DEVELOPMENT OF FOOD BASED DIETARY GUIDELINES FOR THE ASIAN REGION

Final Report of the Recommendations of the Asian Nutrition Forum/WHO Symposium on Diet Related Chronic Diseases in ASIA

10-14 February 1997
India International Centre
New Delhi
The Food Based Dietary Guidelines (FBDGs) were prepared by a drafting committee members, namely, Prof. Prakash S. Shetty (U.K.), Convenor; Dr Cecilia Florencio (Philippines); Dr Ge Ke-you (China); Dr Michael Gibney (U.K.); Dr Kraisid Tonisirin (Thailand); Dr. Kamla Krishnaswami (India); Dr Muto Shimako (Japan); Dr Sultana Khanum (WHO/SEARO); Dr B.K. Nandi (FAO/ASIA Pacific Region).

These guidelines could be appropriately adopted by the Member Countries themselves.
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SUMMARY

As the new millennium approaches, the nutritional scientists from Asian region considers this an opportune moment to take stock of the situation of the health and nutrition of the population of their region which comprises over half the world’s population. It is crucial to recognize that the adequate and proper nutrition of the population of this region is a goal to be achieved since it is the foundation for the good health and well-being of the people and their development. Although, reportedly spectacular improvements in health occurred during this period viz, infant mortality have fallen, life expectancy has increased, while several nutritional disorders such as beriberi and pellagra have virtually disappeared, but undernutrition and micronutrient deficiencies of iron, iodine, vitamin A deficiency persists in many countries and pose challenges to health care. On the other hand, diet-related chronic noncommunicable diseases put a severe burden on health services and are already the leading cause of death and disability in several countries of South-East Asia region. With increasing urbanization, changing dietary habits and changing lifestyles this alarming situation is bound to become even more severe in the years to come. It thus appears that countries of Asian region will have to carry the dual burden of old problems which have not been eradicated while having to deal with the new problems which are emerging. The challenge ahead is to devise strategies that will both ameliorate undernutrition due to poverty and prevent diet-related chronic noncommunicable diseases. It is necessary now to take comprehensive and multifaceted preventive action based on scientific evidences in order to promote healthy nutrition for all.

Based on WHO/FAO dietary guidelines, Food Based Dietary Guideline (FBDG) is therefore recommended as part of this preventive strategies. FBDGs provide a framework for advice on the selection and consumption of nutritionally adequate, safe, healthy and affordable diets and encourage healthy lifestyles. FBDGs have been recommended as the core dietary guidelines for national committees by the drafting committee, based on the scientific data presented at the symposium. Thus the committee was aware that the FBDGs will need to be developed at national levels within the region to take into account those diet-related public health problems that predominate in their countries; and at the same time be culturally sensitive and take into consideration the traditional food practices, customs, cooking practices etc and with awareness of the needs of the target groups within these population.
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FOR THE ASIAN REGION

Introduction

As we approach the new millennium, it is an opportune moment for the nutritionists of the Asian region to take stock of the situation of the health and nutrition of the population of their region which comprises over half the world's population. We need to look beyond the strictly nutritional aspects of the situation and critically review the context and impact of the demographic, environmental and socio-economic developmental trends in this region of the world. Not only should an attempt be made to deal with the overall general situation but also with the sub-regional variations that are occurring here. Public health strategies need to be generated and implemented which should be tailored to the socio-cultural, economic and environmental conditions of the different regions. These strategies need to take account of the available technology and adapt to the limited resources that can be generated to tackle the wide ranging nutritional and diet related health problems. In this process, it is crucial to recognize that adequate and proper nutrition of the population of this region is a goal to be achieved since it is the foundation for the good health and well-being of the people and their development.

During the second half of this century, many countries in the Asian region attained independence and took responsibility for their own growth and economic development including the health and welfare of their people. Spectacular improvements in health occurred during this period. Infant mortality rates have fallen dramatically in all countries and life expectancy has increased, while several nutritional disorders such as beriberi and pellagra have virtually disappeared. However, protein-energy malnutrition of young children, although less prevalent and in less severe forms, persists in many countries and contributes to poor growth and development and poor health of children. Micronutrient deficiencies of iron, iodine and vitamin A persist and pose challenges to health care. The nutrition of pregnant and lactating mothers continues to be vulnerable giving rise to a high proportion of births with less than desirable birth weight and poor nutrition and health of the pre-school child. Large proportions of adolescents and adults are undernourished and continue to impose an economic burden on society. The population explosion coupled with the enormous and rapid social changes have brought about remarkable alterations in the life styles of the people of this region - some beneficial and others not so. The intensive agricultural practices which are powered the growth in food production have increased the pressure on land and water resources and contributed to environmental degradation. In all countries in Asia, determined efforts have been made to eradicate hunger and poverty, with varying degrees of success and economic growth has not always resulted in the equitable distribution of resources.

