NUTRITIONAL ANALYSIS GUIDE

The purpose of this guide is to assist local authority catering managers, head teachers, governors, in-house catering managers and others responsible for nutritional analysis to facilitate the process of calculating the nutritional content of an average school lunch in line with the standards set out in the Healthy Eating in Schools (Nutritional Standards and Requirements) (Wales) Regulations 2013

We gratefully acknowledge the permission granted by the School Food Trust and the Scottish Government to use extracts from their published documents in the preparation of this guide.

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Introduction

The Healthy Eating in Schools (Nutritional Standards & Requirements) (Wales) Regulations 2013 ('The Regulations') aim to make the food and drink provision throughout the school day healthier. The Regulations came into force on 2 September 2013 in all maintained settings.

There are 14 nutrient standards and 10 food standards. There are also standards for drinks and other food provided outside of breakfast and lunch in maintained settings, under the Healthy Eating in Schools Regulations. Maximum nutrient standards are set for fat, saturated fat, non milk extrinsic sugars and sodium, and minimum standards are set for carbohydrate, protein, fibre, vitamin A, vitamin C, folate, calcium, iron and zinc.

The nutrient standards within the Healthy Eating in Schools Regulations apply to an average school lunch over *five consecutive school days*, and relate to overall food provision rather than individual consumption. Many schools (especially secondary schools) provide a choice of food and drink at lunchtime, so each pupil consumes a different balance of nutrients. Also, some pupils need to eat more than others depending on age, body size, metabolism and physical activity. Therefore, it is an average *school lunch over 5 school days* rather than every lunch consumed that must meet the food and nutrient standards.

The standards within the Healthy Eating in Schools Regulations must be applied to all food and drink provision across the whole school day, not just set menus, provided in cafeterias and dining rooms at lunchtime. Nutritional analysis is required for food and drinks served and sold at lunch times. In secondary school, where main meals or cake/biscuits are served a break time, these must be included in nutritional analysis. Foods served at other times throughout the school day are not nutritionally analysed. Food served at breakfast clubs must comply with Schedule 1 of the Regulations. Drinks served in maintained schools must comply with Schedule 5 and food served other than at breakfast or lunch must adhere to Schedule 6 of the Regulations.

Local authorities and schools that have opted out of local authority catering should be able to demonstrate that their food provision meets the standards within the Regulations. In order to do this, local authorities and schools will need to plan their menus in advance and nutritionally analyse the lunch provision.

For schools that have their catering services provided by the local authority, nutritional analysis should be undertaken by the local authority catering service. If you are a school who plans your own menus, develops your own recipes and determines what food and drink is provided during the school day, then it is likely that the school together with the governing body will need to take responsibility for the calculation of the nutrient content of an average school lunch (e.g. in-house catering provision). Schools that contract out their catering service to an external provider are responsible together with the governing body for assessing the extent to which the food and drink provision meets the Regulations and may want to specify that nutritional analysis is undertaken as part of the provider's contract.

It is important for everyone involved in school meals to understand the requirement to comply with these standards.

Nutritional Analysis Software

Nutritional analysis software is one tool that can be used to demonstrate compliance with the standards in the Regulations. It allows school meal providers to analyse their food and drink provision against these standards.

Using a nutritional analysis software program requires some expertise and nutritional knowledge.

The getting started checklist and flow chart (page 11-16) shows the steps to follow to complete nutritional analysis of school lunches.

Nutritional Analysis Information Required

To carry out nutritional analysis for primary, secondary, middle and special schools and PRUs the following information is required;

1. Number of lunches served (population figure)
2. Total number of each food and drink item served
3. Portion sizes of all foods and drinks served
4. Recipes for all food and drink item served
5. Manufacturers' specifications if required
6. Copy of the weekly menus

Planned Analysis and Operational Analysis

A planned analysis is one which is undertaken using "planned" or "provisional" figures. These figures are generally very accurate as they are based on previous experience of what food items sell well. Individual school catering teams tend to know how many of each food item they'll be "planning" to produce each day.

An operational analysis is based on actual sales data i.e. the number of food items that have actually been sold. As an example; if 40 portions of fish fingers were "planned" but only 25 portions were sold the operational figure would be 25.

Many school meal providers are able to carry out nutritional analysis using planned analysis very accurately. Once the menu has been analysed on planned analysis figures, an operational analysis should be carried out to check that the figures used in the nutritional analysis calculations are as accurate as possible.

Nutritional Analysis in Primary Schools

In schools where only set meals are provided e.g. primary schools, the number of portions served of each item is the number analysed as a child receives a “set meal” including a main dish (including protein and carbohydrate), vegetable item and a dessert. This method is referred to as **Primary School Analysis (PSA).** To make it less complicated, the menus can be analysed using percentages, where the population figure is always 100 and the split of items are divided using prior experience of the choices children have made previously. An example of this would be:-

Item	**Dish**	**Number for analysis**	**Dish**	**Number for analysis**
Protein item	Fish fingers	70	Vegetable and cheese dippers	30
Carbohydrate item	Creamed potato	65	Boiled potato	35
Vegetable	Peas	30	Baked beans	70
Dessert	Fruit wedges	25	Apple crumble	75

This example shows that 70% choose fish fingers while the remaining 30% have vegetable and cheese dippers, 65% choose creamed potato and the remaining 35% have boiled potato and so on for the remaining dishes. Total number of each item choice equals 100 (70 fish fingers + 30 vegetable cheese dippers = 100).

The number of items served is the number that is analysed for “set menus”.

Once analysis is completed using planning data, analysis will need to be completed using operational data, gathered over time to check the accuracy of the results (See the “getting started check list & flow chart”, page 11-16).

Where local authorities serve the same menu in a number of primary schools, analysis should be carried out separately if the “split of choices” between each school is different. To begin with, a planning analysis is sufficient; however an operational analysis is required to confirm if this step is necessary.

