

Department of Human Services (Victoria)

**Nutrition Standards
for
Menu Items
in
Victorian Hospitals
and
Residential Aged Care Facilities**



Date

April 2009

Acknowledgements

The process established to develop these standards identified wide consultation with key stakeholders as a priority including dietitians and food service managers.

The initial group of dietitians responsible for these Victorian Nutrition Standards included Vicki Barrington, Kay Gibbons, Mary-Anne Silvers, Allison Lauder, Sofie Modulon, Linda Nolte and Marlis Gelsheimer supported by Jacquie Krassie.

Since 2005, the core group - Vicki Barrington, Kay Gibbons, Mary-Anne Silvers and Jacquie Krassie have remained active undertaking an annual review of the document, incorporating feedback from hospitals and commercial providers. During that time, the document was circulated to DAA Victoria and a workshop conducted to present the standards and stimulate feedback.

During the past year (2008), active involvement by representatives from the 2 hospital-based central production units has provided an extra dimension providing the knowledge necessary to refine categories and validate nutrient levels. The energy created by this interaction across sites and professions has provided a strong base from which to launch future revisions of the Standards.

The most recent involvement by representatives of the Dietetic Association Rehabilitation and Aged Care Interest Group (RACIG) has provided the expertise to extend the application of the Standards to residential facilities including aged care.

The dedication of all of those involved in this development of these Standards provides a benchmark for nutrition standards documentation in Australia. Each participant in the process is to be commended for their cooperation and professionalism.

Contents

Acknowledgements	1
1 Introduction	3
The process of developing the Standards	3
The philosophy of the Standards	3
Who the Standards are aimed at	4
Scope of the Standards	4
Access to the Standards	5
2 Nutrition principles.....	6
3 Portion sizes for standard items	8
4 Food preparation guidelines	9
5 The Bands – A concept.....	10
SOUP.....	11
MAIN DISHES - Meat.....	11
MAIN DISHES - Vegetarian.....	12
SALADS	12
SANDWICHES.....	13
DESSERTS	14
VEGETABLES	14
7 Recipe Analysis	17
Step 1 – document the ingredients.....	17
Step 2 – The method.....	18
Step 3 – Calculate the number of portions.....	18
Loss during Cooking by Evaporation	19
Loss during Packaging	19
Actual cooking loss	20
8 Recommendations for the 2009	21
Appendix – Background.....	22
Nutrient standards.....	22
The Test Menu.....	23
The Results	23
Acceptability / Patient expectations.....	24
References	26

1 Introduction

The development of the *Nutrition Standards for Menu Items in Victorian Hospitals and Residential Aged Care Facilities* began in 2005 in an effort to create standards for food suppliers catering to the Metropolitan public hospitals. At the time, no common standard existed. Each hospital had either developed their own menu standards or had none at all. Under the direction of the Department of Human Services, a group of dietitians and food service managers worked together to create the first draft of the Standards which have now been reviewed several times and continues to be a dynamic document.

The process of developing the Standards

In 2005 the Department of Human Services in Victoria undertook a Food Services Project that provided a centralised focus for food production for public hospitals. These Standards were initiated during this review process to provide a consistent standard for foods produced by the proposed central production facilities.

The concept for this document was based on the current working model from The Alfred Hospital. Dietitians from the Alfred Hospital collaborated with representatives from an external food service contractor to create a measurable definition of the expectation for the provision of food services with respect to nutrient content. See *Appendix - Background* for further details.

The philosophy of the Standards

Underpinning the Standards is the recognition that:

- Nutrition should be provided from food.^{2,3,4,5,6,7,8} Supplements, traditionally high waste items, are to be avoided where possible.
- The Standards should provide food that is acceptable to patients to ensure it will be consumed.

While being mindful of nutritional goals, the nutritional levels specified in the Standards were developed with an awareness of current eating patterns and taste preferences.

The Standards have been developed to incorporate measurable nutrient goals in a manner that can be utilised by food service departments, central production units and commercial providers. The Standards can contribute to the menu planning process undertaken by food service and dietetic professionals, providing a common language for assessing nutritional objectives and establishing menu patterns (See *How to Use the Standards in Menu Planning*).

Extending the application of this document, in 2008 the Standards were incorporated in Health Purchasing Victoria (HPV) tender specifications.

Who the Standards are aimed at

The Standards are aimed at all parties involved with the production of food for patients and residents including food service, dietetic professionals and commercial manufacturers.

The following table outlines the groups and how these individuals could apply these Standards in the workplace:

Table 1: Intended users and application of the Standards

Profession	Application of the Standards
Central Production Unit (CPU)	Product and recipe development
Producer – Commercial	Product and recipe development
Food Services Manager ¹	Product and recipe development. Menu planning
Dietitian, Nutritionist	Product and recipe development. Menu planning
Accrediting agencies	Monitoring compliance with standards

¹ In some facilities the person responsible for food services could be the Executive Chef, Chef or Manager of the facility.

While the document is aimed specifically at the food producer, whether in-house or an external commercial provider, the Standards are a useful tool for dietitians in the menu planning process. (See *How to Use the Standards in Menu Planning*).

Scope of the Standards

At the broadest level, the goal of the Nutrition Standards is to offer all patients the opportunity to consume a nutritionally adequate diet while in hospital. As the Standards do not guarantee nutritional adequacy, they do not replace the need for nutritional monitoring nor do they address the needs of the chronic poor eater or nutritionally challenged patient.

