

Chapter 6

Diet in Diabetes

1. General Principles

The goals of diet in diabetes include the achievement of optimal nutrition, the avoidance of hypoglycaemia and hyperglycaemia and protection from complications affecting small and large blood vessels. These goals are achieved by control of carbohydrate metabolism, lipid metabolism and weight.

Nutritional requirements are met by the ingestion of a wide variety of foods ensuring the inclusion of all essential foodstuffs. Such requirements are influenced by age, sex and the level of physical activity. The nutritional priorities of all diabetics should reflect those of the community at large and should incorporate the goals of diabetic management as listed in Table 6.1.

Table 6.1: Nutritional priorities for the diabetic

1. Attainment of desirable body weight
 2. Adequate intake of all essential nutrients
 3. Maintenance of normal blood glucose levels
 4. Reduction of blood lipid levels to normal
 5. Allowance for the social functions of food
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Consistency from day to day in total energy intake and its distribution throughout the day is desirable. While consistency in the relative energy contribution from carbohydrate, fat and protein is an additional aim, the food intake pattern should not be restricted to the same foods each day.

Energy (kilojoule, kilocalorie) control is of particular importance, weight reduction being the prime nutritional goal in obese diabetics, with exercise an important adjunct. At least 40% of this energy, and if acceptable to the patient 50% or more, should be obtained from carbohydrate with preference for those foods containing fibre. At least 20g and up to 40g daily of dietary fibre should be included in the diet. A wide variety of fibre-containing foods will provide the whole range of dietary fibre types to optimize health and diabetic control, the major source being whole-grain cereal products, vegetables and fruit.

Carbohydrate should be distributed evenly throughout the day where treatment is restricted to diet. Where insulin or oral agents are required, carbohydrate distribution may need to be modified according to the mode of action of these agents and to the pattern of physical activity. The carbohydrate allocation is increased where hypoglycaemic effects are greater, and decreased where they are less.

The inclusion of as little fat as possible from animal sources will meet the need for increasing the polyunsaturated to saturated fat ratio.

In planning the diet for any patient it is useful first to establish the normal dietary pattern, then to adjust it to meet the nutritional needs of the diabetic by (i) regulating energy intake to energy need; (ii) providing at least 40% of this energy from a variety of carbohydrate foods with emphasis on those with high fibre content; (iii) ensuring appropriate fat restriction; and (iv) choosing the food types familiar to the patient, using food tables (or other methods such as 'portions') to ensure the appropriate balance of the nutrient constituents – carbohydrate, protein and fat.

The next step is to plan meal sizes and content to provide the appropriate carbohydrate distribution.

Finally, it is important to educate the patient to a working knowledge of food composition. The involvement of a trained dietitian interested in diabetes can be of enormous help in this regard.

It is surprising how often very little modification is needed to make the normally taken diet meet the specific needs of diabetes. Avoidance of refined carbohydrate (sweets, sugar, cakes and pastries) and redistribution of foods is often all that is needed.

Alcohol should be used prudently. Some drinks contain much carbohydrate and all are potent energy sources. Such drinks are a potential cause of weight gain. Hypertriglyceridaemia may result from alcohol and in some patients hypoglycaemia may be induced, particularly if food is not taken. The safest way to use alcohol is in moderation, one or two drinks daily taken preferably with food. Special foods for diabetics are not essential. It is both practical and less expensive for diabetics to use normal foodstuffs in choosing foods to meet dietary requirements.

2. Specific Instances

2.1 The Patient with NIDDM

If the patient has NIDDM, is overweight and it is proposed to treat with diet alone, then a reduction diet of 5000 to 6280 kilojoules (1200 to 1500 kilocalories) is needed, with carbohydrate providing at least 40% (if practicable 50% or more) of the energy – 150g contributes 2500 kilojoules (600 kilocalories). If the NIDDM patient, whether using oral agents or not, is about ideal weight and requires more food for weight maintenance, the daily energy allowances and food selection can be calculated as described below for the IDDM patient.

