The development of quantitative nutritional guidelines for a central kitchen: a tool for classifying menu items into diabetic, cholesterol-lowering and weight reduction diets

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THE DEVELOPMENT OF QUANTITATIVE NUTRITIONAL GUIDELINES FOR A CENTRAL KITCHEN:
A Tool for Classifying Menu Items into Diabetic, Cholesterol-lowering and Weight reduction diets.

A major project submitted in partial fulfilment of the requirement for the award of the degree of

MASTER OF SCIENCE
(Nutrition and Dietetics)

UNIVERSITY OF WOLLONGONG

by
Katja Jukkola

GRADUATE SCHOOL OF HEALTH AND MEDICAL SCIENCES
UNIVERSITY OF WOLLONGONG
1995
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ABSTRACT

The catering service of an institution has the responsibility of meeting the residents' nutritional needs. Caterers require practical and specific guidelines to help them plan nutritionally adequate menus. Hence, the purpose of this project was to formulate a set of quantitative nutritional guidelines that would enable a central kitchen to classify menu items into diabetic, cholesterol-lowering and weight reduction diets. The central kitchen caters for several aged care settings and does not employ a dietitian.

The nutritional criteria were developed following a review of existing quantitative dietary guidelines for food service, present recommendations for the management of the three special diets, and current information on the nutritional requirements of elderly people. The lack of rationale for the nutritional guidelines stipulated by other organisations was noted. Hence, the proposed criteria are largely based on recent data regarding the three special diets and the dietary needs of the elderly. The proposed guidelines define acceptable levels of fat, saturated fat and/or sugar for different categories of menu items. A nutrient analysis of 89 per cent of the menu items was conducted using the DIET 1 (Xyris software) computer program. The menu items were then classified as suitable or unsuitable for the three special diets, according to the proposed nutritional guidelines. Sixty per cent of the items were classed as suitable for all three special diets.

It is recommended that the Central Kitchen increase the proportion of items classed as suitable to 70 per cent, by reducing the levels of fat, saturated fat and sugar in various recipes. It is also advised that a dietitian is involved in the planning of new recipes and monitoring the nutritional status of the residents. Furthermore, there is a need to maintain data on the number and types of special diets present at the aged-care sites.
CHAPTER 1: INTRODUCTION

Food service is a crucial element in the health care of people who receive most or all of their food from a catering facility within an institution (such as a nursing home). The catering service bears the responsibility of providing residents with meals that meet individual psychological, sociological and physiological requirements (New South Wales Department of Health, 1989). Therefore, sound nutrition principles are essential to designing institutional menus (Stewart and Hunwick, 1988).

Numerical guidelines are especially valuable to caterers as they require practical recommendations to help them plan healthy menus. However, very few sets of quantitative nutrition guidelines exist in Australia. At the national level, the Dietary Guidelines for Australians are qualitative general recommendations, which offer a foundation for creating more specific and relevant guidelines for particular populations. Thus, many individual organisations have formulated their own sets of nutritional guidelines which reflect the national dietary recommendations (Williams, 1994). Although the guidelines suggested by other organisations may be useful, it is important to modify the criteria according to the requirements of the target population, as well as the constraints of the catering environment in question.

The food service system must also accommodate the special needs of those people on therapeutic diets. Diet is the chief mode of treatment in certain conditions such as diabetes, obesity and hyperlipidaemia. Thus, the development of and adherence to food service nutrition standards for such conditions is vital. Numerical guidelines can help to ensure that therapeutic menus are nutritionally adequate and appropriate. Hence, this project was undertaken to create a comprehensive set of quantitative nutrition guidelines, which would enable a Central Kitchen to classify menu items into diabetic, cholesterol-lowering and weight reduction diets. The Central Kitchen caters for a number of aged-care settings, and so the target population consists of institutionalised elderly people.
The term 'elderly' can be defined as a state of mind, however the more common definition refers to persons over the age of 65 years. The appropriateness of this definition is questionable, as biological and chronological age are not always corresponding. Consequently, ‘elderly’ people are a very heterogeneous group. Regardless of this notion, this report will use the conventional definition above.

The proportion of elderly people in Australia is expanding. In 1993, 11.7 per cent of the total population was aged 65 years and over (Australian Bureau of Statistics, 1994). It has been forecast that by the year 2041, the elderly will comprise between 20.5 and 22 per cent of the population (ABS, 1994). Today the average life expectancy for men is 73.9 years and for women is 80 years (ABS, 1992).

One major impact of the aging boom is the increase in chronically ill and/or dependent persons. Currently elderly people account for 30 per cent of all health care services (Bidlack, Hamilton-Smith, Clemens and Omaye, 1986), and this demand will inevitably expand. The mounting strain on health services (public and private) necessitates greater attention by all health care professionals (Fischer and Johnson, 1990). That is, there is a growing need for both services (such as home-delivered meals) that assist elderly people to remain living independently, as well as institutional care facilities.

The institutionalised elderly are defined as those elderly persons who permanently reside in homes, long-stay hospital wards, nursing homes, or hostels (Stewart and Hunwick, 1988). The term ‘aged care setting’ encompasses all of these institutions as well as retirement villages and self-care units. The majority of elderly people live independently in the community, however, 16 per cent reside in nursing homes or hostels (Australian Council on the Aging, 1990, cited in Stewart, 1993). The proportion of people living in institutions is correlated with advancing age, whereby five per cent of those aged 65 to 74 years are institutionalised, compared to more than 40 per cent of those beyond age 85 years (National Health & Medical Research Council, 1992a). Nursing home residents tend to be more frail, have serious physical and/or functional impairment, and are
more dependent. Whereas, elderly people who are relatively healthy, independent and mobile may live in hostels, self-care units or rest homes.

The need for provision of medical, social and government services for older people will intensify. In order to maintain health and vigour, independence and quality of life, it is necessary to reduce the incidence of diseases and improve control of symptoms of established disease states (Stewart, 1993). Meeting the nutritional needs of the elderly will assist in achieving these goals. Therefore, it is important to develop nutritional guidelines for the catering service of institutionalised elderly people.

In this project, a nutrient analysis of the current menu items (provided by the Central Kitchen) will be performed. These results will be compared with the proposed nutritional guidelines so as to determine which items are suitable and unsuitable for the three special diets (ie: diabetic, cholesterol-lowering and weight reduction diets). The difficulties and issues that arise during the development and implementation processes of the nutritional guidelines will contribute to the recommendations made for future research into dietary guidelines for food services.
RESEARCH AIM:
To develop quantitative nutritional criteria for the classification of menu items suitable for a diabetic diet, cholesterol-lowering diet and weight reduction diet, in a Central Kitchen which provides meals to a number of aged care settings.

RESEARCH OBJECTIVES:
1) To perform a nutrient analysis of the prepared items available on the menu.

2) To develop quantitative nutritional criteria to enable the classification of meals into diabetic, cholesterol-lowering diets and weight reduction diets.

3) To classify the analysed menu items as suitable or unsuitable for diabetic, cholesterol-lowering and weight reduction diets.

4) To make recommendations which will assist the Central Kitchen to modify recipes to meet the proposed guidelines.

5) To describe and review criteria that the Central Kitchen currently uses to classify meals into special diets.
2.1 Existing dietary guidelines

In Australia, hospitals and other institutions (which are responsible for catering for their residents) have been encouraged to provide healthy food choices for their clients (Better Health Commission, 1986). However, there are few sets of comprehensive nutrition guidelines available to caterers. At the national level, the Dietary Guidelines for Australians provide a foundation for developing specific recommendations for different target groups.

(2.1.1) Dietary Guidelines for Australians

In 1982, the Commonwealth Department of Health first published the Dietary Guidelines for Australians. These were last revised in 1992 by the National Health and Medical Research Council (NH&MRC, 1992b). The guidelines, listed in order of priority, are as follows:

1. Enjoy a wide variety of nutritious foods.
2. Eat plenty of breads and cereals (preferably whole grain), vegetables (including legumes) and fruits.
3. Eat a diet low in fat and, in particular, low in saturated fat.
5. If you drink alcohol, limit your intake.
6. Eat only a moderate amount of sugars and foods containing added sugars.
7. Choose low salt foods and use salt sparingly.
8. Encourage and support breast feeding.

Guidelines on specific nutrients:

1. Eat foods containing calcium. This is particularly important for girls and women.
2. Eat foods containing iron. This applies particularly to girls, women, vegetarians and athletes.
The Guidelines translate current scientific data into simple nutrition messages for the community. They only apply to healthy adults, and are not suitable for people with particular nutritional concerns. The guidelines are not designed to be quantified, and they should be regarded as a complete set rather than as separate objectives (NH&MRC, 1992b). Also, the guidelines refer to the total diet, and should not be used to rate the nutritional value of individual food items (NH&MRC, 1992b).

Despite these limitations, the Dietary Guidelines for Australians are a useful framework for creating more comprehensive and relevant guidelines for specific population groups, such as the elderly. In the ‘Guidelines for Nutritional Care and Food Service in Nursing Homes’, it is suggested that nursing home meals are to be catered according to the national Dietary Guidelines (Commonwealth Department of Health: Nutrition Section, 1984). Both the North Sydney (1992) and Lachlan (1995) Area Health Services also advise that nutritional standards for older people should be based upon these guidelines. One of the main reasons why it is appropriate to apply these guidelines for the elderly is their requirement for more nutrient dense foods. For instance, restricting fat (Guideline no. 3) and sugar (Guideline no. 6) intake increases the nutrient density of the diet.

There have been several attempts to implement nutrition guidelines in food service systems. Some important implications for planning menus that conform with such guidelines are illustrated with the following examples:

* The menu in a 100 bed community hospital in England was modified with a view to creating a more healthy menu, which was acceptable to patients as well as being no more expensive than the existing menu (Anderson, Cook, Debenham, Myatt and Wykes, 1986). A healthier menu was achieved by changing the food preparation techniques and adjusting the ingredients (eg: low fat milk was substituted for full cream milk). The project highlighted the following needs;

1. catering recipes that meet dietary guidelines
2. dietetic advice in both food purchase and training of catering staff
3. contracts to supply bulk orders of healthy food products.
* The construction of a new, 150 bed private hospital in Perth provided an ideal opportunity to establish a food service which conformed to the Australian Dietary Guidelines (Dawe, 1987). Staff and patients considered the resultant meal service as successful. The strategies used to implement the service included: close consultation between the chef and dietitian; “Food News” leaflet distributed to patients to increase their nutrition awareness; nutrition in-service training for all nursing and catering staff; food service questionnaire for patients.

* Richards DeLeeuw, Windham, Lauritzen and Wyse (1992) assessed the difficulties in formulating diets that meet Recommended Daily Allowances (RDAs) and Diet and Health recommendations. One of their findings was that fatty spreads (and other high fat items) had to be either omitted or severely restricted, because of their nutrient ‘dilution’ effect. That is, over-consumption of fats meant that the requirements for other nutrients could not be met without exceeding the recommended level of energy intake.

* Clarkson and Nutbeam (1991) examined the implementation of healthy food policy in over 100 hospitals in Wales. The study revealed some common problems when implementing a nutrition policy;

1. inadequate preparation for introducing the policy - whereby few staff were trained and there was limited promotion of the policy to staff and patients
2. decrease in initial momentum - reflecting a lack of detailed planning of the implementation process
3. inconsistencies within hospitals between different food providers
4. external constraints on implementing the policy - including costs and external bidding for catering contracts.

* A study of 13 nursing homes in the Central Sydney Health Service Area revealed that the Australian Dietary Guidelines were not being fully implemented (Chapman, Samman and Lilburne, 1993). Among other features, menus were assessed according to the number of ‘high fat’ and ‘high salt’ items served in a menu cycle. Foods that were classed as ‘high fat’ included: fried foods, fatty meats, quiches, mornays. Thus, qualitative (non-numerical) standards were used to
classify food items. The study found that 31 per cent of meals were high in fat and 20 per cent were high in salt. The authors recommended that it may be easier to design menus using lists of high fat/sugar foods, rather than assess each menu item according to the Dietary Guidelines.

* Dollahite, Franklin and McNew (1995) analysed hospital menus that were designed to meet the (American) Dietary Guidelines and the RDAs for individual nutrients. Those menus which met the guidelines tended to be inadequate in one or more micronutrients. However, this problem was overcome when the guideline for ‘variety of foods’ was emphasised. The authors concluded that it is challenging, though possible, to design menus which meet the Dietary Guidelines and RDAs.

* A survey of New South Wales hospital menus indicated that in recent years there has been a positive trend towards menus that are more consistent with the Dietary Guidelines for Australians (Dunn and Williams, 1995). Some of the changes that had occurred include: increased availability of low fat milk and polyunsaturated margarine, inclusion of nutrition messages on menus, and reduction in percentage of high fat main menu items offered.

The Australian Dietary Guidelines are qualitative and relatively non-specific, and are therefore open to interpretation. Caterers require more practical and concrete recommendations. The Victorian Catering Improvement Program and the Dietary Guidelines for Australian Caterers are intended to assist caterers to plan healthy menus.

(2.1.2) Victorian Catering Improvement Program (Leng and Woods, 1990)

The Victorian Food and Nutrition Policy, adopted in 1987, supports the principles of the Dietary Guidelines for Australians. This policy was the foundation for the Catering Improvement Program which aims to assist caterers to incorporate the Dietary Guidelines into their catering practices. The program includes a rating system for selecting foods. Caterers are given a chart which grades food items as either “Excellent”, “Good”, “Fair” or “Not recommended”. The foods are rated according to the number of Dietary Guidelines they meet (eg: “Excellent” foods meet four specific guidelines). The Food Selecting Rating Chart is therefore a useful tool for choosing foods which reflect the Dietary Guidelines.
(2.1.3) Dietary Guidelines for Australian Caterers (Williams, 1992)
Williams (1992) has developed a set of guidelines created specifically for caterers, to assist them in providing healthier food choices. These guidelines are also based on the Dietary Guidelines for Australians. One of the primary rationales for this approach is that the range and quality of food provided in health care facilities should represent the nutrition messages given to the general public (BHC, 1986).

Williams outlines detailed criteria for assessing menus. However, the recommendations are mostly qualitative and there is minimal quantifying of standards for particular nutrients per food item.

The standards suggested in the Catering Improvement Program and by Williams are useful for planning menus which cater for general diets. But they are not comprehensive enough to be appropriate for planning special diets. Consequently, the trend has been for individual institutions to create their own nutrition criteria for therapeutic menus, which embody the principles of the national Dietary Guidelines (Williams, 1994). Five sets of current, quantitative guidelines (in addition to the Guidelines for Australian Caterers) are reviewed, and are summarised in Table 1.1 (on pages 16 to 18).

(2.1.4) Illawarra Area Health Service (IAHS) Healthy Food and Nutrition Policy (IAHS, 1993)
The IAHS Healthy Food and Nutrition Policy was first implemented in 1994, and applies to all IAHS hospitals. Six aims of the policy address many issues, including: prevention of diet-related disease; food costs; food quality; and availability of nutritious foods. The policy embodies part of the IAHS philosophy to create structural change which supports nutritious and sustainable food choices. Sound nutrition is seen as an integral and cost-effective method of preventing illness and early death. Hence, the relation between diet and disease is the main rationale for the food policy.

It is stated that the Australian Dietary Guidelines are fundamental to all food service establishments. The IAHS aims to quantify the Dietary Guidelines, thereby defining the nutrient content of a healthy diet. Hence, the policy presents a plan for encouraging healthy eating in the IAHS.
Acceptable levels of fat, energy, protein, carbohydrate, added sugar, sodium and some additional nutrients are outlined for various food items (Table 1.1).

The policy is primarily intended for general, selective diets. However, the menu is also claimed to be suitable for diabetic, low cholesterol and reduction diets, since the principles of nutrition management for these diets are similar to the Dietary Guidelines. It is recognised, though, that the Dietary Guidelines may not be appropriate for various groups, such as the elderly, who have different nutrient requirements.

(2.1.5) South Western Sydney Area Health Service (SWSAHS) Nutritional Standards of Food Service (SWSAHS, 1994)
The philosophy of the SWSAHS food service is to provide a menu to staff, patients and visitors that is consistent with the Dietary Guidelines for Australians, and also meet the diverse nutritional requirements of hospital inpatients. This philosophy aims to ensure the availability and promotion of healthy food choices within the SWSAHS.

The food policy sets out nutritional standards for non-therapeutic and therapeutic diets - which have been integrated as much as possible. For instance, low fat, diabetic and reduction diets have almost identical criteria. There is limited discussion on the rationale behind the numerical criteria. The standards (shown in Table 1.1) are largely based on the Dietary Guidelines for the general population - with appropriate modifications made for groups with particular nutritional needs. Also, food items that are in line with the BHC recommendations are substituted for similar foods which are high in fat, sugar and/or sodium. The document also stipulates additional suggestions - for menu planning which reflect the Dietary Guidelines. Each menu is considered nutritionally adequate, since a standard day’s intake is estimated to meet the NH&MRC Recommended Dietary Intakes (RDIs) for nutrients.

(2.1.6) Noarlunga Health Service (NHS) Food Policy (NHS, 1990)
The NHS Food Policy presents selection guidelines for all food and beverages funded by the NHS and most activities (eg: staff functions) and agencies affiliated with the NHS. The implementation
of the policy coincided with the opening of the Noarlunga Hospital. The policy is intended to exemplify the philosophy of the health service, which is to provide individuals access to an environment which supports a healthy lifestyle, including healthy nutrition practices. This not only applies to the general community, but also to the NHS employees, who are encouraged to practice and promote healthy nutrition behaviours.

The aims of the Food Policy are as follows;

1. produce an environment at NHS which encourages and enables individuals to accept and consume nutritious foods based on the Australian Dietary Guidelines
2. give guidelines on appropriate food choices which are healthy;
3. present healthy foods as attractive and appetising
4. raise an awareness of the importance of healthy nutrition
5. acknowledge individuals right for choice and different food values and cultures
6. through example motivate individuals, other agencies and the community to include healthy nutrition practices
7. promote practices which do not degrade the natural environment and limit the wasteful use of scarce resources needed for food production and distribution.

The policy is modelled mainly on the National Heart Foundation’s (NHF) recommendations, the Victorian Food and Nutrition Program and the Australian Dietary Guidelines. The latter serve as the basis for a set of qualitative guidelines (eg: Use only unsweetened or fresh fruit). Also, common food items are listed and rated as either “Excellent”, “Good” or “Fair” choices, according to how closely an item conforms to the Dietary Guidelines. The policy further stipulates which combinations of these types of food items should be offered.

In addition to the qualitative guidelines, the NHS states numerical standards for selecting foods to be offered. These standards (shown in Table 1.1) are primarily adapted from the NHF recommendations. Therefore, the guidelines are seen to be appropriate for cholesterol-lowering and weight reduction diets, since the policy is based on other sets of guidelines which apply similar principles to those suggested for these two special diets. However, the NHS Food Policy
guidelines for sugar content may be too generous for a diabetic diet. This issue will be addressed in the Discussion of this report.

(2.1.7) Diabetes Australia Nutrition Guidelines for Recipe Development (Diabetes Australia, 1991)

The guidelines that were formulated by Diabetes Australia are designed to enable professionals to evaluate the nutritional quality of recipes. Initially the guidelines were only intended to be used in relation to diabetes management (by people with diabetes and their health care educators), but it was realised that the policy could be applied in other situations (for instance nursing homes) once suitable modifications were made for the target group. The guidelines define “ideal”, “acceptable” and “occasional use” levels of fat, fibre, added sugar and sodium for five key groups of food items (Table 1.1). Those foods which meet the “occasional use” levels are permitted in the diet, but only on days when “ideal” foods predominate. This allowance for otherwise unacceptable items acknowledges the complex role of food. Food is not only a source of nutrition, but can effect one’s quality of life in many other ways. Thus, the document states that foods which will never meet the criteria should not be completely excluded from the diet.

