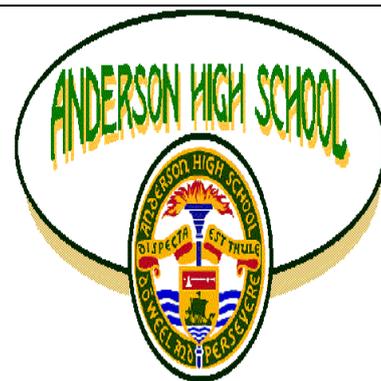


# HEALTH & FOOD TECHNOLOGY

## HIGHER

# FOOD FOR HEALTH

## BOOK 2 DRV's & THE DIETARY NEEDS OF INDIVIDUALS



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## **Dietary reference values**

Dietary reference values (DRVs) were produced in 1991 after a request by the Chief Medical Officer to the Committee on Medical Aspects of Food Policy (COMA) to set up a panel to reach some sort of standard recommendation as to how much of each nutrient is required by each individual.

People differ from each other in the amounts of energy and nutrients they need. DRVs give figures for nutrients which are enough or more than enough to cover the needs of almost every healthy person in the country.

- All DRVs are intended to apply to healthy people; they do not make any allowance for the different energy and nutrient needs imposed by some diseases.
- The aim of the DRVs is to ensure that everyone in the country gets enough of every nutrient. The figures chosen should therefore be high enough to cover the needs of people who have high requirements. Inevitably, this means that if people with average or lower than average needs eat that much, they will be getting far more than they need.
- The quantity of most nutrients that may be consumed by some people in excess of their needs is most unlikely to be harmful, but some people do try to eat larger amounts of nutrients than required. This can prove expensive and wasteful. Some nutrients, if eaten in large amounts, are toxic.
- All of these issues were addressed by the panel in considering the DRVs so it is not surprising that they have produced not one set of figures but up to four for some nutrients.

## **Dietary reference values**

Dietary reference value is the general term used to cover all the figures produced by the panel. It includes:

- estimated average requirements (EAR)
- reference nutrient intake (RNI)
- lower reference nutrient intake (LRNI)
- safe intake.

## **Estimated average requirements**

- Energy intake has been treated differently.
- If the standard for energy intake of a group of people was designed to be enough for those individuals with high needs, it would be too much for most people in the group.
- If all the members of the group consumed that much energy, many of them would become obese, which would not be desirable.

## **Reference nutrient intake**

- An amount of a nutrient that is enough for every individual, even someone who has a high need for the nutrient.
- This level of intake is therefore considerably higher than most people need.
- If individuals are consuming the RNI of a nutrient, they are most unlikely to be deficient in that nutrient.

## **Lower reference nutrient intake**

- An amount of a nutrient that is enough for only a small number of people with low needs.
- Most people will need more than the LRNI if they are to eat enough.
- If individuals are habitually eating less than the LRNI they will almost certainly be deficient.

## **Safe intake**

- A term normally used to indicate the intake of a nutrient for which there is not enough information to estimate requirements.
- A safe intake is one which is judged to be adequate for almost everyone's needs but not so large as to cause an undesirable effect.

## **How should DRVs be used?**

### ***Assessment of an individual's diet***

DRVs may help to give an indication of the likely adequacy of an individual person's diet, but great care needs to be taken in using figures for this purpose. If a person is regularly consuming less than the LRNI, it is likely that the individual will not be getting enough. Someone consuming the RNI or more than that is unlikely to be deficient.

### **Nutritional labelling**

Nutritional labels are used by individuals, and what is appropriate for groups may not be appropriate for individuals; '4 mg of iron per 100 g of food' does not mean much to many people. Knowing that a 125 g portion supplies 40% of what they need may mean more, and that is the form which is to be recommended for food labelling in the future. The nutrient content should be expressed as a percentage of EAR, which would be interpreted as an average requirement. This is in preference to using the RNI figure as this would provide more than most people need.

