that school day**.

22. The **energy (kcal)** and **nutrient** content of the average school lunch across a week should be calculated using the following formula;

$$(C/D)/E$$

Where 'C' is the total energy (kcal) and nutrients provided in all schools lunches served at the school lunch **in a school week** (four or five days as determined by the user). Where 'D' is the estimated number of school lunches served to pupils during that school week. Where 'E' is the number of number of days in the school week.

23. The software must allow the portion size as served or number of servings to be adjusted by the user either when putting a food, drink or recipe into a menu plan, or after it is within a menu plan.
24. The software must have a recipe analysis function to nutritionally analyse individual recipes. This should be flexible to allow substitution of ingredients and alteration of ingredient quantities and/or portion size to enable users to undertake recipe adaptation and reformulation. This should have version control built in to allow comparison between different versions of recipes.
25. The software must have the ability for data within recipes and manufactured products to be updated when new nutritional composition data is made available. This should be able to be tagged/identified when the data has been updated with date and the user who completed this. The old information should be available as a historical record which can be retrieved in the future.
26. The software must have a search and replace function to identify recipes which are high or low in a particular nutrient and offer appropriate alternatives.
27. The ability to identify:
- the weight of fruit and/or vegetables per portion of a product or recipe and/or;

- if a product or recipe contains a portion of fruit or vegetables (40g for primary schools and 80g for secondary schools with the exception of dried fruit which is 15g and 30g respectively) per serving.

28. The ability to flag if the number of main meals served exceeds or does not equate to the number of children having lunch each day. For example, a menu based on 100 children having lunch but the analysis contains only 90 main meals. This is to avoid manual calculation error.

Output of the System

29. The software must display whether the value of energy is within a 15% tolerance the nutrient standard on a daily basis, and a 10% tolerance on a weekly basis. No tolerance should be built into the system or displayed for any other nutrient.

30. The software must display the absolute values for energy and each of the 16 nutrients of the analysed menu and compare these to the statutory nutrient standards selected (primary or secondary). This must include the % of the value against each nutrient standard. Absolute values for energy and each of the 16 nutrients must be displayed on any graphical output.

31. The menu plan, including when exported, must display the number of servings and portion size for each menu item.

32. The nutritional value per portion of each recipe must be able to be displayed, exported and printed in a clear, legible format. For sweetened and baked goods (as defined in the Regulations), this should show the nutrient values per portion compared to the specification for products in this category set within the Regulations, at both lunch and outwith lunch. The recipe should be able to be exported and include ingredient weights and method so that it can be used as a recipe in a kitchen.

33. The software must have the ability to export the data in a format that can be printed, emailed and saved.

34. A back-up of data saved and menu plans worked on will be in place.

Use of the System

35. The software provider must provide a user guide to allow a user to understand how to navigate and use the software.

36. Technical support for problems encountered by the user must be provided.

37. The system must be fully resilient.

38. The software provider must give users sufficient notification of system upgrades or maintenance, and ensure any down time is kept to a minimum.

Desirable Criteria

39. The ability for an existing database of food, drink and recipes to be uploaded by the software provider, including nutritional values (meeting the requirements listed above) in a suitable format (e.g. excel spreadsheet).
40. The ability for manufactured products and user recipes on the database to be regularly reviewed to ensure they contain accurate information, have been updated, and are removed if not been used for a set length of time e.g. two years.
41. Default portion sizes can be built into the system but should clearly marked as such to ensure the user does not automatically select these without checking this is the portion size to be served.
42. For face to face training on the use of the software either individually or in a small group.
43. For the costs of ingredients and products to be added and a function to enable costs of recipes and meals to be calculated by the system.
44. The ability to show allergen content of products or recipes in line with Allergen Regulations (the EU food information for consumers Regulation No. 1169/2011) and for this to be exported in a format suitable to be shared with parents, schools and school kitchen staff.
45. The ability for the amount of red and red processed meat (cooked weight) to be calculated and shown in comparison to maximum values set within the food and drink standards.
46. The ability to highlight obvious errors, for example:
 - missing micronutrient values for dishes which should contain them e.g. no calcium in macaroni cheese.
 - identify manual data entry error e.g. 20ml portion of soup rather than 200ml or 400g portion of melon rather than 40g.
 - manufactured products entered as a portion weight of 1g rather than weight of product.



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Any enquiries regarding this publication should be sent to us at

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