The following Dietary Goals (for total daily intake) are also recommended;
- 30% of energy as fat (10% saturated, 10% monounsaturated, 10% polyunsaturated)
- 55% of energy as carbohydrate (5% as added sugar for diabetics)
- 15% of energy as protein
- alcohol, if included, in moderation.

Some qualitative guidelines are also provided. These generally encourage the use of low fat, low saturated fat, and high fibre alternatives. Thus, the suggestions are in line with the Australian Dietary Guidelines.

The criteria have been developed with regard to recent research on the glycaemic index. Hence, the guidelines are relatively flexible with added sugar content. However, the document does include prudent recommendations which discourage the use of sugar in recipes in which an artificial
sweetener may be substituted.

(2.1.8) Guidelines for acceptability of National Heart Foundation (NHF) approved’ products (NHF, 1993)

The NHF ‘Pick the Tick’ Food Approval program was launched in 1989 and aims to encourage the production and sale of food items that meet the Australian Dietary Guidelines. The specific aims of the program are to;

- make it easy to identify healthier foods at point of sale;
- increase the supply of healthier foods and demand for them;
- raise public knowledge of good nutrition.

The NHF criteria are based on the Dietary Guidelines as well as the NHF’s own Dietary Goals for Australians, which are as follows;

1. decrease fat consumption to 30% of total energy intake
2. substitute unsaturated fats for unsaturated fats where possible (so that saturated fats contribute no more than 10% of total energy intake and polyunsaturated and monounsaturated fatty acids together contribute 20% of total energy intake)
3. achieve normal weight
4. decrease cholesterol intake to under 300mg/day
5. limit alcohol intake (no more than 2 drinks/day)
6. decrease salt intake
7. increase fibre intake.

The NHF guidelines (Table 1.1) define acceptable levels of fat, saturated fat, cholesterol, sugar and fibre for a ‘heart healthy’ diet. Such a diet is mainly aimed at correcting blood lipid levels, but not necessarily prevent or cure heart disease. The NHF guidelines are considered suitable for the general population, and are not designed to be used with special diets.

It is stated that ‘approved’ foods must provide nutritional benefit, and not merely add variety to the diet. However, the NHF approves certain ‘treat’ foods (eg: ice cream) explaining that such items can be part of a healthy diet, when consumed in small amounts.
The criteria for fat are not necessarily low, but are lower in fat compared to similar food items. Foods are also assessed on the type of fat, whereby a level of less than 20 per cent saturated fat is acceptable (regardless of the total amount of fat). Therefore, various high fat foods (eg: nuts, chips, oils) are approved by the NHF. This means that the guidelines are not necessarily relevant for weight reduction diets. Similarly, the sugar criteria may be unsuitably high for a diabetic diet.

(2.1.9) Guidelines for Meals-on-Wheels
It is useful to also consider the guidelines that specifically relate to Meals-on-Wheels, particularly since the Central Kitchen in this study caters for this service. Furthermore, many elderly people rely on this service, which may be one of their primary sources of nutrition (Bell, Dunn, Whitehead and Xouris, 1993).

The Commonwealth Department of Health advises that each meal must supply: at least one-third of the RDI for energy, two-thirds of the RDI for Vitamin C, one-third of the RDI for calcium, and half the RDI for other vitamins, minerals and protein (New South Wales Department of Community Services, 1993).

The North Sydney Area Health Service (1992) has developed a manual for Meals-on-Wheels providers. The manual presents practical advice for planning meals which meet the Department of Health’s recommendations as well as the Australian Dietary Guidelines. The nutritional philosophies behind the suggestions are also explained.

(2.1.10) Summary of current dietary guidelines
Some general themes are apparent from reviewing the nutrition guidelines of various organisations. Firstly, it is widely agreed that food service establishments (particularly those associated with health institutions) should follow food policies which are based on the Dietary Guidelines for the general population.

Secondly, there is a strong trend to integrate menus for different diets. This is logical, since it is well known that similar principles apply for nutritional management of diabetes, hyperlipidaemia
and obesity.

Thirdly, it is emphasised that for groups (eg: elderly) with special requirements, additional recommendations must be made beyond the Dietary Guidelines.

Each of these issues are important and worthwhile to regard when formulating nutritional guidelines for a particular group.
Table 1.1 Summary of existing quantitative nutritional guidelines

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<tr>
<th>Menu item</th>
<th>Serve size</th>
<th>Fat</th>
<th>Carbo-hydrate</th>
<th>Added sugar</th>
<th>Fibre</th>
<th>Organisation</th>
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<tr>
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<td></td>
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<td>4g</td>
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</tr>
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<td>15g/100g</td>
<td>3g</td>
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<td>5g/100g</td>
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<td>15g/100g</td>
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* All values stated for Diabetes Australia are those rated as “ideal”
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<th>Carbohydrate</th>
<th>Added sugar</th>
<th>Fibre</th>
<th>Organisation</th>
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<td>3g/100g</td>
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<td>-</td>
<td>15g/100g</td>
<td>3g/100g</td>
<td>NHS</td>
</tr>
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<td>3g</td>
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Table 1.1 (continued)

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<th>Carbohydrate</th>
<th>Added sugar</th>
<th>Fibre</th>
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<td>3g</td>
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<td>3g</td>
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Key: IAHS: Illawarra Area Health Service  
SWSAHS: South Western Sydney Area Health Service  
NHS: Noarlunga Health Service  
Diab. Aust: Diabetes Australia  
NHF: National Heart Foundation  
Williams: Dietary Guidelines for Australian Caterers (William, 1992)
2.2 Quantitative versus qualitative guidelines

There are a number of reasons why quantitative nutrition guidelines may be preferable to qualitative ones. Firstly, numerical standards are more practical for caterers aiming to provide healthier meal alternatives (Williams, 1994). Secondly, qualitative guidelines may not ensure that a meal actually meets the intended nutrition status (eg: low fat). For example, a “low fat lasagne” made (according to qualitative guidelines) with lean mince and reduced fat cheese may still be relatively high in fat, if made with a high proportion of these ingredients. Therefore, qualitative guidelines may not be precise enough to use with therapeutic diets. Thirdly, non-numerical guidelines usually suggest alternative or modified products. However, elderly people may not like low fat/sugar/increased fibre items. Also, some recipes do not work as well with substitutes (eg: cake made with artificial sweetener instead of sugar). Modified ingredients can be more expensive. Furthermore, workload is doubled when separate meals (using special ingredients) need to be prepared for those residents on special diets. In contrast, quantitative guidelines allow more freedom with choice of ingredients and cooking methods. Regular (not “diet”) ingredients (eg: full cream milk) can be used in recipes - provided that the final product meets the given guidelines. This is a very important consideration with the institutionalised elderly, as it is crucial to accommodate their preferences and provide familiar, well-liked foods. Finally, quantifying permits comparisons to be made between menu items as well as entire menus (eg: proportion of high fat desserts can be compared for two menus).

2.3 Nutrition and the elderly

2.3 (a) Role of Nutrition

Nutrition plays a significant and central role throughout the life-cycle, including the advanced years. Poor or unbalanced nutrient intake can lead to several negative outcomes, including impairment of the immune system which leads to increased risk of infection, aggravated dementia/mental confusion, frailty, and general deterioration of health (Stewart, 1988). In contrast, an optimal nutritional intake can promote:

* greater mobility as a result of weight control
* fewer clinical complications associated with surgery
* curtailing of degenerative changes that are linked with aging
The two overall possible outcomes of adequate nutrient intake are therefore;

1) increased quality of life
2) increased length of life.

Good nutrition can contribute to an increased life span through the prevention of disease and control of symptoms of various conditions. However, a longer life is not always favourable, if the individual is suffering from a disorder or otherwise lacks pleasure and fulfilment. Although, nutrition has a far more complex role than merely adding years to a person’s life. “Nutritional well-being is an integral component of the health, independence, and quality of life of the elderly” (American Dietetic Association, 1987:344). A nutrition policy should aim to achieve a balance between improved health through diet modification, and enjoyment of meals. ‘Quality of life’ incorporates several meanings. Quality is not synonymous with extended length of life, although this may be part of the definition. For elderly people in institutions, factors which may contribute to their quality of life include: quality of food, freedom to make choices, level of autonomy, pleasant dining atmosphere (Gilmore and Russell, 1991), participation in activities in the institution, and the attitudes of the staff and other residents (Chernoff, 1991). Quality of life may also mean social equity in health, whereby people should have equal access to health and health care, including good nutrition (Hollliday and Macoun, 1995). Therefore, quality of life, for elderly people in institutions, may be defined as one’s level of independence, well-being and outlook.

Nutrition can effect one’s quality of life in several ways. Firstly, in institutions, mealtimes may signify the highlight of the day, and provide the opportunity for social interaction. Food can provide pleasure and a sense of security. Furthermore, nutrition may assist in alleviating symptoms
of chronic conditions and decrease the incidence of disease states which may predispose people to become dependent on care providers (Stewart, 1993). By promoting a better quality of life, a person will have a more positive outlook, which can lead to better cooperation and compliance with nutrition regimens (Chernoff, 1994).

2.3 (b) Nutritional requirements of the elderly

(i) Energy

Energy requirements decline with advancing age. This reduction is primarily associated with atrophy of lean tissue (muscle) mass and consequent decrease in basal metabolic rate (BMR) as well as reduced physical activity, and to a lesser extent with fewer cell numbers and age-related intracellular changes in enzyme activity (Steen, 1994). For the institutionalised elderly, a sedentary lifestyle, coupled with disabilities (such as arthritis) which further restrict mobility, are important contributors to lower caloric needs. The current RDI for energy for men (64 years and over) and women (54 years and over) are 10.6 and 8.0 megajoules, respectively (NH&MRC, 1991). These recommended intakes are based on moderate activity levels for men, and light to moderate activity levels for women. Clearly, such guidelines overestimate the energy requirements of sedentary, institutionalised elderly people. The NH&MRC makes allowances for such individuals by suggesting an energy intake of 1.3 to 1.4 times the BMR. However, recommended energy needs are based on the assumption that elderly people already have a reduced energy intake, and thus the recommendations may overestimate the actual energy needs of older adults (Blumberg, 1992).

(ii) Carbohydrate

An RDI for carbohydrates does not exist, although it is suggested that a minimum intake of 50 to 100g per day is required to prevent ketosis (Dietitians Association of Australia, 1990). A commonly recommended level for carbohydrate is 50 to 60 per cent of total energy consumption (DAA, 1990). Elderly people tend to have reduced glucose tolerance, and thus are less able to tolerate large quantities of sugar in the diet (Bidlack et al, 1986). The BHC (1986) advise that dietary sugar should not exceed 12 per cent of total energy consumed.
(iii) Fat
Dietary fat is a source of essential fatty acids. However, only two to three per cent of total kilojoules as essential fatty acid will meet daily needs. It is recommended that fat consumption is below 33 per cent of total energy consumed (BHC, 1986)(DAA, 1990).

(iv) Fibre
The current suggested amount of intake of fibre for adults is 25 to 30g per day (DAA, 1990), a level that is also applicable to elderly persons. This amount of dietary fibre can assist treatment of conditions such as constipation, diabetes, dyslipidaemia and gastrointestinal disorders - all of which are common afflictions among older people.

2.3 (c) Factors that affect nutritional status of the elderly
When devising recommendations for nutrient intakes for the elderly (or when using currently established RDIs), it is necessary to consider the factors which influence nutritional status of this group. These factors include:

* income
* psychological well-being (eg: depression, apathy, loneliness)
* medications (drug-nutrient interactions)
* reduced physiologic functioning - decreased absorption, transportation, metabolism, excretion of nutrients (American Dietetic Association, 1987)
* nutrition knowledge
* high prevalence of chronic disease
* intermittent concurrent illness (Chernoff, 1994)
* mobility
* sensory perceptions
* past eating habits

Some of these factors have less influence for those older persons who either live in an institution or otherwise receive cooked meals from a central kitchen. Firstly, these elderly people do not need to procure or prepare their meals. Also, it is assumed that staff/carers provide appropriate assistance
and encouragement during mealtimes. Common dining rooms may reduce a sense of loneliness. Also, the limited choice of items available on the menu somewhat supersedes the influence of nutrition knowledge and past eating habits on the selection of foods. Thus, in an institution, the key factors which determine the nutritional status of an elderly resident are;

1) nutrient content of menu items
2) chronic disease
3) drug-nutrient interactions
4) reduced physiological function

The degree to which the latter three factors can be controlled is fairly limited, whereas the nutrient content of meals can be manipulated. Hence, the menu is a chief factor which influences the nutritional status of the institutionalised elderly person. Therefore, designing and planning a nutritionally adequate menu deserves much attention. This raises the need for guidelines which stipulate recommended amounts of different nutrients per menu item. This need is particularly crucial for those residents requiring therapeutic diets - whereby dietary intake can have profound effects on their health.

2.4 Feasibility of dietary guidelines for the elderly

Steen (1994:227) poses two fundamental questions to consider when debating the need for dietary guidelines for older people;

"Do poor dietary practices determine the chronic disease problems that result in premature death or reduction in disability-free life?

Does modification of dietary practices result in gain in survival, and in survival free of disability?"

To date, there are no conclusive answers to these questions, as there are arguments both for and against the feasibility of nutrition guidelines. Various reasons which support the development of dietary guidelines for the elderly are illustrated by the following:

* Several studies of institutionalised elderly people demonstrate that both the nutritional quality of meals and the health status of the residents need to be improved (Chapman et al, 1993). Hence, the
implementation of nutrition guidelines will help to ensure better nutritional status of elderly people in institutions.
* The catering department has a responsibility to provide residents with meals which meet their nutritional requirements. Therefore, nutrition guidelines should form a blueprint for planning the menu.
* The NH&MRC (1990) found the nutritional status of some institutionalised elderly people was unsatisfactory, due to the inadequate quality and quantity of the food supplied to them. Based on this finding, the NH&MRC emphasises the importance of adequate nutrition to maintain the health of residents in nursing homes.
* Anderson et al (1986) demonstrated that a diet based on healthy eating recommendations could be successfully introduced into a small community hospital. During their study they identified the need for the development of catering recipes that meet with nutritional guidelines. The development of nutritional criteria would facilitate the formulation of such recipes.
* Greater attention toward the nutritional status of the elderly may assist in reducing their prevalence of undernutrition and consequently improve their quality of life (Mowe, Bohmer and Kindt, 1994).
* The Commonwealth Nursing Home Outcome standards recommend the development, implementation and review of appropriate nutritional care for the institutionalised elderly (Central Coast Area Health Service, 1995).
* The prevalence of chronic diseases is much higher among the elderly, therefore it is necessary to establish nutrition guidelines which assist in postponing or controlling such diseases.
* Preventative actions (such as a healthy diet) can be effective among elderly people, by assisting them in maintaining functional capacity (Johnson and Kligman, 1992).
* Guidelines specifically for the elderly are needed, as those for middle-aged adults may not be appropriate.
* The risk of drug-nutrient-interactions could be decreased by stricter dietary management of treatable disorders, such as diabetes (Andres and Hallfrisch; 1989).

In contrast, there are several arguments which contend the usefulness of nutrition guidelines for elderly people;
* Older persons have followed a lifetime of eating habits, which are well established by the time they are admitted to an institution (Eckstein, 1993). This notion that elderly people are fixed in their eating patterns is debatable. For instance, Hunwick and McDonald (1983) successfully incorporated nutrition guidelines into a nursing home food service, and found a high level of patient acceptance.

* The elderly are a very heterogeneous group - physiologically and psychologically. Therefore, generalised guidelines are inappropriate, and nutrition intervention should be individualised. However, limited access to dietetic services (either through a lack of funds or availability of the service) necessitates the use of broad dietary guidelines. Providing a range of dietary recommendations will assist in meeting the diversity of needs (Tapsell, 1990).

* Food must be ingested in order to be nutritious. The imposition of strict guidelines that render food unpalatable and greatly limit the variety of dishes offered, would clearly result in a reduced intake (and enjoyment) of food.

* The nutrient requirements among the elderly are not static, but continue to change with increasing age and recurrent/ progressive illness.

* There is a lack of research into the nutritional needs of the elderly and “large uncertainties still exist” (Andres and Hallfrisch, 1989:1741). Current RDIs for the elderly have been extrapolated from data for middle-aged adults. Until further, conclusive research is done, any nutrition guidelines for the elderly will be based on limited data and speculation. However, monitoring the outcomes of implemented guidelines will assist in determining nutritional requirements of elderly adults. An institution (such as a nursing home) represents a controlled setting for observing the long-term effects of nutrition intervention, thus providing valuable insights to the dietary needs of older people (Schneider, Vining, Hadley and Farnham, 1986).

2.5 Special diets among the elderly

A ‘special diet’ is defined as a diet (eating pattern) that is modified from the individual’s routine intake, with the purpose of attaining therapeutic benefit. Benefits generally include maintenance or improvements in physiological, psychological and mental well-being (eg: euglycaemia, delayed progression of organ failure, improved bowel function) (Zeman, 1991). Modifications may
involve any aspect of food intake (e.g., reduction in calories, texture alterations, timing of food consumption). The terms ‘special diet’ and ‘therapeutic diet’ refer to the same definition, and will be used interchangeably throughout this report.

The high prevalence of illnesses and chronic conditions among the elderly means that special diets are frequently required for this group. It has been estimated that about half of nursing home residents require at least one dietary modification (Eckstein, 1993). Brady-Moran and Reed (1993) found that 30 per cent of elderly clients at congregate meal sites required special diets, whereby the most frequently requested ones were low sodium and/or low fat/low cholesterol. Some of the most common special diets among institutionalised elderly are: diabetic diets, low salt, low fat, soft, vegetarian. In a study of nursing homes in Central Sydney, 28 per cent of the residents required texture-modified diets, and 12 per cent of residents were on special diets - which were diabetic and/or weight reduction diets (Chapman et al, 1993).

The same therapeutic diet may have different outcomes for different people. For instance, a low salt (sodium) diet may be prescribed for someone with hypertension, alternatively, a person with renal failure would also benefit from the same diet. Furthermore, special diets tend not to conform to universal guidelines, so that policies for special diets will vary among different institutions. For example, the study of nursing homes in Central Sydney showed several variations on the definition for a diabetic diet (definitions included: no added sugar, no added sugar/reduced fat, no added sugar/reduced fat/increased fibre) (Chapman et al, 1993).

The most common special diets catered for by the Central Kitchen referred to in this study are: low sodium, soft, diabetic, cholesterol-lowering and weight reduction. This report will focus on the latter three diet types.

2.6 Diabetes and the elderly

2.6 (a) Prevalence of diabetes among the elderly

Diabetes Mellitus (commonly referred to as diabetes) is a disorder of the endocrine system,
whereby the ability of the pancreas to produce and secrete insulin is absent, reduced or delayed (Zeman, 1991). The disease is characterised by raised blood glucose levels (hyperglycaemia) caused by the lack of insulin, which impairs the body’s ability to metabolise glucose (Zeman, 1991). Diabetes is one of the most common disorders among older people. 11.7 per cent of elderly Australians have diabetes (NH&MRC, 1992a). This proportion is similar for the institutionalised population, whereby 11.9 per cent of nursing home patients are diabetic (Rosenthal, Hartnell, Morley, Mooradian, Fiatarone, Kaiser and Osterweil, 1987). An additional 11.2 per cent of elderly people have impaired glucose tolerance (NH&MRC, 1992a). The prevalence of diabetes increases dramatically with advancing age. A peak prevalence occurs in the seventh decade (Mooradian, Osterweil, Petrasek and Morley, 1988), with 20 per cent of those aged 80 years and over having diabetes (Rosenthal et al, 1987). The majority (86 to 92 per cent) of older diabetics have non-insulin dependent diabetes mellitus (NIDDM) (NH&MRC, 1992a).