The Standards cover requirements for full ward diet and other diets that can be catered for by the 'main' menu with respect to:

- Nutritional composition of individual menu items
- A classification system for menu items reflecting absolute and relative nutritional value
- Portion sizes
- Guidelines for developing menus

The Standards do **NOT**:

- **Specify requirements for specialised therapeutic diets** e.g. low sodium, low potassium, gluten-free, metabolic disease, ketogenic. Health Professionals at each site are responsible for identifying patient groups at their facility that require variations to the nutritional standards and build the appropriate modified menu.
- **Define levels of texture modification**, they are intended to apply to 'soft' and 'minced moist' textures recognising that achieving these standards for 'smooth pureed' diets will be difficult. The reader is referred to the *Australian Standardised Definitions and Terminology for Modified Texture Foods and Fluids* launched in June 2007 by the Dietitians Association of Australia (DAA) and Speech Pathology Australia (SPA) for definition of textures.

- **Address short order menu items**

This includes menu items that may be offered to long term and difficult to feed patients/residents. Sites may identify menu items that are not compliant with the Nutrition Standards that can be offered to specified patients/residents.

- **Specify mid meals**

Mid meals will vary with respect to energy and nutrient value. Specifications for mid-meals are not included in these Standards. Each facility will be required to specify the standards for mid-meals to be provided at their site based upon the patient demographics and nutritional requirements. For nutritionally compromised patients, mid meals can make a significant nutritional contribution to their intake.

The use of high energy, high nutrient mid meals is considered appropriate for groups at nutritional risk such as aged care, psychiatry, frequent patients, paediatrics, rehabilitation young, rehabilitation older, palliative care and other long stay patients, including long stay patients in acute hospitals.

Examples of nutrient dense mid meals include scones, muffins, pikelets, cake, cheese and biscuits, sandwiches and custard tart or milk based drinks such as Milo and milk coffee. This list needs to be site specific and developed in consultation with the dietetic staff based on the nutrition profile for the patient population.

- **Include nutritional supplements**

The Standards recognise that although the food provided to patients is nourishing and provides adequate amounts of energy, protein and other vitamins and minerals, some patients/residents may require oral supplements that are additional to their meals and mid meals.

Oral nutrition supplements including fortified beverages are not considered a routine part of the standard meal service. A dietitian should be consulted in their application.

- **Replace the menu planning process** or address all the details of menu planning, such as the frequency of menu items on a menu, specific menu items. The Standards do support one aspect of the menu planning process – the specification of nutrition standards for menu items.

- **Detail service aspects of food provision**

This includes meal times and the provision of assistance with meals.

Access to the Standards

The latest version of the document can be obtained from the Victorian Department of Health or the HPV websites:

http://www.health.vic.gov.au/patientfood/nutrition_standards.pdf
http://www.hpv.org.au/tender_full.asp?id=70

The intent is to review the document annually and update the details consistent with the latest nutrition knowledge and feedback from the users and industry.

Since 2005, the Standards have been revised annually, incorporating feedback from users and providers, both public hospital production facilities and commercial manufacturers to reflect current nutrition treatment practices and production technology.

2 Nutrition principles

As mentioned in the previous section, the process of developing the Standards focused on providing guidance for the development of menu items that are:

- Acceptable to patients
- Meet their nutritional needs, and
- Minimise the need for supplementation

The following section discusses these patient and resident needs in more detail.

The health care population includes patients and residents with varying nutritional needs.

As **poor nutritional status** is often present and is a precursor or directly contributes to the need for hospitalisation, the hospital food supply needs to ensure all patients and residents are able to meet their individual nutrient requirements.^{3,4,5,6,7,8}

People entering acute, sub acute or rehabilitation facilities are a **heterogenous** group. We know that a majority are either already in, or at risk of developing, states of protein-energy malnutrition.

Older patients can be in hospital for extended periods waiting the resolution of complex medical problems and/or placement in rehabilitation or aged care facilities. These patients tend to consume **less quantity** than dietitians may consider ideal, and are frequently prescribed some form of oral supplement to boost their energy/protein intake. For many of these patients, getting them to eat is the problem and the food does need to be **tasty** to tempt them. As a result, most of these patients should not be actively managed for dietary risk factors such as salt and fat intake.

For the patient with a **small appetite**, offering a main meat-containing meal twice daily in addition to a cooked breakfast assists them in choosing meals that have the potential to meet their nutrient needs while minimising the need for special supplements.

The **acutely ill** patient who remains in-hospital for less than 5 days often eats small amounts of food and subsequently, they are further challenged to meet their nutrient requirements.

The nutritional needs of patients requiring **modified diets** who are in hospital for periods greater than 5 days are a group that are at nutritional risk and are the most difficult to accommodate with a standard menu. As their specific nutrient needs vary and their appetites are unpredictable, standard menus are often less than adequate. Likewise, the frequently admitted patients are also a group at nutritional risk.

Paediatric patients present a range of nutritional challenges associated with short stay patients, 'frequent flyers' and children who rely on nutritional intervention as dietary therapy. While few paediatric patients are considered 'malnourished, a portion of these patients require comprehensive, often individualised dietary intervention, the specifics of which are not addressed in this document.

At sites with **Rehabilitation and Aged Services Programs**, the patient profile varies from younger people (some teenagers/young adults) undergoing rehabilitation, to older people in rehabilitation or residential care, those admitted to an aged person's mental health program and those with neurological disorders for whom there is an increased need for energy in the diet.

This varied patient profile means that there needs to be a number of responses in terms of food, one being attention to availability and frequency of higher biological protein sources.

This is one of the principles supporting the provision of cooked breakfast and cooked meals at both lunch and dinner for some clients.

People admitted to sub-acute units, rehabilitation and residential care have **longer lengths of stay** and therefore the food supply is critical part of health maintenance and treatment for restoration of adequate nutritional status as part of clinical management. The more restrictive the food supply, the less likely individual patient needs can be met, affecting clinical management and quality of life. The importance of food in the clinical process in terms of cost benefit is well documented.

3 Portion sizes for standard items

The following chart identifies portion sizes for individual menu items. These portion sizes are intended to apply to all diets unless specified differently for specialised diets. Also:

- Requests for ‘small’ meals are expected to be provided with ½ serves.
- Requests for ‘large’ meals are expected to provide with 1½ standard serves.