Nutritional Analysis in Secondary Schools

Nutritional analysis of school meals can be seen as complicated when menus offer many combinations of items e.g. cafeteria style menus in secondary schools. This is because foods on the menu are often offered for sale as single items rather than a "set" meal. Pupils can purchase any number of items of their choice which may or may not make up an "ideal" or "set meal". In this instance, although the cafeteria may serve 400 pupils, 650 items of food may be sold therefore making it complicated to work out the "number of lunches" (population figure) served. Although all the items are not "meals" they still need to be analysed and the overall menu offered to pupils needs to meet the food and nutrient standards.

Therefore, a method to analyse cafeteria style menus has been developed, **Secondary School Analysis (SSA)**. This method provides a consistent approach to determining the number of lunches served via collecting information on the number of main items (see pages 15 & 36 for definition) sold. It can be used with estimated uptake figures for a planning analysis initially, and should be checked for accuracy using actual uptake figures for an operational analysis. Page 15 provides a detailed explanation of how to undertake SSA for secondary schools that operate a cafeteria style system.

The Secondary School Analysis (SSA) method should only be followed where cafeteria style menus are served. Secondary schools that provide set meals only i.e. no single serve items can be purchased should follow the Primary School Analysis (PSA) method.

NB: Staff/visitor meals should not be included in the figures for calculating nutritional analysis

Nutritional Analysis in Special Schools

Pupils who need assistance with eating and drinking, or food with modified consistency, or who are selective eaters may have the same energy and nutrient requirements as other pupils. Therefore, they must also be provided for within an overall provision that is healthy and nutritionally balanced, i.e. meets the standards in the Regulations.

It is recognised that helping pupils with complex physical, emotional, behavioural and medical needs to meet their nutritional requirements may be harder to achieve than pupils without these conditions, but every effort should be made to cater for individuals with special dietary needs. The nutritional and texture requirements of the individual pupil should be considered along with the statutory standards when planning menus for pupils with special dietary needs. Additionally, provision should be made to ensure that the needs of pupils with conditions which require a medically prescribed diet are met.

To provide a special diet, schools and local authorities may need to work in partnership with a number of people including parents/carers, dietitians, school nursing service, catering staff, midday supervisors, teaching and support staff to ensure the Regulations are met. Setting out a clear procedure for identifying, reporting and delivering special dietary needs in the form of a policy is good practice.

Nutritional analysis applies to all schools. Food and drink provided as part of lunchtime provision must be nutritionally analysed using the appropriate methods (i.e. primary or secondary analysis) in line with procedures set out in this document. Only specialist foods provided as part of a medically prescribed diet would not need to be included within nutritional analysis calculations e.g. foods prescribed by dietitians such as supplement feeds. Advice should be sought from specialists for pupils with complex dietary needs.

Nutritional Analysis in Schools with Private Catering

In order to ensure that the food and drinks provided by a private caterer comply with the Regulations, the contract with the catering provider should specify that they provide the school with:

1. A copy of the full school lunch menu cycle including all food and drink items provided across the whole school day
2. A copy of the nutritional analysis results of the menu cycle for lunchtime provision. The nutritional analysis results show the nutrient content of an average school lunch provided as a bar chart or in table form. The nutritional analysis results should be based on foods served for lunchtime provision over 5 consecutive days. For secondary schools, where food provided at morning break is considered part of lunchtime provision e.g. baguettes or cakes/biscuits, this should also be included in the nutritional analysis results. The table/graph of nutritional analysis results should state the standards that the menu is analysed against e.g. secondary or primary.
3. Population figure – number of lunches served
4. Provision mix (an estimate of the number of portions of each item planned for lunchtime provision during the menu cycle). This should be detailed on the menu cycle
5. For secondary school analysis (SSA), copies of the data collection sheets and calculations carried out if applicable

On request, the contractor should also provide a copy of any specific recipes including recipe portion size, nutrient profile of the recipe and product specifications for bought-in items. This will enable you to confirm if specific dishes contain/do not contain ingredients e.g. that fruit based desserts contain enough fruit per portion to be classed as a fruit based dessert.

Evidence of meeting the food standards across the whole school day

Some nutritional analysis software programmes can assess provision of food standards. However, not all of the food standards can be assessed using nutritional analysis software. Separately from the results of nutritional analysis, you will need to ask the contractor to provide evidence of how they meet the following food standards across the whole school day;

- Meat
- Meat products
- Confectionery & savoury snacks
- Cakes & biscuits
- Salt & condiments
- Fruit
- Vegetables
- Fish (including oily fish)
- Potato and potato products
- Deep-fried or flash-fried food
- Drinks

Schools that contract out their catering services *must ensure* menus provided by private caterers are analysed against the standards in the Healthy Eating in Schools Regulations for *Wales*, in line with procedures set out in this document.

If your contract is already agreed, ask to renegotiate the contract to include the above to ensure compliance with the Regulations.

If it is not possible for the private caterer to nutritionally analyse the provision of food and drink on offer, it is the responsibility of the school to undertake it. The school will require the private caterer to provide the information in points 1 – 5 and using a nutritional analysis software program and/or advice from specialists, nutritional analysis calculations should be carried out to demonstrate compliance in line with the methods set out in this guide.

Points to consider

- Join up with other schools to work together to provide food and drink menus which comply with the Healthy Eating in Schools (Nutritional Standards & Requirements) (Wales) Regulations 2013

- Local authorities may wish to undertake joint working with other local authorities and/or opted out schools. Benefits of joint working include; cost savings in the purchase of services, menu planning, analysis and training as well as being able to develop an efficient service that avoids duplication of effort.

