

INTER-
INSTITUTIONAL
LINKAGES
PROGRAMME



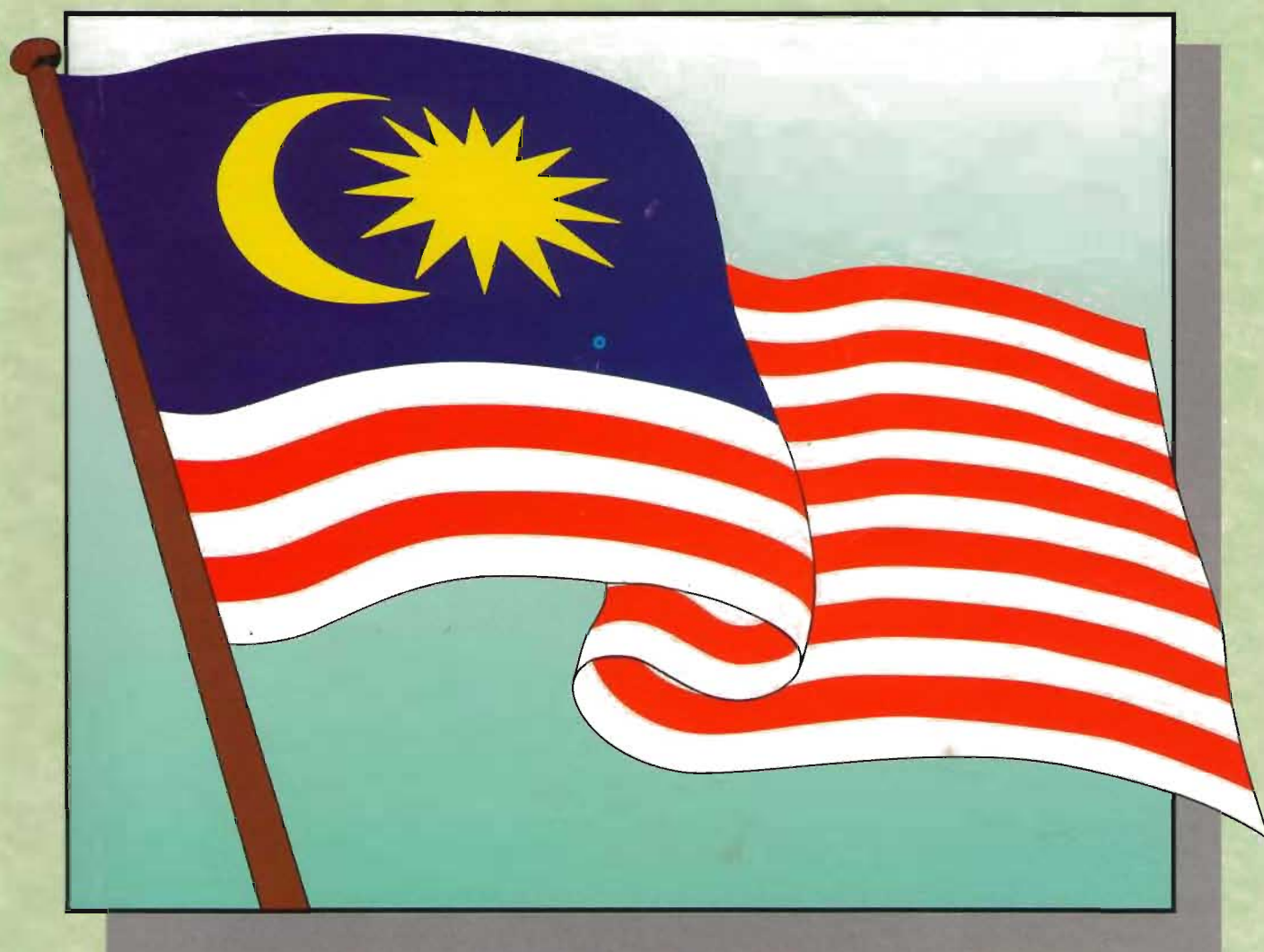
BRUNEI DARUSSALAM
INDONESIA
MALAYSIA
NEW ZEALAND
PHILIPPINES
SINGAPORE
THAILAND



Selected Annotated Bibliography
of
**RESEARCH PUBLICATIONS
AND RESOURCE MATERIALS**
(1980-1993)

in

**FOOD, NUTRITION & HEALTH PROMOTION
IN MALAYSIA**



Selected Annotated Bibliography

of

**RESEARCH
PUBLICATIONS AND
RESOURCE MATERIALS
(1980-1993)**

in

**FOOD, NUTRITION & HEALTH PROMOTION
IN MALAYSIA**

Annotated and Compiled by

Tee E Siong

**ASEAN-New Zealand Inter-Institutional Linkage Programme (IILP)
Project 5 National Committee, Malaysia**

1994

ISBN 967-937-236-1

© ASEAN-New Zealand IILP Project 5 National Committee Malaysia

Published by:

**Food Technology Research Centre,
MARDI
P O Box 12301 GPO
50774 Kuala Lumpur
Malaysia**

**Telephone No.: (603) 9486401/2/3
Facsimile No.: (603) 9422906**

1994

Printed by:

Malindo Printers Sdn. Bhd.

RESEARCH PUBLICATIONS AND RESOURCE MATERIALS (1980-1993)

in

FOOD, NUTRITION & HEALTH PROMOTION IN MALAYSIA

Contents

	<i>Page</i>
Acknowledgements	iv
Preface	v
Abstracts	
Part 1: Research Publications	1
Part 2: Resource Materials	97
Appendix 1 IILP Functions and Objectives	109
Author Index	113
Subject Index	117

Acknowledgements

The ASEAN-New Zealand Inter-Institutional Linkages Programme (IILP) Project 5 National Committee, Malaysia wishes to express its sincere appreciation to the government of New Zealand for the financial support to enable the publication of this compilation of *Selected Annotated Bibliography of Research Publications and Resource Materials in Food, Nutrition and Health Promotion*.

Preface

The ASEAN-New Zealand Inter-Institutional Linkages Programme (IILP) started in 1990 between participating institutions in ASEAN member countries and New Zealand, with financial assistance from the government of New Zealand. The overall goal of the Programme is the establishment of self-sustaining linkages between ASEAN and New Zealand institutions.

Project 5 of the IILP focuses on Food, Nutrition and Health Promotion with objectives of developing sustainable institutional linkages, improving access to data and information, and broadening knowledge and improving competency of key institutions in the area of food, nutrition and health promotion (Appendix). Activities carried out under this Project in Malaysia are managed by the National Committee, comprising the following:

Zahara Merican (Chairman)	MARDI
Khatijah Idris (Secretary)	MARDI
Dr Mat Isa Awang	MARDI
Dr Mohd. Ismail Noor	UKM
Mohd Nordin Abd. Karim	UPM
Safiah Mohd. Yusof	Ministry of Health
Sahari Jantan	Schools Div., Ministry of Education
Dr Tee E Siong	IMR
Dr Zaitun Yassin	UPM
Zanariah Jiman	MARDI

This compilation of Selected Annotated Bibliography of Research Publications and Resource Materials in Food, Nutrition and Health Promotion in Malaysia is one of the activities carried out to meet the objectives of the Programme. The compilation consists of two sections. The first section contains 230 selected abstracts of research publications on food, nutrition and health in the country. The second section comprised 34 abstracts of resource materials prepared for nutrition and health promotion. Members of the National Committee contributed publications and materials from their respective organizations. An effort was also made to actively search for materials available in various libraries. Each publication obtained was reviewed and an abstract prepared or modified as appropriate. Resource materials obtained were reviewed and a brief annotation prepared.

I thank all members of the National Committee for their cooperation in providing materials for this compilation. I congratulate Dr Tee E Siong, Head of the Division of Human Nutrition, Institute for Medical Research, Kuala Lumpur for having successfully completed this compilation.



Zahara Merican
Chairman,
National Committee for Project 5
ASEAN-New Zealand IILP

July 1994

abstracts

part 1

RESEARCH PUBLICATIONS

1. ABDUL RAHMAN W

Rancangan makanan tambahan sekolah (School supplementary feeding programme)

Report of the Workshop on Malaysian Case Studies on Food and Nutrition Interventions, National Committee on the ASEAN-New Zealand Inter-Institutional Linkage Programme, Kuala Lumpur; 1993; pp. 61-68.

The school supplementary feeding programme is one of the efforts of the Ministry of Education Malaysia to provide food to deserving primary school children. The Programme aims to (1) provide a nutritious food supplement to assist the pupils in growth and development, (2) carry out health and nutrition education directly or indirectly, (3) instill proper eating habits, hygienic practices and discipline. The paper provided an overview of the Programme, including coverage, educational activities, food preparation and the menus.

2. ABDULLAH AR

Current status and future challenges of food safety in Asia: an overview

Proceedings of the First Asian Conference on Food Safety, (Zahara M, Normah A, Yeoh QL, Moy GG, Noraini MO, Harrison Aziz S and Abd Rahim M. ed.), 2-7 September 1990, Kuala Lumpur; Malaysian Institute of Food Technology, Kuala Lumpur, 1991; pp. 8-10.