Readers are reminded the Standards do not specify the frequency that items are offered on the menu. Each site is to determine the frequency with which each menu item appears on the daily menu.

Table 2: Portion sizes

Menu item	Portion size
Fruit juice, no added sugar or 100% pure	At least 100 ml
Porridge	At least 180 g
Ready to eat cold cereal (exclude muesli)	At least 20 g
Ready to eat muesli	At least 50 g
Milk, Low fat or full cream	At least 140 ml
Bread or toast, white or wholemeal or multi grain	1 slice, at least 30 g
Yoghurt (exclude Fruche)	100 g unless as a dessert on its own in which case the portion is at least 175 g
Cheese	At least 15 g
Butter or margarine	At least 7 g
Fruit, canned, drained	At least 100 g
Fruit, fresh	1 piece or equivalent
Jelly	At least 120 g
Ice cream	At least 100 ml
Soup	180 ml. It may be acceptable to have a smaller portion if soup is ordered with a main meal.
Main meal – Meat and vegetarian	See <i>Section 5</i>
Vegetables	See <i>Section 5</i>
Salads	See <i>Section 5</i>
Sandwiches	See <i>Section 5</i>
Desserts	See <i>Section 5</i>
Tea and coffee or milk based drinks	150 – 200 ml
Eggs, cooked (Breakfast)	At least the equivalent of 1 egg/serve
Bacon	At least 45 g

Note: With respect to yoghurt, a portion size range has been included to reflect the nutritional significance of the dessert menu items for undernourished patients.

4 Food preparation guidelines

The following provides further advice on the ingredients to be used in the selection and preparation of menu items for patients and residents:

- Use cooking methods such as steaming, grilling and baking more often than frying
- Meat and poultry will have gristle, cartilage and visible fat removed
- Fish will be boneless
- Offer choice of reduced fat and low fat dairy products
- Reduce the added fat used in recipes
- Use mono- and poly-unsaturated oils in cooking
- Use mono and polyunsaturated margarine and salad dressings
- Offer choice of wholegrain breakfast cereals and breads
- Fruit juice will be no added sugar, 100% juice
- Avoid prolonged cooking of vegetables and fruit
- Use reduced sodium products where possible e.g. Canned fish packed in water
- Offer choice of unsweetened canned fruits, in natural juice

While these Standards specify reduced fat and low fat dairy products and reducing the amount of fat added to recipes, for long term patients and residents where treating under-nutrition is the priority it may be appropriate for this to be optional. However, care must be taken to ensure that the nutrient density is not reduced by the use of high fat items.

5 The Bands – A concept

The Victorian Nutrition Standards use the concept of 'Bands' as a method of classifying menu items with respect to nutritional content and density:

These 'Bands' define nutritional profiles within each menu item category - soup, main dishes – meat and vegetarian, salads, sandwiches, vegetables and desserts – providing manufacturers with a measurable nutritional outcome for their products.

As well as grouping dishes by common nutrient profile, the Bands attempt to reflect foods typically used in the Australian diet to ensure a range of menu items are able to be offered to all patient groups including acute, sub-acute residents and patients who are frequent patients.

The Bands have been developed to address:

- Energy content
- Nutrient density
- Patient expectations

The Bands allow sites to individualise their menu format by:

- Selecting the appropriate band(s) for their client group(s)
- Assigning a contribution level (percentage) for each band for each client group

For further information see *How to Use the Standards in Menu Planning*.

The remainder of this section defines the nutritional standards for each Band for:

- Soup
- Main Dishes - Meat
- Main Dishes - Vegetarian
- Salads
- Sandwiches
- Desserts
- Vegetables

These Standards assume a tolerance of +/-10% in both nutrient content and portion size to allow for variations in nutritional analysis and portion size.

Nutrient levels in the following tables are specified for the portion size.

All examples cited below refer to a specific recipe. Depending upon the recipe, the same menu item (e.g. Pumpkin soup) can have a different Band allocation. Each facility needs to analyse their recipes and assess Band compliance.

SOUP

Band	Description	Portion size ml	Nutrients per portion size				Examples of typical compliant menu items
			Energy kJ	Protein g	Fat g	Sodium mmol (mg)	
1	Significant nutrient value. Represents a substantial part of the meal/daily intake.	180	At least 360	At least 5	Max 9	Max 27(621)	Minestrone, Lentil, Chicken and Sweet corn and Pea & Ham
2	Accompaniment for flavour and variety. Provides moderate energy but little other nutrients of any significant value.	180	At least 180	At least 2	Max 9	Max 27(621)	Pumpkin soup, Tomato soup and Potato & Leek

Broth is not considered a nutrient source and has not been included as a 'Band',
 Broth can be offered as a fluid source and should be offered where appropriate for fluid and special diets

MAIN DISHES - Meat

Band	Description	Portion size g	Nutrients per portion size				Examples of typical compliant menu items
			Energy kJ	Protein g	Fat g	Sodium mmol (mg)	
1	Predominantly solid/ single ingredient	90-110 ¹	At least 550	At least 20	Max 10	Max 7(161) ²	Roasts, fish
2	Wet dish with high meat content	Edible meat component 90-110 g. Total cooked weight of the entire dish at least 150 g	At least 700 Max 15 g carbohydrate /serve	At least 20	Max 15	Max 15 (345)	Examples include beef stroganoff, pork goulash, chicken and vegetable casserole, Moroccan lamb and cottage pie
3	Fairly even mix of meat and vegetables.	Edible meat component at least 75 g. Total cooked weight of the entire dish at least 160 g.	At least 700 Max 40 g carbohydrate /serve	At least 10	Max 15	Max 25 (575)	Salmon Quiche and Tuna mornay, Stir fries and Chicken risotto

Main Dishes (Meat) do not include vegetables or starches (e.g. potato, rice and pasta) accompanying the main meal.