In teaching the diet, carbohydrate and energy control should be emphasized and their rationale explained. Energy restriction achieves

weight loss and improves sensitivity to endogenous insulin. Unrefined carbohydrate limits the postprandial blood glucose rise and its contribution to energy intake allows the fat content of the diet to be reduced. The dietary carbohydrate should be spread evenly over the day and food substitution explained, to allow variety in the meals without sacrificing dietary consistency.

2.2 The Patient with IDDM

If the patient has IDDM the basal energy allowance can be estimated from the ideal weight and activity: 85 to 110 kilojoules (20 to 25 kilocalories) per kilogram per day, 25 to 30% above these basal levels for a sedentary person, 40 to 50% for moderate activity and 75 to 100% for continuous strenuous work.

However, it should be remembered that there is considerable variation in individual energy requirements and it is best to tailor advice on the basis of prior energy intake and recent weight change. The aim should be to provide at least 40%, and if acceptable to the patient 50% or more, of this energy from unrefined carbohydrate. The food lists which follow are the source of food selection, the patient's preference determining the actual menu.

The carbohydrate-containing foods (bread, cereals and biscuits, vegetables, fruit and dairy foods) are listed in servings each providing fifteen grams of carbohydrate (300 kilojoules or 70 kilocalories), with the exception of vegetables where two servings provide 15g carbohydrate. One or two servings of dairy foods should be included daily in the carbohydrate moiety of the diet; these contain energy from fat and protein in addition to the carbohydrate.

Protein and fat containing foods are listed in serving sizes, each of which provides 315 kilojoules (75 kilocalories). Those marked with an asterisk contain least fat and should be given preference.

Fat foods are necessary for their essential fatty acid content and fat-soluble vitamin sources, and could provide up to 30 to 35% of daily energy. The more of this fat coming from vegetable and marine sources the better.