Food safety is recognised as a worldwide public health issue both in the industrialised world and, more so, in the developing countries. For most countries in Asia, the food industry is still in the formative stages, with the majority being small manufacturers. Improper and uncontrolled application of traditional methods to the mass production requirements of the modern food industry will eventually pose public health problems. Therefore, in order to see that the safety of food is maintained, a multidisciplinary approach involving shared responsibility of the government, food industries, and the public is required. By far, microbial contamination leading to foodborne diseases is the greatest threat to food safety in the region. In addition, there are other threats from the extensive use of chemicals, injudicious application of pesticides, and the continuous pollution of the environment, all of which may lead to food contamination. In combating these problems, education with emphasis on basic hygiene and food handling practices must be aimed at all levels of society. An effective food control system, coupled with adequate food legislation, is needed to ensure the safe production and handling of food under hygienic conditions. Adherence to good agricultural practices, good manufacturing practices, and quality assurance by food growers, manufacturers, operators, and food handlers is essential for assuring the safety of our food supply.

3. ABIDIN H

Aflatoksin dan kesannya ke atas kesihatan manusia (Aflatoxins and their effects on the health of humans)

Teknologi Makanan, 1(1):13-19, 1982

The problem of aflatoxin contamination of foods and other agricultural products and its effect on human health and animals is still not being fully realised by the public. This paper discussed several important aspects of the problem so as to provide

further insight into the group of toxins. Topics discussed included types of aflatoxins, factors encouraging the production of these toxins and their contamination of foods, the biological and toxicological effects of aflatoxins, and the control strategies for preventing contamination.

4. ADINAN H and ZANARIAH J

Changing food habits and their nutritional implications

Proceedings of the the First Scientific Conference of the Nutrition Society of Malaysia, (Chong YH and Mohd Ismail N, ed.), 1 March 1986, Kuala Lumpur; Nutrition Society of Malaysia, Kuala Lumpur, 1986; pp. 25-30.

Modernization and advances in food science and technology have contributed significantly to the needs of consumers. New foods have been introduced and manufactured. Changes in food consumption and habits have occurred amongst adults and children in towns, rural areas as well as among 'Orang Asli'. Convenience foods, fast-foods and take-aways are slowly replacing conventional meals in big towns and cities. Infant feeding patterns have also changed with the ready availability of infant formulae and commercial infant foods. The nutritional implications of these foods are discussed.

5. AHMAD MUSTAFFA B

Kemajuan perusahaan susu ke arah memperbaiki kesihatan kanak-kanak sekolah (Dairy development towards improving health of school children)

Proceedings of the Seminar on Supplementary Feeding Programme in Malaysia, 16-17 January 1980, Kuala Lumpur; pp. 43-47.

Milk, whether of human or animal origin has been recognized as the most complete single food item available to man. It is the perfect food for supplementary feeding programmes especially in developing countries where protein calorie deficiency has been identified as a major nutritional problem. The paper discussed the long term development of dairy industry in Malaysia in order to make more milk available to school children through these feeding programmes. In 1978 only 5% or less of the national dairy requirement was produced locally. Plans of the Department of Veterinary Services (DVS) Dairy Development Programmes to increase milk production to meet 20% of the national demand by 1990 were discussed. Figures were presented to show the increasing contributions made by DVS in the supplementary feeding programmes of school children. It was emphasized that the DVS will attempt to play a greater role in these feeding programmes in the years to come.

6. AHMAD MUSTAFFA B

The role of the academia in food safety

Proceedings of the First Asian Conference on Food Safety, (Zahara M, Normah A, Yeoh QL, Moy GG, Noraini MO, Harrison Aziz S and Abd Rahim M, ed.), 2-7 September 1990, Kuala Lumpur; Malaysian Institute of Food Technology, Kuala Lumpur, 1991; pp. 196-199.

Academia has an important role to play in educating the masses on food safety. Publications by academia on food safety should not reflect just a fraction of the total picture of what constitutes safe or unsafe food or contaminants of food. Often academicians unintentionally through their publications or statements cause the wrong information to be transmitted to the lay public. The paper discussed the role of academia in consumer education and research.

7. ALINI M, FATIMAH A, TARIQ AR and KAMSIAH J

Influence of dietary fat on plasma lipid profiles of Malaysian adolescents

American Journal of Clinical Nutrition. 53:1010S-1014S, 1991

The effects of saturated (palm olein) and polyunsaturated (soybean oil) cooking oils on the lipid profile of Malaysian male adolescents eating normal Malaysian diets for 5 weeks were studied. Diets cooked with palm olein did not significantly alter plasma total cholesterol, LDL cholesterol, and HDL cholesterol concentrations or the ratio of total cholesterol to HDL cholesterol compared with diets cooked with soybean oil. However, the diet cooked with palm olein significantly increased apolipoprotein A-I (11%) and apolipoprotein B (9%) concentrations. Unexpectedly, soybean-oil-cooked diets caused a significant increase (47%) in plasma triglycerides compared with palm-olein-cooked diets. It was concluded that palm olein, when used as cooking oil, has no detrimental effects on plasma lipid profiles in Malaysian adolescents.

8. AMINAH A, ABDUL SALAM B and ZAWIAH H

Food intake of the rural community

Paper presented at the International Seminar on Family in the Eighties, 20-23 February 1984, Universiti Pertanian Malaysia, Serdang; 16 p.

A total of 169 individuals from two villages in Selangor, namely Jendram Hulu (n=70) and Hulu Langat (n=99) were surveyed at random for their daily intakes of foods. The subjects were questioned on the food items consumed for all meals in a day, and the protein and calorie content of the foods calculated from food tables. Subjects were categorised into three age groups (adults, adolescent and children). Results obtained indicated that the mean protein and calorie intakes of the subjects of Hulu Langat were higher than that of Jendram Hulu. Protein intake for all age groups in both villages was found to be higher than the Recommended Daily Allowance of Malaysia, while the calorie intake was slightly lower than requirement. Dietary pattern of the subjects was also discussed.

9. AMINAH A and NORIMAH AK

Pengambilan makanan snek dan makanan di luar sekolah (Consumption of snack and other foods outside the school)

Proceedings of the Workshop on Food Habits of Primary School Children., (Zanariah J, Aminah A, Yunus J, Nawalyah AG and Sahari J, ed.), 23-24 August 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1988; pp. 120-141.

The consumption of processed snack foods by children has caused considerable concern among parents, teachers, nutritionists, medical officers, and consumer

associations. Results of studies carried out on school children in the districts of Baling/Sik and Kuala Lumpur showed that 67% of the children liked to eat snacks and the majority (60%) of the parents allowed their children to consume these foods. The percentage of children consuming snacks was highest among Indian children (79%), followed by Malay (67%) and Chinese children (51%). The average daily consumption of snacks was one packet and the main reason the children consumed these snacks was because of the taste. These children obtained information on the snacks through television advertisements. However, given the choice of consuming processed snacks or fruits, 90% of the children preferred the latter. More than 80% of the children had breakfast before going to school. The most common breakfast drink among Malay children was tea, while coffee was the most common among Indian children. Most of the Chinese children had malted milk drinks for breakfast. The most common food for breakfast was rice, followed by bread, local cakes and mee. Almost all (99%) the children had lunch and 97% took dinner. The carbohydrate food for these two meals was rice, and the protein source was fish. Only 80% of the children ate vegetables and 50% had fruits. On the whole, the Chinese children were found to have better food habits compared with Malay and Indian children.

10. AMINAH A, ROSELINA K and NORIMAH K

Intake of commercially extruded snack foods by rural primary school children

Proceedings of the 2nd Scientific Conference of the Nutrition Society of Malaysia, (Tee ES, Chong YH and Mohd Ismail N, ed.), 28 February 1987, Kuala Lumpur: Nutrition Society of Malaysia, Kuala Lumpur, pp. 69-73.

The intake of commercially extruded snack foods (CES) has been of great concern to most parents, nutritionists, consumer groups and even some politicians. One of the guidelines for school canteen operators is to encourage the sale of nutritious foods. In order to find out the popularity of CES among primary school children, a survey was conducted in July 1986. Results of the survey indicated that 58% Chinese, 67% Malays and 77% Indian primary school children consumed CES, with an average daily intake of one packet. This paper attempted to identify the popularity of extruded snack foods and factors associated with consumption of these foods. The nutrient content of some selected snack foods was highlighted.

11. AMINAH A and SAUYAH A

Effect of three different cooking methods on fat level and cholesterol contents of chicken meat

Proceedings of the Nutrition Society of Malaysia, 5:42-46, 1990

This study was carried out to determine the effect of three different cooking methods namely boiling, steaming and frying on fat level and cholesterol content of four different parts (skin, breast, drumstick and thigh) of chicken. The result indicated that fat and cholesterol contents were highest in the skin (36.7% and 141.5 mg/100g respectively), followed by thigh, drumstick and breast. Frying seemed to retain the most cholesterol (58-92%) compared to either boiling or steaming (52-89% for all parts of chicken studied).