The rapid and extensive urbanization contributed to by the large scale rural to urban migration in the Asian region has introduced new problems. The impact of the information revolution and the media have also contributed to modify food related behaviours and have lead to changes in food purchasing and food consumption trends in the region. The consequent changes in life-styles, value systems, occupational patterns and dietary habits are increasingly reflected in the changes in the morbidity and mortality patterns of the population. Communicable and infectious diseases persist, but are increasingly accompanied by chronic degenerative and non-communicable
diseases some of which appear to be an unmasking of a genetic predisposition as a result of diet and life-style changes.

It thus appears that countries of the Asian region will have to carry the dual burden of 'old problems' which have not yet been completely eradicated while having to deal with the 'new problems' which are emerging as a consequence of the developmental process. This 'epidemiological transition' of varying degrees in the different countries of Asia poses a burden, economic and otherwise, on the health systems of the region. The challenge ahead is to devise strategies that will both ameliorate undernutrition due to poverty and prevent chronic non-communicable diseases in the countries of this region.

The Framework for Food Based Dietary Guidelines

The 1992 International Conference on Nutrition called for the development of Food Based Dietary Guidelines that were based on the prevailing diet-related health problems to promote appropriate diets and healthy life-styles. Recommended Nutrient Intakes (also called recommended dietary allowances or recommended dietary intakes or dietary reference values or population reference intakes) are authoritative, quantitative estimates of human requirements of essential nutrients considered to be adequate to meet known nutrient needs of practically all healthy persons. Dietary Guidelines as defined by the Joint FAO/WHO Consultation (1996) on the other hand, are sets of advisory statements that give dietary advice for the population to promote overall nutritional well-being and relate to all diet-related conditions. Dietary guidelines can only result from the analysis of the prevailing nutrition and health status of the population and from an understanding of the diet related public health issues that affect the population. Dietary goals can then be determined that will improve the overall health of the population and reduce the risk of diet-related disease. Food Based Dietary Guidelines (FBDG) are essential since people at large think in terms of food rather than nutrients. These guidelines take into consideration both the traditional and contemporary dietary patterns in the widest variation. Thus these guidelines need to be realistic and culture sensitive. They will take into consideration those aspects of the diet that should be modified including the safety of food that is consumed. Dietary guidelines provide a framework for advice on the selection and consumption of nutritionally balanced, health and affordable diets and encourage healthy life-styles.

The framework for Food Based Dietary Guidelines need to fulfil the following criteria:

(1) A broad context that takes into account transitions in demographic, epidemiological, nutritional and social institutions.

(2) The preponderance of adequate and sound scientific evidence.

(3) The traditional diet and food practices as the starting point for its formulation.

(4) Starting from national estimates of the health and nutrition situation, national diets, food production and recommended nutrient allowances and then move on to a consideration of intra-country variations.

(5) Identify the links between undernutrition and overnutrition and food commonalities for the prevention of both.
(6) Dietary concerns may fall under four categories: Qualities, Safety and Enjoyment of what we eat.

(7) Recognize and incorporate both the local knowledge and the scientific base.

(8) Formulation and implementation on an inter-sectoral basis involving food, agriculture, trade and commerce, health, education, information and environment while appreciating the short, medium and long term implications to these sectors.

(9) Monitor to modify, if necessary taking into account developments in the science-base and changes in food production and human behaviour.

(10) Assess the effectiveness of these guidelines at the level of the family and households.

Core Dietary Guidelines for National Committees

Food Based Dietary Guidelines (FBDG) should provide for an adequate intake of macro and micro nutrient components and bio-active compounds which promote health and are protective. While recognizing the importance the FBDGs developed within this broad remit, the Committee felt the need to emphasize the importance of breast feeding and good infant feeding practices, the need for adequate physical activity and physical exercise, the importance of cultural practices in the region that promote the reduction of stress and induce mental relaxation, and the need to avoid smoking and the consumption of other intoxicants while reducing environmental pollution.