2.6 (b) Goals of diet therapy for diabetes

There are no dietary goals or recommendations specifically intended for elderly people with diabetes. Hence, nutrition goals are the same for adults of all ages with diabetes. The overall aim of nutritional management of diabetes is to normalise blood glucose levels. Further objectives include prevention of acute signs and symptoms, and prevention/delay of chronic complications (DAA, 1990)(Coulston, 1994a). Shrapnel (1994) emphasises that glycaemic control, rather than prevention of cardiovascular disease, should be the primary goal of nutritional management. It seems logical that diabetic diet therapy, particularly for the elderly, should firstly aim at avoiding acute problems, and that chronic complications should be a secondary concern. However, Garber (1993) believes that lipid abnormalities are undertreated in the management of diabetes, and he also points out that glycaemic control alone will not normalise dyslipidaemia (elevated triglycerides and low high density lipoprotein levels). The American Diabetes Association (1994) recommend that diet therapy should aim to achieve glucose, lipid and blood pressure goals. Studies have shown that glycaemic control and lipid normalisation are both achievable and beneficial in the treatment of elderly diabetics (Rosenthal et al, 1987).

It is widely agreed that correction of obesity among NIDDM patients is a priority (Wood and
Bierman, 1986). Obesity aggravates dyslipidaemia, elevates blood pressure and reduces glucose
tolerance, thereby impeding control of diabetes as well as substantially increasing the risk of
cardiовascular disease. Weight management is particularly relevant for the elderly since the
frequency of both obesity and diabetes increase with aging (Kannel, Garrison and Wilson, 1986).
Furthermore, the reluctance of health care professionals to apply drug therapy reinforces the
importance of weight loss for older diabetic patients (Reaven, 1985). The ultimate weight loss
goal is to achieve and maintain an ideal body weight, although even moderate weight loss improves
both blood glucose control and plasma lipid levels (Kannel et al, 1986). Reaven (1985)
demonstrated that an average weight loss of nine kilograms in elderly NIDDM patients resulted in
dramatically improved glycaemic control, even though all of the subjects remained overweight. He
thus concluded that it is not necessary for elderly diabetics to achieve ideal body weight so as to
benefit from weight reduction.

In summary, the basic goal of diabetic diet therapy for the elderly is to maintain glucose levels as
normal as possible (including avoidance of serious hypoglycaemia), without unnecessary
limitations on lifestyle (Horwitz, 1982).

2.6 (c) Rationale for diet therapy for elderly people with diabetes

Many experts agree that diabetic control is justified in the elderly person with diabetes. The efficacy
of a ‘diabetic diet’ for an older adult is illustrated with three key issues, namely: complications of
poorly controlled diabetes, inherent risks associated with diabetes, and (potential) benefits of
nutritional management - implications for prevention.

Complications of poorly controlled diabetes:

It may be argued that elderly diabetic patients will not live long enough to die of long-term
complications. However, poorly controlled blood glucose levels increases the risk of both acute
and chronic complications. Uncontrolled diabetes results in death in over 30 per cent of patients
who are older than 50 years, compared to less than three per cent of younger patients (Carroll and
Matz, 1983). Hypoglycaemia is a common occurrence for the older diabetic patient, and elderly
people are usually less tolerant of hypoglycaemia than younger diabetics (Lipson, 1986). Recurrent
low blood glucose levels may aggravate various conditions which tend to correlate with diabetes, such as coronary insufficiency and cardiovascular disease (Rosenthal et al, 1987). Hypoglycaemia can also be fatal, especially for elderly diabetics who can be unaware of the symptoms (Walter, 1990).

At the other extreme persistent hyperglycaemia increases risk of infections (usually affecting the urinary tract or skin), reduces the pain threshold (thereby decreasing the awareness of signs of neuropathy), worsens the outcome of cerebrovascular accidents (Mooradian et al, 1988), and promotes nocturia and blurred vision (Lipson, 1986). Nathan, Singer and Godine (1986) showed that nephropathy was more strongly correlated with the level of diabetic control than was age of the person. Also, hyperglycaemia is extremely hazardous for those with dementia, as they tend not to respond to the thirst mechanism which is indicative of hyperosmolarity (Rosenthal et al, 1987). Therefore, since there is growing evidence to the possible harmful effects of uncontrolled hyperglycaemia, it would be remiss to not promote better control through diet therapy.

**Inherent risks associated with diabetes:**

In their survey of clinical manifestations in elderly nursing home patients with diabetes, Mooradian et al (1988) found a very high prevalence of both macroangiopathy and rate of infections. These conditions are typically associated with diabetes, as are nephropathy, retinopathy and neuropathy. Diabetic patients also tend to have abnormal lipid profiles, characterised by raised triglyceride and very low density lipoprotein (VLDL) levels, and low high density lipoprotein (HDL) levels (Kannel et al, 1986). Hence, people with diabetes are at far greater risk of cardiovascular disease than their non-diabetic counterparts. Dietary management of diabetes may assist in curtailing these risks.

**Potential benefits of nutritional management - implications for prevention:**

Cardiovascular disease is not an inevitable outcome of diabetes or the aging process (Kannel et al, 1986). Established diabetic complications may be irreversible, however the progression of further disease may possibly be hindered by nutritional management, along with other treatment modes such as medications (NH&MRC, 1992a). However, Wood and Bierman (1986) emphasise a lack
of evidence and understanding about dietary approaches for controlling diabetes and its complications, and suggest that any benefits attributable to a strict diet are unfounded. Although, the authors do acknowledge that certain dietary recommendations are clearly advantageous: a low fat diet may reduce vascular complications; modifying calorie distribution assists in control of hypoglycaemia; and attainment of lower body weight (for overweight patients) decreases fasting blood glucose levels and normalises insulin response. Garber (1993) argues that age should not be an obstacle for intervention, as coronary risk factors continue to predict the incidence of events for older persons.

Therefore, awareness of the potential consequences of poorly controlled diabetes and the detriment to quality of life, warrants the recommendation for a suitable diabetic diet for an elderly person. Diet is the preferable mode of treatment for overweight NIDDM patients since large doses of insulin are required to achieve sufficient blood glucose control (Reaven, 1985).

2.6 (d) Current dietary recommendations for diabetes

**Carbohydrate:**

Traditionally it has been suggested that in a diabetic diet carbohydrates should provide at least 50 per cent of total energy intake, and the carbohydrate ingestion should be evenly spread throughout the day (DAA, 1990). The rationale behind this recommendation was mainly that high intakes of protein or fat promote weight gain, impair glycaemic control and exacerbate complications. However, this recommendation is now being reconsidered with studies indicating that high carbohydrate, low fat intakes may aggravate risk factors for cardiovascular disease (Coulston, 1994b). Carbohydrates promote changes in glucose and lipid metabolism, and contribute to increased plasma triglycerides and decreased HDL concentrations (Coulston, Hollenbeck, Swislocki and Reaven, 1989). Truswell (1994) reports that the degree of response varies among different subjects, whereby some individuals (such as older males) are more sensitive than others, and that the rise in triglyceride levels is usually transient. Furthermore, he points out that the relative risk of elevated triglycerides and cardiovascular disease is unclear. Kannel et al (1986) state that raised triglycerides may not be an independent risk factor for coronary disease, however they often correlate with elevated LDL and VLDL values, which are atherogenic.
A recent study compared the effects of a high carbohydrate diet (energy: 55% carbohydrate, 10% monounsaturated fat) to a high monounsaturated fat diet (energy: 25% monounsaturated fat, 40% carbohydrate) among NIDDM patients, and found that the former diet type increased plasma triglycerides and VLDL levels by over 20 per cent, as well as worsening the degree of glycaemic control (Garg, Bantle, Henry, Coulston, Griver, Raatz, Brinkley, Chen, Grundy, Huet and Reaven, 1994). The authors thus recommend that NIDDM patients consume high monounsaturated fat diets, whereby the energy contribution from carbohydrates is approximately 40 per cent.

**Sucrose:**

The most basic form of diet therapy for diabetes has been the avoidance of "simple sugars", which is based on the assumption that sugars are more quickly absorbed than starches and thereby produce a sharp rise in blood glucose levels. However, more evidence is accumulating which suggests the contrary, that some starchy foods actually produce higher glycaemic responses than do sucrose/fructose-containing foods. Bantle, Swanson, Thomas and Laine (1993) found that a high sucrose diet (19% energy) did not cause an increase in glycaemia (or lipaemia) in NIDDM subjects.

The American Diabetes Association (1995) agrees that the incorporation of sucrose into the daily meal plan does not undermine blood glucose control among individuals with diabetes. However, the American Diabetes Association does caution that the nutritive value of sucrose must not be overlooked, and that the use of sucrose should not be in addition (rather a partial replacement) to usual carbohydrate intake. Non-nutritive sweeteners (such as aspartame or saccharin) are a useful alternative, especially in assisting control of kilojoule intake. Horwitz (1986) also points out that sugars may at times markedly influence blood glucose levels, however it is not necessary to severely restrict sugar in a diabetic diet.

The glycaemic index concept of ranking foods according to their glycaemic effect may be a more suitable approach to dietary management of diabetes, as opposed to avoidance of simple sugars. The glycaemic index has been shown to be a reliable predictor of blood glucose responses, and therefore a useful tool in clinical management of diabetes (Brand Miller, 1993).
**Fibre:**
The American Diabetes Association (1995) currently recommend a daily intake of 20g to 35g of dietary fibre from a wide variety of food sources. The benefits from (soluble) fibre include reduced postprandial blood glucose concentration (Wood and Bierman, 1986)(Zeman, 1991) and decreased total plasma cholesterol, as well as improved weight control through increased satiety (Thomas, 1994). However, a high intake of (insoluble) fibre can be detrimental particularly for the elderly, as this can exacerbate constipation (especially in immobilised patients) as well as compromise micronutrient absorption (Rosenthal et al, 1987). Brown and Jackson (1994) believe that increased fibre intake should only be encouraged for those patients who are ambulatory. Therefore, a moderate fibre intake (primarily in the soluble form) may be more appropriate for elderly people.

**Fat:**
Concern about the potentially harmful effects of a high carbohydrate intake on plasma lipoprotein concentrations has lead to recommendations for reduced carbohydrate consumption, with an increased intake of a suitable alternative energy source (Garg, 1994). Since protein should contribute to approximately 10 to 20 per cent of energy intake (DAA, 1990), the remainder of calories (80 to 90 per cent) needs to be distributed among carbohydrates and fats. A high intake of saturated fats is correlated with increased risk of cardiovascular disease, thus no more than 10 per cent of energy should be derived from these fats (American Diabetes Association, 1995). Similarly, up to 10 per cent of calories may be obtained from polyunsaturated fats (as these are known to reduce protective HDL levels). Therefore, 60 to 70 per cent of calories remains to be divided among carbohydrates and monounsaturated fats. Monounsaturated fatty acids are known to lower LDL concentrations without an accompanying reduction in HDL levels. It has been suggested that around 40 per cent of total energy from monounsaturated fats may be a suitable level for treatment of diabetes (Rivellese, Auletta, Marotta, Saldalamacchia, Giacco, Mastrill, Vaccaro and Riccardi, 1994). Garg et al (1994) found beneficial effects with an intake of 25 per cent of energy from monounsaturated fats for NIDDM subjects. This level may be more palatable and practical. However, a diet rich in any kind of fat will promote weight gain, therefore the relevant distribution of calories from fat and carbohydrates needs to be according to individual weight status.
Summary of dietary recommendations:
Carbohydrate: 40 to 55 per cent of total calories (emphasis on foods with low glycaemic index value)
Sucrose: up to 10 per cent total energy
Fibre: up to 30g from a wide variety of sources
Fat: up to 40 per cent of total energy (no more than 10 per cent energy from saturated fatty acids and no more than 10 per cent energy from polyunsaturated fatty acids).

2.7 Hyperlipidaemia and the elderly
Hyperlipidaemia refers to elevated levels of plasma cholesterol or triglycerides, the main lipid (fat) components in the blood (Zeman, 1991). Lipids are transported in the blood by lipoproteins. Raised levels of blood lipids are a primary risk factor for coronary heart disease (CHD) (Kannel, 1986) (Forette, Tortrat and Wolmark, 1989). More than 70 per cent of deaths beyond the age of 75 years are attributable to coronary artery disease (Zimetbaum, Frishman and Aronson, 1991, cited in Leaf, 1994).

It has been shown that serum cholesterol levels do not tend to rise after age 60 in men, and age 70 in women, and that the risk for CHD associated with raised cholesterol is less with advancing age (Kannel, 1986). Despite this reduced influence, blood lipids do predict CHD in the elderly (Kannel et al, 1986)(Shipley, Pocock and Marmot, 1991). Aronow, Herzig and Etienne (1989) showed that increased serum total cholesterol correlated with new coronary events in elderly men and women with no previous coronary artery disease.

While it is possible to treat hyperlipidaemia in the elderly, there is disagreement about whether dietary manipulation is valuable. Stone (1994) argues that correction of cholesterol levels in the elderly is not justified for those with a low-risk profile for CHD, the existence of terminal illness, or co-morbidities. Gordon and Rifkind (1989) advise that therapy is worthwhile considering, except when the person’s remaining life expectancy and quality of life is so limited by advanced age, that preventing death from CHD would simply be exchanging one cause of death for another, with no improvement in lifestyle. Others believe that the most rational approach toward treating
high blood cholesterol in the elderly, is through modest dietary changes, such as a small increase in the quantity of fish consumed (Kaiser and Morley, 1990).

The debate over whether elderly people are candidates for dietary treatment for cholesterol-lowering is beyond the scope of this paper, and the decision for therapy will be influenced by several factors pertaining to the individual.

2.7 (a) Current dietary recommendations for hyperlipidaemia

Fat:

It is often recommended that the contribution of fat should be no more than 30 per cent of energy intake (DAA, 1990). Although, Nestel (1992) argues that the main issue should be the type of fat, rather than the quantity. Indeed, since the different influences of various fatty acids are well known, it is fair to suggest that a diet which aims to correct lipaemic levels, should emphasise type rather than total fat composition. However, for obese hyperlipaemic individuals, weight adjustment is of primary importance, and thus the total fat ingestion will need to be an initial consideration.

Saturated fats are known to increase total serum cholesterol levels more than any other dietary component (Zeman, 1991). It is thus suggested that intake of these fats should be restricted to 10 per cent of total energy (DAA, 1990).

Polyunsaturated fats reduce total cholesterol concentration - including the protective HDLs. Therefore, a restricted intake of these fats is also advisable, a suggested level being 10 per cent of total energy (DAA, 1990).

In contrast, monounsaturated fatty acids favourably reduce serum cholesterol concentration, without lowering HDL levels. A study on the effects of fat-modified diets in hypercholesterolaemic subjects found that lipid profiles were improved when part of the saturated fatty acids (14% to 11% of energy) were replaced with unsaturated fatty acids (monounsaturated fat: 10% to 11% of energy), without altering the total fat intake (34% of energy) (Sarkkinen, Uusitupa, Pietinen, Aro, Ahola, Penttila, Kervinen and Kesaniemi, 1994). Furthermore, a high monounsaturated fat diet
(more than 20 per cent of total energy) may be more appropriate than a high carbohydrate diet due to the relationship with triglyceride and low HDL levels (Crane, 1995).

**Fibre:**
Soluble fibres may assist in retaining cholesterol in the intestine, thereby preventing its reabsorption (Wardlaw and Insel, 1990). Thus, it may be useful to encourage consumption of food sources of soluble fibre, such as oats, legumes and vegetables. Optimal amounts of different types of fibre have not been suggested, however a level of 30g of total fibre (from a variety of sources) is recommended (DAA, 1990).

**Cholesterol:**
Dietary cholesterol is known to have only a small influence on plasma cholesterol, and a restricted intake is not considered important in patients with mild or moderate hyperlipidaemia (Thomas, 1994)(Callaway, 1994). In patients who may benefit from a restriction of dietary cholesterol, a restricted saturated fat intake tends to limit dietary cholesterol. The DAA (1990) advise that cholesterol intake should not exceed 300mg per day.

**Summary of dietary recommendations:**
- Fat: up to 30 per cent total energy
- Saturated fat: up to 10 per cent total energy
- Polyunsaturated fat: up to 10 per cent total energy
- Fibre: 30g per day (from a wide variety of sources)
- Cholesterol: up to 300mg per day

**2.8 Obesity and the elderly**
Obesity is usually recognised as an excess of body fat, and is defined as a body mass index\(^1\) above 30 (DAA, 1990). There is a natural tendency for body weight to increase with advancing age. This tendency is associated with a loss of lean body mass, increase in fat tissue, reduced basal metabolic rate and decreased physical activity. Thus, the prevalence of obesity increases with

\(^1\) body mass index = weight (kg) divided by height (m) squared. Acceptable range is between 20 and 25.
aging. The general pattern for weight fluctuation begins with a marked increase in weight at middle-age, which then remains stable during the sixties and early seventies, followed by a decline in weight in very old age (Kannel et al, 1986). A study of malnutrition in institutionalised elderly people found that overnourished subjects tended to use more medications, had fewer feeding impairments and had an adequate mental state (Keller, 1993).

Despite the strong association, obesity is not an unavoidable outcome of the aging process (Watson, 1994), and dietary intervention can assist in stabilising body weight. However, it is unclear whether intervention is worthwhile for older persons who have been overweight for some years, as there is a lack of research into the relationship between obesity and life span when no other disease is present (Jeffay, 1982). Nestel (1992) poses the question whether restriction of dietary fat should be advised for the overweight elderly person who has no other disorders that are aggravated by fat. However, since excess body weight precipitates such disorders, some restriction of fat intake seems justifiable.

Obesity impairs glucose tolerance and exacerbates all atherogenic factors (Kannel et al, 1986). Therefore, the clinical benefits of weight reduction include lowered resistance to insulin (and improved glucose tolerance) with consequent correction of plasma cholesterol profile. Weight loss also reduces stress on the joints and thus improves mobility.

### 2.8 (a) Current dietary recommendations for obesity

**Energy:**

It is recommended that energy intake should be liberal to provide adequate nutrients, but not excessive so as to achieve and maintain a desirable body weight (DAA, 1990)(Wylie-Rosett and Edlen-Nezin, 1991).

**Carbohydrate:**

Carbohydrates have less than half the energy value of fat. Also, carbohydrates provide fibre which promotes satiety and thereby tends to reduce the propensity to overeat. Thus, it is suggested that carbohydrates should contribute 50 to 60 per cent of total energy intake, with an emphasis on fibre-
rich carbohydrates (DAA, 1990)(Thomas, 1994).

**Fat:**
A high fat diet promotes weight gain. Therefore, in order to improve weight control and reduce the risk of hyperlipidaemia, it is recommended that less than 30 per cent of total energy intake should comprise fat (DAA, 1990).

**Summary of dietary recommendations:**
Energy: balanced intake - to meet nutrient requirements and promote attainment of ideal body weight.
Carbohydrate: 50 to 60 per cent total energy (emphasis on high fibre foods)
Fat: up to 30 per cent total energy

**Summary of dietary recommendations for diabetes, hyperlipidaemia and obesity**
The nutrition principles and goals are similar for all three special diets discussed. The current dietary recommendations (outlined above) for these diets are summarised in Table 1.2.

### Table 1.2 Summary of main dietary recommendations for diabetic, cholesterol-lowering and weight reduction diets

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Diabetic diet</th>
<th>Cholesterol-lowering diet</th>
<th>Weight reduction diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>---</td>
<td>---</td>
<td>balanced intake</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>40-50% energy</td>
<td>---</td>
<td>50-60% energy</td>
</tr>
<tr>
<td>Sugar</td>
<td>&lt;10% energy</td>
<td>&lt;30% energy</td>
<td>&lt;30% energy</td>
</tr>
<tr>
<td>Fat</td>
<td>&lt;40% energy</td>
<td>&lt;30% energy</td>
<td>&lt;30% energy</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>&lt;10% energy</td>
<td>&lt;10% energy</td>
<td>---</td>
</tr>
<tr>
<td>Fibre</td>
<td>30g</td>
<td>30g</td>
<td>high fibre intake</td>
</tr>
</tbody>
</table>
2.9 Methodology

2.9 (a) Menu item analysis

The prepared menu items, according to the Central Kitchen’s standard recipes, will be analysed for their nutrient composition using the nutrient analysis software package ‘DIET 1’ (Xyris software). This method of analysis is chosen as the Central Kitchen is considering installing the same program, and may therefore be able to continue to analyse new recipes using the technique employed in this study.