The portion size range above represents the tolerance of +/-10% in portion size noted on the previous page.

Sauces/gravies accompanying hot main dishes are expected to be not less than 40 ml per serve.

¹ While the Standards specify a portion size of 100 g of cooked meat (edible portion), the impact of factors such as cooking technique on cooked yield is recognised. There is an expectation in the industry that 130 g raw meat provides 100 g cooked meat and therefore 20-25 g protein. Where production techniques result in a cooked yield is less than 100 g per 130 g of raw meat, kitchens and production facilities have the option of confirming the protein content of the edible portion of their cooked product by submitting product samples for chemical analysis. The site dietitian should interpret this analysis or method for suitability. At the same time, the impact of a reduction in edible portion size on plate appearance and patient/resident satisfaction at the site needs to be considered before deciding to reduce the portion sizes.

² Corned Beef, turkey³, ham and cheese are examples of meat items that will not comply with the sodium level specified for any of the Bands. These items are considered to make a valuable contribution to protein and micronutrient intake as well as menu variety and can continue to be included as a non-compliant menu item at a frequency to be determined by the dietitian and based upon the patient/resident needs. These items are however, expected to meet all the other nutrient criteria, except for sodium, in their relevant category.

Some hospitals may offer non-compliant 'Main Dishes - Meat' such as meat pies or sausage rolls on their menu at pre-determined frequency. While these items are of poor nutritional quality, facilities may choose to offer these items for popularity and variety.

³ At the time of this document being written turkey was only available as a high sodium product.

MAIN DISHES - Vegetarian

Band	Description	Portion size G	Nutrients per portion size				Examples of typical compliant menu items
			Energy kJ	Protein g	Fat g	Sodium mmol (mg)	
1	Higher protein content	160 cooked weight	At least 700	At least 15	Max 25	Max 25 mmol (575 mg)	Macaroni and cheese, lentil and tofu curry and spinach & ricotta slice
2	Lower protein content	160 cooked weight	At least 700	At least 8	Max 25	Max 25 mmol (575 mg)	Vegetable mousaka, vegetable patty, and ravioli with tomato sauce

Vegetarian do not include vegetables or starches (e.g. potato, rice and pasta) accompanying the main meal.

Portion sizes for vegetarian menu items will vary considerably. As a general guide, an assessment of portion sizes undertaken during the development of this document suggests:

- Portions of vegetarian paella and nasi goreng were acceptable at 160g
- Portions of flan and vegetable cottage pie were acceptable at 180g.

SALADS

Band	Description	Portion size g	Nutrients per portion size				Examples of typical compliant menu items
			Energy kJ	Protein g	Fat g	Sodium mmol (mg)	
1	Includes meat such as roasts and fish	Meat at least 100 g See below for Starch and salad components.					Roast Beef salad and Tuna Salad
2	Moderate protein content	Meat at least 90 g. See below for Starch and salad components.	At least 900	At least 10	Max 30	Max (575) ¹	Quiche and salad, Egg salad
3	Minimal nutrient value. Included for variety	At least 5 vegetables/fruit with a minimum of 90 g total weight	At least 100				Side salad, and Greek salad

The nutritional analysis for each Band excludes salad dressing (e.g. Portion control pack).

The nutritional analysis for each Band does include salad dressing used in composite salads.

Starch component (Potato, Rice, Beans, Bread or Crackers) must weigh not less than 90 g or be equivalent to 1 slice of bread (15-30 g CHO/serve).

Salad component (excluding the starch) must be a minimum of 5 vegetables/fruit with a minimum of 90 g total weight.

¹ Corned Beef, turkey, ham and cheese are examples of meat items that will not comply with the sodium level specified for any of the Bands. These items are considered to make a valuable contribution to protein and micronutrient intake as well as menu variety and can continue to be included as a non-compliant menu item at a frequency to be determined by the dietitian and based upon the patient/resident needs. These items are however, expected to meet all the other nutrient criteria, except for sodium, in their relevant category.

SANDWICHES

Band	Description	Portion size Points and g filling	Nutrients per portion size				Examples of typical compliant menu items
			Energy kJ	Protein g	Fat g	Sodium mmol (mg)	
1	Significant nutrient value. They may represent a substantial part of the meal/daily intake.	4 points. The lean meat component must be greater than 50 g/sandwich, cheese must be greater than 25 g/sandwich, egg must be greater than 45 g/sandwich and fish must be greater than 50 g/sandwich.	At least 800 including starch component	At least 10	Max 15 includes filling and spreads	Max 25(575) ¹	Egg and Lettuce sandwich and Roast Beef sandwich
2	Minimal protein value. They are included for a snack or light meal	4 points	At least 500 including starch component	At least 3	None specified	None specified	Assorted sandwiches and salad sandwich

¹ Corned Beef, turkey, ham and cheese are examples of meat items that will not comply with the sodium level specified for any of the Bands. These items are considered to make a valuable contribution to protein and micronutrient intake as well as menu variety and can continue to be included as a non-compliant menu item at a frequency to be determined by the dietitian and based upon the patient/resident needs. These items are however, expected to meet all the other nutrient criteria, except for sodium, in their relevant category.

Those responsible for this document recognise that the sodium levels allocated for sandwiches are relatively high but reflect patient acceptability and product availability. The Committee will be approaching relevant organisations to initiate discussions with industry with respect to reducing the level of sodium in bread to facilitate the move to reducing the overall intake of sodium across the population.