Nutritional Management of the Diabetic Patient

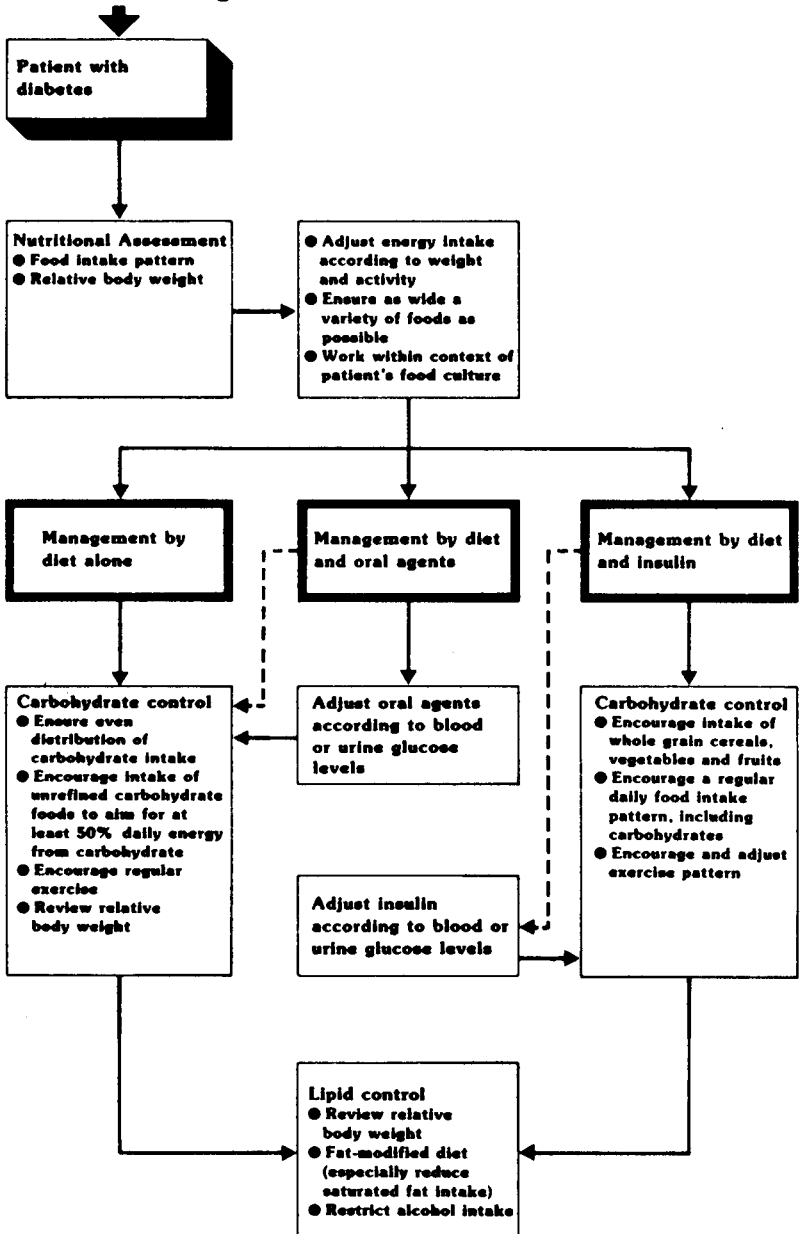


Figure 6.1: Reproduced with permission: M.L. Wahlqvist and R.W. Simpson *Patient Management*, April 1982, page 63.

3. Practical Applications

Example 1. Reduction diets for treatment of the overweight patient, usually the NIDDM patient.

The smaller diet contains 155g carbohydrate, the larger 185g, thus approximately 50% of food energy in each. Foods to make up the meal are selected from the food lists which follow on page 62.

	Diet 1	Diet 2
	5000kJ (1200kcal)	6200kJ (1500kcal)
	155g carbohydrate	185g carbohydrate
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Breakfast		
Fruit	1 serve	1 serve
Cereal	1 serve	1 serve
Milk	100ml skim	100ml skim
Bread	1 serve	1 serve
Fat	1 serve	1 serve
Lunch		
Protein/fat food	1 serve	1 serve
Bread	2 serves	3 serves
Fat	2 serves	3 serves
Low energy foods	as desired	as desired
Fruit	1 serve	1 serve
Dinner		
Protein/fat food	3 serves	4 serves
Starchy vegetables	3 serves	3 serves
Low-energy foods	as desired	as desired
Fruit	1 serve	1 serve
Supper		1 fruit
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Tea or coffee may be taken as desired with skim milk (200ml) from remainder of daily allowance of 300ml. Where more than one serve of any food group is allowed at a meal, one food or a combination of different foods from that group may be used to make up the allowed number of serves.

Example 2. Diets where weight maintenance is the aim. This example is for a male whose ideal body weight is 70kg. This type of dietary prescription is applicable to most insulin-requiring patients.

First, calculate the energy needs. Energy for basal metabolism, $105\text{kJ/kg/day} = 7360\text{kJ}$ ($25\text{cal/kg/day} = 1750\text{kcal}$). Add 35% for moderate activity = 9670kJ (2330kcal).

Second, allocate the carbohydrate.

1. Determine the amount. By definition this will be around 50% of the daily energy supply, or 1200kcal . Since 1g carbohydrate provides 4kcal energy, about $1200 \div 4 = 300\text{g}$ carbohydrate will be required daily.
2. Select the foodstuffs to provide this amount (300g/day). Since each serving in the carbohydrate food lists contains 15g carbohydrate, with the exception of starchy vegetables where two serves provide 15g , 20 servings will be required.
3. Choose foods from each carbohydrate category (bread, biscuits, cereal, fruit, vegetables, milk and derived foods) according to the patient's preference to make up the 20 serves, including at least two from the milk foods list.
4. Distribute the carbohydrate evenly throughout the day.

Third, supply the protein. Arbitrarily three to four meat exchanges per 1000kcal of energy requirement will supply protein needs. In this patient, six exchanges will be allocated, limiting the use of those with high fat content.