Menu items will be categorised according to the following definitions (as stated by the author);

*Hot breakfast items:*
Foods offered at breakfast and are served hot. The foods are either meat or meat equivalents. Porridge is excluded, and is categorised as a *hot breakfast cereal* item.

*Main meat-only dishes:*
A main\(^2\) dish which consists only of meat, poultry or fish. The dish is served without sauce or gravy.

*Main wet/soft/blend dishes:*
A main dish which has one or more of the following characteristics: served with a sauce or gravy; the food does not require chewing; does not include pastry. Some of these items are listed as ‘softs’ or ‘blends’ on the menu.

*Main pastry dishes:*
A main dish which has a pastry or dough base.

\(^2\) ‘Main’ refers to a menu item which is served only once per day, is served hot, and the serving size is usually greater than 100g.
**Main vegetarian:**
A main dish which contains no meat, poultry or fish. The dish may contain dairy or egg products as well as animal-based flavouring agents (e.g. chicken booster).

**Light/snack/salad:**
A hot or cold dish which usually has a serve size of less than 100g. These items are generally served in the evening, and are not served with side dishes of hot vegetables or potato/rice/pasta.

**Potato/rice/pasta:**
A dish that is based on potato, rice and/or pasta. The dish is served as an accompaniment to the main dish.

**Single vegetable:**
A single serve (less than 100g) of vegetable/s, which is served as an accompaniment to the main dish. Generally, this menu item has a low level of total carbohydrate.

**Milk-based dessert:**
A sweet dish served after the main meal. Milk/dairy products are one of the main ingredients in these dishes. These items are potentially good sources of calcium.

**Non-milk-based dessert:**
A sweet dish served after the main meal. These dishes are not made with significant quantities of milk or dairy products. Fruit (fresh and canned) is also included in this category, as it is offered as a dessert option.

'Sauces/gravy' will also be analysed.

2.9 (b) Development of quantitative nutritional guidelines
Guidelines will be developed for each of the menu item categories listed above. Separate criteria will also be suggested for fruits.
Guidelines will be formulated for breakfast cereals, milk and spreads (though they are not listed on the menu) as there exists significant differences in the nutrient content of these foods.

A set of criteria will not be defined for breads as they do not appear on the menu, and also because there is little variation in the nutrient value of different breads.

The same set of nutritional guidelines will apply to all three special diets being considered (ie: diabetic, cholesterol-lowering and weight reduction diets), since the nutrition principles for these diets are alike.

2.9 (c) Nutrients to be analysed
The nutrient analysis will be limited to those nutrients (listed below) which have a central role in the management of diabetes, hyperlipidaemia and obesity;

1) energy in kilojoules
2) total fat in grams
3) saturated, monounsaturated and polyunsaturated fatty acids, in grams
4) total carbohydrate in grams
5) starch and sugars in grams
6) fibre in grams

i) Energy
“Energy is not a nutrient, but is released from food components” (NH&MRC, 1991:4). Energy is used for metabolic purposes, physiologic functioning, muscular activity, thermogenesis and growth (NH&MRC, 1991). Excess energy is stored as fat and thus promotes weight gain or obesity, whereas an inadequate energy intake contributes to lethargy and weight loss. Energy requirements are based on resting metabolic rate and energy expenditure (through physical activity) as well as affect of disease state.
ii) Fat

Fat is the most concentrated source of energy, providing just over twice as many kilojoules (per gram) than either protein or carbohydrate. A high intake of fat leads to weight gain. The DAA (1990) recommend a dietary fat intake of less than 30 per cent of total energy.

iii) Saturated, Monounsaturated, Polyunsaturated Fatty Acids

Saturated fats increase plasma LDL levels and thereby promote CHD. Monounsaturated fats reduce plasma LDL concentration. These fats have also been suggested as an alternative energy source to carbohydrates in management of diabetes. Polyunsaturated fats decrease total plasma cholesterol, including HDL levels. No more than 10 per cent of energy consumed should be in the form of saturated or polyunsaturated fats (DAA, 1990).

iv) Carbohydrate

A level of approximately 60 per cent of energy intake is recommended for general (non-therapeutic) diets, weight loss, cholesterol-lowering and NIDDM diets (DAA, 1990). Complex carbohydrates provide vitamins and mineral as well as fibre. Fibre promotes satiety and can assist in bowel function. Carbohydrates have less than half the kilojoule content of fat, and are thus an efficient energy source.

v) Starch and Sugars

Sugars aggravate hyperinsulineamia and thereby decrease HDL concentration. Furthermore, excess sugar consumption stimulates weight gain and may aggravate triglyceride levels. In the nutrient analysis, ‘sugars’ include all added sugars as well as those which occur naturally in food items. Added sugars refer to monosaccharides (eg: glucose, fructose), disaccharides (eg: sucrose, maltose), honey, malt and malt extract (National Food Authority, 1995).

Starches should comprise most of the carbohydrate content of the diet as they provide micronutrients and fibre.
vi) **Fibre**

Fibre can be useful in the treatment of obesity as it contributes to satiety and thereby helps curb the tendency to overeat. High fibre foods tend to produce slow rises in blood glucose levels and are therefore beneficial in the management of diabetes (Thomas, 1994). The soluble form (found in oats, fruit and vegetables) has known hypocholesterolaemic properties.

Protein, alcohol and cholesterol will not be considered in the analysis. Protein does not have a direct influence in the management of the three special diets. The alcohol content of food items tends to be very small, and thus contributes little energy value. Dietary cholesterol does not greatly affect plasma cholesterol. Also, many foods that are high in saturated fat are also significant sources of cholesterol. Thus, any criteria that address saturated fat will tend to restrict cholesterol.

2.9 (d) **Menu Classification**

Existing menu items will be assessed according to the proposed guidelines. These results will be useful for developing new recipes and modifying those that do not meet the guidelines.

2.10 **Profile of study population**

The organisation cares for over 1700 elderly people residing in 27 accommodation complexes. The number of residents at each of the three types of aged-care settings is as follows: 1211 in hostels, 742 in self-care units, and 285 in nursing homes. The age range of all residents is 55 to over 93 years. The average age of self-care and hostel residents is 76 and 81 years, respectively. Two-thirds of the self-care residents are aged between 69 and 83 years. Whereas, approximately two-thirds of the hostel residents are between 78 to 89 years of age.

The Central Kitchen caters for most of the 27 aged-care settings as well as the Meals-on-Wheels service (which operates in the same region), thereby providing approximately 1300 meals daily, with an additional 100 to 200 meals for the Meals-on-Wheels service. The Kitchen does not regularly cater for the self-care units, although the residents have the option of buying meals from the Kitchen.
The menu (Appendix I) and standard recipes (example shown in Appendix II) used by the kitchen have been planned by the Catering Officer with some input from kitchen staff. The menu operates on a six-week cycle, and meals are prepared by the cook-chill method.

**Serving of meals...**

Chilled items are distributed to the peripheral sites, where they are reheated and served (cafeteria style) from bain-maries. Meals are consumed in common dining rooms. However, bed-bound (non-ambulant) residents receive their meals in bed. A kitchen staff member serves the food to the residents, according to what the person chooses. Meals are not pre-ordered. Those on special diets are given appropriate foods (ie: "diet" dishes) in their recommended portion sizes.

At breakfast, a range of breakfast cereals are offered (eg: Corn Flakes, Weetbix) with either full cream or skim milk, as well as porridge and other savoury hot dishes. Residents are provided with a piece of fresh fruit at the main midday meal, and have access to a self-serve salad trolley. This trolley contains: vegetables (eg: cucumber, beetroot), cold meats, cheese and mixed salads (eg: coleslaw). Sliced bread (white and wholemeal) is also available, and residents can add their own choice of spread (butter, margarine, vegemite, jam or low-joule jam). Beverages offered include coffee, tea, fruit juices (sweetened and unsweetened), cordial (regular and low-joule). Also, if there are left-over items at a meal, residents can request a second serve.

Residents living in nursing homes and hostels receive all their meals from the Central Kitchen. Those living in self-care units have the option of purchasing a meal from the Kitchen. A meal ticket costs around $1.40.

**Menu Review...**

New items/recipes are introduced as the need arises. The need may be indicated if a particular meal is very unpopular, or if the food does not present well upon reheating. A new item may be trialled once every eight weeks, when the Catering Officer distributes the kitchen’s newsletter.
CHAPTER 3:
METHODS

3.1 Selection of special diets
The Catering Officer identified three of the most common special diets provided for by the Central Kitchen. Also, twelve of the nursing homes (catered by the Central Kitchen) provided a list of the number and types of special diets at each of these sites.

3.2 Nutrient analysis of menu items
Each menu item was entered into a nutrient analysis software package ‘DIET 1’ (Xyris software), which uses the NUTTAB 92 data base, to obtain a nutrient analysis for the menu item. Menu items were entered according to their standard recipes and standard serve size. The serve size refers to the “adjusted portion” size which accounts for weight losses during processing. Only those nutrients which were selected for the analysis were investigated. The nutrient analyses are shown per serve in the results section (analyses per 100g are shown in Appendix III).

For those ingredients that were not listed on the program, nutrient data were obtained from the food manufacturer, nutrition information panels on food product labels, or from the Australian Food Composition Tables (English and Lewis, 1992). The manufacturers contacted were able to supply most of this information, however some nutrient breakdowns were limited to only certain nutrients (for example, the relative amounts of fatty acids were not known). If nutrition data appeared to be similar for a substitute product listed on the DIET 1 programme, then that data was used in the analysis. For example, cornflour (listed on DIET 1) is nutritionally similar to Hi-flo (a thickening agent - not listed on DIET 1 - used in several meals), thus cornflour was substituted into recipes which included Hi-flo. Appendix IV lists the sources of nutrient information for products which do not appear on the software program.
All food items were analysed as their raw (uncooked) state so as to standardise for each meal. However, various food preparation processes (for example, peeled vegetables, canned fruit, diced meat) were included for the analysis. It is recognised that the nutrient value of foods can alter during cooking or processing. However, such changes tend to mainly affect the levels of micronutrients (vitamins and minerals) - which are not being assessed in this project. Fibre is somewhat changed (usually reduced) during processing, hence the nutrient analysis is likely to overestimate the fibre content of some menu items. In order to account for changes in moisture content which occur during cooking, the “water discard” ingredient was not included in the analysis, and the “adjusted portion” size was used as the measurement for standard serving size (see example of standard recipe in Appendix II).

Items which were currently not on the menu (such as Christmas dinner items) were not included in the analysis. These foods are offered only on special occasions (a few times per year) and therefore do not have a significant or lasting impact on the individual’s health and nutritional status. Some additional items which do not appear on the menu were also analysed. These items (eg: salads on the salad trolley) are offered regularly (as reported by the Catering Officer) and may include a standard recipe.

### 3.3 Development of nutritional criteria

A set of quantitative, nutritional guidelines was developed for the purpose of enabling the Central Kitchen to classify menu items into the three special diets. The guidelines were established following a comprehensive literature review. The criteria were adapted from similar guidelines stipulated by: the Dietary Guidelines for Australian caterers, Illawarra Area Health Service, South Western Sydney Area Health Service, Noarlunga Area Health Service, Diabetes Australia and National Heart Foundation. The criteria were also developed using research findings on the relationship between health and disease. Nutritional recommendations, specifically for the elderly, were also considered. Furthermore, discussions with the Catering Officer ensured that each guideline was realistic and achievable from a practical standpoint, and that sensory properties would not be compromised. The proposed guidelines are expressed according to serving size of
the menu item.

3.4 Classification of menu items

The menu items were then classified as either suitable or unsuitable for the selected diets, according to the criteria developed. The dietary aspects assessed were: total fat, saturated fat and/or sugar.

3.5 Review of current method for classifying menu items

The Catering Officer described the methods that are currently used by the Central Kitchen to create and classify recipes into special diets.
CHAPTER 4: RESULTS

4.1 Description of special diets

Four out of 27 sites provided lists of special diets which were present at the site. Six sites reported to have no special diets. Another seven sites reported to not have records of special diets present at the site. The special diets which were identified by four of the sites are shown in Table 4.1.

Table 4.1. Number of different special diets present at four sites catered for by the Central Kitchen

<table>
<thead>
<tr>
<th>Special diet</th>
<th>Number reported</th>
<th>Associated condition/reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low fat</td>
<td>11</td>
<td>Heart complaints</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gallstones</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>3</td>
<td>Religious reasons</td>
</tr>
<tr>
<td>Bland food</td>
<td>2</td>
<td>Hiatus hernia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Digestive problems</td>
</tr>
<tr>
<td>Low carbohydrate/low sugar</td>
<td>2</td>
<td>Dumping syndrome</td>
</tr>
<tr>
<td>Very high fibre</td>
<td>2</td>
<td>Obstruction problems</td>
</tr>
<tr>
<td>Colostomy</td>
<td>1</td>
<td>Colostomy</td>
</tr>
<tr>
<td>Diabetic</td>
<td>1</td>
<td>NIDDM</td>
</tr>
<tr>
<td>Gluten free</td>
<td>1</td>
<td>Not stated</td>
</tr>
<tr>
<td>High fibre</td>
<td>1</td>
<td>Not stated</td>
</tr>
<tr>
<td>Low fat/Very high fibre</td>
<td>1</td>
<td>Not stated</td>
</tr>
<tr>
<td>Low fat/Low salt</td>
<td>1</td>
<td>Anaemia</td>
</tr>
<tr>
<td>Low salt</td>
<td>1</td>
<td>Renal failure</td>
</tr>
<tr>
<td>No dairy</td>
<td>1</td>
<td>Allergy</td>
</tr>
<tr>
<td>Soft/low fat</td>
<td>1</td>
<td>Not stated</td>
</tr>
</tbody>
</table>
“Fibre” refers to both soluble and insoluble fibre.

The nutrient analysis tables also display the proposed guidelines for each menu item category. Those items which are shaded are classed as suitable for the three special diets. The corresponding nutrients which meet the guidelines are also shaded.
Table 4.2 Proposed quantitative nutritional guidelines for diabetic, cholesterol-lowering and weight reduction diets

<table>
<thead>
<tr>
<th>Menu item category</th>
<th>Serving size</th>
<th>Fat (maximum)</th>
<th>Sugar (maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast cereal</td>
<td>30-60g</td>
<td>2g</td>
<td>7% w/w</td>
</tr>
<tr>
<td>Milk</td>
<td>100-200mL</td>
<td>2%</td>
<td>-</td>
</tr>
<tr>
<td>Hot cereal</td>
<td>100-200g</td>
<td>2g</td>
<td>7% w/w</td>
</tr>
<tr>
<td>Hot breakfast</td>
<td>60-200g</td>
<td>5g</td>
<td>-</td>
</tr>
<tr>
<td>Main meat only</td>
<td>100-160g</td>
<td>10g *</td>
<td>-</td>
</tr>
<tr>
<td>Main pastry dish</td>
<td>100-170g</td>
<td>10g *</td>
<td>-</td>
</tr>
<tr>
<td>Main vegetarian</td>
<td>80-160g</td>
<td>10g *</td>
<td>-</td>
</tr>
<tr>
<td>Main wet/soft/blend</td>
<td>110-160g</td>
<td>10g *</td>
<td>-</td>
</tr>
<tr>
<td>Light/snack/salad</td>
<td>40-100g</td>
<td>5g</td>
<td>-</td>
</tr>
<tr>
<td>Potato/rice/pasta</td>
<td>50-120g</td>
<td>1g</td>
<td>-</td>
</tr>
<tr>
<td>Sauces/gravy</td>
<td>30-100g</td>
<td>1g</td>
<td>-</td>
</tr>
<tr>
<td>Single vegetable</td>
<td>50-80g</td>
<td>1g</td>
<td>-</td>
</tr>
<tr>
<td>Soups</td>
<td>120-180g</td>
<td>2g</td>
<td>-</td>
</tr>
<tr>
<td>Spreads</td>
<td>8-10g</td>
<td>mono/poly fat</td>
<td>low joule</td>
</tr>
<tr>
<td>Milk-based desserts</td>
<td>60-150g</td>
<td>3g</td>
<td>10% w/w</td>
</tr>
<tr>
<td>Non-milk desserts</td>
<td>60-150g</td>
<td>3g</td>
<td>10% w/w</td>
</tr>
<tr>
<td>Fruit - fresh</td>
<td>one piece</td>
<td>0.5g</td>
<td>none added</td>
</tr>
<tr>
<td>Fruit - canned</td>
<td>1/2-1 cup</td>
<td>0.5g</td>
<td>none added</td>
</tr>
<tr>
<td>Fruit - juice</td>
<td>100-200mL</td>
<td>0.5g</td>
<td>none added</td>
</tr>
</tbody>
</table>

* maximum fat up to 15g when saturated fat content is less than 30% of fat
Table 4.3 Nutrient analysis of hot breakfast items (per serve)

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Serve size</th>
<th>Energy (kJ)</th>
<th>Total</th>
<th>Fat (g)</th>
<th>Total Sat’d Mono Poly</th>
<th>Total Carbohydrate (g)</th>
<th>Total Starch</th>
<th>Sugar</th>
<th>Fibre (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baked beans</td>
<td>200 g</td>
<td>540</td>
<td>1.0</td>
<td>0.2</td>
<td>0.1</td>
<td>0.5</td>
<td>19.6</td>
<td>9.2</td>
<td>10.4</td>
</tr>
<tr>
<td>(canned)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grilled bacon</td>
<td>80 g</td>
<td>1374</td>
<td>28.0</td>
<td>11.3</td>
<td>12.5</td>
<td>2.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Grilled</td>
<td>140 g</td>
<td>1848</td>
<td>34.0</td>
<td>13.6</td>
<td>16.2</td>
<td>2.7</td>
<td>14.7</td>
<td>14.4</td>
<td>0.3</td>
</tr>
<tr>
<td>sausages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrambled</td>
<td>120 g</td>
<td>461</td>
<td>7.2</td>
<td>3.3</td>
<td>2.6</td>
<td>0.5</td>
<td>3.7</td>
<td>0.0</td>
<td>3.7</td>
</tr>
<tr>
<td>eggs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spaghetti</td>
<td>200 g</td>
<td>510</td>
<td>0.8</td>
<td>0.1</td>
<td>0.1</td>
<td>0.3</td>
<td>23.4</td>
<td>22.4</td>
<td>1.0</td>
</tr>
<tr>
<td>(canned)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposed</td>
<td>60-200 g</td>
<td>-</td>
<td>5g</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Shaded values indicate that the values meet the guidelines.
Shaded menu items indicate that the item is classified as 'suitable'.
Table 4.4 Nutrient analysis of main meat-only dishes (per serve)

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Serve size</th>
<th>Energy (kJ)</th>
<th>Total</th>
<th>Fat (g)</th>
<th>Sat’d</th>
<th>Mono</th>
<th>Poly</th>
<th>Carbohydrate (g)</th>
<th>Starch</th>
<th>Sugar</th>
<th>Fibre (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken drumstick</td>
<td>138 g</td>
<td>734</td>
<td>7.6</td>
<td>2.2</td>
<td>3.4</td>
<td>0.9</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Corned silverside</td>
<td>142 g</td>
<td>628</td>
<td>2.9</td>
<td>1.3</td>
<td>1.2</td>
<td>0.1</td>
<td></td>
<td>1.7</td>
<td>0.0</td>
<td>1.7</td>
<td>0.1</td>
</tr>
<tr>
<td>Crumbed fish</td>
<td>160 g</td>
<td>1286</td>
<td>13.9</td>
<td>3.4</td>
<td>5.5</td>
<td>4.2</td>
<td></td>
<td>10.9</td>
<td>10.9</td>
<td>0.0</td>
<td>0.8</td>
</tr>
<tr>
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<td>17.4</td>
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<td>735</td>
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<tr>
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<td>653</td>
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<tr>
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<td>100-160 g</td>
<td>-</td>
<td>10g</td>
<td>&lt;30%</td>
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* this guideline applies only to those dishes with total fat content of 10-15g
Table 4.5 Nutrient analysis of main pastry dishes (per serve)