DESSERTS

Band	Description	Portion size g	Nutrients per portion size				Examples of typical compliant menu items
			Energy kJ	Protein G	Fat g	Calcium mg	
1	Moderate energy, high protein and calcium content. They may represent a substantial part of the meal/daily intake.	90-120	At least 500	At least 4	Max 7	At least 100	Baked custard and cheesecake
2	Significant level of energy and protein. They may represent a substantial part of the meal/daily intake	90-120	At least 800	At least 4	Not specified	Not specified	Fruit based desserts
3	Varying nutrient value. They provide moderate energy but little other nutrients of any significant value. They are included for variety and popularity.	At least 80 Excludes Mousse and whips which should weigh at least 60g	At least 300	Not specified	Max 7	Not specified	Fruit crumble and mousse
Custard/sauce are additional dessert components and should not be less than 60ml.							

VEGETABLES

POTATO/ RICE/ PASTA	Potato OR Rice OR Pasta not less than 90 g cooked weight. No added salt unless a multiple ingredient recipe is involved ¹ No added fat unless a multiple ingredient recipe is involved ¹
VEGETABLES	2 vegetables (total 120-140 g cooked weight) exclusive of vegetables in the Main Dish. No added salt unless a multiple ingredient recipe is involved ² No added fat unless a multiple ingredient recipe is involved ² Two contrasting colours.
¹ Vegetables include 'crushed' vegetables of multiple vegetables mixed together e.g. peas and corn; sweet potato and parsnip. ² Multiple ingredient vegetables have the potential to contribute to energy, protein and micronutrient levels. Examples of multiple ingredient vegetables include mashed potatoes, ratatouille and potato bake.	

6 How to use the Standards in Menu Planning

The Standards have been developed as one of the tools used in the menu planning process.

The following identifies how to use the Standards as part of the menu planning process.

1. Assess the patient/resident demographics required to determine the macronutrient requirements

The dietitian in consultation with relevant staff would identify the population group, their relevant demographics (e.g. Age, gender, medical circumstances) to develop a profile that provides the basis for documenting daily macronutrient requirements – energy and protein overall.

In some cases, there may be particular ward areas that have specific demographics that vary from the majority of patients/residents within the facility e.g. Maternity ward or Rehabilitation ward within a general acute care hospital.

This background data in combination with factors such as average length of stay inform the development of a menu format, degree of choice and menu selections.

2. Assess the macronutrient requirements for each patient/resident group

Again the dietitian at the site would be the person responsible for determining the specific nutrient levels that the menu should provide on a daily basis.

The information collected in the previous step will inform this calculation.

3. For each patient/resident group, document the number of meals and mid meals to be offered each day

The food service manager and the dietitian can collaborate in the development of a menu format including:

- The number of meals
- The number of mid meals

e.g. Acute care patients may be offered 3 meals plus 2 mid meals.

e.g. Older long stay patients/residents should be offered 3 meals and 3 mid-meals.

3. For each patient/resident group, document a menu format (list of menu items) for each meal and mid meal

The food service manager and the dietitian collaborate to identify the menu format:

- The menu items offered at each meal and mid meal (e.g. soup, main, salad, sandwich, dessert)
- The degree of choice for each of these

e.g. The breakfast format may include juice, fruit (canned), porridge, cold cereal, toast, condiments and hot beverage.

4. For each menu category specify the percentage of each Band

Based upon the patient profile, each site will nominate the Band frequency. The Bands are used to ensure the selection of menu items will be able to comply with the daily nutrient requirements (Steps 1 and 2 above). The Band frequency needs to be identified for each menu item.

e.g. Soup for Older long stay patients/residents may be required to meet Band 1 standards for 60% of the soups offered at the evening meal and Band 2 for the remaining 40% of soups.

e.g. Soup for acute care clients may be required to meet Band 2 standards for 90% of the soup served at the evening meal. However, when the main meal is sandwich or salad, the soup may be required to meet Band 1 standard.

As Band 1 is typically more nutrient dense than Bands 2 or 3, sites with patients/residents who are at risk nutritionally will nominate a higher percentage of Band 1 items.

5. For each menu category (e.g. Soup), specify dishes that comply with the criteria for the Bands

In order to ensure the final menu complies with the allocation of Bands, each site needs to allocate their menu items to a Band.

Depending upon the system operating at each site, dishes may be sourced as prepared products from a central production facility or an external provider or they may be produced on-site. Regardless, a nutritional analysis is required for energy, protein, sodium as a minimum to allocate items to Bands.

6. Allocate specific menu items to a meal period within the menu cycle

At this point the standard menu planning process begins as specific menu items selected to suit the Band profile nominated for each site.

As well as addressing nutritional adequacy, the dishes should reflect typical menu selections for the patient/resident group.

Factors such as variety and combinations of flavour, colour, texture and taste are considered in the determination of the final menu.

7. The final step

Once the menu has been documented, a selection of menu items can be analysed with respect to key nutrients and compared to the nutritional requirements nominated for the facility (Step 2 above). This may involve analysing the nutrients for a sample of days rather than the entire cycle.

The results of this step will confirm the ability of the menu to meet the nutrient requirements for the population at the facility. If there are discrepancies, a number of options are available to improve the nutritional offering such as modifying the Band frequencies, providing additional menu items (e.g. soup or dessert) or offering additional mid meals.

7 Recipe Analysis

The following information is presented as a guide to analysing the nutritional content of a recipe.

The information is expected to be relevant to:

- Dietitians
- Food service managers
- Production managers
- Chefs

This document presents a protocol for undertaking a nutritional analysis using a computer software system, highlighting issues to be considered at each step in the process. This protocol summarises the experience of food service and dietetic staff associated with the food production facilities in Melbourne at Austin Health (MediChef) and Southern Health. The collaboration between dietitians and food service professionals at these production facilities has presented a unique opportunity to accelerate the development of systems at each site as well as collaborating on this document.