12. ARMSTRONG RW, ARMSTRONG MJ, YU MC and HENDERSON BE

Salted fish and inhalants as risk factors for nasopharyngeal carcinoma in Malaysian Chinese

Cancer Research, 43:2967-2970, 1983

A case-control study of nasopharyngeal carcinoma (NPC) among Malaysian Chinese to test inhalants, salted fish consumption, and use of tobacco, alcohol, and nasal ointments as risk factors for the disease was conducted. Interviews with 100 cases and 100 controls indicated that salted fish consumption during childhood was a significant risk factor; childhood daily consumption of this food item compared to nonconsumption carried a relative risk of 17.4. Occupational exposure to smokes and to dusts was also significantly associated with NPC. The two risk factors (consumption of salted fish and exposure to smoke and/or dust) were independent of each other. There was no association between NPC and tobacco, alcohol, or nasal ointments.

13. ARMSTRONG RW and CHAN ASE

Salted fish and nasopharyngeal carcinoma in Malaysia

Social Science and Medicine, 17(20):1559-1567, 1983

The evidence for a hypothesis that eating salted fish is associated with nasopharyngeal carcinoma (NPC) was reviewed. The hypothesis was tested among Malaysian Chinese using a matched case-control design. The kinds of salted fish and patterns of use were also investigated in a control group comprising 100 Chinese, 50 Malay and 50 Indian households. During 1980, in Selangor, interviews with 100 Chinese cases of NPC and 100 non-disease controls indicated that salted fish consumption during childhood was a significant risk, with an elevated risk for daily as opposed to less frequent consumption. Salted fish consumption during adolescence was a less significant risk, and current consumption not at all. There were 19 kinds of fishes reported as being eaten as salted fish by the 200 control households. There were marked differences between ethnic groups in preference for different kinds. Salted fish was hardly ever eaten daily by any household; weekly was a moderate frequency in all ethnic groups; less than weekly most common. There were no statistically significant differences between Chinese NPC case and non-disease control participants in kind of salted fish eaten. Results were the same when the data were analysed by sex, subethnic group and income.

14. AROKIASAMY JT

Preventing cancers

The Medical Journal of Malaysia, 38(4):261-265, 1983

As a result of considerable work in cancer epidemiology, the aetiological and risk factors of many cancers are being recognized, which if removed or modified may prevent cancers. The paper discussed some of these factors. The relationship between aflatoxins and the occurrence of hepatocellular carcinoma was reviewed. Studies have also indicated a consistent and specific causal association between hepatitis B virus and hepatocellular carcinoma. Other viruses known to have oncogenic potential are Epstein-Barr virus and Herpes simplex virus-2 and their association with nasopharyngeal and cervical carcinoma respectively. The role of chemical carcinogens in

nasopharyngeal carcinoma has also been suggested, e.g. exposure to nitrosamines through consumption of salted fish at an early age. Of increasing interest is the relationship between smoking and cervical cancer. The type of diet we consume are also known to either predispose us to cancer or protect us from it. The involvement of alcohol consumption in the aetiology of cancer of various sites in the human body, particularly the mouth, pharynx and oesophagus was briefly reviewed.

15. BAUTISTA OK, KOSIYACHINDA S, ABD SHUKOR AR and SOENOEADJI

Traditional vegetables of ASEAN

ASEAN Food Journal, 4(2):47-58, 1991

The objective of the paper is to give an overview of the traditional vegetables of ASEAN, in the hope that interest in their usage and in their nutritional values will be stimulated in places where they are available but underutilised. Some 40 of these vegetables were discussed, including their dietary use as well as nutrient content.

16. CAVALLI-SFORZA LT

Breastfeeding in urban China and urban Malaysia: similarities and differences in two transition societies with different socio-economic structures

Proceedings of the Nutrition Society of Malaysia, 8:127-145, 1993

Changes in infant feeding practices and causes for these changes were analysed for two countries, the People's Republic of China and Malaysia: in the former, mainly through findings of a study conducted in Chengdu, the capital of Szechuan, in 1989; in the latter, through a review of studies conducted in Peninsular Malaysia in the 1980's, including an analysis of trends over a twenty years period. A comparison of the two societies with different socio-economic structures finds similarities in the greater prevalence and duration of breastfeeding (BF) in rural than urban areas and in less educated versus more educated mothers. Similar negative influences on BF practices in maternity hospitals were found in both countries, including late initiation of BF, bottle feeding with glucose water, infant formula or cow's milk, inadequate support/encouragement to breastfeed and to breastfeed on demand. Family income did not affect BF in urban China, where there was much greater uniformity of economic conditions, while higher income in Malaysia was associated with lower rates of BF. No effect of parity could be detected in Chengdu, where only 2% of mothers had more than one child, while in Malaysia pluriparous mothers tended to breastfeed more and for longer periods. Maternity leave also had different effects on BF duration in the two countries, being about twice as long in Szechuan than in Malaysia. However, while 95% of mothers worked outside the home in the Chinese study, only about 1/3 did so in Malaysia. Wide interethnic variations in the frequency and duration of BF, attributable to cultural and socio-economic differences, were found in Malaysia but not in urban Szechuan, where one ethnic group prevailed, the Han.

17. CHANDRASEKHARAN N and MARIMUTHU T

An inquiry into the state of food, nutrition and health in plantations

The Medical Journal of Malaysia, 34(3):226-229, 1980

The study aimed to assess the food and dietary habits of workers and their families in two plantations in Selangor. Selected households in these plantations, one a rubber plantation and the other having both rubber and oil palm, were visited regularly and information gathered by personal interviews and observations. Various socio-economic data were also collected. Results presented included average family size, household income, expenditure on various food items, habit of drinking of alcoholic beverages, and farming and gardening activities. Comparing the nutrient intake of these households with the recommended national allowances, it was found that their diets (especially those in plantation I) were inadequate in calories, protein, calcium, iron and riboflavin. Measures recommended to improve the nutrition, health and productivity of these workers and their families included improvement in the socio-economic status, health and nutrition education, improvement of environmental sanitation, agriculture extension services, and food subsidies for infants and vulnerable groups.

18. CHEE HL

Health status and the development of health services in a colonial state: the case of British Malaya

International Journal of Health Services, 12(3):397-417, 1982

The health of a population and the development of health services in a country at a particular time in history are directly linked to the socioeconomic system. This paper discussed health and health services in the Malay Peninsula during the time that it was a British colony. Economic production under British colonialism, which was basically a capitalist system, was organized primarily for the purpose of realizing profits. The health of the population was in direct conflict with and generally subordinated to this main objective. The pattern of health that emerged reflected this general framework. Various infectious diseases of the gastrointestinal tract were rampant. Nutritional deficiency and respiratory diseases, diseases related to bad living conditions and poverty were equally widespread. These include beri-beri, protein-calorie malnutrition, anaemia, vitamin A deficiency, diarrhoea and enteritis, tuberculosis, diphthria, and pneumonia. Health services were developed under the colonialist system, but they were developed primarily to serve the economic interests of the colonialists. Hence structure of health services was biased towards curative medicine and centered mainly in the urban areas.

19. CHEE HL

Nutrient intake levels in an urban squatter community

Proceedings of the Nutrition Society of Malaysia, 4:25-34, 1989

A dietary survey was conducted to assess the daily intake of major nutrients, and its association with some demographic and socio-economic factors, in the urban squatter community of Kampung Baiduri, Petaling Jaya. Residents 16 years old and above were stratified according to ethnicity and occupation, and the sample of 263 people selected were interviewed using a pre-coded questionnaire which contained a three-day 24-hour dietary recall. The mean daily per capita calorie intake was 1477 kcal, fat 34g, and protein 59g. However a wide variation was observed. The energy intake reported in this study was generally lower than the findings of several other local studies. It was found that calorie and protein intakes were lower in women than men, while in the respective ethnic and occupational groups, nutrient intake values were lowest amongst the Indians and the sales and service as well as production and general workers. It was also noted that protein and calorie intakes had a positive correlation

with individual as well as household income. The problems and short comings of the three-day dietary recall method was also pointed out.

20. CHEE HL

Health and health care in Malaysia: present needs and implications for the future

Institute for Advanced Studies, University of Malaya, Kuala Lumpur, 1990.

The first section of the monograph delineates the scope of discussion, outlines the sources and limitations of data. The second section is an evaluation of the current health status of Malaysians, the types of health problems that are prevalent and the population groups which are in particular need of health care. The development of the health care delivery system in the last thirty years (1957-1987) are described in the third section, outlining the achievements and shortfalls of the system. In the final section, the implications of the various policy options are discussed.

21. CHELLADURAI J and CHELLADURAI N

Breastfeeding in child nutrition: a period of preparation for school learning

Proceedings of the Nutrition Society of Malaysia, 3:16-23, 1988

The nutrition of the infant with its related effects on the learning abilities at school has assumed a new significance with the realization that the feeding of this age group may have a marked influence on its health and productivity as adults. This paper reviewed nutrient needs of infants, in the context of protein-energy malnutrition stressing the implied need for mothers to breastfeed their infants. The discussion was based on reviews and surveys on infant feeding practices in Malaysia, citing relevant studies in the South-East Asian region as well. In particular, the paper emphasized the value of breastfeeding and the role played by it in promoting good child nutrition. In addition, some socio-cultural influences on infant feeding practices were reviewed together with the need to help mothers cope with social changes in the community, with a view to enhance efforts to prevent the decline in breastfeeding. It is hoped that the review would throw light on the important role played by breastfeeding in child nutrition and how it can enhance the child's ability to benefit from instructions at school.