### **RNI for energy**

The amount of energy required by different individuals is related to a wide variety of factors, including:

- age
- basal metabolic rate
- gender
- weight/height/body size
- lifestyle/physical activity level (PAL)
- occupation
- special circumstances e.g.pregnancy and lactation, convalescents, weight reduction, vegetarians.

**Age:** Everyone needs energy from their food but as we get older, ie after 60/65 years of age, and slow down in movement, the body needs less energy as people become less active, eg on retirement from work.

**Basal metabolic rate:** The amount of energy used when the body is resting. The basal metabolic rate, which varies with age, also affects the amount of energy that is required.

**Gender:** Usually has an influence on body development and weight in non-obese people.

**Weight, height, body size:** Adult males normally have greater body size than females and adults are taller than younger teenagers. Every single body cell needs to be supplied with energy; therefore the larger the body size, the more energy is required.

**Lifestyle, PAL, occupation:** The amount of energy needed by adults, in particular, depends on whether they are very active, the type of work they do and how much physical energy is required to do it.

## **Special circumstances**

### **Pregnancy**

Although energy is needed during this time to support the growth of the foetus and to enable fat to be laid down in the mother's body for child birth and later breast-feeding, considerable reductions occur in physical activity during the last 3 months of pregnancy. The amount of energy required is therefore limited to an EAR of 0–8 MJ per day for the last 3 months only.

### ***Lactation***

Breast-feeding demands energy as the milk has to contain enough energy to supply the needs of the growing infant. Apart from the body fat laid down for this purpose, an additional EAR is calculated for energy, which increases generally with each month of breast-feeding up to the time the mother decides to stop breast-feeding.

### ***Convalescents, invalids***

People who are largely immobile, ie confined to bed or to a wheelchair because of disability or illness, or not doing a lot in the house or hospital while they recover from an illness (convalescing), do not have the normal requirement for energy. They should cut down on sugar and fat, and ensure that large quantities of starchy carbohydrates are not eaten, so preventing obesity.

### ***Weight reduction***

People who are attempting to lose weight sensibly will be given a medically approved diet which reduces the EAR of energy. Cutting down on the energy level for these people means their bodies will be forced to use up the stored fat as an energy source, so reducing weight as the fat level in the body falls. For severely underweight or anorexic people, EARs do not provide enough energy for them to gain weight. Special diets have to be made up which will include more energy foods than the EAR for individuals of the same age, sex and of normal weight.

### ***Vegetarians***

The same amount of energy is required by vegans/lacto vegetarians as non-vegetarians. Energy will come from cereals, grains and potatoes, particularly for vegans. Lacto vegetarians may have to be careful of the amount of saturated fats – eggs, cheese, milk – in their diets, which may raise energy levels.

## **RNI for protein**

If energy needs are not met, dietary protein is used as a source of energy rather than as the raw material required for tissue growth and repair.

**The amount of protein any group requires is directly related to the following factors:**

### ***Weight, height, body size***

Males normally have greater body size than females, and obviously adults and teenagers have more body volume than infants and young children, ie the greater the body size, the more protein is required to repair and maintain body tissue.

### ***Age/growth***

This is partly related to the previous factor in that protein is required to make all the new body tissue, eg bone, skin, muscle that is associated with growth. A 7-year-old, therefore, needs less protein than a 17-year-old because the 17-year-old has a larger body to repair and maintain as well as needing the protein for growth. Adults who have stopped growing do not need protein for growth but still need protein for repair and maintenance.

Adequate protein continues to be important to elderly people because body tissue wears out quickly in older age groups but with an adequate amount of protein in the diet, this process will not happen more quickly than it should do.

## **Special circumstances**

### ***Pregnancy***

Extra protein is required for the growth and development of the foetus in addition to the normal protein needs of the woman herself.

### ***Lactation***

Similarly, women who breast-feed their baby for the first 4 months of the baby's life should increase protein intake.