Fourth, add fat energy. Fat needs will be met by the use of one level teaspoon (5g) margarine or butter per slice of bread and by the fat content of the protein-fat foods using minimal fat in cooking. From these considerations the following diet is prepared as an example.

Diet containing 9670kJ (2300kcal) with 285g carbohydrate providing 4790kJ (1140kcal) daily

Tea or coffee may be taken as desired with milk of reduced fat content (equal parts of whole and skim milk or commercial preparations such as *REV* which contain 1.2% fat) from total daily al-

lowance of 600ml. Where more than one serve of any food group is allowed at a meal, one food or a combination of foods from that group may be used to make up the allowed number of serves.

	<i>Carbohydrate</i>	<i>Protein</i>	<i>Fat</i>
Breakfast			
Fruit	1 serve		
Cereal	2 serves		
Milk	200ml		
Bread	2 serves		
Fat (margarine)			2 serves
Morning tea			
Biscuits	2 serves		
Fat (margarine)			2 serves
Lunch			
Bread	4 serves		
Meat or alternative		2 serves	
Fat (margarine)			4 serves
Low energy foods	as desired		
Fruit	1 serve		
Afternoon tea			
Fruit	1 serve		
Dinner			
Meat or alternative		4 serves	
Vegetables	3 serves		
Low energy foods	as desired		
Bread	1 serve		
Fat (margarine)			1 serve
Fruit	1 serve		
Supper			
Fruit	1 serve		
Milk	200ml		

4. Food Groups

The following pages identify foods in groups, each foodstuff equivalent to the others in that group. There are five groups.

1. Unrefined carbohydrate foods
 - Bread, biscuits and cereals
 - Vegetables
 - Fruit
 - Milk and derived foods
2. Protein-fat foods
3. Fat foods
4. Low energy, low carbohydrate, low protein/fat foods
5. Refined carbohydrate foods

4.1 Unrefined Carbohydrate Foods

Unrefined carbohydrate can be defined as naturally occurring starches and sugars found in association with dietary fibre. Foods containing unrefined carbohydrate are nutritious and an essential component of any diet.

4.1.1 *Bread, Cereals and Biscuits*

Each of the following contains approximately 15 grams of carbohydrate and approximately 300kJ (70kcal) of energy. Wholemeal varieties of bread, cereals and biscuits are preferable as they contain more fibre and B vitamins than products made with white flour.

Bread

Wholemeal/rye/black	1 presliced slice (30g)
Raisin/white	1 presliced slice (30g)
Bread roll	$\frac{1}{2}$
Hamburger bun	$\frac{1}{2}$
Muffin or crumpet	$\frac{1}{2}$

Bagel	½ medium 7.5cm in diameter
Matzos	1 12.5cm square
Flatbread Lebanese	¼ slice (25g)
Breadcrumbs	2 tablespoons (20g)
Tortilla (15cm diameter)	1 (30g)

Cereals

Wheat germ	3 level tablespoons (30g)
Allbran	⅓ cup (20g)
Rolled oats, cooked	⅔ cup (150g)
Weetbix	1½
Unsweetened wheatflakes, corn-flakes, branflakes, puffed rice, puffed wheat	⅔ cup (20g)
Flour, wholemeal/white	2 level tablespoons
Cornflour, custard powder	3 level dessertspoons
Pearl barley, cooked	½ cup (75g)
Lentils, dried beans, dried peas, cooked	¼ cup
Baked beans	¼ cup
Rice, cooked	⅓ cup (60g)
Macaroni, spaghetti noodles, cooked	⅓ cup (60g)
Potato, 1 small	⅓ cup (90g)
Grape-nuts	¼ cup (30g)
Grits, cooked	½ cup (100g)
Popcorn, large kernel	3 cups (45g)
small kernel	1½ cups (20g)
Cornmeal, dry	1½ T* (15g)
Tapioca, uncooked	1½ T* (25g)

* Tablespoon measure used refers to 20ml tablespoons. American tablespoon measures 15ml.