Step 1 – document the ingredients

The first step in the process of analysing recipes is to read through recipe and become familiar with the ingredients and method. Ensure the detail related to each ingredient is sufficient to allow each ingredient to be specified accurately. For example, detail:

- The cut and/or the trim of the meat
- Brand of margarine
- Brand of stock cube. Is it the salt reduced version?
- Sodium levels in canned products such as tomato paste
- Bacon specifications - rindless? middle cut? trimmed?
- Stir fry mix - which vegetables are included?
- Cooked or raw ingredient? Generally ingredients are entered as raw weight
- Sizes of the eggs
- Weight/volume of the ingredient recorded as 'each'

Where possible, use the nutritional analysis specific to the product and brand, especially where this can make a significant difference to a nutrient being assessed. For example, document the actual sodium levels for ingredients such as vegetable booster and satay sauce. Check the package label or the manufacturer's website to collect nutrient values. This 'new food' can be entered into the nutrient database.

Where in-house products are used as an ingredient in another recipe (e.g. white sauce in penne pasta carbonnara) the nutritional analysis for the in-house product should be entered into the analysis of the final recipe.

Typically herbs and spices (e.g. turmeric, parsley) do not need to be recorded unless they contribute a relevant nutrient such as a sodium-based flavouring.

It is worth noting that the actual ingredient amounts will vary slightly from the theoretical amounts on the recipes due to rounding up or down. For example a recipe that specifies 68.9 kg chicken, cooks will typically use 70 kg.

Other factors such as whether the blood is drained from the meat can affect the ingredient inputs. It is important for food service managers and dietitians to realise that food service is not an exact science; the interpretation of these results needs to be tolerant of the limitation of the cooking process.

Step 2 – The method

Read through the method to identify the outcome of each ingredient. For example, check if any ingredients/juices are discarded at any point during production as you will need to account for this in your analysis.

Once you have all of the above information the ingredients can be entered into the nutritional analysis program.

Step 3 – Calculate the number of portions

The next step is to compare the portion (serve) size nominated in the recipe with the actual yield or number of portions. To calculate the actual number of portions:

- Determine the cooked weight of the recipe. This can be done by adding together:
 - the amount put in each tray/container plus
 - the amount taken for product modification (e.g. texture modification) if applicable) plus
 - the amount remaining attached to cooking equipment plus

This amount remaining attached to the cooking equipment can be affected by the product and the size of kettle being used. These amounts will stay the same whether producing a full batch or part thereof. The following are examples product loss associated with the kettles from one kitchen:

150 litre kettle	2 kg
400 litre kettle	20 litres

- Divide the cooked weight by the number of serves specified in the recipe.
- Compare the actual cooked weight per portion (serve) and compare this to that on the recipe portion size.
- A discrepancy in portion (serve) size can be the result of:
 - An inaccurate cooked weight
 - An error in ingredient weight/s
 - A recipe that does not reflect actual production
 - Unanticipated cooking losses

The following section discusses sources of product loss during cooking that affect yield.

Loss during Cooking by Evaporation

The degree of product loss during cooking will be affected by a range of factors including variations from the recipe that can be affected by interpretation by the cook and equipment specifications. Standardising these processes will contribute to consistency of production yield and confidence in the nutrient density of the end product.

One method of addressing cooking loss and standardising yield in wet dishes (casseroles) involves using a 'dip stick' to measure and control volume. The following technique is currently used at 2 production kitchens in Melbourne to control yield for soup, gravy and sauces.

Insert the dip stick in the kettle and note the depth to confirm required total recipe volume required after cooking process and before dispensing process is performed. If the final volume is less than the original amount, stock or water (depending on recipe) can be added to re-establish the original volume, ensuring the nutritional concentration of the final product is consistent with the intent.

Loss during Packaging

During production food product can be lost during transfer from the cooking vessel to the tray/container.

As these physical losses can vary with the preparation methods, observation of the production process is necessary to confirm these losses.

Once the quantity is confirmed the inclusion of the losses into the recipes needs to be considered. If losses are included, the number of serves may need to be increased to ensure an appropriate nutrient concentration in the analysis. For example, if a recipe specifies a yield of 20 serves but the chef has incorporated an amount for known physical losses, this additional volume needs to be included in the analysis by increasing the number of serves.

The amount of this loss will be affected by the processing equipment

A manual system where food is scooped from a large pot into smaller pan will result in less residual loss than an automatic system with pumps, valves and hoses e.g. 2 kg in 100 litre kettle.

Observations at one Melbourne production kitchen using a mixer kettle indicated a 2 kg product waste in system with a knock-off valve. This amount was consistent, regardless of the batch size.

With the automatic system there will be an additional amount left in the valves and hoses that are not visible to the eye.

With both systems the amount of product left attached to the cooking vessel can be observed and estimated visually as an absolute amount.

In both cases the amount of loss needs to be accounted for when calculating the yield.

Regardless of the system used, each production kitchen needs to identify the amount of residual loss for their products or product types.

Actual cooking loss

Table 3 below presents examples production yields observed at individual production kitchen in Melbourne. These yields may provide a point of reference for facilities when they are assessing yield and calculating actual portions.

These yields are provided as a guide only. Readers are reminded that each facility must confirm yields that accurately represent their recipes, equipment and processes.

Table 3: Yield from individual hospital kitchens

Product	Yield	Comment
Pasta	1 kg dry = 3 kg cooked	Based upon San Remo penne pasta cooked according to directions at 2 production kitchens. Sites using cook chill technology are advised to use high durum wheat pasta to avoid the end product becoming 'mushy' on reheating.
Casseroles		
Apricot chicken	92%	This result is based upon cooking the casserole for 1 hour with a sealed lid. A similar result was recorded in a commercial bratt pan.
Moroccan Lamb	87%	This result is based upon cooking the casserole for 2.5 hours with a sealed lid. A similar result was recorded in a commercial bratt pan.
Penne Pasta Carbonara	87%	
Zucchini Slice	95%	The method involves assembly of ingredients in the tray. The cooking loss reflects an oven loss associated with cooking for 1 hour at 150°C. As this is a soft choice the product is cooked slowly without a browning process for the top, both of which could reduce yield.