22. CHEN PCY

Endemic goitre: a preventable and yet highly prevalent disease in Sarawak

The Medical Journal of Malaysia, 36(2):67-69, 1981

In this Editorial, a brief review of the goitre problem in Sarawak is given. The prevalence of goitres among women 15 years and above, in most parts of this eastern state of Malaysia, varies from 40 to 50 percent. Iodine deficiency is said to be the main cause of this endemic goitre, and in most parts of Sarawak goitrogens only play a small and unimportant role. Although a voluntary salt iodization programme has been in existence in the state since 1957, it is said to be less than successful. It was suggested that the most effective single measure would be to legislate that all types of salts imported into Sarawak must be iodized. Bearing in mind the need to protect the 35,000 newborns added to the Sarawak population each year, urgent and adequate actions need to be taken.

23. CHEN PCY

Ecological basis of malnutrition among the Muruts of Sabah

The Medical Journal of Malaysia, 38(1):9-14, 1983

In an earlier anthropometric study by Chen et al. (1981) in Sabah, it was found that 37.1% of the children examined were nutritional dwarfs, 12.5% were acutely malnourished, and 9.4% were stunted and wasted. It was also noted that Muruts were among the top five most malnourished ethnic groups in the State. The present study examined the ecology of a resettled Murut community of 89 households in the Keningau District to determine the interplay of various factors in the causation of malnutrition amongst this community. It was concluded that a variety of interrelated factors, including the lack of education, climatic and soil conditions, poverty, food habits and taboos, as well as diseases from poor sanitation and malaria contributed to the presence of malnutrition among rural Muruts. It was recommended that a multidisciplinary approach be taken to control the prevalent malnutrition and that the single most important measure aside from malaria control is education of the people and the development of marketable skills.

24. CHEN PCY, CHAN MKC, TEOH ST, BENT B, YAP SB, FONG T, ONG FPT and LEE CC

A nutrition study of the Interior, West Coast and Kudat Divisions of Sabah

Department of Special and Preventive Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur and Office of the Director of Medical Services, Sabah, Kota Kinabalu, Malaysia, Kuala Lumpur, 1981.

This extensive survey was carried out between mid 1978 and continued until April 1980 in the Interior, West Coast and Kudat Divisions of Sabah. Approximately 49% of the people in the State live in these three Divisions. The predominant ethnic groups in the study areas were (in descending order) the Kadazans, Chinese, Bajaus, Malays and the Muruts; the report gave a brief description of each of these groups. A total of 3,672 children under 13 years were examined clinically and measurements of various anthropometric indicators taken. Blood and urine were also collected from the children for some biochemical examinations. An ecological assessment of five communities was also carried out. Data collected from visits to 106 households included household food consumption, food beliefs and practices, socio-economic status, food production, distribution and availability and the pattern of infection. Results of the survey showed that malnutrition was fairly extensive and an important problem in Sabah. Various recommendations were made, particularly those involving the health sector.

25. CHEN PCY, CHEN ST, HARDIN S, KIYU A and YAP SB

Primary Health Care Among the Orang Ulu of Sarawak, Malaysia

Faculty of Medicine, University of Malaya, Kuala Lumpur and Office of the Director of Medical Services, Kuching, Sarawak, Malaysia, Kuala Lumpur, 1989.

A rural health care system provides preventive and curative health services to a large proportion of the rural Malaysian population. However, in the sparsely populated state of Sarawak, up to 68% of the people remain underserved, one of the least served areas being the District of Baram. Among the several ethnic groups (the Orang Ulu) living in

Baram, the most disadvantaged were the Penans. In order to meet the health needs of the people, an action-research primary health care project was started in 1982 with full community participation and integration with the existing health care system. The health staff were also re-oriented to their new role to focus on health prevention and promotion rather than on curative care. The villagers were encouraged to form Village Development Committees to coordinate all developmental activities in their villages and Village Health Promoters were given intensive training. A comprehensive supervisory system was also developed and mechanisms for supervision established, to ensure quality and success. An impact evaluation carried out showed improvements in all participating communities. Village Development Committees set up in all the villages were supportive of the project. Immunisation coverage, environmental sanitation and safe deliveries improved, while stillbirth and infant mortality rates reduced significantly. The most prominent changes were found among the Penans where agricultural activities were slowly gaining favour alongside the more traditional hunting and gathering activities. The primary health care project served to bring essential health services to these disadvantaged people in the Baram and also helped develop an enduring sense of self-reliance. Although much was achieved, the authors emphasised that much remains to be accomplished.

26. CHEN PCY and LIM PPE

The prevalence of endemic goitre in the Tinjar area, Sarawak

The Medical Journal of Malaysia, 37(3):265-269, 1982

The prevalence of goitre was investigated in a sample from six longhouses and five primary schools located at varying degrees of remoteness along the Tinjar river, Sarawak. The main ethnic groups in the communities were the Kenyak/Koyan and the Iban. A total of 286 males and 269 females aged five to fourteen years and 202 females aged fifteen years and above were examined. The overall prevalence of palpable goitre detected from the age group 5-14 years were 71.7% and 77.0% for males and females respectively, and 77.7% for females aged 15 years and above. The prevalence for both Iban and Kenyah/Kayan of either sex and for all age groups varied from 63.4 to 80.4%. The prevalence at each location did not differ significantly. A study was also made on the type of salt used by the households. The fact that 58.7% of them used only uniodized coarse salt would imply that legislation on "table" salt iodization must be interpreted to mean not only the iodization of the fine table salt, but in the case of rural longhouse communities, the iodization of coarse salt as well.

27. CHEN PCY, WONG ML and ONG FPT

The prevalence of endemic goitre in the Keningau Division of Sabah

Asia Pacific Journal of Public Health, 3(1):78-81, 1989

Four areas of differing remoteness were studied to determine the prevalence of goitre in the Keningau Division of Sabah. These areas were Keningau town, the Biah Resettlement Scheme, the Dalit subdistrict and the Pagalungan subdistrict. The predominant ethnic group in these areas was the Murut. The overall endemicity of goitre for the study population was 76.5% for females aged 15 years and above. There was a significant correlation between the incidence of goitre and the remoteness of an area. The Dalit subdistrict had the highest incidence of goitre (82.6%) followed by the Pagalungan subdistrict (77.8%), the majority of these goitre cases being classified as grade 2 (visible goitres). These were the two most remote areas in the study. In contrast, Keningau

town, the least remote area had the lowest incidence of goitre (62.5%) with most of the goitres being relatively small. With regards to salt usage in the Dalit subdistrict, only 3.0% used iodised salt; 28.0% used fine salt; 3.6% used coarse salt and 65.5% used both fine and coarse salt. In the Pagalungan subdistrict, all females used uniodised salt with 17.6% using fine salt, 20% using coarse salt and the remainder using both fine and coarse salt. As yet, there is no legislation for the iodisation of salt in Sabah. It is clear that all types of salt need to be iodised and adequately distributed to deprived areas, particularly inland areas.

28. CHEN PCY and YAP SB

The prevalence of endemic goitre among penans of the baram

The Medical Journal of Malaysia, 43(2):159-161, 1988

A total of 253 Penan households from the Silat area, Ulu Baram and the Tutoh of the 4th Division, Sarawak were studied with regards to the prevalence of endemic goitre and the consumption of iodised salt. Of the 343 Penan women aged 15 years and above who were examined, 60.6% had goitres. The serious nature of this, in the case of the Penans, is indicated by the fact that 39.3% of adult men have goitres. For both sexes, the remote Silat Penans had the highest rate of goitre prevalence, followed by those from the less inaccessible Ulu Baram, while the more accessible Tutoh had the lowest rates. Only 10.7% of the Penan households interviewed consumed iodised salt, while the majority (73.0%) used rock salt. There is thus a need to revise legislation to require the iodization of all forms of salt including rock salt.

29. CHEN ST

Breastfeeding and hospital practices

The Medical Journal of Malaysia, 34(4):325-328, 1980

Human milk is best suited to the human infant and there is no substitute for it. Although some present day infant formulae attempt to overcome some of the nutritional difficulties associated with cow's milk feeding, the cost of such formulae is too high for the majority of people living in Malaysia. Besides, manipulation of infant formulae may lead to new problems. It is therefore essential that all newborn infants should be breast-fed as far as possible. A few concerted efforts have been carried out to reverse the observed decline in the incidence and duration of breastfeeding in the country. However there has been little change in most hospital practices to actively support breastfeeding although studies have shown that minor modifications in the function and regimen, of hospital requiring little or no additional expense, could result in an increase in the incidence and/or duration of breastfeeding. This paper suggests some such modifications to promote breastfeeding. The author urged that hospitals practices should plan their activities with breastfeeding in mind. All categories of staff should encourage, motivate and support mothers to breastfeed, such as during antenatal clinic sessions, in puerperal care, in postnatal wards, in children's hospitals, and the setting up of special care nurseries for sick or premature babies.