### ***Convalescents, invalids***

Invalids would normally need additional protein because repair of weakened or damaged tissue caused by illness or an operation would need to take place.

### ***Weight reduction***

The most effective and healthy way to reduce weight is to take in slightly less energy from food than the body needs each day.

## ***Vegetarians***

The same amount of protein is required by vegan/lacto vegetarians as non-vegetarians but this must be supplied by the type of protein foods that are considered suitable for them.

## **DRVs for fats and fatty acids**

The DRVs for fat found in food, which includes saturated, polyunsaturated and monounsaturated fatty acids, are given as a percentage of total food energy intake. It is recommended that the following intakes are practised:

- Total fat should provide no more than 35% of total energy intake.
- Saturated fats should provide no more than 11% of total energy intake.
- Trans fatty acids should provide no more than 1% of total energy intake.

These figures for fat consumption are related to the importance of the type of fat consumed to prevent coronary heart disease.

## **DRVs for carbohydrates (starches and sugars)**

DRVs for carbohydrates are given as a percentage of daily total energy intake. It is recommended that:

- approximately 10% of carbohydrates are in the form of sugar
- approximately 37% of carbohydrates are in the form of starches
- total carbohydrate intake should average 47% of total dietary energy for the population.

## **NSP**

A DRV for NSP is based on an estimated average intake of 18 g per day. No benefit is thought to occur if excess of 32 g per day is eaten, therefore adults should aim at an intake of between 18 and 32 g per day. Because of their smaller body weight children should eat less.

## Special circumstances

- *Pregnancy and convalescents.* Sufficient fibre/NSP in the form of fruit, vegetables and wholegrain products will prevent constipation. Inactivity, due to illness or in the later stages of pregnancy, will increase the risk of constipation.
- *Weight reduction.* Foods rich in fibre/NSP will aid weight reduction by providing a feeling of fullness, so reducing the risk of snacking on high-fat or sugary foods.
- *Vegetarians.* The extra bulk provided by the fibre/NSP in foods such as plant protein foods may have to be spread throughout the day to avoid feeling too full after a meal.

## RNI for vitamins

### Special circumstances

#### *Pregnancy and lactation*

Women intending to become pregnant, and for the first 12 weeks of pregnancy, are advised to take supplements or foods rich in folic acid. This will help reduce the risk of their baby developing a neural tube defect. Additional vitamin B1 (thiamine) is also required during the last 3 months of pregnancy and if lactating because of increased metabolism in the body.

## RNI for minerals

The requirements for minerals are expressed in exactly the same way as for vitamins using the three figures of LRNI, RNI and EAR.

### Special circumstances

#### *Women of child-bearing age*

The RNI given for iron would not be sufficient for women who have a high menstrual loss each month. The most effective way for such a person to meet the iron requirement would be to increase iron-rich foods, although supplements could also be considered.

#### *Pregnancy*

During pregnancy, calcium absorption increases and no additional calcium is generally required. However, an exception would be the pregnant adolescent whose bones are still forming and whose bone density is still being laid down. The increased needs of pregnancy for iron should be met without a further increase in iron intake because of the cessation of menstrual periods.

## Dietary needs

### Pregnancy

#### **General points**

- Pregnant women should have a nutritionally sound diet so that they produce a healthy baby and are able to sustain their own health throughout the pregnancy.
- Poor eating habits of mothers affect foetal growth and development, which in turn affects the wellbeing and growth of the child into adulthood.
- Smoking in pregnancy will reduce the flow of nutrients to the foetus.
- Any alcohol consumed during pregnancy will interfere with the nutrient absorption of the mother and also passes into the unborn baby's bloodstream.
- Pregnant women will get dietary advice from the community midwife, doctor and health visitor, who all keep a careful check on the health of mother and baby.