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<tr>
<th>Menu Item</th>
<th>Serve Size</th>
<th>Energy (kJ)</th>
<th>Total Fat (g)</th>
<th>Fat Sat'd (g)</th>
<th>Fat Mono (g)</th>
<th>Fat Poly (g)</th>
<th>Carbohydrate Total (g)</th>
<th>Carbohydrate Starch (g)</th>
<th>Carbohydrate Sugar (g)</th>
<th>Fibre (g)</th>
</tr>
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<tbody>
<tr>
<td>Cauliflower &amp; sweet flan</td>
<td>140 g</td>
<td>681</td>
<td>10.2</td>
<td>6.0</td>
<td>3.1</td>
<td>0.5</td>
<td>12.5</td>
<td>10.6</td>
<td>1.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Chicken &amp; corn puffs</td>
<td>100 g</td>
<td>873</td>
<td>11.5</td>
<td>6.1</td>
<td>3.8</td>
<td>0.6</td>
<td>17.4</td>
<td>15.3</td>
<td>1.9</td>
<td>1.2</td>
</tr>
<tr>
<td>Chicken &amp; ham vol.</td>
<td>170 g</td>
<td>868</td>
<td>9.2</td>
<td>3.7</td>
<td>3.6</td>
<td>0.7</td>
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<td>2.1</td>
<td>1.5</td>
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<td>146 g</td>
<td>1482</td>
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<td>4.9</td>
<td>2.3</td>
<td>0.3</td>
<td>46.4</td>
<td>0.0</td>
<td>9.5</td>
<td>1.1</td>
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<tr>
<td>Potato &amp; tuna puff</td>
<td>100 g</td>
<td>844</td>
<td>11.4</td>
<td>6.3</td>
<td>3.7</td>
<td>0.7</td>
<td>15.9</td>
<td>15.3</td>
<td>0.6</td>
<td>0.9</td>
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<td>708</td>
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<td>4.3</td>
<td>2.9</td>
<td>0.5</td>
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<td>1.7</td>
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<td>1270</td>
<td>20.7</td>
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<td>6.8</td>
<td>1.1</td>
<td>15.4</td>
<td>12.8</td>
<td>2.7</td>
<td>0.5</td>
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<td>Savoury meat &amp; potato slice</td>
<td>120 g</td>
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<td>13.1</td>
<td>12.4</td>
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<td>0.6</td>
<td>15.4</td>
<td>12.7</td>
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<td>918</td>
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<td>6.3</td>
<td>3.7</td>
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<td>16.7</td>
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<td>Steak &amp; mushr'm pie</td>
<td>160 g</td>
<td>1272</td>
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<td>7.6</td>
<td>5.2</td>
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<td>22.8</td>
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<td>1.1</td>
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<td>160 g</td>
<td>1319</td>
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<td>7.9</td>
<td>5.4</td>
<td>0.9</td>
<td>23.8</td>
<td>22.9</td>
<td>1.3</td>
<td>1.0</td>
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<td>Steak &amp; veg. pie</td>
<td>160 g</td>
<td>1287</td>
<td>14.7</td>
<td>7.6</td>
<td>5.2</td>
<td>0.9</td>
<td>22.2</td>
<td>20.7</td>
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<td>0.9</td>
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<tr>
<td>Proposed guideline</td>
<td>100-170 g</td>
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<td>&lt;30% of fat</td>
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* this guideline applies only to those dishes with total fat content 10-15g
Table 4.6 Nutrient analysis of main vegetarian dishes (per serve)

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<tr>
<th>Menu Item</th>
<th>Serve</th>
<th>Energy (kJ)</th>
<th>Total Energy (%)</th>
<th>Fat (g)</th>
<th>Total Sat’d Mono Poly</th>
<th>Total Carbohydrate (g)</th>
<th>Carbohydrate Starch Sugar</th>
<th>Fibre (g)</th>
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<tbody>
<tr>
<td>Asparagus mornay</td>
<td>140 g</td>
<td>693</td>
<td>10.4</td>
<td>5.0</td>
<td>4.1</td>
<td>11.7</td>
<td>8.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Baked egg mornay</td>
<td>140 g</td>
<td>1286</td>
<td>23.2</td>
<td>11.4</td>
<td>8.9</td>
<td>12.2</td>
<td>9.3</td>
<td>2.9</td>
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<td>Egg and aspar.mornay</td>
<td>140 g</td>
<td>949</td>
<td>16.5</td>
<td>7.7</td>
<td>6.5</td>
<td>9.1</td>
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<td>Fettucine Napolitan</td>
<td>124 g</td>
<td>734</td>
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<td>17.1</td>
<td>14.6</td>
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<td>Macaroni cheese</td>
<td>123 g</td>
<td>741</td>
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<td>5.3</td>
<td>2.1</td>
<td>17.4</td>
<td>15.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Spinach,cheese and onion puff</td>
<td>79 g</td>
<td>844</td>
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<td>7.9</td>
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<td>Spinach mornay</td>
<td>60 g</td>
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<td>Spinach quiche</td>
<td>150 g</td>
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<td>19.5</td>
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<td>15.0</td>
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<td>Vegetable lasagne</td>
<td>120 g</td>
<td>782</td>
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<td>3.1</td>
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<td>Vegetable patties</td>
<td>85 g</td>
<td>1017</td>
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<td>*</td>
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<tr>
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<td>80-160 g</td>
<td>10 g</td>
<td>&lt;30% of fat*</td>
<td>-</td>
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</table>

* this guideline applies only to those dishes with total fat content of 10-15g
Table 4.7 Nutrient analysis of main wet/soft/blend dishes (per serve)

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<tr>
<th>Menu Item</th>
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<th>Energy (kJ)</th>
<th>Total Energy (%)</th>
<th>Fat (g)</th>
<th>Total Fat (%)</th>
<th>Sat’d (g)</th>
<th>Monounsaturated (g)</th>
<th>Poly (g)</th>
<th>Carbohydrate (g)</th>
<th>Total Starch (g)</th>
<th>Sugar (g)</th>
<th>Total Fibre (g)</th>
<th>Starch (g)</th>
<th>Sugar (g)</th>
<th>Poly (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baked soya lamb</td>
<td>130 g</td>
<td>635</td>
<td>4.4</td>
<td>2.0</td>
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<td>0.2</td>
<td>0.1</td>
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<tr>
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<td>0.2</td>
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<td>0.2</td>
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<td>Serve size</td>
<td>Energy (kJ)</td>
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<td>Fat (g)</td>
<td>Sat'd</td>
<td>Mono</td>
<td>Poly</td>
<td>Carbohydrate (g)</td>
<td>Starch</td>
<td>Sugar</td>
<td>Fibre (g)</td>
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<td>7.9</td>
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<td>5.0</td>
<td>3.7</td>
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* this guideline applies only to those dishes with total fat content of 10-15g
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<tr>
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<tr>
<td>Menu Item</td>
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<td>Energy (kJ)</td>
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<td>Fat (g)</td>
<td>Sat’d</td>
<td>Mono</td>
</tr>
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<td>-------------</td>
<td>-------</td>
<td>---------</td>
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<td>------</td>
</tr>
<tr>
<td>Creamed potatoes</td>
<td>60 g</td>
<td>282</td>
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<td>0.6</td>
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<tr>
<td>Hash brown</td>
<td>54 g</td>
<td>747</td>
<td>12.4</td>
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<td>*</td>
<td>*</td>
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<td>Italian potatoes</td>
<td>60 g</td>
<td>286</td>
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<td>0.7</td>
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<td>Oven fries</td>
<td>90 g</td>
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<td>275</td>
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<td>1.3</td>
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<td>Potatoes Parisienne</td>
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<td>0.5</td>
<td>0.2</td>
<td>0.2</td>
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<tr>
<td>Savoury rice</td>
<td>60 g</td>
<td>126</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Proposed</strong></td>
<td><strong>50-120 g</strong></td>
<td><strong>-</strong></td>
<td><strong>-</strong></td>
<td><strong>-</strong></td>
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</tr>
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<td>Fat (g)</td>
<td>Total Sat’d</td>
<td>Mono</td>
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<td>-------</td>
<td>---------</td>
<td>-------------</td>
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</tr>
<tr>
<td>Apple sauce</td>
<td>53 g</td>
<td>72</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>Con casse sauce</td>
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<td>40</td>
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<td>0.0</td>
<td>0.0</td>
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<tr>
<td>Gravy</td>
<td>99 g</td>
<td>131</td>
<td>0.5</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<td>Mushroom sauce</td>
<td>116 g</td>
<td>149</td>
<td>0.5</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Onion gravy</td>
<td>100 g</td>
<td>126</td>
<td>0.4</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<tr>
<td>Parsley sauce</td>
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<td>138</td>
<td>0.8</td>
<td>0.5</td>
<td>0.2</td>
<td>0.0</td>
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<td>Provencal sauce</td>
<td>48 g</td>
<td>60</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>Sweet and sour sauce</td>
<td>97 g</td>
<td>225</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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Table 4.11 Nutrient analysis of single vegetable dishes (per serve)

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<tr>
<th>Menu Item</th>
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<th>Energy (kJ)</th>
<th>Total Fat (g)</th>
<th>Fat Sat’d (g)</th>
<th>Fat Mono (g)</th>
<th>Fat Poly (g)</th>
<th>Total Carbohydrate (g)</th>
<th>Carbohydrate Starch (g)</th>
<th>Carbohydrate Sugar (g)</th>
<th>Fibre (g)</th>
</tr>
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<tbody>
<tr>
<td>Baton carrots</td>
<td>57 g</td>
<td>69</td>
<td>0.4</td>
<td>0.2</td>
<td>0.1</td>
<td>0.0</td>
<td>2.9</td>
<td>0.0</td>
<td>2.9</td>
<td>1.6</td>
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<tr>
<td>Braised onions</td>
<td>50 g</td>
<td>56</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.4</td>
<td>0.0</td>
<td>2.4</td>
<td>0.8</td>
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<tr>
<td>Broccoli</td>
<td>60 g</td>
<td>61</td>
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<td>0.0</td>
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<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
<td>0.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>60 g</td>
<td>68</td>
<td>0.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.3</td>
<td>0.0</td>
<td>1.3</td>
<td>2.2</td>
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<tr>
<td>Cabbage</td>
<td>60 g</td>
<td>66</td>
<td>0.7</td>
<td>0.4</td>
<td>0.2</td>
<td>0.0</td>
<td>1.5</td>
<td>0.0</td>
<td>1.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>60 g</td>
<td>48</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.2</td>
<td>0.0</td>
<td>1.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Cauliflower and cheese</td>
<td>60 g</td>
<td>165</td>
<td>2.6</td>
<td>1.7</td>
<td>0.6</td>
<td>0.1</td>
<td>1.1</td>
<td>0.0</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Mixed vegetables</td>
<td>72 g</td>
<td>94</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>3.4</td>
<td>1.0</td>
<td>2.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Peas</td>
<td>60 g</td>
<td>150</td>
<td>0.9</td>
<td>0.5</td>
<td>0.3</td>
<td>0.1</td>
<td>3.4</td>
<td>2.3</td>
<td>1.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Roast pumpkin</td>
<td>60 g</td>
<td>95</td>
<td>0.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>3.8</td>
<td>1.3</td>
<td>2.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Sliced beans</td>
<td>60 g</td>
<td>47</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.7</td>
<td>0.9</td>
<td>0.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Sweet corn kernals</td>
<td>60 g</td>
<td>277</td>
<td>1.3</td>
<td>0.4</td>
<td>0.2</td>
<td>0.0</td>
<td>11.8</td>
<td>10.2</td>
<td>1.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>72 g</td>
<td>40</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
<td>0.9</td>
</tr>
<tr>
<td>Turnips</td>
<td>60 g</td>
<td>49</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.0</td>
<td>0.1</td>
<td>1.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Vegetable blend</td>
<td>133 g</td>
<td>245</td>
<td>0.5</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
<td>8.1</td>
<td>4.1</td>
<td>4.1</td>
<td>4.7</td>
</tr>
<tr>
<td>Zucchini and tomato</td>
<td>60 g</td>
<td>96</td>
<td>1.3</td>
<td>0.7</td>
<td>0.3</td>
<td>0.0</td>
<td>1.5</td>
<td>0.5</td>
<td>1.0</td>
<td>0.9</td>
</tr>
<tr>
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<td>50-80 g</td>
<td>-</td>
<td>1 g</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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Table 4.12 Nutrient analysis of soups (per serve)

<table>
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<tr>
<th>Menu Item</th>
<th>Serve Size</th>
<th>Energy (kJ)</th>
<th>Fat (g)</th>
<th>Carbohydrate (g)</th>
<th>Fibre (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Sat'd</td>
<td>Mono Poly Total</td>
<td>Starch Sugar Fibre</td>
</tr>
<tr>
<td>Chicken noodle soup</td>
<td>120 g</td>
<td>84</td>
<td>0.2</td>
<td>*</td>
<td>4.0 3.2 0.7 *</td>
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<tr>
<td>Cream of chicken soup</td>
<td>120 g</td>
<td>104</td>
<td>0.5</td>
<td>*</td>
<td>4.1 3.2 0.8 *</td>
</tr>
<tr>
<td>Cream of pumpkin soup</td>
<td>120 g</td>
<td>203</td>
<td>1.2</td>
<td>*</td>
<td>8.6 5.0 3.6 *</td>
</tr>
<tr>
<td>Cream of tomato soup</td>
<td>120 g</td>
<td>104</td>
<td>0.5</td>
<td>*</td>
<td>4.1 3.2 0.8 *</td>
</tr>
<tr>
<td>Pea &amp; ham soup</td>
<td>120 g</td>
<td>158</td>
<td>0.7</td>
<td>*</td>
<td>6.1 5.9 0.2 *</td>
</tr>
<tr>
<td>Spring vegetable soup</td>
<td>120 g</td>
<td>58</td>
<td>0.1</td>
<td>*</td>
<td>2.8 2.6 0.4 *</td>
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<tr>
<td>Thick vegetable soup</td>
<td>120 g</td>
<td>139</td>
<td>0.0</td>
<td>*</td>
<td>6.2 5.4 0.8 *</td>
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<td>120-180 g</td>
<td>2g</td>
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Table 4.13 Nutrient analysis of milk-based desserts (per serve)