30. CHEN ST

Physical health problems and needs of the child

Journal of the Malaysian Society of Health. 1(1):7-11, 1980

The major health problems faced by children in developing countries are high mortality and morbidity. In 1975, the infant mortality rate in Malaysia was 30 which was twice as high as that of USA and the toddler mortality rate was 3 which was 4 times as high as that of USA. The paper discussed the major causes of death in children in these countries, namely diarrhoeal diseases, pneumonia and other infectious diseases. Malnutrition, though not listed as a leading cause of death, was also a major problem amongst these children. The author emphasized that major causes of mortality and morbidity were largely preventable. The leading causes of death during infancy were next discussed. The paper also touched on the problems faced by the handicapped children in the country.

31. CHEN ST

Breastfeeding versus bottle-feeding

Proceedings of Food Conference 1982, (Theng CY, Kwik WL and Fong CY, ed.), 16-20 May 1982, Singapore; Singapore Institute of Food Science & Technology, Singapore, 1982; pp. 264-266.

Breastfeeding and bottle-feeding were compared under two headings: comparison of the composition and bioavailability of breast and cow's milk; and effects of the two forms of feeding on growth, development, infections, allergy and child spacing. Human milk is best suited to the human infant and there is no substitute which is equal to it. Nutritionally it provides optimal nourishment including brain growth with minimal stress upon the immature systems of the young infant. Immunologically it protects the infant against infections and allergy during the period of physiologically transient immune deficiency state. Early, frequent and prolonged breastfeeding fosters maternal-infant bonding which is essential for the optimal development of the infant. The child spacing effect of breastfeeding is important in developing countries. Although some present day infant formulas overcome some of the nutritional difficulties associated with cow's milk feeding such as higher content of protein and phosphorus and lower content of lactose and polyunsaturated fatty acids, but the cost of such formulas is too high for the majority of people living in developing countries. Besides, manipulation of infant formulas may lead to new problems such as vitamin E deficiency anaemia in preterm infants fed on high polyunsaturated fatty acid infant formulas. Therefore it is essential that all newborn infants, as far as possible, should be breast fed.

32. CHEN ST

Infant and toddler feeding

The family Practitioner, 6(1):51-53, 1983

Food is required by the child for metabolism, growth and energy. The process of feeding has social and psychological implications as well. The paper described briefly the proper infant and toddler feeding practices. Breast milk is the best food for infants and there is no substitute which is equal to it. The composition of human milk is such that it provides optimal nourishment for growth, including brain growth, with minimal stress

upon the immature systems of the young infant. In contrast, serious nutritional consequences can result from bottle-feeding infants with inappropriately prepared feeds. After the age of 6 months, introduce some home-made weaning foods since breast milk alone will not provide sufficient calories for the growth of the infant. By one year of age, slowly introduce some family food and by 2 years of age, the child can share almost all family food.

33. CHEN ST

Status pemakanan dikalangan kanak-kanak Malaysia - aliran dan masalah (Nutritional status of children in Malaysia - trends and problems)

Proceedings of the Workshop for Users of Food Composition Data, (Khatijah I and Mohamad Nordin AK, ed.), 10-11 October 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1989; pp. 48-68.

The problem of undernutrition still exists among poor children although Malaysia has made rapid progress in socio-economy and human health. The major nutritional problems are retarded growth resulting from protein and energy malnutrition, anaemia due to iron deficiency and goitre among underserved children. On the other hand, obesity has become an increasing problem among urban children. Although children are now taller when compared with ten or twenty years ago, many children are not able to achieve their full growth potential. On the average, the elite Malaysian children are smaller and have less body fat when compared with European children. The Malaysian children, however, have longer head-hip ratios than children in Britain who possess longer leg measurements. The smaller size of Malaysian children, as other Asian children, could be due to genetic differences as well as environmental factors.

34. CHONG YH

Nutrition and related indicators in a rapidly developing economy: some pointers from Malaysia

Proceedings of the Third Asian Congress of Nutrition, (Didin S Sastrapradja, Soenartono Adisoemarto and Setijati Sastrapradja, ed.), 6-10 October 1980, Jakarta; pp. 547-560.

Various cross-sectional nutritional surveys conducted in the rural and urban areas of Peninsular Malaysia during the past decade indicate that the triad, viz., protein-calorie malnutrition (growth retardation), vitamin A deficiency and iron deficiency anaemia remain the major nutritional problems of the pre-school and primary school population. Evidences for the existence of malnutrition amongst pre-school children were presented in the paper in the form of several tables and figures. Indirect and direct indicators of change, as well as the findings of a ten-year-follow up study of McKay were next put forth to indicate an improving nutrition situation. Extrapolating from the prevalence data presented, the number of malnourished pre-school, primary school children, and pregnant and lactating women from the rural and disadvantaged urban sectors in Peninsular Malaysia has been quantitated. It was estimated that about 3/4 millions of these vulnerable groups may be in need of assistance for supplementary foods, and that \$25 million would be required annually for the purpose.

35. CHONG YH

Nutrition and athletic performance

Paper presented at the Seminar on Sports Medicine, November 1980, Kuala Lumpur; 9 p.

Aside from innate ability and training, athletic performance also depends on energy source for muscular contraction which is diet dependent and can be nutritionally conditioned. The paper outlined the chemistry of muscular contraction, and explained the importance of glycogen stores during high intensity exercise of long duration, especially at the end of the competition when an intensive spurt may be decisive for winning the race. In recent years, it has been found that muscle glycogen stores can be greatly increased when a high-carbohydrate diet is introduced during the week preceding competition. Increasing the muscle glycogen stores upgrades performance by increasing anaerobic energy production. A dietary regime to improve muscle glycogen store in endurance events was outlined. Some advice on meal times on the day of competition was given. Some common myths regarding diets and nutrition and athletic performance were also discussed.

36. CHONG YH

Malnutrition, food needs and prospects for supplies

Journal of the Malaysian Society of Health, 1(1):12-19, 1980

Nutritional well-being is dependent on the availability of food which in turn must depend on food production, the various factors that affect food production and its distribution. The paper focused attention on the need to consider agricultural productivity in relation to nutritional problems. The twin faces of malnutrition in the country were first discussed. Amongst the disadvantaged poor, be they in the rural inland areas or the cities, protein-energy malnutrition whether in its severe or moderate forms, was said to be still rampant. In marked contrast, obesity and hyperlipidemia are increasingly common amongst the more affluent city dwellers. The author next discussed current trends in population growth and food production, food availability and food demand. Reviewing the trends in food production and population growth in the country from 1960-1975, it was pointed out that the production of major food commodities seemed to have outstripped population growth estimated at 2.6% per annum for the corresponding period. Estimates of food availability in 1975 showed that food energy may be marginal in certain sectors. Protein availability however appeared to have exceeded requirements by a considerable percentage. The projected demand for the major food items in 1990 was tabulated. To meet this demand, various measures to increase food productivity and availability were suggested. The prospects for the required increase food production was examined. Considering all evidences presented, it was felt that the prospects for feeding Malaysia's growing population was bright.

37. CHONG YH

The prevalence of childhood malnutrition: its measurement, what it means and its uses

The Medical Journal of Malaysia, 34(4):329-335, 1980

The prevalence of childhood malnutrition in a population or community may be measured in terms of mortality and morbidity. Toddler mortality rate, for instance, is widely accepted as a rough indicator of malnutrition. Morbidity with reference to malnutrition is usually monitored by growth retardation. This is reflected either by a loss in weight or a slowing growth, i.e. height. The three widely used indicators of growth monitoring are: weight-for-age, weight-for-height and height-for-age. Based on these criteria, the prevalence of protein-energy malnutrition in several rural and urban areas of Peninsular Malaysia were briefly discussed. Evidences from such mortality and morbidity data were said to suggest an improvement in the nutritional situation in the rural areas. It was emphasized that nutritionists in Malaysia have a continued role to play in defining and drawing attention to the country's nutritional problems and in monitoring the trends of nutritional status in the wake of the country's rapidly changing economy and programmes for eradicating rural poverty.

38. CHONG YH

Population and social indicators of food and nutrition in Peninsular Malaysia

The Medical Journal of Malaysia, 37(2):134-140, 1982

The paper presented and discussed recent trends in population indicators that relate to food, nutrition and nutritionally-related health situation in Malaysia. Changes in toddler mortality rates from 1957-1978, incidence of low birthweight for 1978 and recent trends in food pattern and availability were presented. Results of some recent direct assessment of community nutritional status were next reviewed. While the indirect population indicators suggested an improving nutritional situation, methods of direct assessment had shown that chronic protein-energy malnutrition and anaemia were still common amongst pre-school children in both the rural and urban disadvantaged sectors. Moderate anaemia also affected a significant proportion of older children and women of child-bearing age. In striking contrast, evidences were presented to show that diseases associated with dietary excesses and increasing affluence had emerged as the major killers in the country. The author emphasized the need for continued efforts to improve the nutritional health of the rural and urban poverty communities as well as to stem the rising number of deaths associated with increasing affluence.

39. CHONG YH

Tropical diseases research in Sabah: nutrition (a report of 1981 baseline studies by the IMR/WHO/HSS collaborative programme for research and training in tropical diseases, Sabah)

In: Bulletin No. 20, Institute for Medical Research, Kuala Lumpur, 1983; pp. 77-89.