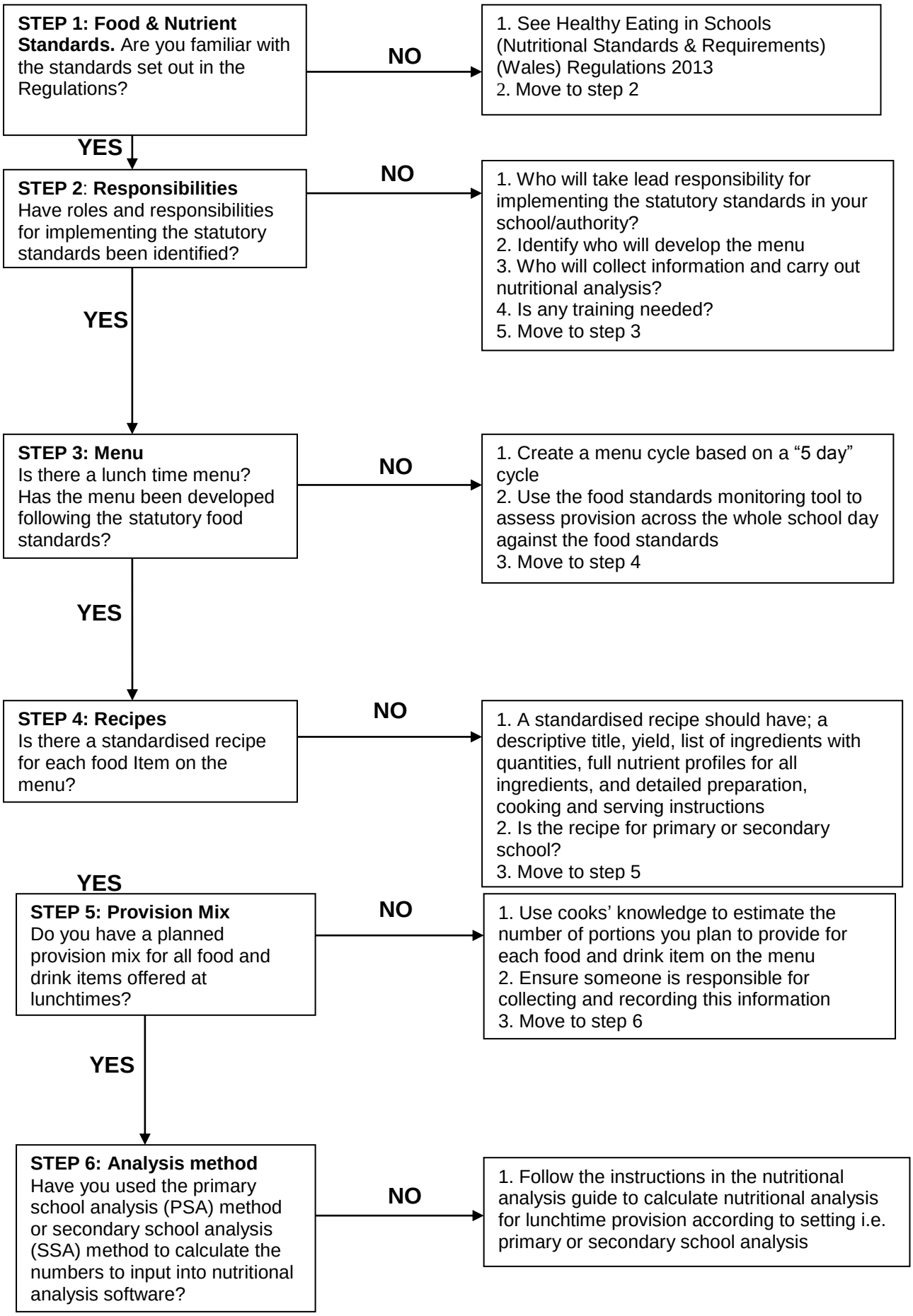
- Ensure there are clear roles, responsibilities and delegation between the school, private contractor and local authority if applicable. The checklist for caterers (page 31) may help opted out schools to review their current position in terms of undertaking nutritional analysis.