Biscuits

Wholemeal Saladas	5 small
Ryevita	2
Krispy Wheat	3
Nutra Wheat	7
Sesa Wheat	4
Uneeda (snack size)	4
Thin Captain	3
Savoy	5
Branettes	7
Shredded Wheatmeal	3
Arrowroot	3
Marie	2
Morning Coffee	3
Ginger Nuts	2
Graham cracker	2
Saltine	6
Soda cracker (6cm ²)	4
Muffin (2 in) diameter)	1
Oyster	20
Melba toast (9cm × 5cm)	4
Pretzels (8cm × 0.25cm)	25

4.1.2 Vegetables (Starchy)

The following vegetables contain a significant amount of unrefined carbohydrate. Two serves of these vegetables are approximately equivalent to 15 grams of carbohydrate and approximately 340kJ (80kcal).

Some vegetables are low in energy and carbohydrate and are listed later.

Beetroot (fresh)	½ cup	(100g)
Broadbeans	¼ cup	(45g)
Carrots	½ cup	(100g)
Corn	¼ cup	(35g)

Lima beans	¼ cup	(45g)
Mixed vegetables	⅓ cup	(50g)
Parsnips	⅓ cup	(65g)
Peas	½ cup	(100g)
Potato	½ small	(45g)
Pumpkin	½ cup	(100g)
Squash	½ cup	(100g)

4.1.3 Fruit

Most fruit contains significant amounts of unrefined carbohydrate. All fruit should be fresh, stewed without sugar or tinned/canned without sugar. Choose one fruit marked with an asterisk each day as these fruits are rich sources of vitamin C. Each of the following provides approximately 15 grams of carbohydrate and approximately 220kJ (50kcal).

Apples	1 small (110g) ½ cup stewed 120ml juice
Apricots	3 medium (130g) 6 dried halves (25g)
Bananas	1 small (approx. 11cm long)
Blackberries	¾ cup (120g)
Cherries (raw)	20-22 (125g)
Custard apples	½ small (65g)
Figs	2 medium fresh/ dried
*Grapefruit	½ large (120g) 150ml juice
Grapes	18-25 (125g)
Honeydew melons	½ (200g)
Loganberries	¾ cup (100g)
Loquats	12 (100g)
Mandarins	3 small (150g)

*Mangoes	1 small (100g)
Nectarines	2 medium (100g)
*Oranges	1 medium (160g edible) 150ml juice
Passionfruit	3 (75g)
*Paw paw	$\frac{3}{4}$ cup diced (150g)
Peaches	1 large canned (200g)
Pears	1 small (100g)
Plums	6 small (100g)
Prunes	3 medium (25g)
*Pineapples	100g fresh 3 slices canned 120ml juice
Raspberries	$\frac{3}{4}$ cup (120g)
Raisins	1½ tablespoons (20g)
*Rockmelons	1 small 200g diced
*Strawberries	18 medium/9 large (180g)
Sultanas	1½ tablespoons (20g)
Watermelons	$\frac{1}{2}$ large slice (200g without skin)

4.1.4 Milk and Derived Foods

The energy content of milk and milk products is variable, depending on the fat content. For example, whole milk contains twice as much energy as skim milk (non-fat milk) although the carbohydrate content is the same.

Each of the following contains approximately 15 grams of carbohydrate and represents one milk exchange.

Milk

Whole	1½ cups (300ml)
Skim and other low fat milk	1½ cups (300ml)
Powdered (whole)	42g
Powdered (skim)	30g
Evaporated (whole or skim)	½ cup

Yoghurt (Whole and non-fat)

Natural	6 rounded tablespoons (250g)
Added fruit	3 rounded tablespoons (140g)
Flavoured	3 rounded tablespoons (140g)

Ice cream

Plain and flavoured	1 scoop (45g)
Weight Watchers'	2 scoops (90g)

4.2 Protein-Fat Foods

These foods contain little or no carbohydrate. They are essential sources of protein, vitamins, minerals and fatty acids. They are high in energy (joule or calorie) content and if taken in excess will lead to an increase in body weight. The daily allowance is calculated according to energy needs.