#### **Dietary guidelines**

All nutrients are important in pregnancy but particularly the following:

- *Protein*: A little additional protein will be required for the development of the foetus's body cells. Too much, however, could contribute to weight gain.
- *Carbohydrate*: In the last 3 months of pregnancy, the body has a greater requirement for energy. This is a time of rapid growth and development for the baby. However, it is important at this stage not to eat too many energy foods as weight gain may occur because of reduced activity at this stage in pregnancy.
- *NSP*: Constipation can be a problem in pregnancy. If it is, more NSP should be taken along with increased fluid intake and gentle exercise such as walking or swimming.
- *Iron*: The mother must have enough iron during pregnancy to supply her own body and to provide the growing baby with a store of iron for the first 4 months after birth. Breast milk and cow's milk are both poor sources of iron, so a store of iron is essential. A mother's haemoglobin count is checked regularly during pregnancy.

- **Vitamin C:** To enable iron to be absorbed, foods rich in iron and vitamin C are required. Vitamin C is also required for the baby's tissue formation.
- **Folic acid:** Women have been advised to ensure that their diet contains adequate supplies of folic acid before becoming pregnant and during pregnancy, especially the first 3 months. Folic acid reduces the risk of babies being born with neural tube defects such as spina bifida. It is required for the development of the brain and nervous system of the foetus.
- **Calcium:** The baby's bones are supplied with calcium provided by the mother's diet. It is important that vitamin D and phosphorus intakes are also maintained to ensure that calcium deposits from the mother's bones and teeth are not used for this purpose.

### **Foods to avoid during pregnancy**

*Too many sugary and fatty foods*, especially during the later stages of pregnancy. Women generally are less active then and this could lead to excess body fat, which can then be difficult to lose.

*Soft, ripened cheeses*, such as brie and camembert, and also pâté should be avoided, as they may contain listeria bacteria, which can be harmful to the unborn child. Cook-chill meals should be thoroughly reheated as they may also contain listeria bacteria.

*Eggs* should be thoroughly cooked as they may contain salmonella bacteria, which can cause food poisoning. Raw egg dishes should also be avoided for the same reason, eg soufflé, rich ice cream.

*Liver* and its products should be avoided as they may contain large amounts of vitamin A, which can be harmful to the developing baby.

### **Breast-feeding (lactation)**

Scotland does not have a good rate of breast-feeding although there has been a slight improvement in recent years. Evidence has confirmed that breast milk has more advantages than milk formulae. Scottish dietary targets recommend that mothers breast-feed their babies for at least the first 6 weeks of life.

There are a number of advantages of breast-feeding.

#### ***Psychological benefits***

- Mother bonds with child and establishes a close emotional attachment to the child.

### ***Health benefits***

- Breast milk contains antibodies and other protective substances which provide specific protection for the child and encourage growth and development of infant tissues and organs.
- The baby is less likely to become overweight because the baby decides when he/she is full.
- No likelihood of allergies to breast milk.
- Greater resistance to infection, especially gastro-intestinal infection and diarrhoea.
- Medical evidence suggests that babies who are breast-fed have a lower risk of developing asthma.
- Breast-feeding may help the mother to lose excess fat stores gained during pregnancy.
- Medical evidence suggests that women who breast-feed have a lower risk of developing breast cancer.

### ***Food safety benefits***

- Human milk is germ/bacteria free.
- Less chance of the baby developing stomach upsets through unhygienic preparation of feeds.

### ***More convenient and labour saving***

- No preparation time is needed and there is less hassle.
- No equipment to sterilise.
- Possible to feed baby on demand and quickly if necessary.
- Cannot be prepared incorrectly.

### ***Easier to digest and suitable for all babies***

- Easier to digest therefore less chance of nappy rash and stomach upsets.
- Milk contains all the energy and essential nutrients needed by babies and in the correct proportion.

### ***More economical***

- No extra equipment is needed, no milk formulae to buy – breast-feeding is free.
- Breast milk is always at the correct temperature so no heating is needed.