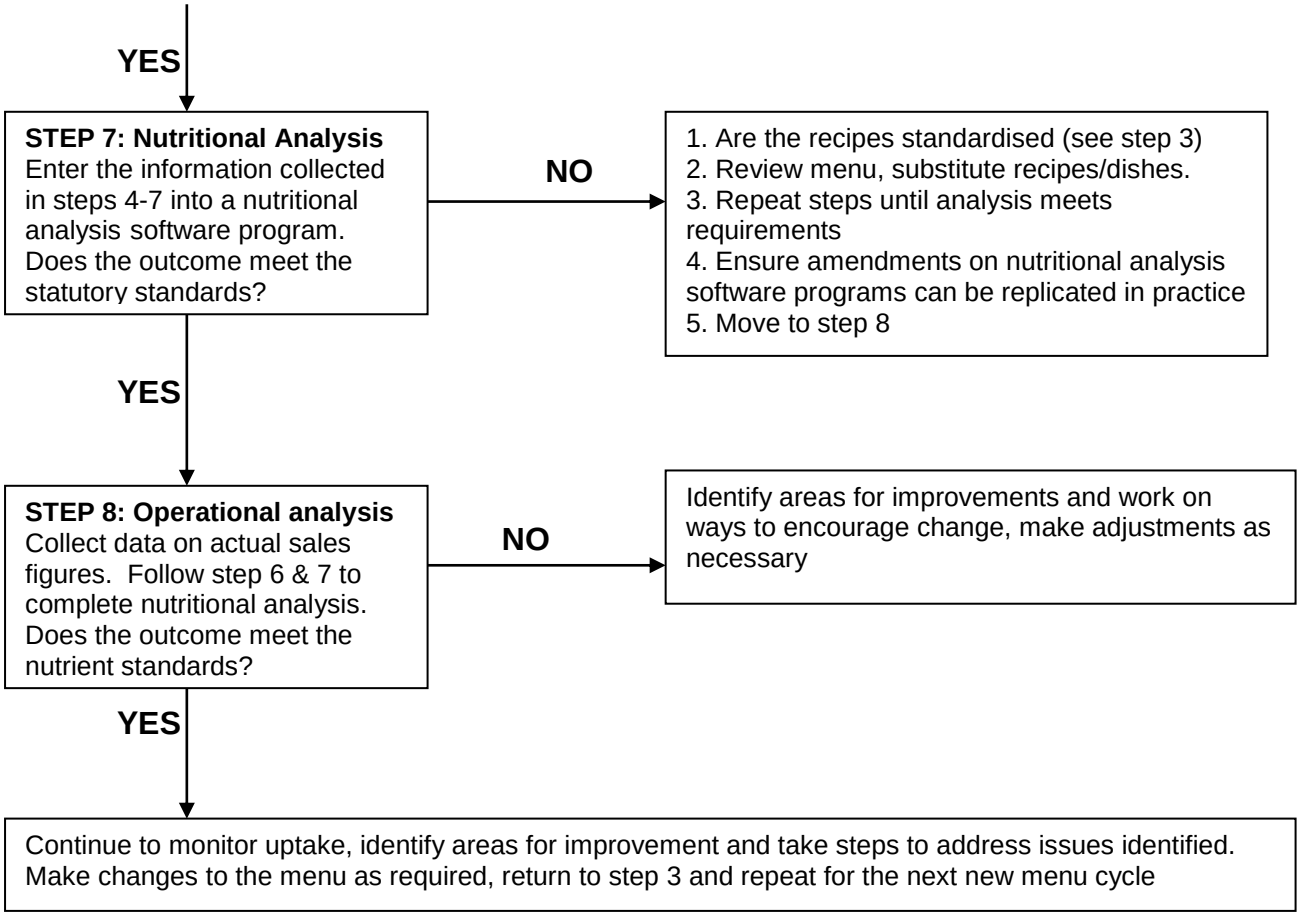
Getting Started Check List

	What do I need to do?	✓
1	Get to know the Regulations and the nutritient and food standards stipulated within, clarify roles and responsibilities for implementation (within the school and with the local authority if applicable)	
2	Plan your lunchtime menu cycle. This can be for one, two, three or four weeks. However, it should be analysed in “5 day” cycles i.e. one week at a time	
3	Collect all the recipes required for the planned menu cycle. You may need to collect manufacturers’ specifications for bought in products or special ingredients. It’s helpful if the recipes are standardised to include a descriptive title, measurement of each ingredient and specific ingredient details, detailed instructions for preparation and service, number of portions and portion size	
4	Estimate your planned provision mix. For each food and drink item, estimate the number of portions you plan to provide during the menu cycle. Remember to include all food and drink items available at lunchtime in your analysis (except unrestricted bread). This is known as	

	the “planning analysis”.	
5	Enter the information collected in steps 1 – 3 into a nutritional analysis software program. The preferred software program for Wales is Saffron but you can use any nutritional analysis software program (see page 24). Accurate analysis will depend on standardised recipes and consistent inputting.	
6	For primary schools: Complete the process “Primary School Analysis (PSA)”. See page 6 for details of the process.	
7	For secondary schools who serve cafeteria style menus: Complete the process “Secondary School Analysis (SSA)”. See pages 7 & 15 for details of the process. Secondary schools who serve set meals only should follow the PSA process.	
8	Check your nutritional analysis results against the standards. Are the recipes correct? Are the portions sizes correct? Is the provision mix correct? Is the population figure correct?	
9	Re-develop your recipes and/or menu to meet the food and nutrient standards	
10	Re-check your nutritional results against the standards. If menus are not compliant, check provision mix is correct and redevelop recipes/menus until compliant (remember to taste test any recipes that you redevelop)	
11	When substantial changes are made to the menu cycle (recipes or provision mix), analysis of the menu cycle will need to be undertaken again to ensure that it is still compliant with the Regulations	
12	Once the menu is compliant using an estimated provision mix, this menu will need to be checked against actual sales. Sales data will need to be collected showing the actual number of items sold each day of the menu cycle. This is known as an operational analysis. Follow steps 4 – 8 to complete the nutritional analysis using actual sales data for an operational analysis	

Getting Started Flow Chart




YES
STEP 7: Nutritional Analysis
Enter the information collected in steps 4-7 into a nutritional analysis software program.
Does the outcome meet the statutory standards?
NO
1. Are the recipes standardised (see step 3)
2. Review menu, substitute recipes/dishes.
3. Repeat steps until analysis meets requirements
4. Ensure amendments on nutritional analysis software programs can be replicated in practice
5. Move to step 8
YES
STEP 8: Operational analysis
Collect data on actual sales figures. Follow step 6 & 7 to complete nutritional analysis.
Does the outcome meet the nutrient standards?
NO
Identify areas for improvements and work on ways to encourage change, make adjustments as necessary
YES
Continue to monitor uptake, identify areas for improvement and take steps to address issues identified.
Make changes to the menu as required, return to step 3 and repeat for the next new menu cycle

Secondary School Analysis – SSA

1. Work out the total number of main items sold per day on the week's menu. This is the number that will be used as the "*population figure"* to calculate number of lunches served. All of these main items (in the proportions sold/planned for) will be included within the nutritional analysis.

Main items are defined as:

- Traditional meals, e.g. roast chicken dinner (including the vegetables/ potatoes), curry and rice etc (those with at least a starchy component and a protein component)
- Sandwiches/baguettes/panini/salad boxes, e.g. ham salad baguette, wraps
- Snack type options, e.g. filled baked potato, pizza, or a burger in a bun.

NB: Meal deals will need to be split in order to be analysed i.e. the "meal" will be counted as the main item and the other foods as part of the meal deal (e.g. dessert, fruit, yogurt, drink etc) will need to be categorised as below.