The Committee was also aware that FBDGs will need to be developed at national levels within the region to take into consideration those diet-related public health problems that predominate in their countries and at the same time be culturally sensitive and take into account the traditional food practice, customs, cooking practices, etc. Awareness of the needs of specific target groups within these populations who may be nutritionally vulnerable also needs to be considered.

FBDGs have been developed in some countries of the Asian region. Presented here are some of the Core Guidelines which merely seek to illustrate the kinds of concerns and criteria that have been used in the development of FBDGs by appropriate bodies. These are:

(1) Eat enough food to meet body needs and maintain healthy body weight
(2) Eat a variety of foods
(3) Eat clean and safe food
(4) Eat whole grain cereals, legumes, roots and tubers
(5) Eat plenty of vegetables and fruits regularly
(6) Eat moderate amounts of fat in your diet
(7) Limit salt intake
(8) Moderate sugar intake
(9) Avoid or limit alcohol
(10) Breast feed, as appropriate
(1) **Eat enough food to meet body needs and maintain healthy body weight**

The first part of this guideline underlines the importance of eating enough to meet body needs and thus reduce the risk of both under and over nutrition. The term 'healthy' body weight has been coined in the context of what is generally accepted to be within the range of body weights or appropriate weights for heights i.e. body mass index (BMI), compatible with good health and free from either chronic undernutrition or overweight and obesity. In view of the specific predisposition of South Asians to non-insulin dependent diabetes mellitus (NIDDM) and risk of coronary heart disease (CHD) associated with central obesity, a healthy body weight for this group is likely to be on the lower end of the range of acceptable BMIs. Since maintenance of a healthy body weight would require appropriate levels of physical activity implicit in this guideline is the need to maintain a level of physical activity which favours the maintenance of a healthy body weight when enough food is eaten to meet body needs. The appropriateness of the level of physical activity would depend upon the level of occupational and daily activity patterns. The aim is to discourage sedentariness particularly among sub-groups at risk in the population. They would be encouraged to participate in sports and games or undertake periods of physical exercise (about 20 minutes) to increase their level of physical activity. It would not be considered appropriate to recommend additional physical exercise for those individuals who already had moderate to high levels of energy expenditure on a day to day basis.

Several countries in the Asian region have formulated guidelines related to maintenance of appropriate body weight or consumption of foods to provide sufficient energy / body requirement. They include 'maintain appropriate body weight by balancing physical activity and food intake' (Brunei); 'consume foods to provide sufficient energy' (Indonesia); 'achieve and maintain desirable body weight' (Philippines); 'maintain desirable body weight' (Singapore); 'maintain normal body weight' (Thailand); 'consume foods according to body requirement' (Vietnam).

(2) **Eat a variety of foods**

Although the number of foods were not specifically identified, the Committee felt that recommending the incorporation of a wide variety of key food items apart from cereals in the diet was an essential core guideline. There are several merits in broadening the food base by increasing variety of food consumed. Variety would also avoid the problems of micronutrient deficiencies as Vitamin A, iron and iodine deficiencies in the population. Country specific guidelines may also be developed. For instance, in countries where fish was available and consumed, encouraging the intakes of fish would have to be a country specific FBDG. Similar food based guidelines could be developed for instance to encourage consumption of milk and dairy products in order to increase calcium intake and reduce the problem of osteoporosis if this was a diet related public health problem. It could also help encourage, in moderation, the consumption of eggs and meat in countries where the consumption of these food items was a practice and was feasible in terms of availability, affordability and supply.

Countries in the Asian region have formulated dietary guidelines recommending the consumption of a wide variety of foods. Some examples are: 'eat nutritionally adequate diet composed of a wide variety of foods' (Brunei); 'eat a wide variety of foods' (Indonesia); 'eat a wide variety of foods everyday' (Philippines); 'eat a variety of foods' (Singapore); 'consume five food groups daily' (Thailand); 'prepare a diversified meal, composed of different types of food'
(3) Eat clean and safe food

'Clean' and 'safe' food denotes food which is not contaminated with micro-organisms or has inappropriate levels of food additives or contaminants, toxins or environmental pollutants and pesticides. The Committee was aware of the importance of street foods as a major source of daily food of the people in the Asian region. It also felt the need to disseminate awareness of fungal toxins such as aflatoxins in the food resulting from poor storage or increase in pesticide contaminants resulting from high levels of technological inputs to promote food production.