Nutritional studies were part of the Collaborative Programme of the Institute for Medical Research (IMR), the Health Services of Sabah (HSS) and the World Health Organization (WHO) initiated in 1980. Nutrition surveys were conducted on two occasions during 1981: the first on population of 6 villages in the Bengkoka Peninsula in April 1981, and the second, a follow-up study on the village of Pantai, in October 1981. In the first survey, 101 pre-school children were measured for their weight, height and mid-arm circumference, and 157 of them were bled for Hb determination. The study showed that there was a serious problem of chronic protein-energy malnutrition and anaemia in the villages studied. A follow-up and more detailed study was thus conducted in one of the villages, Kampong Pantai in October. A total of 48 children 0 to 6 years and

40 women of child-bearing age were investigated using a combination of clinical, anthropometric and biochemical studies. Twelve of the total of 44 households were also interviewed for their socio-economic status, food habits and food consumption pattern. Results of this second study were also presented in detail.

40. CHONG YH

Malnutrition in the rural kampungs and approaches for its reduction

Proceedings of the 4th Asian Congress of Nutrition, (Tanphaichitr V, Dahlan W, Suphakarn V and Valyasevi A. ed.), 1-4 November, 1983, Bangkok: Aksornsmait Press, Bangkok, 1984; pp. 535-542.

Recent studies indicate that chronic protein-energy malnutrition and iron deficiency anaemia are the major nutritional problems of present day disadvantaged kampungs in rural Peninsular Malaysia. These problems are found in association with a high incidence of poverty, lack of basic amenities like piped water, electricity and proper sanitation, leading to a high rate of intestinal parasitism. It must however be borne in mind that though malnutrition is often associated with poverty and a low level of socio-economic development, not all the poor need to suffer from protein-energy and other deficiencies. There is little doubt that in the long run, national economic growth, increased per capita income of the poor, access to primary health care and increased agricultural output will improve nutritional status. But during the interim period, much can be done to improve the nutritional situation and the quality of life of kampung folks. Such interim measures therefore call for the intensification of the following activities, such as nutrition education, food production on under-utilised land, promotion of income generating activities, control of infections and school health programmes.

41. CHONG YH

Nutritional considerations in palm oil breeding

In: *Oil Composition in Oil Palm* Report of PORIM Task Force, PORIM, Bangi, 1985; pp. 55-57.

Recommended specifications for the fatty acid composition of palm oil of new breeds were made taking into consideration the current state of knowledge on the dietary fat-coronary heart disease hypothesis. The fatty acid targets proposed for such new breeds are: 1. an increase of 18:1 oleic acid to the level found in olive oil; 2. decrease of 16:0 palmitic acid to a minimum and feasible level; 3. an increase of 18:2 linoleic acid to an optimum and feasible level. It was suggested that palm oil that takes on the above characteristics may possess several nutritionally desirable features in relation to the dietary fat-heart disease hypothesis, namely: an increase in 18:1 fatty acid that is neutral; an increase in 18:2 fatty acid and a reduction in 16:0 fatty acid that can lead to a hypolipidemic effect.

42. CHONG YH

Diet and coronary heart disease: current issues

Proceedings of the the First Scientific Conference of the Nutrition Society of Malaysia, (Chong YH and Mohd Ismail N. ed.), 1 March 1986, Kuala Lumpur: Nutrition Society of Malaysia, Kuala Lumpur, 1986; pp. 31-37.

Cardiovascular diseases are a leading cause of mortality and morbidity in industrialised countries and they are also emerging as a prominent public health problem in developing countries. In Malaysia, coronary heart disease (CHD) is now a major killer and there are already indications that the average levels of serum cholesterol of urban children and adults now approach the levels found in western societies where CHD rates are high.

43. CHONG YH

Editorial: Nutrition scene in Malaysia

The Medical Journal of Malaysia, 41(1):1-3, March 1986

Recent indicators and proxy indicators of nutrition for Malaysia such as toddler mortality, incidence of low birthweight, life expectancy at birth and food balance sheet statistics suggest a favourable and an improving nutrition situation at the macro level. However, nutritional studies conducted at the local level indicate that there are still a considerable amount of protein-energy malnutrition, iron deficiency anaemia and vitamin A deficiency. Endemic goitre can still be found in the interior of the Peninsula, Sarawak and Sabah. In striking contrast, chronic diseases associated with dietary excesses and the country's increasing affluence, such as coronary heart disease, hypertension and cancers have now emerged as the country's major killers to assume public health importance. The editorial highlights several nutrition-related issues in the country, including research, public health care, public awareness, and nutrition counselling and education. It was emphasized that medical doctors, nutrition scientists and public health professionals all have a role to play in educating the public for the prevention of malnutrition and the reduction of morbidity due to chronic illnesses.

44. CHONG YH and NG TKW

Effects of palm oil on cardiovascular risk

Medical Journal of Malaysia, 46(1):41-50, 1991

A major public health concern of affluent nations is the excessive consumption of dietary fats which are now closely linked to coronary heart disease. Against this scenario, the tropical oils and palm oil in particular, has been cast as major villains in the U.S.A., despite the fact that palm oil consumption there is negligible. The unsuspecting public may not realise that the call to avoid palm oil is nothing more than a trade ploy since in recent years palm oil has been very competitive and has gained a major share of the world's edible oils and fats market. The allegation that palm oil consumption leads to raised blood cholesterol levels and is therefore atherogenic is without scientific foundation. Examination of the chemical and fatty acid composition of palm oil or its liquid fraction should convince most nutritionists that the oil has little cholesterol-raising potential. Feeding experiments in various animal species and humans also do not support the allegation that palm oil is atherogenic. On the contrary, palm oil consumption reduces blood cholesterol in comparison with the traditional sources of saturated fats such as coconut oil, dairy and animal fats. In addition, palm oil consumption may raise HDL levels and reduce platelet aggregability. On the basis of palm oil's chemistry and the evidence for its favourable cholesterolemic effect, the incorporation of palm oil in the traditional Asian diet of cereals, legumes, vegetables and meat or fish is certainly nutritionally sound and possibly protective from the viewpoint of cardiovascular health.

45. CHONG YH and ROZIA HANIS H

Recent birthweight distribution and trends in Kuala Lumpur

The Medical Journal of Malaysia, 37(1):40-45, 1982

Birthweight in relation to the duration of gestation is regarded as an important index of fetal growth and development. It has also become an indirect indicator of the general health and level of socio-economic development of a country as well as reflection on the gap between the privileged and the less privileged in the same community. The study was undertaken to provide recent information on recent birthweight distribution, pattern, incidence of low birthweight and to examine birthweight in relation to the sex and length of infants, gestational age, gravida and maternal age. The birthweights of 13,614 singleton infants comprising 5,376 Malays, 5,352 Chinese and 2,886 Indians born at the Maternity Hospital, Kuala Lumpur, during 1973, 1975 and 1977 were extracted from the records and analysed. Mean birthweight of Chinese infants were significantly heavier than the Malay infants, who in turn were significantly heavier than the Indians. The Indians were also found to have the highest incidence of low birthweight. The mean gestational period and the proportion of full-term births were similar for all 3 races; maternal age at first birth was also closely similar. Significant correlations were found between birthweight and length of neonates, birthweight and gravida, birthweight and maternal age. Comparing the result obtained to those reported by Thomson (1962), it was found that present-day Malay and Indians full-term infants were significantly heavier than their counter-parts born at the same hospital two decades ago, but no difference in birthweight was observed for Chinese infants during this time interval. The gap between the incidence of low birthweight found in Malaysia and those in the developed countries was said to be narrowing and may be taken to reflect the overall effects of socio-economic development, including the greater availability of general health and antenatal care throughout the country since its Independence in 1957.

46. CHONG YH, TEE ES, NG TKW, KANDIAH M, ROZIA HANIS H, TEO PH and SITI MIZURA S

Status of community nutrition of poverty kampungs

Institute for Medical Research Bulletin No. 22, Kuala Lumpur, 1984.

This monograph presents the findings of four separate nutrition surveys conducted at approximately yearly intervals between September 1979 and September 1983. The impetus for these studies was said to have been provided initially by the nationwide survey on the incidence of poverty in rural disadvantaged kampungs conducted by the Prime Minister's Department during 1978. This highlighted the need to assess the status of nutrition of such communities of whom we have limited and inadequate knowledge. The series of studies mentioned were conceived and planned during early 1979 as part of the Division's overall research strategy for the Fourth Malaysia Plan. They involved the examination of about 3600 persons drawn from 14 kampungs in the states of Kelantan, Johore, Kedah and Perak. Blood specimens were obtained from about 3000 individuals, while 1,500 persons provided stool and urine samples. Visits were made to 548 houses for collection of data on socio-economic characteristics, food consumption and pattern, food beliefs and practices. Findings from each of the 4 areas were separately presented as well as combined. Wherever approximate, findings of the different areas were compared. Correlative studies were also carried out for some of the parameters measured. It was found that the incidence of poverty was high; 78% were found living below the poverty line. There was a lack of proper sanitation and clean water in the majority of households contributing towards

a contaminated environment that gave rise to a high incidence of intestinal parasitism, skin infections and head lice. Chronic undernutrition, i.e. "stunting" was found in major proportions of pre-school children (43%) and primary children (49% for boys and 25% for girl). There was a preponderance of underweight people compared to overweight persons amongst the adult population. Anaemia, large due to nutritional iron deficiency, was found in practically all sections of the community with moderately high prevalence rates in pre-school and primary school children, adolescent boys and girls, women of child-bearing age, senior male and female adults over 46 years old. Household food consumption and distribution studies revealed a shortfall of calorie consumption of 66% of households and a deficit of dietary protein in 34% households. Various measures were recommended for the improvement of family nutrition in the communities studied.