2. All other items not classed as main items (see above) are grouped together under the following categories:

A	B	C	D	E
- Soups - Desserts - Fruit portions - Yoghurts - Custard - Cheese & Crackers - Home baking	- Single serve vegetables - Single serve Salad	**Drinks** Including bottled water and fruit juice	**Side dishes** - potato wedges - coleslaw - chips - garlic bread - pasta - rice - potatoes	**Extras** - jam - margarine - sachets of tomato sauce - sachets of salad cream - sachets of mayonnaise

3. Enter the number of "category" items sold per day in each category A – E using the table above to categorise the items on your selected menu (see page 21 for category totals table to help organise the data).

4. Use this information along with the daily data collection sheet (see page 18) to determine whether or not you need to use the SSA calculation (see page 20) to work out the proportionate number of items to include within the nutritional analysis.

5. Once you have worked out the proportionate numbers of items to include in the analysis, transfer this information into a nutritional analysis programme. Remember to enter the population figure for each day in the population field.

REMEMBER: the calculation need only be carried out where the category total is **greater** than the **population figure**, if the category total is less than the **population figure,** all items within the category should be included in the analysis in the numbers sold/planned for.

Daily Data Collection Sheet

The daily data collection sheet (see page 18) should be customised to include all the food items relevant to your authority/school within the correct categories (main items and A – E) in *column 2*.

Complete *column 3* of this sheet for each day of your menu cycle, entering number of portions sold of each item. You may wish to transfer the "total figures" for each category into the categories total table (see page 21) to help you determine whether the total for each category is more or less than the number of main meal items.

If the total number of each category is **less** than the total number of main items (***XXX***), all the items in that category (in the numbers planned for/sold) should be entered into Saffron. This means that *column 4* on the daily collection sheet should be populated with 100 (i.e. 100% of the items) and *column 5* should be populated with the same figure as in *column 3* relating to that food (see page 22 for an example).

If the total number of each category is **more** than the total number of main items (***XXX***), the SSA calculation should be undertaken in order to work out the number of each item to include in analysis proportionately to the number of main items served. The figures from the SSA calculation should be used to populate *column 4* and *column 5* on the daily collection sheet (see page 22 for an example)

Daily Data Collection Sheet

DAY = …….

Column 1	Column 2	Column 3	Column 4	Column 5
Category	**Dish**	**Units planned (P)**	**Proportion % (Z)**	**Number equivalent for analysis**
Main items	Main meals		100	
	Snack meals		100	
	Sandwiches & baguettes		100	
	Pasta salads		100	
	Salad boxes		100	
	Panini		100	
	Baked potatoes with fillings		100	
	Total number of main meal items	**XXX[1]**	NA	
A	Soup			
	Fruits			
	Desserts			
	Home baking			
	Yoghurts			
	Total number for category A		NA	
B	**Vegetables (if not already included in main course)**			
	Hot vegetable			
	Side salad			
	Total number for category B		NA	
C	Smoothie			
	Fruit/vegetable juice			
	Water			
	Milk			
	Apple juice			
	Orange juice			
	Total number for category C		NA	
D	**Side dishes (extra and if not included in main meal)**			
	Single serve pasta			

[1] XXX = **Population figure**

	Single serve boiled potatoes			
	Naan/Garlic bread			
	Single serve chips			
	Single serve potato wedges			
	Coleslaw			
	Total number for category D		NA	
E	Salad cream sachet			
	Tomato ketchup sachet			
	Spread portion			
	Total number for category E		NA	

SSA Calculation

The SSA calculation should be carried out to determine the number of each food item to include in analysis in proportion to the population figure (total number of main items). This should be carried out when the category total is greater than the population figure. The answers generated in step one should be entered in *column 4* and the answers generated in step two should be entered in *column 5* of the daily data collection sheet.

Step 1

P (amount of items sold) **X** 100 = Z (% of total sales in category)
Y (total sales of items in category)

Step 2

Z x population figure = quantity of items to go into analysis
100

Example

Y = 700 drinks sold (category C total), but only 428 main items (population figure)
Split is 400 fruit juices, 200 bottles of water and 100 cartons of milk.
Therefore;
400/700 x 100 = 57% and 57% of 428 = 244 fruit juices are analysed
200/700 x 100 = 29% and 29% of 428 = 124 bottles of water are analysed
100/700 x 100 = 14% and 14% of 428 = 60 cartons of milk are analysed
Total number of drinks to include in the analysis = 428

REMEMBER: this calculation need only be carried out where the category total is **greater** than the **population figure**, if the category total is less than the **population figure**, all items should be included in the analysis A spread sheet is available on the Welsh Government website to assist in the calculations.

Category Totals Table

You can complete the following table to help you work out how many main items and items from categories A – E have been planned for/sold per day. Use this data to help you determine whether the total for each category is more or less than the number of main items and whether you need to undertake the SSA calculation.

	Monday	Tuesday	Wednesday	Thursday	Friday
Number of main items sold	***XXX***	***XXX***	***XXX***	***XXX***	***XXX***
Number of category **A** items sold					
Number of category **B** items sold					
Number of category **C** items sold					
Number of category **D** items sold					
Number of category **E** items sold					