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<th>Total Fat (g)</th>
<th>Fat Sat’d (g)</th>
<th>Fat Mono (g)</th>
<th>Fat Poly (g)</th>
<th>Total Carbohydrate (g)</th>
<th>Carbohydrate Starch (g)</th>
<th>Carbohydrate Sugar (g)</th>
<th>Fibre (g)</th>
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</thead>
<tbody>
<tr>
<td>Apple cream (diet)</td>
<td>148 g</td>
<td>420</td>
<td>6.1</td>
<td>4.1</td>
<td>1.6</td>
<td>0.2</td>
<td>11.3</td>
<td>0.4</td>
<td>10.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Baked custard</td>
<td>120 g</td>
<td>428</td>
<td>2.9</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>17.7</td>
<td>1.4</td>
<td>12.8</td>
<td>0.3</td>
</tr>
<tr>
<td>Baked cust’d &amp; apricot (diet)</td>
<td>144 g</td>
<td>327</td>
<td>3.0</td>
<td>2.0</td>
<td>0.8</td>
<td>0.1</td>
<td>9.4</td>
<td>0.0</td>
<td>8.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Baked cust’d &amp; peaches (diet)</td>
<td>144 g</td>
<td>325</td>
<td>3.0</td>
<td>2.0</td>
<td>0.8</td>
<td>0.1</td>
<td>9.6</td>
<td>0.0</td>
<td>8.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Baked rice &amp; pears (diet)</td>
<td>120 g</td>
<td>246</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>13.8</td>
<td>2.2</td>
<td>9.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Baked rice custard &amp; pears</td>
<td>120 g</td>
<td>345</td>
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<td>0.7</td>
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<td>Berry mousse (diet)</td>
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<td>550</td>
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<td>2.6</td>
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<td>7.4</td>
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<td>Caramel cream</td>
<td>100 g</td>
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<td>18.7</td>
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<td>549</td>
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<td>0.1</td>
<td>23.9</td>
<td>21.2</td>
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<td>0.6</td>
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<tr>
<td>Creamed rice &amp; peach (diet)</td>
<td>120 g</td>
<td>246</td>
<td>0.8</td>
<td>0.5</td>
<td>0.2</td>
<td>0.0</td>
<td>12.2</td>
<td>9.9</td>
<td>2.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Creamed rice &amp; pears (diet)</td>
<td>148 g</td>
<td>662</td>
<td>2.3</td>
<td>1.4</td>
<td>0.6</td>
<td>0.1</td>
<td>30.5</td>
<td>21.0</td>
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<td>3 g</td>
<td>-</td>
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<td>-</td>
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<td>&lt;10% w/w</td>
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<td>Fat (g)</td>
<td>Fat (g)</td>
<td>Fat (g)</td>
<td>Carbohydrate (g)</td>
<td>Carbohydrate (g)</td>
<td>Carbohydrate (g)</td>
<td>Fibre (g)</td>
</tr>
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<td>-----------------</td>
<td>-----------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>Sat'd</td>
<td>Mono</td>
<td>Poly</td>
<td>Total</td>
<td>Starch</td>
<td>Sugar</td>
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<td>120 g</td>
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<tr>
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<td>19.9</td>
<td>7.5</td>
<td>12.4</td>
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<td>Ice cream</td>
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<td>1.4</td>
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<td>19.7</td>
<td>13.6</td>
<td>6.1</td>
<td>0.6</td>
</tr>
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<td>Orange mousse (diet)</td>
<td>70 g</td>
<td>179</td>
<td>2.4</td>
<td>1.4</td>
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<td>0.1</td>
<td>3.5</td>
<td>0.0</td>
<td>3.3</td>
<td>0.0</td>
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<td>Passionfruit ice cream</td>
<td>140 g</td>
<td>1153</td>
<td>15.5</td>
<td>10.3</td>
<td>4.0</td>
<td>0.4</td>
<td>29.8</td>
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<td>29.8</td>
<td>0.3</td>
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<tr>
<td>Peach conde (diet)</td>
<td>120 g</td>
<td>317</td>
<td>1.1</td>
<td>0.7</td>
<td>0.3</td>
<td>0.0</td>
<td>14.3</td>
<td>8.6</td>
<td>5.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Pear melba</td>
<td>160 g</td>
<td>515</td>
<td>5.3</td>
<td>3.5</td>
<td>1.4</td>
<td>0.1</td>
<td>17.3</td>
<td>0.0</td>
<td>15.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Trifle/Sherry trifle (diet)</td>
<td>160 g</td>
<td>406</td>
<td>2.5</td>
<td>1.6</td>
<td>0.6</td>
<td>0.1</td>
<td>16.4</td>
<td>10.3</td>
<td>5.7</td>
<td>0.8</td>
</tr>
<tr>
<td>Wine/Sherry trifle &amp; cream</td>
<td>140 g</td>
<td>526</td>
<td>4.7</td>
<td>2.6</td>
<td>1.0</td>
<td>0.1</td>
<td>19.1</td>
<td>3.1</td>
<td>15.4</td>
<td>0.3</td>
</tr>
<tr>
<td>Proposed guideline</td>
<td>60-150 g</td>
<td>3 g</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>&lt;10% w/w</td>
<td>-</td>
</tr>
<tr>
<td>Menu Item</td>
<td>Serve size</td>
<td>Energy (kJ)</td>
<td>Total Carbohydrate (g)</td>
<td>Fat (g)</td>
<td>Total Starch (g)</td>
<td>Total Sugar (g)</td>
<td>Fibre (g)</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Apple crumble</td>
<td>137 g</td>
<td>751</td>
<td>33.9</td>
<td>7.7</td>
<td>26.3</td>
<td>2.8</td>
<td></td>
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<tr>
<td>Apple &amp; rasp-berry sponge</td>
<td>120 g</td>
<td>740</td>
<td>580</td>
<td>3.5</td>
<td>35.0</td>
<td>11.6</td>
<td>22.5</td>
<td>3.1</td>
<td></td>
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<tr>
<td>Apple &amp; rhub. crumble</td>
<td>137 g</td>
<td>580</td>
<td>33.9</td>
<td>7.7</td>
<td>26.3</td>
<td>2.8</td>
<td></td>
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</tr>
<tr>
<td>Apple &amp; rhubarb only*</td>
<td>140 g</td>
<td>243</td>
<td>14.2</td>
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<td>3.0</td>
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<tr>
<td>Apple only sweet*</td>
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<td>0.4</td>
<td>15.3</td>
<td>2.8</td>
<td></td>
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<tr>
<td>Apple pie</td>
<td>120 g</td>
<td>1210</td>
<td>63.0</td>
<td>7.0</td>
<td>55.8</td>
<td>1.3</td>
<td></td>
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<tr>
<td>Butterscotch sponge pudd'g</td>
<td>120 g</td>
<td>820</td>
<td>42.6</td>
<td>20.3</td>
<td>22.3</td>
<td>0.8</td>
<td></td>
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<tr>
<td>Bread &amp; butter jam pudding</td>
<td>111 g</td>
<td>708</td>
<td>30.9</td>
<td>4.6</td>
<td>26.3</td>
<td>1.2</td>
<td></td>
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<tr>
<td>Coconut slice</td>
<td>93 g</td>
<td>1901</td>
<td>39.1</td>
<td>12.4</td>
<td>26.1</td>
<td>4.5</td>
<td></td>
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<td></td>
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<tr>
<td>Dutch apple pie</td>
<td>120 g</td>
<td>822</td>
<td>33.9</td>
<td>12.2</td>
<td>21.3</td>
<td>2.5</td>
<td></td>
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<tr>
<td>Fresh fruit salad*</td>
<td>150 g</td>
<td>198</td>
<td>9.9</td>
<td>0.0</td>
<td>9.9</td>
<td>2.5</td>
<td></td>
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<tr>
<td>Fruit flummery</td>
<td>120 g</td>
<td>492</td>
<td>27.4</td>
<td>0.0</td>
<td>27.2</td>
<td>0.7</td>
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<td></td>
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<tr>
<td>Fruit flummery (diet)</td>
<td>120 g</td>
<td>136</td>
<td>3.4</td>
<td>0.0</td>
<td>3.0</td>
<td>1.5</td>
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<td></td>
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<tr>
<td>Fruit salad canned*</td>
<td>120 g</td>
<td>210</td>
<td>11.3</td>
<td>0.0</td>
<td>9.8</td>
<td>1.8</td>
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<td></td>
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<tr>
<td>Fruit sponge flan</td>
<td>129 g</td>
<td>761</td>
<td>37.1</td>
<td>9.5</td>
<td>26.0</td>
<td>1.1</td>
<td></td>
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<tr>
<td>Jelly</td>
<td>120 g</td>
<td>301</td>
<td>17.0</td>
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<td>17.0</td>
<td>0.0</td>
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<tr>
<td>Proposed guideline</td>
<td>60-150 g</td>
<td>3 g</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>&lt;10% w/w</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Menu item</td>
<td>Serve size</td>
<td>Energy (kJ)</td>
<td>Total</td>
<td>Fat (g)</td>
<td>Carbohydrate (g)</td>
<td>Fibre (g)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Fat (g)</td>
<td>Carbohydrate (g)</td>
<td>Starch</td>
<td>Sugar</td>
<td>&lt;10% w/w</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lemon cheesecake</td>
<td>132 g</td>
<td>1923</td>
<td>25.7</td>
<td>*</td>
<td>50.1</td>
<td>*</td>
<td>25.5</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manchester tart</td>
<td>160 g</td>
<td>1154</td>
<td>11.7</td>
<td>*</td>
<td>40.9</td>
<td>17.1</td>
<td>22.4</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches in jelly (diet)</td>
<td>124 g</td>
<td>71</td>
<td>0.0</td>
<td>0.0</td>
<td>3.7</td>
<td>0.0</td>
<td>3.7</td>
<td>0.9</td>
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<td></td>
</tr>
<tr>
<td>Peach sponge pudding</td>
<td>120 g</td>
<td>920</td>
<td>5.2</td>
<td>*</td>
<td>40.4</td>
<td>15.1</td>
<td>24.1</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pears in jelly (diet)</td>
<td>124 g</td>
<td>119</td>
<td>0.0</td>
<td>0.0</td>
<td>6.8</td>
<td>0.0</td>
<td>5.6</td>
<td>1.2</td>
<td></td>
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</tr>
<tr>
<td>Pears in portwine jelly</td>
<td>100 g</td>
<td>385</td>
<td>0.0</td>
<td>0.0</td>
<td>22.4</td>
<td>0.0</td>
<td>22.4</td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pineapple pie</td>
<td>120 g</td>
<td>921</td>
<td>6.2</td>
<td>*</td>
<td>39.2</td>
<td>12.9</td>
<td>25.9</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rockmelon*</td>
<td>130 g</td>
<td>118</td>
<td>0.1</td>
<td>0.0</td>
<td>6.1</td>
<td>0.0</td>
<td>6.1</td>
<td>1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam’d golden sponge pudd’g</td>
<td>77 g</td>
<td>1057</td>
<td>5.6</td>
<td>*</td>
<td>49.1</td>
<td>14.8</td>
<td>32.9</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stewed fruit*</td>
<td>140 g</td>
<td>287</td>
<td>0.0</td>
<td>0.0</td>
<td>16.8</td>
<td>0.2</td>
<td>15.8</td>
<td>2.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stewed fruit (diet)*</td>
<td>140 g</td>
<td>168</td>
<td>0.0</td>
<td>0.0</td>
<td>9.7</td>
<td>0.2</td>
<td>8.8</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberry fonde swiss</td>
<td>109 g</td>
<td>1057</td>
<td>15.9</td>
<td>*</td>
<td>38.0</td>
<td>13.3</td>
<td>21.0</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two fruits in jelly (diet)</td>
<td>60 g</td>
<td>35</td>
<td>0.0*</td>
<td>0.0</td>
<td>1.9</td>
<td>0.0</td>
<td>1.9</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposed guideline</td>
<td>60-150 g</td>
<td>3</td>
<td></td>
<td></td>
<td>&lt;10% w/w</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* fruit items guidelines:
serve size - one piece/ 1/2 - 1 cup
fat - 0.5g
sugar - none added
4.4 Menu item classification

The proposed guidelines were used to classify menu items as suitable or unsuitable for diabetic, cholesterol-lowering and weight reduction diets.

In cases where the serving size was not within the suggested guideline, the quantity was adjusted and corresponding changes were made to the nutrient contents. For example, if the guideline refers to a 100g serve, but the serving size of the dish is 50g, then the nutrient values for this dish were doubled. This calculation is not shown in the analysis tables, whereby only the actual (original) serve size is listed. However, the adjusted nutrient values were used for classifying the menu item.

An item was classified as unsuitable if the value of a nutrient, for which a criterion was specified, was not known.

Figure 4.1 shows the proportion of suitable and unsuitable items for each menu category. One-hundred-and-sixteen out of 194 menu items (60 per cent) were classed as suitable for all three special diets. The categories in which more than half of the items were suitable were: main meat only dishes, main wet/soft/blend dishes, sauces/gravy, single vegetables, soups, and milk-based desserts. Appendix V shows the number of suitable and unsuitable items for each category.
Figure 4.1 Classification of different menu item categories
4.5 Current method for classifying menu items

The current system for classifying menu items into special diets is based on qualitative evaluation. The Kitchen does not use any quantitative criteria, and the standard recipes have not been previously analysed for their nutrient content. The Kitchen does not employ a dietitian.

Those dishes which are considered suitable are listed as “diet” items on the menu. These items are primarily intended for diabetic diets, although they are also provided for residents who require low fat/low cholesterol diets.

The Kitchen only classifies main menu items and desserts. Light/snack dishes and hot breakfast items are also assessed, upon serving, for their suitability - whereby those items regarded as high in fat are not offered to residents requiring a diabetic and/or low fat diet. All side dishes (ie: potato/rice/pasta, single vegetables, soups, salads, sauces/gravy) are considered acceptable, however, these are not labelled as “diet” dishes.

The main qualitative guidelines (as described by the Catering Officer) which are presently used to classify meals as suitable for special diets are as follows;

* meats must be lean
* low fat cooking methods are used
* sugar is not added to sweets/desserts, although an artificial sweetener may be added.

“Diet” recipes may also be based on those suggested in cookbooks with ‘diabetic’ recipes.
CHAPTER 5: DISCUSSION

5.1 Description of special diets

The apparently small number of special diets (reported by the residential sites) does not reflect what is mentioned in the literature, regarding the high prevalence of diabetes and hyperlipidaemia among the elderly. Some explanations for this probable underestimation may be;

1) Special diets are underdiagnosed for this population - which would reflect a lack of dietetic consultation, and thus support the need for such a service.
2) A lack of awareness of some staff members (at the sites) about the existence of special diets. This would be rather disturbing, as it is important for carers of the residents to know of their dietary requirements so as to help ensure that adequate and appropriate nutrition is provided.
3) Misunderstanding by the staff members about what constitutes a 'special diet'. For instance, texture modified may not have been interpreted as being a special diet.
4) Many of the sites do not keep records on the types and numbers of special diets present at the site. Such statistics are important as they represent documented evidence of the need for dietetic consultancy.

Also, ten out of the twenty-seven sites were not contacted, and the Meals-on-Wheels service was not included in the analysis of the special diets. This was because the Catering Officer stated that these sites either do not have any special diets or do not have information on the number of special diets present. More accurate results may have been obtained by providing each site with a written definition of 'special diet' and a list of examples, including a request for a written response.

However, the number and types of special diets mentioned by the Catering Officer is similar to the patterns stated elsewhere. For example, the study by Brady-Moran and Reed (1993) found that 30 per cent of elderly clients followed special diets. Similarly, in this report, 35 per cent of the residents required therapeutic diets, whereby the most common requests were for diabetic and soft diets.
5.2 Proposed nutritional guidelines

5.2 (a) Comparison with existing nutritional guidelines

Table 5.1 shows a summary of some current dietary guidelines as well as the proposed standards. Although the existing nutritional guidelines represent practical instructions for caterers, the validity of the criteria is debatable for various reasons.

Firstly, other organisations have based their nutritional standards according to the Dietary Guidelines for Australians. These qualitative recommendations were created for the general healthy population, they are not designed to be quantified and they should not be used to assess individual food items (NH&MRC, 1992). This raises the question concerning the meaningfulness of developing nutritional guidelines (especially for therapeutic purposes) which endeavour to quantify qualitative nutrition messages aimed at the general public.

Secondly, while there are similarities among current guidelines, it is unresolved why differences also exist. Presumably, the differences partly arise from modifications that are made to accommodate the unique needs of the specific target populations. Also, the different values may be indicative that the nutrient requirements are yet to be determined for people with diabetes, hyperlipidaemia and/or who are obese. A review of the literature on the existing guidelines reveals a lack of rationale for the numerical criteria. Thus it remains uncertain as to how the values were selected, and consequently why there are inconsistencies between the current guidelines. There is an obvious need for organisations to provide clearer descriptions of the processes used to define their numerical standards.

Furthermore, the differences in nutritional guidelines presents a problem regarding the ability to compare different menus. For example, the percentage of 'high fat' menu items will vary according to the criteria (eg: IAHS versus SWSAHS guidelines) used to assess the menu. This impels the need to decide which set of guidelines is correct for classifying menu items. Hence, further research into formulating scientifically precise guidelines is required. Additionally, there is a need to promote consensus among individual organisations for common sets of (quantitative) nutritional
guidelines for various sub-groups (eg: institutionalised elderly people).

Therefore, since the validity of existing nutritional guidelines is questionable, the benefit of providing a practical tool for food service is undermined. Consequently, it is not appropriate to formulate guidelines which are simply an average of those previously established. Hence, the proposed guidelines are largely based on current scientific data regarding the three special diets as well as special considerations for the elderly. The proposed criteria are not an attempt to quantify the Dietary Guidelines for Australians, yet they are consistent with the national recommendations.

5.2 (b) Integration of the guidelines for different special diets

Food service establishments are using increasingly integrated menus which allow dishes to be selected for general as well as several special diets (IAHS, 1993)(SWSAHS, 1994). There are many advantages in formulating combined nutritional guidelines. From a practical perspective, workload is streamlined as there is less need to duplicate menu items. Consequently, labour and resource costs are reduced.

From a theoretical standpoint, the same nutritional principles apply to all three special diets. For instance, the diets recommended by the American Diabetes Association for diabetics and the American Heart Association for the general population are very similar (Wood and Bierman, 1986). Also, the goals of nutrition therapy for both diabetes and hyperlipidaemia address correction of abnormal plasma lipid levels, weight reduction and prevention/delay of cardiovascular disease. Theoretically, then, the same nutrition guidelines should be applicable for diabetes, hyperlipidaemia and obesity.

Furthermore, the three conditions tend to be associated with one another (for example, obesity is common among people with diabetes). Thus, many people will require multiple special diets. Combining the guidelines for different diets therefore reduces confusion when the need arises to superimpose one diet on another.
5.2 (c) Guidelines for individual menu items

Criteria were developed for each type of menu item, rather than for composite meals. The latter application is less useful, since the ‘meal’ for which the guidelines are specified may differ from what the person actually selects. For example, the guidelines may refer to a meal that consists of meat, a starchy vegetable, and two other vegetables, whereas the person may choose only meat and one starchy vegetable. Thus, specifying criteria for individual items (that is, meal components) permits any combination of menu items to be selected for a meal.

An alternative approach would be to set guidelines for overall daily consumption. This would permit the inclusion of food items which exceed the guidelines, as long as other foods are less than the criteria, to ensure that the overall daily intake meets the guidelines. This technique requires the person to monitor their entire intake. This is inappropriate for some elderly people who may have dementia, mental confusion or some other condition which impairs their short-term memory ability. Also, it is unreasonable to expect staff members to recall the type and amount of foods consumed by each resident. Moreover, different staff may be serving at various meal times, consequently the staff may not be aware of the food items consumed by each resident at the previous meal. Therefore, it is far more practical and accurate to stipulate guidelines for each menu item, and this approach is particularly suitable for the institutionalised elderly.

5.2 (d) Guidelines per serve versus per 100g

The proposed guidelines are stated for the serving size of a dish rather than per 100g of food. The latter approach is helpful for comparing the nutrient content of different foods. However, it is more meaningful to state guidelines for a given serve size, since these guidelines refer to the actual quantity of food that is provided. This also facilitates rapid estimation of a person’s daily intake of a certain nutrient. Comparisons between different foods within a menu item category can still be made, since a limited range of serving sizes is outlined.
Table 5.1 Comparison of proposed and existing nutritional guidelines

<table>
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<tr>
<th>Menu item</th>
<th>Serve size</th>
<th>Fat</th>
<th>Carbo-hydrate</th>
<th>Added sugar</th>
<th>Fibre</th>
<th>Organisation</th>
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<tbody>
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<td>2g</td>
<td>x7.5g</td>
<td>none</td>
<td>-</td>
<td>IAHS</td>
</tr>
<tr>
<td>(cold)</td>
<td>30g</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>SWSAHS</td>
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<tr>
<td></td>
<td>30g*</td>
<td>5g</td>
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<td>3g</td>
<td>4g</td>
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<td></td>
<td>-</td>
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<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Williams</td>
</tr>
<tr>
<td></td>
<td>30-60g</td>
<td>2g</td>
<td>-</td>
<td>7%w/w</td>
<td>-</td>
<td>Proposed</td>
</tr>
<tr>
<td>Cereal</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>IAHS</td>
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<tr>
<td>(hot)</td>
<td>180g</td>
<td>5g</td>
<td>-</td>
<td>-</td>
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<td>SWSAHS</td>
</tr>
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<td>NHS</td>
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<td>Diab. Aust</td>
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<td>Williams</td>
</tr>
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<td>100-200g</td>
<td>2g</td>
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<td>7%w/w</td>
<td>-</td>
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</tr>
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* All values stated for Diabetes Australia are those rated as “ideal”
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<td>none add.</td>
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**Key:**
- IAHS: Illawarra Area Health Service
- SWSAHS: South Western Sydney Area Health Service
- NHS: Noarlunga Health Service
- Diab. Aust: Diabetes Australia
- NHF: National Heart Foundation
- Williams: Dietary Guidelines for Australian Caterers (Williams, 1992)
- Proposed: Proposed nutritional guidelines for diabetic, cholesterol-lowering and weight reduction diets
5.2 (e) Rationale for criteria selection

When deciding which guidelines to include, a distinction must be made whether a particular level of nutrient is desirable or essential to attain therapeutic benefit. For example, a reduced level of saturated fat is essential for lowering cholesterol levels. Whereas, a high intake of soluble fibre is beneficial, but not necessary for decreasing cholesterol concentration. Thus, since some nutrients are not essential in the dietary management, it is not appropriate to use specified amounts of these nutrients as criteria for classifying a food item as suitable or unsuitable for a special diet.

Fat:

Two practical considerations are important when formulating nutrition guidelines for menu items. Firstly, the criterion will vary according to the type of dish (eg: main dish versus salad), and secondly depending on the standard serve size (eg: 120g versus 60g).

Menu items which are based on low fat ingredients (such as fruits, vegetables, cereals, legumes and lean meats) should easily conform with the proposed guideline for fat. The recommended level discourages the inclusion of high fat ingredients, such as cheese, cream, butter/margarine, fatty meats - which are generally significant sources of saturated fat.

SWSAHS define separate criteria for meat and non-meat hot breakfast dishes (Table 5.1). Whereas the proposed guidelines state only one criterion for all types of hot breakfast items. The new level, which is lower than SWSAHS criterion for meat-containing breakfast dishes, does not allow fatty meats (eg: sausages, bacon) to be offered. However, the guideline permits up to one egg per serve.

The same guideline applies to all four types of main dishes. This reduces ambiguity about which guideline to apply when a dish may be classed in more than one category (for example, spinach quiche is both a pastry dish and a vegetarian dish). Thus, the guideline for the vegetarian main is higher than that stipulated by SWSAHS (Table 5.1). Although their level of 5g of fat per serve is considered reasonable, the more relaxed guideline permits the inclusion of fat-containing ingredients (such as cheese or eggs) which can be important sources of various nutrients (eg: calcium, protein, Vitamin B12).
Since the meat (or protein source) portion is much smaller in the light meal/snack/salad than the main dish, the fat content should be proportionally smaller. Therefore, a lower criterion for fat is stipulated for this menu item category. Moreover, as salads are included in this category, a higher guideline for fat would permit the use of high fat dressings.

The proposed maximum level of fat in dessert items is higher than that suggested by SWSAHS and Diabetes Australia (Table 5.1). Their level (1g of fat) is considered unnecessarily restrictive, and difficult for most dessert dishes to conform to. Furthermore, this guideline is not appropriate for institutionalised elderly people, whose highlight of the day may be dessert. It would be unjust to set such a limiting guideline which is likely to compromise their quality of life, by severely confining the variety of sweet dishes offered. Despite being higher, the proposed guideline is considered to be "low fat" as it is consistent with the National Food Authority (NFA) (1995) definition of less than 3g fat per 100g. Although the NFA guidelines are only intended for individual food items, rather than composite meals, in the case of desserts it seems appropriate and useful to compare the proposed guidelines with that of the NFA.