47. COTTRELL RC

Nutritional aspects of palm oil

American Journal of Clinical Nutrition, 53:989S-1009S, 1991

The production, composition, and food uses of palm olein are outlined in this introduction to a detailed appraisal of the nutritional and health implications of the use of palm oil in the food supply. The putative role of dietary fats and oils in general, and of palm oil in particular, in the etiology of coronary heart disease and cancer is critically assessed. It is concluded that the evidence available is difficult to interpret unambiguously. Some evidence to suggest that the minor components of palm oil might have useful biological effects is also discussed.

48. DAVANZO J and HABICHT JP

Infant mortality decline in Malaysia, 1946-1975: The roles of changes in variables and changes in the structure of relationships

Demography, 23(2):143-160, May 1986

Individual-level retrospective data from the Malaysia Family Life Survey are used to examine why the infant mortality rate (IMR) has declined rapidly in Malaysia since World War II. Substantial increases in mothers' education and improvements in water and sanitation have contributed. However, breastfeeding reductions have kept the IMR from declining as rapidly as it would have otherwise. The detrimental effects of reduced breastfeeding more than offset the beneficial effects of water and sanitation improvements. The majority of the IMR decline, however, is not explained by changes in the variables considered here, or in their relationships with infant mortality.

49. DAVANZO J, HABICHT JP and BUTZ WP

Assessing socioeconomic correlates of birthweight in Peninsular Malaysia: ethnic differences and changes over time

Rand Corporation Publications N-1637-AID, Santa Monica, 1983.

This paper presented evidence from the Malaysian Family Life Survey (MFLS) that mothers' reports of their babies' birth weights, including reports of unweighed babies' approximate size at birth, can be used to examine many biological and socioeconomic correlates of

birthweight. The study used a sample 5,583 singleton births that occurred between 1945 and 1976. In these data, the frequency distribution of birthweights and their bivariate and multivariate relationships with the biological correlates of mother's age, baby's sex, first parity, and infant mortality were found to be consistent with those found in prospective studies. A new biological correlate, mother's age at menarche, was introduced as a proxy for the mother's nutrition during childhood. Late age at menarche was found to be associated with low birthweight. Other results showed that mothers younger than 20 years and older than 35 appeared to be at greater risk of bearing small babies, but the former effect was no longer important when parity was controlled. Short birth intervals were associated with small babies, due to the combined effect of prematurity and maternal nutritional depletion; higher income appeared to lessen the deleterious effect of short intervals. Indian babies weighed significantly less than those of other ethnic groups. Furthermore, birthweights were found to have increased since the 1950s for Malays and Chinese, but not for Indians. This lower birthweights and lack of improvement over time for Indians appeared to be due to close birthspacing, lack of access to medical care, and falling incomes.

50. EDMUND G

Role of government agencies and food industries in the development of food technology - a consumer's view

Proceedings of the International Symposium on Food Technology in Developing Countries, (Berry SK, Mohd Ismail AK and Asiah MZ, ed.), 3-5 September 1980. Kuala Lumpur: Universiti Pertanian Malaysia, Serdang, 1982; pp. 402-412.

The type of food which people consume is a major determinant of the state of their health. While wholesome natural foods can boost an individual's vitality and health, many products of modern food technology have negative effects on consumers' safety and health. It is now well known that many modern processed foods contain undesirable additives and chemicals, while many fast foods have low nutritional value. In developing countries, the potential dangers of modern food products are even greater. In general, regulations governing food safety are few and weakly enforced. At the same time, foods of low nutritional value are now flooding the markets of these poor countries, diverting people with already little resources away from consuming foods higher nutritional value. As a result, many health problems such as cancer, high blood pressure and food poisoning have increased, while economically much money has been wrongly channelled into poor nutrition choices. Looking at this situation, government agencies in developing countries should play a strong role in curbing the use of undesirable chemicals in foods, discourage the consumption of nutritionally poor foods and encourage the consumption of good, wholesome, natural foods. The food technologists also have a role to play in pledging themselves to producing only foods which will result in better nutrition and health of the consumers.

51. FATIMAH A

The etiology of iron deficiency anaemia during pregnancy among rural women in Malaysia

Proceedings of the Nutrition Society of Malaysia, 3:7-15, 1988

A total of 378 women attending various health centres in the district of Kuala Selangor were chosen for the study. Haematological indices such as haemoglobin (Hb), packed cell volume (PCV), mean cell haemoglobin (MCH), total red blood cells (TRBC), serum

ferritin and serum folate were determined. Thick blood smears were done to detect malarial parasites and stool samples were examined for ova and cysts. The women were also interviewed to evaluate their socio-economic status, compliance in the intake of iron supplements, parity, nutritional intake, sanitation facilities and other health-related factors. The haematological and biochemical findings indicated that based on levels of Hb < 11.0 g/dl and serum ferritin < 15 ng/ml, 55.1% and 65.0% of the women were iron deficient respectively. Among the iron-deficient mothers, 38% were also folate deficient. A hierarchy of causal factors was ranked by logistic regression analysis which detected two significant variables. In order of magnitude, these are the average duration between pregnancies and dietary protein intake. The findings of this study have significant practical implications especially in the district's existing nutritional and family planning programme.

52. FATIMAH A

Nutrient needs and supplement

Proceedings of the Nutrition Society of Malaysia. 3:42-48, 1988

It would be paradoxical if in Malaysia, where nutritious food supply is abundant, a large proportion of its population use vitamin and other nutrient supplements. It is estimated that one out of six adult Canadians, Australians and Americans regularly use some form of nutrient supplement. These people believe that their practice conform with sound medical opinion or advice. This implies that physicians are influential in changing nutritional practices. They are responsible for promoting good health in their patients by assessing dietary practices and providing support for eating a balanced diet. A physician's education on the use of vitamin or mineral supplements should include vitamin and mineral supplementation history, prevalence and patterns of supplement use, symptoms of vitamin and mineral deficiencies or toxicity, population in need of supplementation, population at risk to excessive supplement use, dosages of supplements for specific conditions and interactions of vitamins, minerals and medications.

53. FATIMAH A, ASIS RA, BHUYAN AH, KOWSUWAN T, TEOKUL W and POJAMARN T

Factors affecting the nutritional status of Indian preschool children in Malaysia

Proceedings of SEAMEO-TROPMED 2nd Seminar on Nutrition, (Pongpaew P, Sastroamidjojo S, Prayurahong B, Migasena P and Rasad A, ed.), 20-21 March, 1989, Jakarta, Indonesia; Mahidol University, Bangkok, 1990; pp. 324-336.

A community diagnosis was conducted in an Indian paddy growing community of Kampung Parit Empat, Tanjung Karang, Kuala Selangor. A combination of anthropometric, biochemical, clinical and dietary assessment was used to determine the nutritional status of 83 preschool children (0-72 months). Stool examination for worm infestation was also carried out. Other related factors contributing to nutritional status such as socio-economic, dietary practices, health and environmental conditions as well as food production and availability were studied. The results of anthropometric measurements for preschool children revealed that 3.8% suffered from severe protein energy malnutrition (stunted and wasted) whereas 32.9% was underweight, 8.9% stunted and 17.7% wasted cases. The clinical and biochemical examination of the preschool children showed high prevalence of anaemia (70.8%), upper respiratory tract infection (20.2%), dental carries (19%) and skin diseases (11.4%). They also had worm

infestation (51.3%) either of *Ascaris*, *Trichuris* or both types. The results of household food consumption showed inadequacy in calorie (44%), protein (12%), iron (69%), vitamin A (46%) and vitamin B (66%) among households respectively. Rice and wheat flour were the main sources of energy and protein.

54. FOO YM and LIM KE

***Penggunaan data komposisi makanan dalam rundingcara dan penilaian diet*
(The use of food composition data in the counselling and evaluation of diet)**

Proceedings of the Workshop for Users of Food Composition Data, (Khatijah I and Mohamad Nordin AK, ed.), 10-11 October 1988. Kuala Lumpur; ASEAN Sub-Committee on Protein. Kuala Lumpur, 1989; pp. 26-32.

Diet counselling plays an important role in the treatment of patients. The nutritional status of patients can be improved through diet counselling. For this purpose, food composition tables are often used. Food tables are used to identify portions of various foods which contain the same amount of nutrients. The food portions are then converted to household measures which are easily understood by the patients. This paper explains the use of food composition data in diet counselling, as well as the problems encountered in the use of these data. It has been found necessary to refer to other tables as data contained in local tables are incomplete.