8 Recommendations for the 2009

The Nutrition Standards are not intended to replace the need for surveillance or monitoring of individual patients or customer satisfaction.

The Nutrition Standards provide a basis from which facilities can monitor compliance, control service delivery and develop corrective action for non-compliance.

There are opportunities to incorporate the Nutrition Standards into KPIs to optimise on-going monitoring and development.

These nutrition standards have been developed assuming that they will be reviewed every 12 months to ensure the standards are achievable and they meet the nutritional needs of the patients and residents.

Topics to be considered for inclusion in the next review (2009) include:

- Protein requirements
- Saturated fat
- Calcium
- Sodium
- The role of mid meals
- Further documentation to support the aged care sector including examples specific to aged care
- Aged care checklist

Appendix – Background

As part of the Metropolitan Melbourne Food Services Project, each Health Service was invited to nominate representatives to participate in a DHS Menu Planning Group, established to assist the project team in the documentation of quantities of menu items used each day and menu formats.

Once this documentation was finalised, the group continued to meet and extended their scope to include the task of developing nutritional standards. The Dietetic Sub-Group of the DHS Menu Planning Group completed the task of setting standards for the nutritional content of menu items. These Nutrition Standards were submitted to the Department of Human Services for endorsement for use in Metropolitan Melbourne Hospitals and were accepted by the DHS Food Services Steering Committee on 5th September 2005. They were subsequently submitted for endorsement as Nutrition Standards for all Victorian Hospitals.

The resulting documentation provides a strong basis from which to launch food service reforms as sites and suppliers (whether external or DHS operated) have an agreed set of documents to allow a coordinated approach to supply and operations focussed on nutritional specifications.

These Nutrition Standards are intended to define the scope within which menus are developed in a manner that accommodates different food service systems and institutions including the successful introduction of any centralised concept. The documentation provides an equally valuable basis from which to negotiate with suppliers and monitor on-going quality of operations of food services.

During the market testing segment of this project, existing food suppliers continually nominated a lack of standard specifications – nutrition, portion size and texture modification – as a major hurdle to increasing the range of products supplied to the healthcare food service market. Suppliers identified the healthcare segment as a growth area. However, due to the relatively small size of the market and the degree of variation across this market segment, suppliers have been challenged to optimise their processes. Standardisation is essential to ensure sufficient quantities for suppliers to provide a cost-effective range of products on a state or national level.

The Standards recognise the range of facilities – acute, rehabilitation, mental health, paediatric, etc – ensuring that individual needs can be accommodated and flexibility of service can be maintained with any system model.

The Menu Group, including the Dietetic Sub-Group, has established itself as an effective mechanism for consultation and coordination of food service and dietetic operational issues, a valuable resource for the implementation and management of any system chosen for Victorian hospitals.

Nutrient standards

The Nutrient Reference Values (2006) were nominated as the reference for assessing the ability of the Standards for specified menu items to provide adequate nutrition for patients/residents.

The **reference persons** nominated to assess the ability of the Standards to meet nutritional requirements was based upon the Nutrient Reference Values:

Male 76 kg 51-70 years
Female 61 kg, 51-70 years

Recognising their intended application to groups of healthy people, protein requirements were adjusted to reflect the increased needs of patients/residents as well as gender, age and weight profile.

The protein requirement selected to assess the Standards was 1.2 g/kg body weight, consistent with recommendations for healing and recovery (See *Table 4* below). This protein requirement is higher than both the RDIs (0.75 to 0.84 g/kg) and the EARs (0.60 to 0.68 g/kg).

Table 4: Protein requirements by medical situation

Protein requirement (g/kg)	Corresponding medical situation ¹¹
0.75	Standard
1.0	Diabetes, CVD , Older Australian ⁸
1.2-1.5	Convalescing from injury or mild trauma, Minor falls, Fractures, Haemodialysis, Liver disease, Pregnancy, Malnutrition, Infection, Older Australian ⁷
1.5-2.0	Cancer, CPD, Surgery, Multiple trauma, Malnutrition, Infection.

The Estimated Average Requirements (EARs) documented in the NRVs were nominated as providing an acceptable prevalence of adequate intakes of micronutrients for those patients/residents not nutritionally depleted.

The Standards assume that nutrient-density would be the foundation of menu items offered to patients/residents and if necessary, additional food and specialised products would be provided for patients/residents who require further nutrition intervention.

The Test Menu

To assess the ability of these Standards to satisfy nutritional requirements, a menu representative of patient/resident meal choices was analysed and compared to the nutritional requirements of Reference Persons.

This assessment focussed on nutrients reported in the literature to be at risk in patient/resident populations – energy, protein, iron, zinc, vitamin C, folate and calcium. ^{9, 10}

Test Menu	
Continental breakfast	110 ml orange juice 100 ml stewed fruit 30 g cereal (cornflakes), 140 ml reduced fat milk 1 slice toast, 7 g margarine, 1 portion control jam
Mid meals	2 sweet biscuits, 2 dry biscuits
Lunch	180 ml chicken noodle soup Egg sandwich 50 g ice cream 100 g stewed fruit (2 desserts)
Dinner	180 ml minestrone soup Roast lamb (100 g or 80 g) 90 g mashed potato 60 g carrots, 60g beans 60 g chocolate mousse

The Results

The test menu analysed was unable to meet the EARs for all Reference persons for: (See *Table 5* below)

- Energy
- Protein – except 0.85 g/kg for male and female and 1.0 g/kg for females
- Zinc except for pregnancy and lactation
- Folate
- Calcium

Energy and protein are critical nutrients with respect to the nutritional management of all patients ^{8,9}

As the menu was only able to meet the EAR for **protein** the Reference Persons for at the lowest level (0.75 g/kg), the significance of maintaining the portion size for meat at 90-110 g is reinforced.