Key
XXX = population figure

Daily Data Collection Sheet – Completed Example

DAY = Monday

Column 1	Column 2	Column 3	Column 4	Column 5
Category	**Dish**	**Units planned (X)**	**Proportion % (Z)**	**Customer number equivalent for analysis**
Main items	Chicken curry and rice	110	100	50
	Vegetable curry and rice	40		16
	Omelette and salad	16	100	16
	Selection of sandwiches	20	100	20
	Selection of baguettes	145	100	161
	Baked potatoes with fillings	45	100	45
	Total	***376***	**n/a**	***376***
A	Oaty apple crumble and custard	23	5.87	22
	Oaty apple crumble	50	12.8	48
	Custard	15	3.8	14
	Flapjack	169	43.1	162
	Banana cake	87	22.2	84
	Fruit salad	30	7.7	29
	Fruit yoghurt	18	4.6	17
	Total	**392**	n/a	376
B	Salad	75	100	75
	Peas	60	100	60
	Total	**135**	n/a	135
C	Water	200	41	154
	Milk	80	16.4	62
	Apple juice	104	21.3	80
	Orange juice	104	21.3	80
	Total	**488**	n/a	376
D	Coleslaw	75	100	75
	Oven chips	175	100	175
	Pitta bread	50	100	50
	Total	**300**	n/a	300
E	Salad cream sachet	80	100	80
	Tomato ketchup sachet	115	100	115
	Total	**195**	n/a	195

Nutritional Analysis – Points to Note

- All food and drinks provided at lunchtime should be included in the nutritional analysis. This includes products sold in other outlets such as vending machines and other take away facilities located within the school.

- The analysis does not take account of plate waste or consumption, nor does it apply to individual meals or selections. This is because the nutrient standards relate to the provision of the *average school lunch over five consecutive school days* and not the consumption of the lunch.

- Analysis should be carried out for each week of the menu cycle as well as for the menu cycle as a whole (i.e. for two, three or four weeks). This will enable you to check that both the nutrient and food standards in the Healthy Eating in Schools Regulations are being met e.g. oily fish must be provided twice over any 4 week period.

- There are different nutrient standards for primary and secondary pupils. For schools with both primary and secondary pupils e.g. special schools, a nutritional analysis should be provided for each set of nutrient standards.

- For the purposes of nutritional analysis, a school week represents a normal week of five consecutive days, Monday to Friday.

Nutritional Analysis Software Programs

The following information is intended as a guide to help you when purchasing a nutritional analysis software program to use for analysing school food provision.

The nutritional analysis software should contain a food directory consisting of data on:

- Ingredients
- Foods
- Drinks
- Manufactured products
- Food groups
- Menu items

These will be used to build up menus for the week and will be used during nutrition analysis.

The software package should use data from the most up-to-date version of 'McCance & Widdowson's Composition of Foods' plus supplements, which holds the composition of all basic foods. In addition, this should include updates on composition data of a range of foods that have been analysed as part of the Food Standards Agency's nutrient analysis catch-up project[2] and nutrient analysis project of pasta and pasta sauces[3].

The software supplier must ensure that a system is in place to update the database when a new version of 'McCance & Widdowson's Composition of Foods' is published or when updates on the composition of other foods are published by the Food Standards Agency.

For each item in the food directory, the software must hold data on the energy and nutrient content per 100g/ml. The software must also hold data on the following nutrients with which the standards for school lunches are based:

[2] http://www.food.gov.uk/science/surveillance/fsis2004branch/fsis6404

[3] http://www.food.gov.uk/science/surveillance/fsis2004branch/fsis6504

- Energy (kcal)
- Fat (g)
- Saturated fat (g)
- Total carbohydrate (g)
- Non milk extrinsic (NME) sugars (g)
- Fibre (g)
- Protein (g)
- Iron (mg)
- Zinc (mg)
- Calcium (mg)
- Vitamin A (µg)
- Vitamin C (mg)
- Folate (µg)
- Sodium (mg)

The food standards should also be part of the analysis wherever possible.

The software must also provide the facility to input data on other foods not included in the 'McCance & Widdowson's Composition of Foods' database (e.g. manufactured products used by schools). The facility should allow for the following data to be inputted:

- Product name
- Manufacturer
- Nutrient composition of food/drink per 100g/ml (must include energy and the 13 nutrients listed above) and indicate whether this nutrient data is "as purchased" or "as served"

Missing values of nutrients need to be obtained directly from the manufacturer or substituted with the nutrient value of a similar food from the 'McCance & Widdowson's Composition of Foods' database. The source of the value used to fill in the missing nutrient must be highlighted within the software (i.e. the code of the food used to substitute the missing nutrient). The software must also have a function to

flag up substituted nutrients values as ‘estimated values’ as part of the nutrient analysis report.

If, for any reason, data on any nutrient (as listed above) is not available / missing for a particular food, the software must have a function to flag up these missing values and to:

a) Distinguish this from a zero nutrient content in the database and
b) Highlight the missing values as part of the nutrient analysis report

For each recipe in the food directory, the software must hold data on:

- The ingredients
  Food Code
  Food Name
  Quantity of each ingredient used
  Cooking method
  Total weight of all ingredients (ideally)
  Total weight of finished dish (ideally)
- Portions/ Servings
  Number of portions
  Portion size (calculated by dividing finished weight of dish by number of portions)
- Nutritional Information
  Per 100g/ml
  Per portion

The software must allow the addition of recipes to the food directory.

The software must allow portion sizes to be adjusted.

The software must allow the user to enter sales splits, and have the capacity to carry out weighted nutrient analysis e.g. menu items that are served to more pupils provide a larger proportion of nutrients for that meal and therefore the nutrients in those menu items must be given more “weight”.

The software must allow the user to input the number of customers/ or meals chosen each day i.e. the population figure as well as work out the nutrients using percentages of number of items served.

For cooked recipes, the supplier of the software must provide the facility to estimate nutrient losses on cooking, using the values in appendix 4.3 of 6th edition of 'McCance and Widdowson's Composition of Foods'

The software must display the absolute values for energy and for each of the 13 nutrients of the analysed menu.

The software must allow the analysis to be calculated for the number of days specified to allow for shorter weeks.

The software must be able to calculate the nutrient content of the school lunch menu averaged over five consecutive school days (or a shorter week) e.g. the total sum of the nutrient over the school week, divided by the number of lunches across the week, divided by the number of days in the school week.