FBDGs developed by some national committees in the Asian region have generated good examples of dietary guidelines in this context: 'consume foods which are prepared hygienically' (Indonesia), 'eat clean and safe food' (Philippines); and 'ensure food hygiene' (Vietnam).

(4) Eat whole grain cereals, legumes, roots and tubers

The objective of this core guideline was to ensure adequate intakes of complex carbohydrates, starch and dietary fibre. In the Asian region this guideline also ensures adequate daily protein intake from non-animal sources. It also helps reduce the consumption of refined cereal foods which are poor in dietary fibre content.

Examples of FBDGs recommended by countries in the Asian region include: 'eat plenty of fruits, vegetables, whole grain breads and cereals' (Brunei); 'obtain about half of total energy from complex carbohydrate rich foods' (Indonesia); 'maintain intake of complex carbohydrate at about 50% of total energy intake. Increase the intake of fruit and vegetables and whole grain cereal products' (Singapore); 'consume foods containing dietary fibre regularly' (Thailand); 'increase intake of fibre, consume a large amount of vegetables, roots, tubers and fruits' (Vietnam).

(5) Eat plenty of vegetables and fruits regularly

The objective of this guideline is to encourage the consumption of fruits and vegetables for a variety of reasons. The term 'plenty' is meant to imply increasing the intakes from current levels for instance in Thailand from 150 gms to 200 gms per day or doubling the intakes from 50 gms to 100 gms in India. The recommended levels of intake may go up to 400 gms. However, given the constraints of availability and affordability it would be pragmatic to phase the increase. No attempt is made to distinguish between green leafy vegetable consumption or the consumption of carotene rich foods. Roots and tubers may also be included in this category of foods.

(6) Eat moderate amounts of fat in your diet

The Committee recognized that the consumption of dietary fat in the Asian region ranged from 20 to 30 per cent energy per day. It felt that the maintenance of dietary fat intakes at this level was compatible with good health and needs to be encouraged while the inclusion of this guideline was specifically to discourage at the same time any attempt to increase the levels of intake beyond this acceptable range which was likely with the developmental and consequent life-style changes in this region. When these guidelines are incorporated specifically to reduce increasing consumption
of fat in the diet it may be necessary to specify the quality of fat and recommend reductions in saturated and increases in poly-unsaturated fat intakes.

Several countries in this region have developed specific guidelines related to fat in the diet. Examples are: 'eat a diet low in fat' (Brunei); 'obtain not more than a quarter of total energy intake from fats or oils' (Indonesia); 'restrict total fat intake to 20-30% of total energy intake, modify the composition of fat in the diet to consist of 1/3 PUFA, 1/3 MUF, 1/3 SF, reduce cholesterol intake to <30mg per day' (Singapore); 'consume the appropriate amount of fat' (Thailand); 'consume a certain amount of fat/oil with attention paid to intake of oil, groundnut and sesame' (Vietnam).

(7) Limit salt intake

Specific guidelines related to salt intake may need to be made in countries where salt intake is likely to be high as a result of traditional food practices or where the problem of salt related hypertension is a high priority. Although the Committee estimated that an intake of 6 gms of salt per day would meet all physiological requirements in a Tropical climate it was hesitant to recommend that salt intakes be limited to 10 gms per day since this may have implications downstream for salt fortification programmes aimed at iodine deficiency. It would be more appropriate for dietary guidelines related to salt (or sugar) intake to be more user-friendly by resorting to household measures (teaspoons) rather than weights (gms).

Several countries in the Asian region have developed dietary guidelines for salt. Examples are: 'use salt sparingly and reduce intake of high-salt foods' (Brunei); 'reduce salt intake to less than 5 gms a day (2000 mg Na), reduce intake of salt cured, preserved and smoked foods' (Singapore); 'reduce intake of sodium' (Thailand), 'reduce the salt intake to below 10 gms per head per day' (Vietnam).

(8) Moderate sugar intake

Current research indicates that the prevailing consumption levels of sugar in countries of the Asian region may not be implicated in the increase in chronic diseases other than in the development of dental caries. However, the customary practices of using free sugars in tea and coffee and the frequent consumption of sugar based food items or the addition of sugars into a wide range of food items during cooking among some populations or sub-groups within a population was a concern. Despite the generally low consumption levels of sugar in this region, in view of the predisposition of South Asians to NIDDM and with increasing prevalence of obesity the Committee felt that sugar consumption levels of populations in the Asian region should not increase beyond present levels and hence this could be a specific guideline.