Each of the following foods is approximately equivalent to 315kJ (75kcal) of energy or one meat exchange and is therefore interchangeable with any other on the list.

Lean red meat (beef, lamb, liver, kidney, brains)	30g
Chicken (no skin), turkey, rabbit	45g
White fish	60g
Canned tuna or salmon	45g
Oysters or scallops	12
Prawns, crayfish or crab meat	100g
Sardines (no oil)	3 medium
Egg	1 large

Cheese	30g
Low-fat cottage cheese	100g (½ cup)
Creamed cottage cheese	50g (½ cup)
Lean bacon (cooked)	30g (2 thin slices)
Nuts	15g
Peanut butter	3 level teaspoons

4.3 Fat Foods

All types of fat are concentrated sources of energy and hence need to be restricted.

Butter and margarine contain the fat-soluble vitamins A, D and E. The use of polyunsaturated fats is recommended so as to minimize the risk of cardiovascular disease, a major complication of diabetes.

Each of the following foods is approximately equivalent to 150kJ (35kcal) of energy or one fat exchange and is therefore exchangeable with any other on the list.

Margarine or butter	1 level teaspoon (5g)
Oil	1 level teaspoon (5g)
Cream	2 level teaspoons (10g)
French dressing (no added sugar)	2 level teaspoons (10g)
Mayonnaise	1 level teaspoon (5g)
Peanut butter	1½ level teaspoons
Coconut, shredded or fresh	2 tablespoons
Olives	5 small, 3 large (700g)
Avocado	⅛ of 10cm diameter (240g)

4.4 Low Energy, Low Carbohydrate, Low Protein-Fat Foods

The following foods have a very low energy content and may therefore be taken in addition to the daily allowances to add taste and variety to the diet and to satisfy the appetite.

Vegetables (Non-starchy)

Asparagus	Egg plant	Parsley
Beans, French	Endive	Radish
Bean shoots	Garlic	Silverbeet
Broccoli	Kale	Spinach
Brussel Sprouts	Kohlrabi	Swedes
Cabbage	Lettuce	Summer squash
Cauliflower	Marrow	Tomatoes
Celery	Mushrooms	Tomato puree
Chinese cabbage	Onions	Turnips
Choko	Pepper, red/green	Watercress
Cucumbers		Zucchini

Other low energy foods, drinks

These include flavouring agents, such as herbs and spices, which are also low in energy and carbohydrate and may be used freely. In the interests of general health, it is advisable to avoid a large intake of salt (sodium).

Foods marked with an asterisk contain significant amounts of sodium.

Water	Sterilized bran	*Salt
Soda water	Vanilla essence	*Bonox
Tea	Pepper	*Bovral
Coffee	Mustard	*Soup cubes
Mineral water	*Junket Tablets	*Vegemite
(unsweetened)	Gelatine	*Curry
Chives	Vinegar	*Paprika

Special 'diabetic' products in this group are
 Low calorie jelly crystals
 Weight Watchers' jam and marmalade
 Low calorie salad dressings
 Diabetic mint sauce
 Artificially sweetened soft drinks and cordials

4.5 Refined Carbohydrate Foods

These are foods which have a very high sugar content. They do not contain significant amounts of other nutrients and should not be eaten under normal circumstances.

Sugar: white, brown, raw, icing, coffee crystals

Honey

Jam/jelly, marmalade, sweet spreads

Soft drinks and cordials

Toppings and syrups

Lollies, chocolate, toffee

Cakes, cream and iced biscuits, doughnuts, sweet desserts

Sweetened tinned fruit, glacé fruit

Sweetened condensed milk

Beer, stout, sweet sherry, liqueurs, port, sweet wines (sauterne)

5. Alcohol

The intake of alcohol should be limited for several reasons.