Experts recommend that babies are breast-fed for at least 4 months as there are real health benefits. Babies should not be given solid food until they are 4 months old – this is called weaning. By this time, babies have developed sufficiently to cope with a more varied diet.

## Weaning

### ***Practical guidelines***

- Introduce new foods gradually.
- Introduce different textures and flavours in food.
- Establish regular eating times.
- Aim for five small meals a day.
- Foods should be sieved or pureed.
- By 6 months, the baby should have a diet that is a mixture of solid and liquid food.
- Choose foods with no additives.
- Choose foods that are low in sugar and salt.
- Restrict the intake of sweets.
- Encourage the drinking of milk.

## Infants and young children

### ***General points***

- Poor diet in childhood can lead to health problems in later life.
- Good eating habits start in childhood and poor eating habits may be difficult to change in later life.
- A healthy diet will help children avoid becoming overweight or obese.
- Regular meals, consisting of small attractive servings and a pleasant atmosphere, are important in encouraging young children to eat.
- Include the use of naturally brightly coloured foods in meals and snacks.
- Introduce new tastes and textures gradually.
- Use food products that are additive free.

### ***Dietary guidelines***

- A variety of foods should be introduced so that a range of nutrients is obtained.
- Some complex carbohydrate foods such as wholemeal bread and potatoes should be included to supply energy.
- Do not include too many NSP-rich foods as they are very filling and children will be unable to eat enough food to supply all the other nutrients they need.
- Avoid giving children too many foods high in fat or fried foods. As children approach school age their fat intakes should be in line with the Scottish dietary recommendations.
- Choose low-fat versions of dairy produce. After the age of 2 semi-skimmed milk may be given, provided adequate energy intake is ensured from the rest of the diet. Skimmed milk should not be given before 5 years of age.

- Avoid too many sugary foods, as this will contribute to obesity and tooth decay. Avoid giving sweets as a reward and avoid sugar-coated breakfast cereals.
- Encourage the eating of fruit and vegetables as a low-fat and sugar snack. Serve vegetable sticks as snacks and give fresh and dried fruits as snacks in order to supply vitamin C.
- Protein is required for growth of new body cells and tissues as well as repair of damaged tissues. Children will be going through a growth spurt at this age.
- Calcium, phosphorus and vitamin D are required to form and maintain strong bones and teeth. Serve milk instead of sugary drinks.
- Supply iron rich foods to prevent anaemia, eg add dried fruits to breakfast cereals.
- Avoid salty foods as this encourages a liking for salt in the diet. Avoid salty snacks and a lot of processed foods in the diet.

## Teenagers

### **General points**

- Adolescence is a period of rapid growth and body development so nutrient requirements increase at this stage.
- Many teenagers have a tendency to 'graze' on snack or fast foods so it is essential to encourage a healthy diet.
- Food habits during teenage years will affect health in later life.
- Smoking is extremely detrimental to bone health and alcohol should only be drunk in moderation, as it is a toxin to bone cells. Teenagers should establish a regular exercise programme as exercise can increase and stimulate bone density.

### **Dietary guidelines**

- *Energy*: Teenagers have increased requirements, especially if taking part in sports. Males need more energy than females because:
  - they tend to have a larger body size than females and so require more energy
  - they tend to be more muscular than females and so will have a greater need for supplying energy sources to the muscles. Energy should be provided in the form of complex carbohydrates. Vitamin B complex is required to release energy from carbohydrate foods.
- *Calcium*: About 45% of the adult-sized skeleton forms during adolescence, so plenty of calcium- and phosphorus-rich foods should be eaten to ensure the proper formation of bones and teeth. Vitamin D will promote the absorption of calcium.