Generally, the suggested guidelines for fat for each menu item category are the same or lower than those stated by other organisations (Table 5.1). Elderly people have lower energy requirements due to a slower metabolic rate which is related to a decline in lean body tissue. However, their nutrient requirements are mostly the same as other adults. This means that the elderly should mainly consume nutrient dense foods, so as to avoid excessive kilojoule intake. Since fat is very energy dense, it crowds out other nutrients. Therefore, nutrition standards for elderly people should recommend fat levels which tend to be lower than what is suggested for middle-aged or younger adults.

**Saturated fat:**
A restriction on saturated fatty acid content of a meal is a relevant guideline for management of diabetes, hyperlipidaemia and obesity, since each of these conditions is an independent risk factor for heart disease. A low intake of saturated fat assists in correcting an abnormal lipid profile. It is recommended that the ratio of intake of unsaturated to saturated fat should be two to one (DAA,
Therefore, the suggested guideline of less than 30 per cent of total fat as saturated fatty acids (when total fat is relatively high), requires that less than a third of the fat is saturated and that greater than two-thirds be unsaturated - thereby achieving the recommended ratio. This is higher than the level stated in the NFA definition for 'reduced saturated fat' and 'reduced cholesterol', which is also suggested by the NHF. However, their criterion of 20 per cent is very difficult to attain for those dishes in which the main source of fat is a product of animal origin. For example, none of the main meat only dishes (Table 4.4) have a saturated fat content of less than 20 per cent total fat. Thus, although the proposed level of 30 per cent is less conservative, it still maintains a desirable fatty acid ratio.

**Carbohydrate:**

The carbohydrate exchange system has been a common tool for managing diabetes, by monitoring the amount and distribution of carbohydrate intake. The criterion set by the IAHS (Table 5.1) may be practical for the purpose of calculating carbohydrate exchanges, yet it also imposes unnecessary restrictions. For example, none of the soups (Table 4.12) which were analysed would meet the IAHS guideline. Hence, it seems inappropriate to classify menu items as unsuitable according to the carbohydrate content. Apart from the IAHS, none of the organisations reviewed (including Diabetes Australia) stipulate (total) carbohydrate guidelines.

The glycaemic index system may be a more useful method for controlling blood glucose (Brand-Miller, 1993). Thus, a guideline for total carbohydrate may not be required as the glycaemic index method replaces the exchange diet. However, it was beyond the scope of this project to attempt to incorporate the glycaemic index directly into the nutritional guidelines. Until more comprehensive lists of the glycaemic values of foods are developed, it is still valuable to observe the total carbohydrate level. The use of the glycaemic index as a tool for classifying menu items is an area for future research.

**Added sugar:**

It is important to advise a maximum level of sugar as a high intake not only promotes weight gain, but also tends to aggravate abnormal lipid levels and may compromise plasma glucose control.
Furthermore, sugar provides kilojoules without nutrients. Therefore, these 'empty' kilojoules of sugar dilute the nutrient density of sugar-containing foods.

The proposed guidelines refer to total rather than added sugar. This is because the system used to perform the nutrient analysis does not differentiate these two types of sugar. A guideline for added sugar would be more valuable, since the amount of added sugar in a dish can be altered accordingly. However, such a guideline increases the complexity of the classification method, as it would be necessary to examine the complete nutrient analysis in order to identify the source/s of sugar in the recipe. Also, the total sugar content of a dish tends to be mostly from added sugars - except in the case of some fruit-based items.

It is recommended that no sugar is added to those menu items in which sugar is not an integral ingredient (eg: salads), or whereby it only serves to enhance sweetness (eg: fruit juice). This guideline is not based on the effect on blood glucose levels, rather the contribution of extra (empty) kilojoules. However, for dishes in which sugar has important properties (such as textural qualities) the guideline is less stringent. The criterion for desserts is higher than that stated by most other organisations (Table 5.1). There are two main reasons for this decision. Firstly, the awareness that the glycaemic value of sucrose and other "simple sugars" is lower than many "starchy" foods, which implies that blood glucose control will not be impeded by ingestion of small amounts of sugars. Secondly, as previously mentioned it is important to not insist upon guidelines which severely limit the choice of foods available for the elderly person. Weight gain is not likely to occur with consumption of small amounts of sugar, provided that most menu items are not sweetened with sugar.

The guideline is expressed as a percentage of weight rather than as grams per serve. This is because there is a wide degree of variation for serving sizes of desserts (60 to 150g). A percentage guideline infers that a large dish will have a large quantity of sugar. However, the recommended maximum serving size of 150g means that the maximum level of sugar is 15g, which is considered to be an acceptable amount. Also, very few dessert items exceed the suggested upper limit for serving size.
The criterion for breakfast cereals is lower than the NHF standard (Table 5.1) - which is not considered applicable to persons with diabetes. However, the guideline is greater than the level advised by Diabetes Australia, as well as the NFA (1995) definition for 'low sugar' - 5g per 100g food. The main reason for a higher guideline is to permit greater variety in choice of breakfast cereals. For example, the sugar content of Corn Flakes (approximately 6.6g per 100g) exceeds the levels recommended by Diabetes Australia and the NFA, yet it meets the proposed standard.

There is no guideline for sugar in savoury dishes. This is because the quantity of sugar is likely to be relatively small, and thus have negligible physiological effect. Also, some items (eg: roast pumpkin) which appear to be high in sugar may not have any 'added sugar'. Hence, it is not suitable to define guidelines for such items which are intrinsically high in sugar (as the sugar content cannot be altered).

**Fibre:**
Soluble fibre is found in vegetables, fruit, oat products, rice and legumes. It is known to have mild hypocholesterolaemic properties, as well as promoting satiety and thus helps curb the tendency to overeat. The nutrient analysis for fibre is mainly useful for identifying which menu items are significant sources of fibre. However, a guideline is not specified as fibre intake is usually of secondary importance to fat and sugar in nutritional management of diabetes, hyperlipidaemia and obesity. Also, some menu items may be low in fibre yet valuable sources of other nutrients (eg: yoghurt). Furthermore, in many circumstances it is impractical to attempt increasing the fibre level of a particular dish (eg: scrambled eggs). Although, as new recipes are developed, a criterion for fibre may be useful for increasing the proportion of menu items considered to be good sources of fibre. Hence, it may be more worthwhile to suggest a given percentage of items on any one week of the menu cycle must have a certain level of fibre per serve.

**Energy:**
A maximum level of energy per menu item was not defined, since the kilojoule content is regulated by the restrictions on fat and added sugar per serving size.
5.3 Classification of menu items

Most of the menu items (89 per cent) were analysed. Some items were not assessed because there was no standard recipe available, or the nutrient breakdown for specific ingredients was not available.

An absolute approach is used for classifying menu items, whereby those dishes which marginally do not meet the guidelines are classed as unsuitable. This reduces debate over what is considered an acceptable level for a nutrient. Also, it would seem that for those menu items which slightly exceed the criteria, only small modifications to the recipe would see that these items met the guidelines.

Hot Breakfast

The menu features some very high fat choices for breakfast (Table 4.3). Such items (eg: grilled bacon) may be popular with the elderly. Thus, it would perhaps be particularly useful to discuss alternative choices (which conform with the guidelines) with the residents themselves.

Main Meat only dish

The majority of these dishes conformed with the guidelines (Table 4.4), which may suggest that the nutrient analysis underestimated the quantity of fat. This is possible since the type of meat specified in the analysis was “lean”. However, it was assured by the Catering Officer that all meats used were lean, and any visible fat (apart from skin on the roast chicken) was trimmed. Also, most of these dishes were well below the guidelines.

Main Pastry dish

As may have been expected, many of the pastry dishes were unsuitable due to a high content of (saturated) fat (Table 4.5). Generally, the chief source of fat was the pastry itself. It may not be practical to suggest using a lower fat fillo pastry instead, as the pastry is delicate and requires careful handling, and the product is unlikely to present well after reheating.
Main Vegetarian Dish
It is somewhat surprising to find that many of the vegetarian dishes were classed as unsuitable (Figure 4.1), due to unacceptably high levels of fat - particularly of the saturated kind (Table 4.6). This occurred since the meals primarily consisted of ingredients such as eggs, cheese, full cream milk and butter or margarine. The result indicates that the vegetarian person who requires a therapeutic diet for which the proposed guidelines are intended for, will have a very limited choice of main meals throughout the menu cycle. Another interesting result was that none of main vegetarian dishes appeared to be good sources of fibre (Table 4.6). Obviously there is scope to either improve the existing recipes and/or develop new recipes which meet the proposed guidelines.

Main Wet/soft/blend dish
The few wet dishes which were classified as unsuitable tended to consist of fatty, processed meats (eg: sausages, frankfurts) or were mornay dishes - which mainly comprise eggs, cream and/or cheese. Some of the mornays were classed as suitable (Table 4.7), therefore it seems reasonable to suggest that the other mornay recipes could be modified to meet the guidelines.

Light/Snack/Salad
Many of the dishes in this category are based on ‘convenience’ foods, which require no/little preparation and need only to be heated. As the results show, such foods tend to have unfavourable nutrient breakdowns (Table 4.8). However, processed items are extremely practical, as well as being tasty with good textural qualities. Thus, a feasible recommendation would be to use convenience foods which are relatively low in fat.

Potato/Rice/Pasta
The essential ingredients in this menu item category are low fat foods, yet most of the items featured on the menu exceeded the criterion for fat (Table 4.9). However, none of these menu items are prepared using high fat cooking techniques (such as frying). Fatty ingredients are therefore added for the purpose of improving the appearance and palatability of the dish. Consequently, alternative low fat ingredients should be substituted into the recipes in order to make
the dishes suitable.

**Sauces/Gravy**
All of the sauces/gravy were classed as suitable (Figure 4.1). Two of the sauces had relatively high levels of sugar (Table 4.10). These sauces are classified as suitable since there is no guideline defined for this menu item category. However, the level of sugar in the two sauces is considered insignificant, as the quantity is fairly small and is therefore unlikely to induce hyperglycaemia or contribute to weight gain.

**Single Vegetable**
Most of the single vegetable items comfortably met the proposed guidelines (Table 4.11). Those items which were prepared with the addition of fat or cheese exceeded the defined level for fat. Since the fat is not added during the actual cooking process, rather it is added once cooking is complete for the purpose of enhancing the vegetable’s appearance, it is considered reasonable to suggest omitting the addition of fat.

**Soups**
All of the soups analysed are classed as suitable for the three therapeutic diets (Figure 4.1). The soups are reconstituted from powdered ingredients, however, often leftover vegetables or pasta are also added. The nutrient analyses do not recognise these additions, although it is unlikely that the final products would exceed the guidelines. In fact, the soups are probably good sources of fibre with the inclusion of vegetables.

**Milk-based Desserts**
Since the key ingredient in these desserts is milk, a low level of fat should easily be achieved with the use of low/reduced fat milk (or other dairy products). Although, as the results show, many of the desserts had low amounts of fat (Table 4.13), despite being made with full cream milk. Also, milk-based desserts are not usually baked, therefore artificial sweeteners (which can be unstable when used in baking) may be incorporated into the recipe so as to reduce the proportion of sugar. Three of the desserts which were classed as unsuitable were based on commercial (full dairy) ice
Non-milk-based Desserts

Most of these desserts were too high in both fat and sugar (Table 4.14). Many of the desserts are made with premixed ingredients (e.g., cake mix) and are thus made up according to the manufacturer's directions. This limits the extent to which modifications can be made to the recipe. Such ingredients tend to be more convenient, require less labour to prepare the dish, and yield more consistent products than recipes which use raw ingredients. Therefore, it may be unreasonable to suggest that these desserts should be made using unprocessed ingredients. Also, there are very few "diet" (i.e., low fat and low sugar) dessert products available commercially. Food manufacturers should therefore be encouraged to develop such products.

It should be noted that it is not essential for all the menu items to be classed as suitable for special diets, since the menu is also intended for non-therapeutic general diets. In fact, it would be unreasonable for such an expectation, as some of the guidelines are fairly limiting, such as for dessert items. However, from a practical perspective, it is useful if many of the menu items are suitable so as to avoid the need to duplicate recipes. It is suggested that the Central Kitchen increases the proportion of 'suitable' items from 60 per cent to 70 per cent (i.e., 136 out of 194 items). This tentative goal requires that an additional 20 items meet the proposed nutritional guidelines. Recommendations for recipe modifications are shown elsewhere in this report.

5.4 Current method for classifying menu items

The method currently used to classify menu items into special diets illustrates some of the disadvantages associated with qualitative guidelines. Firstly, there is a very limited assortment of desserts offered, since the items are confined to those which can be prepared without sugar. Also, a dish may be incorrectly regarded as low fat. For example, apple cream is listed as a "diet" dish, yet one of the main ingredients is cream, and is thus higher in fat than the proposed guideline.

A distinct finding was that qualitative guidelines can be unduly restrictive. A large number of items
(eg: chicken satay) that were not offered as “diet” dishes, were found to be suitable. This point is worthwhile to consider as it indicates that separate dishes (for some menu items) may not need to be prepared for special diets, and thereby there is potential to considerably save on labour and other costs.

Therefore, the possible benefits of replacing the current classification system with the proposed guidelines include:

1) increased variety of dishes available to the resident
2) greater assurance of providing nutritionally suitable foods
3) less need for duplicating menu items specifically for therapeutic diets
4) reduced production costs
5) nutritional value of different dishes and menus can be compared
6) with monitoring, provides insights about the nutrient requirements of elderly people and the usefulness of therapeutic diets.

5.5 Potential applications of the proposed guidelines

The guidelines are specifically designed for the following diets: diabetic, cholesterol-lowering, weight reduction. Modifications were made from common nutritional recommendations for these diets to accommodate the needs of elderly people. Since the target population in this report is considered to be similar to other institutionalised elderly groups, these guidelines may be applicable to other aged-care institutions.

The guidelines are not considered relevant for general, non-therapeutic diets, as they are too restrictive.

Some of the criteria may be suitable for other (non-geriatric) health-care facilities or settings which cater for one or more of the three special diets. This is because the guidelines are similar to those stipulated by Diabetes Australia and the NHF, which are intended for adults of all ages. However, since older persons have lower energy requirements, the overall set of proposed guidelines may be
too conservative. Thus, it would be more appropriate to use only some of the criteria (eg: guidelines for main dishes, but not single vegetables).

The guidelines are not considered appropriate for children, who have higher nutrient and energy requirements than elderly people.

Hence, the proposed guidelines may therefore be viewed as a framework for establishing similar guidelines, whereby adjustments are made to accommodate the nutritional needs the target population.

5.6 Recommendations for modifying those recipes which are classed as unsuitable

Hot Breakfast
* discuss ideas for alternative choices with the residents.

Main meat only dish
* increase the variety of fish dishes offered.
* bake/grill the crumbed meat dishes (instead of deep frying) or shallow fry in unsaturated fat.
* remove skin from chicken before cooking or purchase skinless chicken cuts.

Main pastry dish
* use puff-pastry that is made with canola margarine.
* substitute low-fat evaporated milk for cream.
* decrease quantity of cheese by half or use reduced fat cheese.
* dry fry/boil/steam vegetables (instead of frying in fat).

Main vegetarian
* decrease quantity of cheese by half or use reduced fat cheese.
* use puff pastry made with canola margarine.
* replace roux sauce with white sauce made with milk and thickening agent.

* develop new recipes which mainly use vegetables, legumes, pasta and rice.

**Main wet dish**

* substitute low-fat evaporated milk for cream.

* decrease quantity of cheese by half or use reduced fat cheese.

* incorporate more legumes or vegetables - to increase the fibre content and decrease the proportion of high fat ingredients.

* replace roux sauce (made with butter) with white sauce and with milk (full cream or fat-reduced) and thickening agent (‘Hi-flo’)

* increase variety of dishes offered, eg: pasta and meatballs, rice with chicken pieces.

**Light/Snack/Salad**

* increase variety of salads offered.

* reduce fat content of dressings (eg: substitute mayonnaise with mixture of half mayonnaise and half plain yoghurt).

* use low/reduced fat convenience products.

* make own fish cakes, bean patties, lentil patties.

* offer sandwiches for evening meal.

**Potato/Rice/Pasta**

* omit the addition of fat.

* decrease quantity of cheese by half or use reduced fat cheese

* decrease quantity of ham by a third or replace with vegetable/s (eg: mushroom).

* add flavour with sauces or spices.

* prepare mashed potato without fat (or use monounsaturated margarine).

* bake instead of frying potatoes (pomme parisienne).

**Single vegetable**

* omit the addition of butter or margarine.
* cheese is offered separately on the salad trolley, thus it is not necessary to add it to the vegetables.

**Soups**
* add legumes, vegetables, pasta or rice to increase fibre.

**Milk-based desserts**
* offer ready-to-serve items such as yoghurt.
* use low/reduced fat dairy products (including milk, ice cream), eg: replace cream in apple cream with low-fat condensed milk.
* develop new recipes, eg: yoghurt slice (made with diet yoghurt).

**Non-milk based desserts**
* use recipe ingredients (ready-mixed) which are lower in fat and sugar (eg: diet mousse mix by Nestle).
* use artificial sweetener in place of sugar in fruit-based recipes (ie: dishes in which fruit is the primary ingredient, such as fruit crumble or stewed fruit).
* replace butter with monounsaturated fat.
* incorporate dried fruits into recipes to increase fibre and add sweetness.
* fruit crumble topping: use crushed cornflakes or muesli.
* use low-joule jam and artificial sweetener in bread and butter jam pudding.
* develop new recipes, eg: fruit cake.

**5.7 Recommendations for the Central Kitchen**
(1) The classification method requires that recipes are analysed for their nutrient content. The technique for analysis in this project was a computer software program (DIET 1). It is therefore suggested that the Central Kitchen obtains this type of program. The data should be entered by a (consultant) dietitian, who should also interpret the analyses and discuss recipe modifications with the Catering Officer. Following appropriate training, the assistant/catering officer may partly
assume the role of entering and interpreting the data. However, it is advisable that a dietitian
monitor this process, to ensure greater accuracy.

(2) It is recommended that the Central Kitchen follows the NSW Department of Health (1989)
"Standards for Food Service", particularly those referring to menu planning. These standards
address the following issues: dietary planning, menu cycle duration, meal patterns, food types,
variety and repetition, selective menus, special diets and staff qualifications. Furthermore, the
Central Kitchen should aim to meet the general objectives of the food service standards. Finally, it
is emphasised that the menu should otherwise be consistent with the Dietary Guidelines for
Australians (refer to Young, 1995, unpublished Master of Science major project).

(3) The Central Kitchen should maintain ongoing consultation with a dietitian. Firstly, menus
should be jointly designed with a dietitian. Secondly, a dietitian should be involved in planning the
preparation, service and distribution processes of items for special diets (NSW Department of
Health, 1989). Thirdly, a dietitian should assess residents to determine their nutritional
requirements and prescribe suitable diets. Accordingly, the residents’ condition should be
monitored and evaluated in response to diet therapy and changing nutrient requirements with aging.
This will help to determine the usefulness of the guidelines. Also, elderly people should have
access to professional dietetic services.

(4) It is suggested that each peripheral site maintains statistics of the number and types of special
diets present.

(5) Nutrition in-service training should be provided for all catering staff, to ensure that the
guidelines are understood and that appropriate serving sizes will be given. Also, standard recipes
that will be adhered to by kitchen staff need to be developed. The guidelines are meaningful only if
the standard recipes are strictly adhered to. The assistant catering officer should supervise staff to
see that the recipes are followed.

(6) It is recommended that the Central Kitchen conducts customer (residents and Meals-on-Wheels
recipients) satisfaction surveys. Nutrition messages and menu changes should be promoted among
the residents. This type of communication may encourage a sense of security for the residents as
well as increase acceptance of recipe alterations.
CHAPTER 6: CONCLUSIONS

(1) Eighty-nine per cent of the prepared menu items were analysed using a computer software program. The following nutrients were analysed: energy, fat, saturated fatty acids, monounsaturated fatty acids, polyunsaturated fatty acids, total carbohydrate, starch, sugar and fibre.