1. All alcoholic drinks are high in energy value. This should be considered particularly where weight control is important.
2. Alcohol may induce hypoglycaemia if too much is taken at any one time, or it may react adversely with some oral hypoglycaemic agents, particularly chlorpropamide.
3. Many alcoholic beverages, such as beer, sweet wine and liqueurs, contain significant amounts of carbohydrate, and will therefore contribute to blood glucose levels.
4. Alcohol has been shown to induce hypertriglyceridaemia in some patients.

A moderate intake of alcohol will usually have no detrimental effect on a diabetic, but the doctor or dietitian should discuss alcohol intake on an individual basis.

Alcohol should **never** be taken on an empty stomach.

Alcoholic beverages suitable for the diabetic include dry wines, sherries and vermouths, and spirits. Low carbohydrate mixes in-

clude water, ice, soda or mineral water or artificially sweetened tonic water, dry ginger ale, cola or lemon.

Diabetic beers contain a significant quantity of alcohol and energy and should be treated with caution. The intake of other beers, stout, sweet wines, sherries and vermouths, liqueurs and port should be avoided.

6. Meals Away From Home

Eating meals away from home can be a concern to the new diabetic. Once the diabetic becomes familiar with his/her dietary restrictions and management, eating out and travel become possible. Learning to make appropriate food choices and adjustments to meal times are important if the 'normal' lifestyle is to be maintained.

6.1 Meal Times

The non-insulin-dependent diabetic can usually cope with some flexibility in meal times. However, in the insulin-dependent diabetic, this flexibility may be quite limited. If a significant time delay is expected, as when dining out, then a small snack of one to two serves of carbohydrate-containing foods should be taken at the usual meal time, and the remainder of the usual allowance should be taken with the meal.

If eating out over an extended lunch period, the diabetic patient may include in the lunch meal any snack normally taken during the afternoon. If an extended evening meal is taken, then any supper allowance may be taken with the meal. If supper is being taken away from home, one to two serves of carbohydrate-containing foods may be left from the evening meal and added to the supper.

Protein and fat allowances may be 'saved' during the day and included in the special meal, but foods containing carbohydrate must be taken regularly throughout the day.

6.2 Meals in Restaurants

Most restaurants offer a menu which allows selection of a meal suitable for the diabetic. Simple dishes are usually a better choice than fancy ones and the waiter will always explain what is in a dish if asked. The intake of foods such as bread, biscuits and fruit juices can be adjusted to balance the carbohydrate content of a meal.

How to choose from the menu.

Soups	Avoid creamed and thickened soups. Clear soups are best.
Entree	Vegetable, meat or seafood entrees are suitable. Avoid pastry and large quantities of thickened sauces.
Main course	Meat, fish, chicken, seafood or egg dishes are suitable. Avoid those which contain batters, pastry and thickened sauces. Select potatoes, vegetables and salads according to prescribed allowances.
Bread	If you are unable to select sufficient carbohydrate from the menu, it may be necessary to have extra bread. Ask the waiter for it.
Dessert	Fresh fruit or fresh fruit salad is always a good choice if available. If sugar has been added, do not eat the syrup. Ordinary ice cream is suitable if it is available. Alternatively, dry biscuits and cheese may be taken (this is often a better choice).
Beverages	Have only moderate amounts of dry wine, spirits and diet ale (say two drinks). If ordering 'mixed-drinks' make sure the spirits are mixed with low-calorie soft drinks or soda water.

Restaurants offering meals of different cultures should be treated with care. Some Asian-style dishes are suitable although dishes with batters, pastries and sweetened sauces should be avoided. Combinations of steamed vegetables with meat, poultry or seafood and boiled rice are the best choices.

Meals from Italian, Greek and Middle Eastern cultures are also possible once the diabetic is familiar with his/her diet, although these are frequently high in fat/oil content. Rice or pasta may be exchanged for starchy vegetables or bread from the usual diet.