Several countries in the Asian region have specific dietary guidelines for sugar. They include the following: 'eat a diet low in refined and processed sugars' (Brunei); 'reduce intake of refined and processed sugar to less than 10% of total energy intake' (Singapore); 'consume sugars in moderation' (Thailand); 'consume a little amount of sugar, adult as well as children must not take candy, cakes or sweet beverages before the meal. Everyone is recommended to take about 500 gms of sugar per month' (Vietnam).
(9) **Avoid or limit alcohol**

Alcohol intake varies from country to country within this region. The Committee was sensitive to the religious customs of the countries which discouraged or imposed restriction on alcohol consumption. Given the incidence of alcohol related problems in this region, it felt the need to make a definite statement avoiding alcohol intake. Several countries in this region have combined guidelines related to alcohol consumption with positive guidelines related to adequate consumption of water and fluids every day.

Examples from Nationally developed guidelines are: ‘*drink adequate quantities of fluid that are free of contaminants, avoid drinking alcoholic drinks*’ (Indonesia); ‘*for those who drink, limit alcohol intake to no more than two standard drinks a day (about 30 gms of alcohol)*’ (Singapore); ‘*avoid drinking alcohol*’ (Thailand); ‘*take enough clean water and reduce the intake of alcohol and beer*’ (Vietnam).

(10) **Breast feed, as appropriate**

The inclusion of breast-feeding as a food based dietary guideline was considered essential to promote and sustain the levels of breast feeding to infants and to discourage the increasing practices of bottle feeding that accompany the developmental and life-style changes in this region. Guidelines may also encompass recommendations regarding duration of exclusive breast feeding as well as other infant feeding practices such as time of introduction of appropriate complementary feeds.

The country base examples of guidelines concerning breast feeding are: ‘*breast feed your baby exclusively for four months*’ (Indonesia); ‘*promote breastfeeding and proper weaning*’ (Philippines); ‘*encourage breast feeding in infants till at least six months of age*’ (Singapore).

**How should the Food Based Dietary guidelines be used and by whom?**

The Food Based Dietary Guidelines developed by appropriate National/Regional/ Sub-national Committees in the Asian region need to be disseminated and directed to ongoing food distribution, food service and nutritional and health programmes. They should be forwarded to government departments which are concerned with health, family welfare, maternal and child health services as well as departments concerned with food, agriculture, trade, commerce, labour and environment. They need to be made available to non-governmental and other agencies or organizations involved in broad based multi-sectoral concerns related to food, nutrition and health.

The Committee reiterated the process outlined by the Joint FAO/WHO Consultation on the implementation of FBDGs drawn up by National/Regional Committees of the region. Recognition of the multi-factorial nature of the implementation process of FBDGs implies that the approach should be one of co-operative partnership with several experts involved in the promotion of better nutrition and health. Nutritionists would have to verify the scientific content of the messages to ensure correctness and validity; while communication experts would need to produce the appropriate messages which are appealing and effective in communicating the dietary guidelines as health messages to the population. Dissemination and implementation will only be effective if the participation of a wide range of experts such as educators, health professionals, social workers,
extension agents, nurses and others involved in activities in this multi-sectoral sphere of activity. The participation of societies and associations of nutrition and other related health professionals may play a key role in enabling dissemination among the professionals and experts in areas pertaining to health and nutrition.

The Research Agenda for the Asian Region

(1) Qualification of the extent of the problem in the population

The Drafting Committee recognized that Dietary Guidelines could not be developed without a realistic assessment of the diet related health problems and their extent within countries of the Region. This was identified as a major barrier to the development of food based dietary guidelines, dietary goals and health targets. The need to collect, collate and analyze data on diet-related health problems within the region was considered a priority research area. This information was essential for inter-sectoral interactions such as with Agriculture for food supply and food production. Hence quantification of the diet-related health problem was considered an important research priority in the region. The Committee was impressed with the methodology based on hospital information adopted to assess the problem of osteoporosis within the population, by China. Valid methodologies like that need to be developed and this was also considered a priority.