(2) A set of quantitative nutritional criteria were created for the purpose of enabling the Central Kitchen to classify menu items into diabetic, weight reduction and cholesterol-lowering diets. The criteria were developed following a comprehensive literature review, which examined: existing numerical guidelines for food service; current data on recommendations for the nutritional management of diabetes, weight reduction and cholesterol-lowering; and current information on the nutritional requirements of elderly people. The lack of rationale for the quantitative standards stipulated by other organisations was noted. Hence, this report identified the need for further research into quantifying nutritional guidelines which assist caterers to provide menus that are consistent with the Dietary Guidelines for Australians.

The nutrients for which acceptable levels are defined are: fat, saturated fat and/or sugar. The same criteria apply to all three special diets. An integrated set of guidelines is more practical. Also, theoretically the same nutrition goals and recommendations apply to diabetes, obesity and hyperlipidaemia.

(3) The Central Kitchen’s menu items were classified as suitable or unsuitable for the three special diets, according to the proposed criteria. Sixty per cent of the total number of menu items were classed as suitable for diabetic, weight reduction and cholesterol-lowering diets. The menu item categories in which more than half of the dishes were classed as suitable were: soups, main meat only dishes, main wet/soft/blend dishes, single vegetables, sauces/gravy, milk-based desserts. It was somewhat surprising to find that most of vegetarian dishes and potato/rice/pasta dishes were unsuitable due to unacceptably high levels of fat.
(4) It is recommended that the Central Kitchen increases the proportion of items classified as suitable from 60 per cent to 70 per cent. Some general recommendations for modifying the recipes of those menu items classed as unsuitable include: use reduced fat dairy products; reduce the quantity of cheese; reduce the quantity of fatty meats and replace with vegetables or legumes; omit the addition of fat when cooking vegetables; any added fat should be unsaturated; and use artificial sweetener in place of sugar in desserts that primarily consist of fruit.

(5) The current classification system used by the Central Kitchen to classify meals into special diets was reviewed. The present method is based on qualitative evaluation, and the standard recipes have not been previously analysed for their nutrient content. Some disadvantages associated with qualitative guidelines were evident, such as the limited variety within a menu item category. The disadvantages indicate potential benefits of replacing the current classification system with the proposed, quantitative nutritional guidelines.
CHAPTER 7:
LIMITATIONS OF THE PROJECT

The suggested recipe modifications were discussed with the Catering Officer. Most of the changes were considered useful and achievable. Some of these alterations have been made, which are apparently well accepted by staff and residents. The main constraints involved in altering the recipes, as well as using the proposed nutrition guidelines, are identified below;

* The complex nature of the menu (six-week cycle) and the large number of meals prepared places constraints on any modifications. Many aspects (eg: equipment required, cooking time) need to be considered before any changes can be implemented. Therefore, changes can only occur with much planning.

* A cook-chill system means that some recipes are not suitable to alter, and that new recipes must be trialled several times so as to attain a successful product. However, this should not be considered a barrier to implementing guidelines. The Central Kitchen should maintain a willingness to try new recipes.

* Some of the suggested recipe alterations may call for nutrient-modified ingredients (eg: reduced fat cheese) in order to meet the guidelines. Such ingredients can be more expensive. For example, reduced fat cheddar cheese entails an added cost of about 4000 dollars per year. However, the use of modified ingredients may only be recommended for a few dishes. Also, the additional cost of a particular ingredient may be balanced by a reduction in costs in another recipe (for example, if meat is partly replaced with vegetables). It would be useful to conduct a cost-benefit analysis to ascertain whether or not added expenditure is justifiable.

* The proposed classification method relies on the premise that standard recipes are followed, since the nutrient analyses are based on the recipes. However, the Catering Officer reported that the recipes are not entirely accurate, whereby they tend to overestimate the true quantity of ingredients. Therefore, the nutrient analyses may not be a valid representation of the nutritional value of the
menu items. Consequently, some menu items may be incorrectly classified. It is more likely that menu items have been wrongly classified as unsuitable (since the amount of fat and sugar stated in the recipes tends to be higher than what is really used). Thus, the results may be a conservative indication of the actual number of suitable menu items.

* The nutrient analyses reflect the nutrient content of the raw ingredients rather than the final, cooked product that is consumed. Therefore, since variations in levels of nutrients tend to occur during cooking/processing, the analyses are not completely accurate indications of the nutritional value of the prepared items. However, as previously discussed, the main nutrients whose quantities will alter with cooking are micronutrients - which were not examined in this report. Also, cooking usually reduces the amount of fibre. Thus, the analyses are likely to overestimate the quantity of fibre. This inaccuracy does not significantly effect the results of this report, since the relative amount of fibre was not used to classify menu items.

* The guidelines are stated per serve of menu item (although, a range of serve quantities is given). This assumes that residents receive dishes in the standard serve sizes. The Catering Officer indicated that some items (eg: meat dishes) are not always provided according to the defined serving portions. The nutrient analyses are based on only one serving size for each item, and therefore do not account for size variation. Consequently, some dishes may not be classified correctly. It would be useful to perform nutrient analyses using a variety of serve sizes (eg: small, medium and large serves).

* The proposed guidelines are designed to be broadly applied to all elderly persons (catered for by the Central Kitchen in question) who require either a diabetic, cholesterol-lowering or weight loss diet. However, as previously mentioned older people are a heterogeneous group and would benefit most from individualised therapy.
CHAPTER 8:
AREAS FOR FUTURE INVESTIGATION

A literature review indicated that nutrition therapy for elderly people is controversial and their nutrient requirements have not been clearly defined. Further research should explore the dietary needs of older persons and the efficacy of special diets among this group. At the national level, the formulation of RDIs for the elderly should be investigated. Since the elderly are a very diverse population, RDIs may need to be developed for several sub-groups.

This project raised the question of the value in developing numerical nutritional guidelines that are based on the qualitative Dietary Guidelines for Australians. Nutritional guidelines should be consistent with the Australian Dietary Guidelines, though it is debatable whether these national recommendations should be quantified, and if so, how they can be quantified. Hence, there is a need to further examine this issue.

Since caterers require practical guidelines for providing healthy menus, it is useful to formulate quantitative nutritional standards. In order to be valid, the numerical criteria must be developed more rigorously and with clear rationale. However, such figures are elusive to define, as indicated by the inconsistencies between current sets of dietary guidelines. These differences somewhat reflect gaps in the scientific data regarding dietary requirements, as this report illustrated with reference to elderly people. Therefore, since there are difficulties in determining precise criteria, there is a need to establish agreement among different organisations for common nutritional standards (at the national level) for various target populations. This notion of developing common numerical guidelines requires further investigation.

A follow-up study (in six months to one year) should be conducted to assess the usefulness of the nutritional guidelines formulated in this project. The study would entail monitoring the clinical indicators of those residents on special diets, examining which of the recommendations for the Central Kitchen have been implemented, conducting a subsequent nutrient analysis of the menu items, and reviewing any problems or benefits (attributable to the proposed guidelines and
recommendations) reported by the Central Kitchen.

This project highlighted difficulties in obtaining nutrient breakdowns for many products. Thus, the DIET 1 program should be updated and extended to include more food items. It would also be useful to establish a database which lists nutrient analyses of commercial products.

Some recipe modifications are not feasible for a cook-chill food service system. Hence, there is a need to devise a comprehensive set of standard recipes appropriate for the cook-chill process. This would also be valuable for other food service establishments that convert to using the cook-chill method.

Large-scale caterers often rely on premixed ingredients in order to efficiently produce consistent items. However, there is limited variety of commercially-available products that are suitable for special diets. Therefore, food manufacturers should be encouraged to create more products that are nutrient-modified (e.g., low sugar desserts).
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APPENDICES
APPENDIX I:

Six-week-cycle menu
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<th>TUE</th>
<th>WED</th>
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<td>HOT</td>
<td>GRILLED SAUSAGES</td>
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<td>BACON GRILLED</td>
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<td>SCRAMBLED EGG</td>
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<td>MAIN</td>
<td>CORNED SILVERS IDE</td>
<td>SHEPHERDS PIE</td>
<td>ROAST PORK</td>
<td>FRESH CRUMBLED FISH FILLETS</td>
<td>MIX GRILL - CHOPS &amp; BACON</td>
<td>ROAST CHICKEN</td>
<td>GRILLED LAMB C HOP</td>
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<td>CRUMBED FISH</td>
<td>VEGETABLE PATTIE</td>
<td>MACARONI CHEESE</td>
<td>PARTY PIES</td>
<td>MIX GRILL-SAUSAGES AGES</td>
<td>CHICKEN AND HA GRAVY</td>
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## Menu Report — By Meal Description

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### Menu Report -- By Meal Description

**Menu: W02  STANDARD MENU**

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## Menu Report — By Meal Description
### Menu: W06  STANDARD MENU
#### Ref.:  KHMN2A

**Date:** 11/10/95  
**Page:** 1

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APPENDIX II:

Sample format of a standard recipe
Recipe Full Report
Code Order (From BGARBR to VVZSLB)

Recipe: MMBEGO  BEEF GOULASH

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<tr>
<td>YTD Usage</td>
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<td>Std Ports/Tray</td>
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**INGR. DESCRIPTION/INFORMATION**

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<td>20.000 KG</td>
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<td>$2.950</td>
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**Methodology**

**EQUIPMENT BRATT PAN**

**METHOD**
1. DICE CHUCK
2. PLACE MEAT, WATER AND WINE IN BRATT PAN AND SIMMER FOR 60 MINS.
3. ADD ALL OTHER INGREDIENTS EXCEPT HI FLO AND SIMMER FOR A FURTHER 30 MINS
4. THICKEN WITH HI FLO SOLUTION AND BRING TO BOIL
5. ADJUST SEASONING AND CONSISTENCY
6. PLACE IN TRAYS AND CHILL FOR 120 MINS.
APPENDIX III:

Nutrient analyses of different categories of menu items per 100g
Table 1. Nutrient analysis of hot breakfast items (per 100g)

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<th>Menu Item</th>
<th>Energy (kJ)</th>
<th>Energy (kcal)</th>
<th>Prot’n (g)</th>
<th>Fat (g)</th>
<th>Total Starch</th>
<th>Carbohydrate (g)</th>
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<td>Total</td>
<td>Sat’d</td>
<td>Mono</td>
<td>Poly</td>
<td>Total</td>
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<th>Starch (g)</th>
<th>Sugar (g)</th>
<th>Fibre (g)</th>
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Table 4. Nutrient analysis of main vegetarian dishes (per 100g)

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<th>Menu Item</th>
<th>Energy (kJ)</th>
<th>Prot' n (g)</th>
<th>Total Fat (g)</th>
<th>Carbohydrate (g)</th>
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* indicates that the nutrient data were not available
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<th>Energy (kcal)</th>
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<th>Poly Fat (g)</th>
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<th>Total Starch (g)</th>
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<td>Energy (kcal)</td>
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<td>Total</td>
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<td>Poly</td>
<td>Carbohydrate (g)</td>
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<td>Sugar</td>
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<td>Energy (kcal)</td>
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<td>Total Fat (g)</td>
<td>Sat’d Fat (g)</td>
<td>Mono Fat (g)</td>
<td>Poly Fat (g)</td>
<td>Total Carbohydrate (g)</td>
<td>Starch (g)</td>
<td>Sugar (g)</td>
<td>Fibre (g)</td>
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<td>Energy (kcal)</td>
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<td>Total Fat (g)</td>
<td>Sat’d (g)</td>
<td>Mono (g)</td>
<td>Poly (g)</td>
<td>Total Carbohydrate (g)</td>
<td>Starch (g)</td>
<td>Sugar (g)</td>
<td>Fibre (g)</td>
</tr>
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Table 7. Nutrient analysis of potato/rice/pasta dishes (per 100g)

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<th>Energy (kcal)</th>
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<th>Total Fat (g)</th>
<th>Sat’d (g)</th>
<th>Mono (g)</th>
<th>Poly (g)</th>
<th>Total Carbohydrate (g)</th>
<th>Starch (g)</th>
<th>Sugar (g)</th>
<th>Fibre (g)</th>
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<tbody>
<tr>
<td>Creamed potatoes</td>
<td>470</td>
<td>112</td>
<td>2.3</td>
<td>1.9</td>
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<td>0.1</td>
<td>21.6</td>
<td>20.9</td>
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<td>*</td>
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<td>21.5</td>
<td>20.8</td>
<td>0.7</td>
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</tr>
<tr>
<td>Oven fries</td>
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<td>110</td>
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<td>3.0</td>
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<td>1.3</td>
<td>0.1</td>
<td>17.9</td>
<td>17.5</td>
<td>0.4</td>
<td>1.9</td>
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Table 8. Nutrient analysis of sauces/gravy (per 100g)

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<th>Total</th>
<th>Sat'd</th>
<th>Mono</th>
<th>Poly</th>
<th>Carbohydrate (g)</th>
<th>Total Starch</th>
<th>Sugar</th>
<th>Fibre (g)</th>
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<td>0.3</td>
<td>7.9</td>
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<td>*</td>
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<td>Onion gravy</td>
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Table 9. Nutrient analysis of single vegetables (per 100g)

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<th>Sat’d Fat (g)</th>
<th>Mono Fat (g)</th>
<th>Poly Fat (g)</th>
<th>Carbohydrate (g)</th>
<th>Total Starch (g)</th>
<th>Sugar (g)</th>
<th>Fibre (g)</th>
</tr>
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<td>Fat Total (g)</td>
<td>Carbohydrate Starch (g)</td>
<td>Carbohydrate Sugar (g)</td>
<td>Fibre (g)</td>
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<tr>
<td>Pea &amp; ham</td>
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<td>*</td>
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<td>Spring vegetable</td>
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Table 11. Nutrient analysis of milk-based desserts (per 100g)

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<th>Menu Item</th>
<th>Energy (kJ)</th>
<th>Prot’n (g)</th>
<th>Fat (g)</th>
<th>Total Sat’d Mono Poly</th>
<th>Carbohydrate (g)</th>
<th>Fibre (g)</th>
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<tr>
<td></td>
<td>(kcal)</td>
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<td>Starch Sugar</td>
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<tr>
<td>Apple cream</td>
<td>284</td>
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<td>7.6</td>
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<tr>
<td>Baked custard</td>
<td>356</td>
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<td>2.4</td>
<td>*</td>
<td>*</td>
<td>14.7</td>
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<tr>
<td>Baked custard &amp; apricot (diet)</td>
<td>226</td>
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<td>2.1</td>
<td>1.4</td>
<td>0.5</td>
<td>6.6</td>
</tr>
<tr>
<td>Baked custard &amp; peach (diet)</td>
<td>226</td>
<td>2.2</td>
<td>2.1</td>
<td>1.4</td>
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<td>6.6</td>
</tr>
<tr>
<td>Baked rice &amp; pears (diet)</td>
<td>616</td>
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<td>0.4</td>
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<td>Fat (g)</td>
<td>Total Sat’d</td>
<td>Mono</td>
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<td>Ice cream</td>
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<td>61</td>
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<td>Passionfruit ice cream</td>
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<td>Peach conde (diet)</td>
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<tr>
<td>Trifle/Sherry trifle (diet)</td>
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<td>90</td>
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<td>90</td>
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<td>0.7</td>
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<td>Energy (kcal)</td>
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<td>Fat Mono (g)</td>
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<td>3.2</td>
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<td>Apple &amp; rhubar crumble</td>
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<td>Bread &amp; butter jam pudding</td>
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<td>152</td>
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<td>Coconut slice</td>
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<td>15.7</td>
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<td>Dutch apple pie</td>
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<td>164</td>
<td>1.8</td>
<td>5.1</td>
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<td>Fruit sponge flan</td>
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Table 12. (continued)

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<th>Prot’n (g)</th>
<th>Total Fat (g)</th>
<th>Fat Sat’d Mono Poly</th>
<th>Total Carbohydrate (g)</th>
<th>Starch Sugar</th>
<th>Fibre (g)</th>
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<td>*</td>
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<td>0.0</td>
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<td>767</td>
<td>2.6</td>
<td>4.4</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>33.7</td>
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<tr>
<td>Pears in jelly (diet)</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>*</td>
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<td>Rockmelon</td>
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<td>Steamed gold’n sponge pudd’g</td>
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<td>*</td>
<td>*</td>
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<td>970</td>
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<td>*</td>
<td>*</td>
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</table>
APPENDIX IV:

Sources of nutrient analysis data for various ingredients
Sources of nutrient analysis data for various ingredients

Ingredients omitted from nutritional analyses:
herbs and spices (basil, bay leaves, cinnamon, mixed herbs, nutmeg, oregano, paprika, parsley flakes, pepper)
French mustard
flavour essences (lemon and vanilla)
artificial sweetener (Sugarine)
diet jelly crystals

Product label (Nutrition information panel):
Buitoni pasta sauce
Maggi chicken noodle soup
Maggi cream of chicken soup
Maggi cream of pumpkin soup
Maggi cream of tomato soup
Maggi pea and ham soup
Maggi spring vegetable soup
Maggi thick vegetable soup
Nestle (diet) mousse (orange and forest berry flavours)

Ingredient manufacturer
Amotts biscuit crumb
Bakels Aptio lemon paste
Bakels Aptio utility cake mix
Bakels hadjea flangel neutral
Bakels instant clearjel
Bakels instant custard mix
Bakels no-bake custard mix
Bakels Pettina cheesecake mix
Bakels Pettina fonde swiss
Bakels Starcel sweetpaste mix
Edgell instant mashed potato
Edgell seafood salad mix
Findus vegetable pattie
Goodman Fielder scone mix
Maggi beef stock powder
Maggi chicken stock powder
Maggi green herb stock powder
Maggi maridor seafood booster
Maggi rich gravy mix
White Wings butterscotch self-saucing pudding
White Wings creme caramel custard mix
White Wings creme caramel sauce mix

Australian Food Composition Tables
creamed sweetcorn
jelly crystals (dry)
sweetcorn kernals
Worcestire sauce

Ingredient substitutions from DIET 1 program:
Recipe ingredient:
beans sliced frozen
brussels sprouts frozen
chicken boneless thigh
chuck steak
claret
corn on cob
fettucine noodles
frankfurts cocktail
frozen raspberries
fruit tinned in water
hake fillet with skin
Hi-flo
lasagne instant sheets
mutton boned leg
peas frozen
raspberry baker’s fill
riesling
sesame oil
sausages thin artificial case
strawberry puree
vegetables frozen mixed
vinegar
vol au vents
yearling outside

Substitution from DIET 1:
green beans raw
brussels sprouts raw
chicken boneless unspecified raw lean
beef chuck steak raw lean
red wine
seewtcorn frozen boiled
pasta whit dry
frankfurter
raw raspberries
fruit canned artificially sweetened
fish unspecified raw
cornflour
pasta white dry
lamb boneless unspecified raw len
pea green frozen boiled
raspberry jam
white wine
oil unspecified type
pork sausages cooked
raw strawberries
carrots, peas, beans, turnips
water
one case=30g puff pastry
beef silverside raw lean
APPENDIX V:

Classification of different categories of menu items
## Classification of different categories of menu items

<table>
<thead>
<tr>
<th>Menu item category</th>
<th>Number of items suitable</th>
<th>Number of items high in fat</th>
<th>Number of items high in sugar</th>
<th>Number of items high in fat &amp; sugar</th>
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</thead>
<tbody>
<tr>
<td>hot breakfast</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>main meat only</td>
<td>9</td>
<td>4</td>
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</tr>
<tr>
<td>main pastry</td>
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<td>10</td>
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<tr>
<td>main wet/soft</td>
<td>43</td>
<td>8</td>
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<tr>
<td>main vegetarian</td>
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<td>7</td>
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<tr>
<td>pasta/rice/potato</td>
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<td>6</td>
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<td></td>
</tr>
<tr>
<td>light/snack/salad</td>
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<tr>
<td>single vegetable</td>
<td>13</td>
<td>3</td>
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<tr>
<td>soups</td>
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<td>sauces/gravy</td>
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<td>milk desserts</td>
<td>14</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>other desserts</td>
<td>8</td>
<td>0</td>
<td>7</td>
<td>14</td>
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