6.3 Take-away Meals

These are often of high fat, protein and carbohydrate content and care should be taken in selection. The least fatty foods are best chosen and, if possible, the inclusion of some fresh salad or fruit will help to satisfy the appetite.

7. Emergency Foods

At times it may be necessary for a diabetic to take some refined or quickly absorbed carbohydrate, for example to counteract a hypoglycaemic reaction or if illness prevents the intake of the usual diet.

The following emergency feedings can be substituted for the usual diet. Each feeding is equal to 15g carbohydrate; therefore, if the normal lunch supplies 60g carbohydrate, any four of the following feedings would cover requirements for that particular meal.

- | | |
|-----------------|--|
| 1. Lemon drink | 3 level teaspoons sugar (15g) dissolved in water with a squeeze of lemon juice |
| 2. Sugar | 3 level teaspoons of sugar or 3 cubes of sugar |
| 3. Barley sugar | 15g barley sugar |

- | | |
|------------------------|---|
| 4. Fruit juice | 100ml unsweetened orange, pineapple or grapefruit juice and 1 level teaspoon of sugar
or
150ml unsweetened orange, pineapple or grapefruit juice
or
120ml unsweetened apple juice or 120ml sweetened orange juice |
| 5. Ginger ale | 200ml ordinary (sweet) ginger ale |
| 6. Lemonade | 150ml ordinary (sweet) lemonade |
| 7. Milk and biscuits | 100ml milk, 2 thin Captains or 1 Uneda biscuit (full size) |
| 8. Egg flip | 200ml milk, 1 egg, 1 level teaspoon of sugar |
| 9. Milk and Akta-vite | 200ml milk plus 2 level teaspoons Akta-vite |
| 10. Tinned tomato soup | 100ml concentrated soup with 100ml milk |
| 11. Ice cream | 4 level tablespoons of ice cream (2 scoops, each 5cm diameter) |
| 12. Creamy rice | ½ level tablespoon of raw rice cooked in 150ml milk |

8. Travel

When travelling short distances patients can usually take meals at the normal time. However, long-distance travel may mean a change of pattern, particularly if this involves rapidly changing time zones. When travelling by car, it is advisable to carry extra food to cope with any unusual delay caused by breakdowns, etc. The food served by most airlines can be adapted to suit the majority of diabetics,

although it may be beneficial to notify the airline prior to the journey.

Any intending travellers should discuss their insulin and food requirements with their doctor prior to the trip.

9. Shift Work

The management of the shift worker requires individual attention and the diabetic is best advised to discuss his/her varying lifestyle with his/her doctor and/or dietitian.

10. Diet and Exercise

Exercise forms an important part of a healthy lifestyle and therefore all diabetics should be encouraged to exercise regularly. In well-controlled diabetics any activity taken over and above the usual level is likely to utilize extra blood glucose. As a rule, additional carbohydrate should be taken prior to and sometimes after extra activity. The amount taken should be relative to the extra energy expended and the time taken in the activity. Individuals should discuss their own requirements with their dietitian or doctor.

11. Special Diabetic Products

There are many foods specifically marketed for incorporation into a diabetic diet. However, they tend to be expensive and their use is usually unnecessary.

Some of these are high in energy and are therefore unsuitable for diabetics who need to control weight. The diabetic should learn to read the label of all foods marked 'suitable for diabetics' or 'special dietary food' before making a decision about using these products. The artificial sweeteners cyclamate and saccharine do not supply energy. Sorbitol does supply energy and products containing it should be used only occasionally in small amounts. Where overweight is a problem these products should be avoided. Sorbitol-

containing foods include diabetic chocolate, jams, ice cream and sweets (confectionery). The use of artificial sweeteners continues to encourage the taste for sweet foods.

Further Reading

Chapter 6

Taft P. Dietary management of the insulin dependent diabetic: what is the current consensus?

Patient Management (NZ) 1982; 10: 125-127.

Wahlqvist ML, Simpson RW. The diet in diabetes. *Patient Management* 1982; 4: 53-63.