Zinc is one of the most limiting nutrients in the diet. A main sources of zinc, particularly in aged care includes red meat, white meats (although they are not as high in zinc) and eggs. As both menus (80 g and 100 g meat portions) were unable to meet the EAR for zinc (12 mg per day); the significance of the meat portion was further reinforced.

For facilities with long stay patients or specialised groups such as maternity, improving opportunities to meet the EARs for vitamins and minerals such as calcium will need to be considered on a site-by-site basis.

Meeting the EARs for all patients is challenging, particularly when patient appetites are diminished by their condition or treatment, and the full meal is not consumed.

Table 5: Comparison of EARs for Reference Persons to the nutritional content of sample menus

Nutrient	Unit	EAR for Reference Person ¹²							Menu analysis ¹	
		Variations to protein requirement				Pregnancy	Lactation	Young Children	Average meat serving	
Protein ¹¹	g/kg	0.75	1.0	1.2	1.5	1.2			80g meat	100g meat
Energy	kJ	7.3 -9.6	7.3 -9.6	Increased	Increased	Increased	Increased	Age dependent	6.6	6.7
Protein - male	g	57.0	76.0	91.2	114.0	NA	NA		64.0	68.0
Protein – female	g	45.8	61.0	73.2	91.5	0.82g/kg	0.9g/kg		64.0	68.0
Iron - male	mg	6.0	6.0	6.0	6.0 7 to 16	NA	NA	6 to 8	12.3	12.5
Iron - female	mg	5.0	5.0	5.0	5.0	22-23	6.5-7	6 to 8	12.3	12.5
Zinc – male/ female	mg	12//6.5	12//6.5	12//6.5	12//6.5	8.5-9	9-10	5-11	10.3	10.9
Vitamin C – male	mg	30	30	30	30	NA	NA	28	93.0	93.0
Vitamin C – female	mg	30	30	30	30	38-40	58-60	28	93.0	93.0
Folate	µg	320	320	320	320	520	450	250-330	255.0	255.0
Calcium – male	mg	840	840	840	840	NA	NA	800-1,050	564.0	564.0
Calcium – female	mg	1100	1100	1100	1100	840-1,050	840-1,050	800-1,050	564.0	564.0

¹Analysis was undertaken using Food Works Professional Edition Version 4.00.1158 software, ©Xyris

Acceptability / Patient expectations

The expectations of patients with respect to meal combinations and portion size are critical to ensuring meals are appealing, stimulating to the appetite and consumed. In addressing acceptability and expectations, the Standards offer the following:

Individualisation of menu format

The Nutrition Standards are intended to allow each site to reflect current eating patterns within their community and the nutritional needs specific to their patient/resident groups. Each site retains the option to control the nutritional profile of the menu within the 'Band' concept. While the menu format is provided, the Nutrition Standards do not prescribe the frequency that each band is specified. For example, a site can choose to offer a roast and Band 2 menu item at one meal and sandwich and Band 3 at alternate meal. This allows individual sites to specify the nutritional content and budget for their menu.

Portion size

Feedback from Food Service Managers and dietitians indicates that the appearance of the meal impacts on the acceptability of the meal.

As portion size affects appearance of the meal, portion sizes have been based not only on nutritional requirement, but also to reflect the expectations of the community.

Although the quantities specified in this Standard are appropriate nutritionally, for some people, the portions nominated in the Standards may be larger than what they can eat in one sitting. In this case, 'small' serves are included in the Standards. For those who consume smaller portions, offering a main meat meal twice daily and at breakfast becomes more important. Typically, these patients are nutritionally vulnerable, needing small frequent meals of nutrient and energy dense foods and fluids. While supplements can be used to provide missing nutrients, the Standards assume a duty of care to ensure that food supply can meet food preference and nutritional needs of patients.

References

1. British Dietetic Association. *Delivering Nutritional Care Through Food and Beverage Services*. December 2006.
2. Kondrup J. Can food intake in hospitals be improved? *Clinical Nutrition* 20 Supplement 1 2001; 153-160
3. Milne AC, Potter J, Avenell A. Protein and energy supplementation in elderly people at risk from malnutrition (Cochrane Review). *The Cochrane Library* Oxford: Update Software. 2003; 2
4. Alison S O. ed. *Hospital food as treatment*. Maidenhead: UK: British Association for Parenteral and Enteral Nutrition. 1999.
5. Schenker, S. Undernutrition in the UK. Briefing Paper. *The British Nutrition Foundation Nutrition Bulletin* 2003; 28: 87-120
6. Council of Europe Committee of Ministers. Resolution ResAP (2003)3 on food and nutrition care in hospitals. 12 November 2003. (Also available from: http://195.92.246.148/nhsestates/better_hospital_food/bhf_downloads/nutrition/council_of_europe_adoption_text.doc, accessed 1 September 2005.
7. NHS Scotland. *Clinical Standards for Food, Fluid and Nutritional Care in Hospitals*. (Also available from: http://195.92.246.148/nhsestates/better_hospital_food/bhf_downloads/nutrition/scotland_food_fluid.pdf, accessed 1 September 2005.
8. Better Hospital Food Nutrition. (Also available from: http://195.92.246.148/nhsestates/better_hospital_food/bhf_content/nutrition/overview.asp, accessed 1 Sept 2005.
9. National Health and Medical Research Council. *Dietary Guidelines for Older Australians*. 1999.
10. Porter KH, Johnson MA. Dietary Protein Supplementation and recovery from femoral fracture. *Nutrition Reviews* 1998; 56 (11); 337-340.
11. Curtin University of Technology. School of Public Health. Department of Nutrition, Dietetics and Food Science. *Dietitians' Pocket Book*. January 2006.
12. National Health and Medical Research Council. *Nutrient Reference Values for Australia and New Zealand Executive Summary*. 2006.