The software must provide the nutrient composition data for total non-starchpolysaccharides (Englyst method[4]) for all foods. This is to ensure that analysis of the dietary fibre content of menus can be compared directly with the statutory Nutrient Standard for fibre (non-starch polysaccharides).
'McCance & Widdowson's Composition of Foods' provides dietary fibre values based on the NSP (Englyst) methodology. However, it is recognised that for nutritional labelling purposes, manufacturers are increasingly measuring and recording the fibre levels in food using the AOAC[5] methodology. Therefore, if NSP (Englyst) data is unavailable for foods that are added to the food directory (e.g. by substituting with the fibre (NSP) value of a similar food from the 'McCance &

[4] Englyst H N, Quigley M E, Hudson G J, (1994) 'Determination of Dietary Fiber as Non-starch Polysaccharides with Gas–Liquid Chromatographic, High-performance Liquid Chromatographic or Spectrophotometric Measurement of Constituent Sugars', Analyst, 119, 1497–1509.

[5] AOAC (2000) Methods 985.29 and 991.45. Official methods of analysis 17th Ed W Horwitz, AOAC International, Gaithersburg, MD, USA

Widdowson's Composition of Foods' database), the following approach must be adopted in order to obtain a reasonable NSP value:

Dietary fibre values using the AOAC methodology must be divided by 1.33

The software must have a function to flag up these fibre values as 'estimated values' as part of the nutrient analysis report.

The 'McCance & Widdowson's Composition of Foods' database does not hold data for 'non-milk extrinsic sugars' (NMES). Although several different methods of calculating NMES have been documented[6], the menus must be calculated using the criteria set by Buss et al[7] as outlined below to estimate the non-milk extrinsic sugars (NMES) of all foods and drinks within the Food Directory:

- All the sugars in fruit juices as well as table sugar, honey and the sucrose, glucose and glucose syrups added to foods are taken as extrinsic
- All sugars in fresh fruit and vegetables are taken as intrinsic
- Sugars naturally present in fruit that are canned, stewed, dried or used in preserves are taken to be half extrinsic and half intrinsic
- Lactose, whether in a milk product or not, has been considered as milk sugar and added to the intrinsic sugars.
- The proportions of intrinsic and extrinsic sugars in other mixed and prepared foods are calculated according to the above principles

Note: NMES data on all foods from the National Diet and Nutrition Survey (NDNS) nutrient databank is available from the Food Standard Agency on request.

The software should compare nutritional content of a menu against the nutrient standards as set out in the Healthy Eating in Schools Regulations (Wales) 2013. There are two sets of nutrient standards based on age groups, primary-aged pupils and secondary-aged pupils. The software should allow the user to enter the required

[6] Food Standards Agency research project N08016: Critical appraisal of methods to estimate NMES in foods – identification of a recommended approach http://www.food.gov.uk/science/research/researchinfo/nutritionresearch/dietarynutrientsresearch/n08programme/n08projectlist/n08016/

[7] Buss DH, Lewis, J, Smithers G. Non-milk intrinsic sugars (letter to the editor) Journal of Human Nutrition and Dietetics (1994), 7, 87.

age group, and the nutritional analysis must be set up to use the appropriate statutory standards.

The software should be able to display the comparison of nutrient content of the menu against the nutritional standards, the number of customers and/or meals each day, portion size and sales split data.

Where the software displays the energy content of menus, it should be able to demonstrate if this is within 5% of the standard.

The following list, although not essential requirements of nutritional analysis software would be useful functions to allow for better analysis of school lunch menus.

- The analysis could be displayed in a format that allows the user to easily identify if a nutrient meets or does not meet the statutory standard. This analysis could be a graphical display, such as a bar chart incorporating colour coding to show whether the standard is being met
- The system could be web based to allow the user to access the software from any computer
- Offer system/software support e.g. online or by telephone
- Allow manual entry of recipes or editing of existing recipes to allow for instant adjustment or additions and increased flexibility
- Ability to print recipes, menus and analysis
- Ability to export/ import and email analysis and other data
- Ability to identify dishes on the menu which are high or low in a particular nutrient and offer appropriate substitute dishes
- Highlight or search for recipes or menus containing specific allergens or ingredients
- Cost breakdowns – food and staff costs
- Use of either metric or imperial weights
- Have a platter function to allow the user to add together different components to make up composite dishes of foods already in the database. For example a plate of mixed fruit, sandwiches, or biscuits and cheese, this would allow for various dishes if purchased together to meet the standards

Preparing for Nutritional Analysis – a Checklist for Caterers

Task	Yes	No	Further action required/comments
MENUS			
Is there a menu or menu cycle?			
Does the menu cover all foods produced on site including daily specials and last minute changes?			
RECIPES			
Is there a recipe for every item on the menu?			
Are all the recipes in a standard format?			
Do all recipes contain preparation and cooking instructions?			
Do all recipes contain portion size and number of portions?			
Do all recipes state whether they're for primary or secondary pupils?			
Do all recipes contain the correct ingredients and quantity of ingredients?			
SUPPLIERS			
Is there a regular supplier for every food/drink item?			
Is there a specification for every food/drink item purchased from each supplier?			
Are purchases occasionally made from a supplier not included on an authorised list?			
ADMINISTRATION AND RESOURCES			
Can all the information be gathered easily?			
What additional help do you require to gather information?			
Who can take responsibility for gathering some of the information within the school?			
Who will carry out the nutritional analysis?			
Are there any additional costs associated with gathering information and carrying out nutritional analysis?			
Is there access to a computer connected to the internet and a printer?			
Is extra training/support required to carry out nutritional analysis?			

Standard weights and measures conversion table

The following conversion table may help you when entering recipes into nutritional analysis software programs. Figures should be rounded up to the nearest whole number after conversion.

