

## **SECTION 2: NUTRITION, HEALTH AND DISEASE**

### **2A: SYNOPSIS**

Food is of central importance to human health and wellbeing. Deviations from optimal nutrition span a spectrum from macronutrient (protein and calorie) and micronutrient (vitamin and mineral) deficiencies (undernourishment) to disease states associated with the intake of too much food (overnourishment). The papers in this section survey some of the ways in which variations from biologically healthy diets are manifested at societal and individual levels.

#### **No free lunch: the global distribution of food and micronutrient entitlement**

Despite there being no absolute shortage of food globally, Colin Butler refers to UN estimates that about 800 million people, or 13% of the world's population suffer from energy and/or protein deprivation. In addition, hundreds of millions of people suffer from micronutrient deficiencies, particularly involving iodine and iron. Greater international co-operation is needed for the survival of civilisation. Policies which sustainably improve nutrition for the poor cannot be separated from policies which reduce inequality.

#### **Lessons from the global elimination of iodine deficiency as a cause of brain damage**

Iodine deficiency is the most common cause of preventable brain damage in the world today. The World Health Organisation estimates that there are 2.2 billion people at risk from 130 countries. A Global Action Plan has been established for universal salt iodisation, which has been adopted by the great majority of countries with an iodine deficiency public health problem. The policy has resulted in significant falls in manifestations of iodine deficiency disorders.

#### **Obesity and diabetes**

Obesity and diabetes, representing an excess of food energy intake over expenditure, are two of the commonest public health problems of industrialised societies, which are associated with cardiovascular complications. Dennis Wilson describes how the prevalence of obesity and type 2 diabetes in Australia has doubled for men in the last 20 years and tripled for women. Lifestyle changes leading to reduced exercise are the main reasons for this. A preventive approach requires wider recognition and diagnosis, coupled with lifestyle changes which involve dietary modification, weight loss and an increase in regular exercise.

#### **Food sustainability and health through food variety**

Mark Wahlqvist refers to the most internationally agreed upon dietary guidelines, which specify the promotion of breast feeding and the enjoyment of food variety. The concept of eco-nutrition requires food variety to be linked to sustainable food production which maintains biodiversity. Combining nutritious plant-derived foods with small quantities of fish and lean meat is nutritionally and environmentally attractive. Sustainability of food supply may be promoted by putting more emphasis on local food production and by applying technological innovation through biotechnology and designer foods.

## **Phytochemicals, glyconutrients and health**

Barbara Eckersley describes protective plant substances known as phytochemicals, present in fresh fruit and vegetables, which are frequently deficient in modern Western diets. Glycoconjugate sugars known as glyconutrients, which facilitate intercellular communication, may be similarly deficient in modern compared with pre-agricultural diets. These classes of substances, which have only recently become recognised in nutritional science, may contribute to the prevention of certain collagen disorders, infections, cardiovascular diseases and cancer.

## **Dietary guidelines for older Australians – in practice**

Louise Bartlett focuses attention on the nutritional needs of the growing numbers of older people which have accompanied increases in life expectancy during the past half century. Lifestyle choices include enjoying a wide variety of nutritious food, maintaining an adequate fluid intake, taking regular exercise and improving muscle strength. These measures can reduce the chances of developing so-called degenerative disorders and extend a sense of health and wellbeing into the later years of life.

## **People as omnivores – costs and benefits**

From an evolutionary perspective, being omnivorous has clearly been advantageous for the human species. Rob Loblay examines some of the disadvantages of an omnivorous diet. First are immunological challenges, which cause food allergy in 5-8% of children in the 0-5 age group. Second is food intolerance, which refers to non-immunological adverse reactions provoked by natural and/or added chemicals present in commonly eaten foods. Some of these chemicals have evolved as part of defence mechanisms of plants.

## **Are we complacent about food safety?**

Foodborne illness in Australia is a significant and increasing public health problem, causative agents being mostly harmful microorganisms. Vicki Deakin describes how the increase in foodborne illness in Australia and worldwide is linked to the way consumers choose, handle and store food. Contrary to public opinion, most foodborne illness results from poor handling and storage practices and poor personal hygiene in the home environment. Prevention will depend on the development and implementation of consumer education programs from pre-school onwards.