

LESSON 1 THE DIGESTIVE SYSTEM – EVERYONE IS DIFFERENT

NUTRITION & NUTRIENTS

Nutrition can be defined as the science of food and its relation to health. It involves processes where all people (all living organisms) receive and process the nutrients essential for life.

Nutrients themselves are defined as the chemical compounds from food that are found in a person's diet. Nutrients are essential to life; they play a variety of vital life roles such as in the provision of energy, the promotion of growth and development and in the regulation of bodily processes. There are six main classes of nutrients in food - proteins, lipids, carbohydrates, vitamins, minerals and water.

Foods have very different nutritional densities – this is the nutritional value of food relative to the number of kilojoules (energy) it supplies. In general terms, foods which have a high nutrient density are a good source of that nutrient relative to its contribution of energy. To explain, eggs or liver have high nutrient density as they contribute a great number of nutrients relevant to their kilojoule count, whereas fats and soft drinks provide energy, but have very low nutrient density as they contain few nutrients.

The most essential aspect of nutrition is the volume and variety of nutrients a person consumes in their diet. All people require the same nutrients during each stage in their life cycle although the volume of each nutrient necessary does vary. Here we will consider the differences of each life stage specifically and the major nutritional requirements during this time.

Please note the information herein is general and may not be directly applicable to every population/ community group, chronological information is not absolute, but is based generally accepted standards. Additionally, the numerical data is given as approximates only – based on mean averages from a number of sources.

FOOD PYRAMID AND RECOMMENDED DAILY INTAKE (RDI)

What is the recommended intake of nutrients?

There are many different authorities around the world that publish and promote recommendations.

These recommendations can vary from one authority to the next. As new information comes to light, and our understanding of the human body

Suggested Tasks: ▼

Throughout this course you will be provided with suggested tasks and reading to aid with your understanding. These will appear in the right hand column. Remember: these tasks are optional. The more you complete, the more you will learn, but in order to complete the course in 20 hours you will need to manage your time well. We suggest you spend about 10 minutes on each task you attempt, and no more than 20 minutes.

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Suggested Tasks

Choose a life stage that is of interest to you (for example infancy, childhood, adulthood or elderly).

Conduct an internet search on your chosen age group and research in more detail:

- nutritional requirements
- common nutritional deficiencies
- suitable foods that are good sources of the nutrients that are commonly deficient.

grows, we find recommendations are continuously modified.

In the light of these considerations, you cannot be excessively strict in your adoption of recommendations; but you should always give serious consideration to recommendations made by enlightened and educated experts.

There are limitations of recommended daily intake population based nutrient recommendations which are outlined below. It is wise to become familiar with these to demonstrate your understanding that every individual is different and have specific needs which can't always be addressed by following population based dietary recommendations.

- Individuals have widely varying nutrient requirements - both from person-to-person and from day-to-day general dietary recommendations must, therefore, be used with caution in assessing an individual's diet.
- General dietary recommendations do not allow for illness, medications or the effects of major life stresses, smoking, and alcohol abuse.
- They do not allow for adaptation to high or low intakes of some nutrients (e.g. iron, calcium, energy) for the individual.
- They do not address the minor vitamins and trace elements (it is assumed that if the intake of the main nutrients is adequate, then the requirements for the others will automatically be covered).

POPULATION BASED NUTRIENT REQUIREMENTS

Another method of calculating daily energy requirement is to use average energy requirements for the general population. For example, the UK Department of Health has published estimated average requirements (EARs) of 1940 calories a day for women and 2550 for men. Average energy requirements can also be given by age range, gender and daily activity level. For example, in Australia the estimated energy requirement (EER) for an 18 year old boy is 4000KJ per day.

In addition to providing a daily energy prescription, population based nutrient recommendations are also useful in dietary planning by helping to show the amount of different nutrients required for good health.

There are limitations of recommended daily intake population based nutrient recommendations, however, and some of these are outlined below.

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To help us achieve the recommended intake of nutrients pictorial guides have been developed to show the type and proportions of food the average person should eat on an average day to achieve good nutritional intake, this includes the food pyramid, originally developed in the US and the UK Eatwell plate.

The Eatwell plate divides a plate like a pie, showing the size of each 'slice' of different kinds of food. Cereals and fruits and vegetables have the largest slices while two other categories: dairy foods, and meat, fish, eggs and beans are considerably smaller and foods high in sugars and fats have a very narrow purple-edged slice. The slices have a coloured rim to make the proportions of each food on the plate easy to see.

The US food pyramid follows the same principles as the Eatwell plate.

In this instance different food groups are represented by different levels of the pyramid. The food group with the highest number of recommended daily servings (bread, cereal, and pasta group)

form the base of the pyramid; the group with the lowest recommended number of servings (fats, oils, and sweets) form the apex of the pyramid. The food pyramid is used in a number of countries including Australia and New Zealand.

The United States Department of Agriculture (USDA) has recently turned their food pyramid on its side. It now shows a child walking up the stairs of the pyramid as a way to incorporate exercise into the nutritional eating habits of children. The pyramid also incorporates a new colour scheme.

Released in April 2005, the new Dietary Guidelines from the USDA continues to reflect the tense interplay of science and the powerful food industry.

Several of the new recommendations represent important steps in the right direction:

- The new guidelines emphasize the importance of controlling weight, which was not adequately addressed in previous versions. And they continue to stress the importance of physical activity.
- The recommendation on dietary fats makes a clear break from the past, when all fats were considered bad. The guidelines now emphasize that intake of trans-fats should be as low as possible and that saturated fat should be limited. There is no longer an artificially low cap on fat intake. The latest advice recommends getting between 20% and 35% of daily calories from fats and recognises the potential health benefits of monounsaturated and polyunsaturated fats.

- Shows the importance of fibre as opposed to simple sugars, urging an increase in wholegrain and limiting sugary sweets.

These changes which have been implemented have come about because research showed that American children and children in other countries have had a drastic increase in weight since the food pyramid had started decades ago. Also, the food pyramid was a one size fits all and now has altered itself to include gender differences, age differences, as well as taking into account the amount of physical activity that the person exercises. The food pyramid is broken down into groups of foods. The basics of the food guide pyramid for servings are as follows:

- Fats, oils and sweets group - Limit servings
- Milk group - 2 servings
- Meat group - 2 servings
- Vegetable group - 3 servings

- Fruit group - 2 servings
- Grain group - 6 servings

As well as being a guideline for sources and groups the Food Pyramid and Eat well plate both convey the most important elements of a healthy diet:

- Proportion - simply by the shape of the food pyramid at a glance would indicate that fruits, vegetables and grains should make up a majority of a diet.
- Moderation - meat and dairy products, in moderate amounts, contribute to a healthy diet. The tip of the pyramid consists of fats, which is not omitted from healthy eating but is by far the smallest section on the food pyramid.
- Variety - choosing different foods from each food group every day will likely guarantee someone is consuming a greater variety of foods needed to maintain a healthy diet.

A basic guide to the nutrients required for the vital life processes is:

Materials for	Chemical Nature	Obtained from
Growth	Proteins mainly, but also minerals including calcium, phosphorus and zinc.	Dairy, meat, nuts, shellfish, soy and legumes
Control and regulation of the various processes.	Mineral elements and vitamins.	Vegetables, fruit, legumes, whole grains, meat
Energy production	Carbohydrates and fats; to lesser extent, protein.	Vegetables and fruit, dairy, oils