- *Iron*: Requirements increase as blood volume expands throughout growth. Iron is particularly important, especially in early adolescence for girls to prevent anaemia developing when menstruation starts.
- *Protein*: Teenagers require protein for their rapid growth spurt and to repair damaged tissues, especially if many sports are played.
- *Vitamin C*: Required to assist the absorption of iron. Plenty of fruit and vegetables should be eaten to provide this antioxidant vitamin.

## Adults

### **General points**

- The nutritional requirements of an adult will vary greatly depending on age, gender, lifestyle and occupation.
- Body growth declines in adulthood.
- Adults require a good diet to maintain and repair the body and to keep it healthy.
- Activity levels along with body size will determine the energy and nutrient requirements.
- Women will need less food than men but will need more iron because of menstruation.
- For women, their nutrient requirements will change during pregnancy and after the birth of a baby.

### **Dietary guidelines**

- Adults who are not very active need to pay careful attention to their energy intake because if energy intake exceeds energy output then the result will be weight gain.
- The requirements for protein and most of the vitamins and minerals remain virtually unchanged in the adult years.
- In comparison to adolescents, energy requirements are lower for both men and women, as are requirements for calcium and phosphorous.
- Reducing the intake of saturated fats, while increasing the total complex carbohydrate (TCC) foods, will provide sufficient energy for active adults.

## Elderly

### **General points**

- As people grow older, they need less energy.
- Usually they are less active.
- Basal metabolic rate (BMR) falls because there is a loss of lean tissue mass in the body.
- More elderly people are overweight than underweight due to lack of exercise.
- Obesity can be a problem – increased risk of heart disease and high blood pressure, or extra weight puts undue strain on joints.

- Deteriorating teeth can cause difficulty with chewing.
- Arthritis may cause problems with food shopping and preparation.
- A limited budget may influence food choice.
- An elderly person living alone may lack the motivation to prepare a balanced diet (eg a complete meal for only one person) and may snack on prepared foods high in fat and sugar.

### ***Dietary guidelines***

- A range of nutrients need to be eaten.
- The elderly should be encouraged to eat foods rich in iron to prevent anaemia, eg meat, eggs, breakfast cereals, bread, beans.
- Eating several sources of calcium will keep bones healthy and reduce the risk of osteoporosis, eg milk, cheese, bread, breakfast cereals.
- If the elderly are housebound, then they may lack exposure to sunlight and be at risk from a deficiency of vitamin D. This will lead to poor absorption of calcium and may cause osteomalacia. Vitamin D should be included in the diet.
- There is an increased demand for foods rich in NSP as the decline in activity could lead to constipation. NSP-rich foods should be included in the diet.
- Elderly people who have difficulty in chewing would benefit from fruit and vegetables being pureed to meet dietary needs for fruit and vegetables.

## **Convalescents**

### ***General points***

- Anyone recovering from an illness, accident or operation is a convalescent.
- It may be necessary to adjust the normal diet of convalescents to compensate for body weaknesses, poor appetite or poor digestion.
- Medical advice on diet must be carefully followed.
- Food must compensate for the loss of nutrients when recovering, eg loss of calcium from a bone fracture or reduced iron as a result of losing blood in an operation.
- Highly seasoned, spicy foods should be avoided.
- Small portions should be served as the appetite is likely to be poor.
- Food should be served attractively, and have a variety of colours and textures to encourage appetite.
- Food should be thoroughly cooked to prevent food poisoning.

### ***Dietary guidelines***

- *Patients may require plenty of liquids:* Liquids should provide energy, vitamins and protein. Suggested liquid food includes soups and broths, fruit juice, milk.
- *Avoid foods which contain a lot of fat or sugar* as the convalescent will not be as active as usual to use up all the energy. The energy value of foods should be lower than normal.