Monitoring changes in the patterns and extent of diet related health problems was considered a priority. The development of surveillance systems to monitor these changes, as well as to evaluate the extent and the impact of the dissemination of FBDGs on health pattern of the population were also considered essential to facilitate the achievement of dietary goals and national health targets. The need to develop mechanisms and decisions making processes to monitor frequently and to implement changes at the local decentralized levels was considered essential.

(2) Research priorities

There were several categories of research which were considered as priorities by the Committee. These included several areas of scientific research ranging from identification of specific risk factors to population based genetic research, research on behaviour, policy orientated research and applied research in education and communication. The following research topics were singled out by the Committee as being important but they are not meant to be either comprehensive or exclusive.

(i) The identification of a range of risk factors that are amenable to intervention by primary prevention strategies are considered a research priority. These could be focussed at identification of risk factors that address issues or concerns which are general to the Asian region or which may be specific to some countries within the Asian region e.g. NIDDM and CHD in South Asians. Research in these areas is amenable to inter-country comparisons enabling investigations using common protocols and sharing of information and technology. South-South collaborative research in population based genetic epidemiology is possible in view of the large genetic diversity which has resulted in the manifestation of specific diet related health problems in countries of the region. The development of common research protocols and clinical investigations using modern molecular biology tools to study
the genetic diversity and poly morphism of the population of this region should hence be a priority. *Gene-nutrient interactions* also need to be investigated.

(ii) More research needs to be done on *traditional diets*, and food items consumed by the population of the regions. These may include as wide and diverse a subject area as phyto-estrogens in 'tofu' and the anti-mutagenic effects of spices such as turmeric. Both beneficial and adverse effects of traditional diets and food practices will have to be investigated. Traditional food related remedies and food practices and beliefs will also need to be investigated. Identification of the strengths of the *Asian region* with regard to food and nutrition to promote better health will be a useful strategy to adopt and may lead to the exploitation of the marine resources in Asia or its ecological resource base.

(iii) More research will need to be done on the *bio-availability of nutrients* and the effect of different *cooking practices* of the region on bio-availability as well as production of harmful, carcinogenic compounds. More work needs to be done on *food additives* and effects of food storage technology on nutrient availability as well as production/accumulation of toxins/harmful agents in food. Research will also be needed to address the problem of *environmental pollutants and pesticides* in the food chain.

(iv) Since dietary guidelines are aimed at the eradication of diet related health problems the development of *dietary methodologies* for the assessment of dietary intakes (past and present) is a priority. Generation of food composition data and their harmonization of the Asian region with such a wide variety of foods needs to be supported. Standardization of portion sizes, serving size to calculate more accurately what nutrients people eat will also become important.

(v) *Behavioural research* will have to address consumer attitudes, risk perceptions related to food and social marketing strategies. A whole range of areas such as behavioural and social sciences will need to be marshalled to research the anthropological and other aspects of the food and related ecosystems of the region. Research into health promotion and understanding to changing health related behaviour will also need to be supported. The role of media and other information technologies in enhancing health will have to be investigated.

(vi) Research needs to be conducted on the *implications of intensive agricultural practices* as well as the import of biotechnological advances in agriculture on health of the population. For instance, the effects of intensive agricultural technology and inputs on micronutrient composition within the biomass may be an important topic.

(vii) *Policy oriented research* may have to examine the inter-relationships and tensions between agriculture, food and nutrition and the interactions between vested interests of industry, trade and commerce and their implications to health and nutrition of the population. Strategies may need to be evolved to understand and deal with conflicts between sectoral interests which may potentially harm population health when developmental priorities change.
(viii) *Operational research* will have to be given priority since operationalizing FBDGs would involve development of strategies to translate research and policy into practice. This will involve dissemination of information from policy makers down to the people and facilitating the implementation of the dietary guidelines at the household and individual level. Provision of product information to customers, nutrient labelling of foods will need to be addressed to form the basis of an information tool for customers.

(3) **Training of Human Resource Development**

To meet the challenges of the epidemiological transition in the developing economies of the Asian region human resource development will be a priority. The need to acquire new skills and use new technologies will arise. Training in areas such as nutritional epidemiology, health promotion, behavioural and ecological sciences in the region will need to be supported and strengthened for the development and acquisition of analytical expertise and skills within the region. Education—both formal and non-formal, information technology and communication skills will become important areas demanding investment both human and material. Human resource development will thus demand to be identified as a priority for resource allocation.