1 ounce (oz)	28.35 g
1 pound (lb)	453.6 g
1 gram (g)	0.0353 oz
1 kilogram (kg)	2.20516 lb
1 fluid ounce (fl oz)	28.41 millilitre (ml)
1 pint	568.3 ml
1 litre (L)	1.76 pints
1 teaspoon	1/8 fl oz 5 ml
1 dessertspoon	¼ fl oz 10 ml
1 tablespoon	½ fl oz 15 ml
1 level teaspoon of salt	= 5g (2g sodium)
1 heaped teaspoon of salt	= 8g (3.2g sodium)
1 teaspoon of bicarbonate of soda	= 4g (1.1g sodium)
1 teaspoon of baking powder	= 4g (0.47g sodium)
1 teaspoon of dried herbs	= 1g
1 level teaspoon of curry powder	= 3g

(Food Standards Agency, (2002). Food Portion Sizes, third edition. The Stationary Office)

Frequently Asked Questions

Q. Why do we need to undertake nutritional analysis?

A. School meal providers need to undertake nutritional analysis to know where their menus "comply" with the nutrient standards in the Healthy Eating in Schools Regulations. Nutritional analysis results can be used to help develop and amend recipes as well as for identifying ingredient replacements which might need to be lower or higher in a certain nutrient. Carrying out nutritional analysis using computer software is one method to do this.

Q. Who is responsible for undertaking nutritional analysis to establish the extent to which the food and drink served in schools meets the Healthy Eating in Schools Regulations standards.

A.

- For schools that have their catering services provided by the local authority, nutritional analysis should be undertaken by the local authority catering service.
- For schools that plan their own menus, develop their own recipes and have freedom to determine what foods are provided during the school day, then it is likely that the school together with the governing body will need to take responsibility for the calculation of the nutrient content of an average school lunch (in-house catering provision).
- For schools that contract out their catering service to an external provider, they are responsible together with the governing body for assessing the extent to which the food provided meets the standards and may want to specify that nutritional analysis is undertaken as part of the provider's contract.

Q. Which foods do the nutrient standards apply to?

A. The nutrient standards apply to all food and drink included as *part of the lunchtime provision* (e.g. main meals, desserts, drinks, jacket potatoes, sandwiches, salad bar, soups, baguettes, wraps, side dishes etc.) and not just to the main meal option. This means that all food and drink provided as part of a school lunch should be included in the analysis of an average school lunch. If you are providing foods at morning break which are eaten as a pupil's midday meal, these items should be included in the nutritional analysis of an average school lunch

Q. Why do we need to remove the figures for staff/visitor meals served?

A. The nutrient standards apply to pupils and not staff. Including adult figures with the nutritional analysis calculation will skew the overall results.

Q. Do we need to include items sold in vending machines within the nutritional analysis of the average school lunch?

A. All foods and drinks from all outlets sold as part of the lunchtime provision need to be included within the nutritional analysis. Therefore, if you have a vending machine selling food items, drinks & snacks (following the food standards) to which pupils have access to at lunchtimes then these items need to be included within the analysis. There is no set way to determine what proportion of sales in vending machines is sold at lunchtimes. You will have to use a reasonable estimate. The method used to calculate this should be determined locally and to suit individual circumstances.

Q. Can we include in the planning analysis a portion of fruit and a portion of vegetables for all pupils having lunch?

A. If a portion of fruit & vegetables is included as part of the set meal price and all pupils can have this as part of their lunch, then you can include 100% uptake in the planning analysis. This is the same as for all other items that are included in the cost of a meal. It would be good practice to ensure that menus make it clear that they have been analysed to ensure they meet the standards on the assumption that all pupils take all meal components.

In a secondary school cafeteria style menu, you can only include fruit & vegetables that are included in the cost of a dish, e.g. vegetables served with a main meal or meal deal. If the vegetables are priced separately and pupils pay extra for them, you can include only an estimate of how many portions would actually be purchased. An example would be side salad with a baked potato – if this is included in the cost of a filled potato, you can include 100% uptake of side salad in the planning analysis of the numbers you are using for filled baked potato. If the side salad is priced separately from the baked potato, then an estimate of how many pupils would purchase this item would be required.

Q. We sell a lot of drinks as single purchases in secondary schools. How should these be included in the analysis?

A. These should be included in the analysis in the proportions in which you sell them, with the maximum number included being the customer number. This ensures that single purchases will not skew the analysis, but also takes account of the variety and quantities of different drinks sold.

Q. Will serving meal deals in secondary schools help to meet nutrient standards?

A. Meal deals can help to meet the nutrient standards because pupils are purchasing a package planned to include all the elements they need to have a balanced lunch. If meal deals are marketed as being good value for money, they can be effective in encouraging more pupils to have a balanced lunch, which includes fruit and vegetables.

Q. If we **only** serve meal deals in secondary schools, do we assume in the analysis that all pupils have all meal deal components?

A. Yes. If all components of the meal deal are included in the price, you can assume, for the purposes of the analysis, that all pupils will have all of the meal deal components. This is because all pupils purchasing these meal deals will have the opportunity to have these items without any additional cost. If **only** meal deals are served in secondary schools, analysis can be undertaken using the method for primary school analysis (PSA).

List of Terms

Term	Explanation
Category totals	The total number of food items within each category “A – E” explained in the SSA method (page 13)
Main item	Food which is deemed the main part of the pupils lunch. The number of main items sold per day equals the population figure i.e. number of lunches served. Main items are defined on page 13.
Lunchtime provision	Food and drink provided for the main lunch meal. In secondary school this includes cakes and biscuits provided at break time.
Opted out school	A school that has opted out of *local authority catering services*.
PSA	Primary School Analysis
Population Figure	Number used by nutritional analysis software to determine the number of lunches served.
SSA	Secondary School Analysis
WLGA	Welsh Local Government Association