- *Foods that contain a good supply of calcium should be eaten by convalescents with a broken limb, so that the bone heals strongly.*
- *Protein intake should be sufficient to allow damaged cells and tissues to be repaired.*
- *If the patient is recovering from an accident or operation they should have sufficient protein for body repair and iron to replace any that was lost.*
- *Plenty of NSP in the form of fruit, vegetables and some wholegrain cereals will prevent constipation.*
- *Greasy foods should be avoided as they may be difficult to digest.*

## **Weight reduction diets**

*See also notes on obesity*

Many people in the UK are overweight because although the average energy intakes of the population have decreased over the past few years, activity levels have also dropped. People are taking less exercise, there are now more labour-saving devices and these factors may contribute to the increase in the number of people who are overweight or obese.

### ***Why do people put on weight?***

If we eat food which provides more energy than we need for our normal activities and lifestyle, this extra energy is stored as body fat. For body weight to remain constant, energy intake must equal energy output.

### ***Dietary guidelines***

The most effective and healthy way to reduce weight is to take in slightly less energy from food than the body needs each day. The body then makes up the difference by releasing energy it has stored as fat. In particular:

- cut down on total intake of food eaten each day
- cut down on sugary and fatty foods
- eat more total complex carbohydrate, NSP-rich foods, and fruit and vegetables, which are low in calories and are good sources of NSP, vitamins and minerals. These foods are filling and will help prevent snacking on sugary, fatty foods
- use cooking methods that do not involve adding fat.

Very low-calorie diets, 'crash' diets and meal-replacement drinks are advertised as a quick and easy way to lose weight. These types of diet can cause problems because:

- they do not encourage the dieters to change their eating habits in the long term
- once normal eating resumes, weight may be put back on quickly
- they often lead to loss of muscle instead of fat

## Vegetarians

### **General points**

- Vegetarian diets are followed by people who, for various reasons (religious, ethical, moral, health or personal taste) do not eat animal flesh.
- Lacto-ovo vegetarians do not eat the flesh of meat, fish or poultry. They will eat animal products such as eggs, milk, cheese and dairy products, as well as plant foods.
- Vegans do not eat any animal-derived products, including eggs, milk, cheese and other animal-derived dairy products. They only eat plant products.
- Provided a vegetarian diet is well balanced, it should supply all the nutrients needed by the body throughout life.

### **Dietary guidelines**

- *Lacto-ovo vegetarians* should have few problems achieving a balanced diet as most nutrients are easy to obtain, including the essential amino acids, from the protein found in those animal products which they will eat.
- They should limit their consumption of dairy foods such as cheese, butter and whole milk to avoid too large an intake of saturated fats. Reduced-fat versions of these foods should be used.
- Iron may be unavailable to the body from certain plant foods due to the presence of phytic acid, so limit phytic acid in the diet, eg wheat bran.
- Vitamin C foods should be eaten to help with the maximum absorption of iron from foods.
- They need to use complex carbohydrate as a source of energy.
- Vitamin B12 may have to be supplemented by fortified foods.

## ***Vegans***

- Protein is found in relatively small amounts in plant foods, so a large bulk may have to be eaten. The richest sources are soya beans, beans, pulses, cereals and nuts. A mixture of plant-protein foods should be eaten to make up for the deficiencies of essential amino acids in each.
- The bulk in the diet may lead to indigestion and fullness after a meal, so it would be advisable to spread the intake of foods throughout the day.
- Vitamin D is seldom found in plant foods so the action of sunlight on the skin is an important source of this vitamin. Fortified foods further ensure adequate amounts, eg vegetable margarines, soya milks.
- Vegans can obtain adequate calcium from plant foods. Good sources are tofu, green leafy vegetables, watercress, dried fruit, seeds and nuts. White bread is fortified with calcium, as are soya milks. (The presence of phytic acid in wholegrain cereals may make calcium unavailable to the body.)
- A high intake of NSP in vegans will have a positive effect on health, as more pulses, nuts, fruits and vegetables are consumed.
- As vitamin B12 is only found in animal foods, vegans may be at risk of developing a type of anaemia and may need to take this vitamin in tablet form to prevent this happening.