55. GEORGE J

Towards more organised street vending in Kuala Lumpur

Proceedings of the First Asian Conference on Food Safety, (Zahara M, Normah A, Yeoh QL, Moy GG, Noraini MO, Harrison Aziz S and Abd Rahim M, ed.), 2-7 September 1990, Kuala Lumpur; Malaysian Institute of Food Technology. Kuala Lumpur, 1991; pp. 139-142.

City Hall, a local authority, is in charge of street vending in Kuala Lumpur. One of the main aspects given serious consideration in the control of the hawkers is food safety. With an increase in the number of licensed hawkers in Kuala Lumpur from 5,415 to 28,478 over the last 10 years, several problems have emerged. Among these are the overcrowding of streets, shortages of basic amenities, and a failure by hawkers to practice food hygiene and maintain sanitation. To add to these problems, there is a large number of unlicensed hawkers whose activities are difficult to monitor. The problems have been identified, and various measures are being taken to improve the management of hawkers, to provide basic amenities and facilities, to provide health education, and to enforce relevant laws. This paper gave an overview of the hawker situation in Kuala Lumpur and described the various steps being taken by City Hall to organise the hawker population into a viable and disciplined part of the society, providing clean, reasonably priced, and safe food for the public.

56. GEORGE R, FOO LC, CHONG YH and ABRAHAM SCE

Severe protein-energy malnutrition in Kuala Lumpur

Journal of Tropical Pediatrics, 27:259-262, 1981

Despite the rapid pace of development occurring around the urban city of Kuala Lumpur, protein energy malnutrition (PEM) can still be found in its midst. The present report describes the clinical features, anthropometry, nutritional biochemistry, associated infection and illnesses, and socio-economic background of 25 severe PEM cases (13 of marasmus, 7 of marasmic kwashiorkor and 5 of kwashiorkor) admitted to the Paediatric Unit of the General Hospital during 1975. Some notes on their management were also given. The size of the disadvantaged group of urban dwellers around the city suggests that there would be many other urban children who are potentially vulnerable to the development of PEM.

57. GOBIR S, RAMOSO TL and TAOPRASERT Y

A community diagnosis: the nutritional status of the preschool children in a Chinese fishing community, Bagan Pasir Penambang, Kuala Selangor, Malaysia

Dissertation submitted to the University of Queensland and Universiti Kebangsaan Malaysia in partial fulfillment for the requirements for the Degree of Master of Community Nutrition, 1984

The study was conducted in the Malaysian Chinese fishing village of Bagan Pasir Penambang, Kuala Selangor to determine the nutrition status of 105 preschool children from 51 sample households. A combination of anthropometric, biochemical, clinical and dietary assessments were used. Stool examination for parasite infestations was also carried out. Other related factors contributing to nutritional status like socio-economic, dietary practices, health conditions and food availability were studied. Correlation between the variables measured was also examined. A short and long term planning for the community were formulated on the basis of the analytical interpretations of the collected data.

58. HAAGA J

A framework for analyzing infant nutrition policy in Malaysia

Prepared for The U.S. Agency for International Development, February 1985

Infant feeding practices have changed a great deal in Malaysia in recent decades. The policies considered here include not only the protection and promotion of breastfeeding but efforts to encourage sound supplementary feeding of breastfed infants. Infant nutrition policy is necessarily indirect, attempting to influence a very private and complex area of behavior. The potential for irrelevance and wasted effort is high. Nonetheless, it is an important concern of public policy, as is shown with arguments based both on pragmatic grounds and traditional economic theories of regulation. The programs and policy changes that are assessed include the Breastfeeding Campaign in Malaysia, various regulations and benefits for working mothers, proposed changes in the practices of health care institutions, regulation of breast milk substitutes, nutritional surveillance, and price policies. Programs vary widely in costs, potential benefits, and feasibility. Because of the diversity of feeding patterns among Malaysia's population, no single program is likely to make sense for the whole country. The most promising approaches are through the health care and family planning system, which in Malaysia reach an unusually high percentage of families. These efforts should not concentrate solely on the initial choice of breastfeeding rather than bottle-feeding, because the vast majority of those at greatest risk of child malnutrition and infection, notably rural Malays, still practice breastfeeding. Safer supplementary feeding needs to be encouraged as the primary task of infant nutrition policy. Breastfeeding

is an important determinant of infant and maternal health in Malaysia, especially for such portions of the population as children in areas with poor water quality and quantity and children born to young Indian mothers. Although nationwide programs of health and nutrition education are needed, these vulnerable groups should receive particular attention, if infant nutrition policy is to contribute to child survival.

59. HAAGA J

Evidence of a reversal of the breastfeeding decline in Peninsular Malaysia

American Journal of Public Health. 76(3):245-251, 1986

Data from the Malaysia Family Life Survey show an increase in the percentage of infants breastfed, at least initially, from 75 percent in 1970-74 to 79 percent in 1975-77. Contrary to what would be expected if Malaysia were following the trends observed in the United States and Western Europe, the increase has occurred among poor and uneducated women as well as among the more fortunate. The increase was especially marked for infants born in hospitals and private clinics, which had very low rates of breastfeeding in the early 1970s. The changes may be due partly to a shift in the practices and recommendations of health professionals. Trends in infant feeding practices in Malaysia during the whole period 1950-77 are reviewed. Reasons for thinking the increase in the mid-1970s an artifact of the survey are presented and provisionally rejected. The implications of these findings for child health policy in Malaysia and for theories of infant feeding trends in developing countries are discussed.

60. HAAGA J

Health consequences of infant feeding in Malaysia: A review

Malaysian Journal of Reproductive Health, 3(2):85-104, 1985

Infant feeding patterns affect the health and survival prospects of the child in many ways. This paper reviewed studies of both Malaysian and other populations on this subject, and discussed their implications for public health policy. Studies on infant feeding patterns in Malaysia in recent decades have shown that the percentage of infants breastfed and, for some ethnic groups, typical durations of breastfeeding, had fallen considerably. For those infants who were breastfed, regular supplementary feeding beginning in the first weeks of life became the rule. These trends would be expected to have a negative impact on the health of infants. On the other hand, infant and child mortality rates have also fallen rapidly in Peninsular Malaysia during the same decades, presumably due to improved standards of living, hygiene, and medical care. Nonetheless, understanding the causes and consequences of infant feeding choices, particularly among Malaysia's poor, may help health policy makers promote continued improvements.

61. HABICHT JP, DAVANZO J and BUTZ WP

Does breastfeeding really save lives, or are apparent benefits due to biases?

American Journal of Epidemiology. 123(2):279-290, 1986

Analysis of mothers' recall data collected in 1976-1977 by a probability survey in Peninsular Malaysia showed an association between breastfeeding up to 6 months of

age and improved survival of infants throughout the first year of life. Inappropriate sample selection and inadequate control of confounding can introduce large biases in these analyses. The magnitude and direction of these biases were discussed. Even when these biases were dealt with, unsupplemented breastfeeding appeared more beneficial than supplemented breastfeeding. The younger the infant and the longer the breastfeeding, the greater the estimated benefits in terms of deaths averted. The use of powdered infant formula did not appear to offset the detrimental effects of early weaning and supplementation. The positive relationships found in these analyses between breastfeeding and survival were not due to death precluding or terminating breastfeeding. Nor were they likely to be due to a shift away from breastfeeding because of recent illness, which was also controlled in the analyses. Nor were they likely to be due to other factors that both increase mortality risk and shorten breastfeeding; when such factors were taken into account, the beneficial effects of breastfeeding became stronger and imply that, if there had been no breastfeeding in this sample, twice as many babies would have died after the first week of life.

62. HAMIDAH A, DELFINA MT, KAMARIAH ELLI AY, AZIAH H and MAIMAH S

Anthropometric study in Peninsular Malaysia

Presented at the Seminar: "Towards the Improvement of Quality of Life", Department of Human Development Studies, Universiti Pertanian Malaysia, Serdang, December 1989

Sixty one body dimensions were measured from a total of 6,919 male and female respondents ranging from 3 to 54 years. Data collection was mainly conducted in schools, colleges and universities. The sample distribution according to age, sex, ethnic origin and location by a proportionate sampling of approximately 0.1% of the total population distribution in Peninsular Malaysia (1980 Census) was followed. This study was aimed at obtaining a comprehensive set of anthropometric data according to age, sex and ethnicity. Results showed significant differences due to age for all body dimensions. Body dimensions as a function of sex is significant for 54 measurements including height, weight and shoulder width, but not for height of head, shoulder blade, chest circumference, bust tip distance, leg length or waist height and armseye; Likewise, ethnic origin showed significant effect on all body dimensions except for bust tip distance and elbow circumference. It was found that there were significant differences in height between the sexes at 12 years of age from 14 to 54 years old. The trend also suggests that height increase in both male and female is steady up to 19 years of age. Significant differences in weight between the male and female were found at 12 years old and from 15 to 44 years. The results also showed that there were significant differences in mean weight due to sex and ethnic origin with age variable under control. The average height of male was generally greater than that of the female except at ages 10-13. At this period, girls tend to be taller or heavier than boys. The result further suggest that adolescent growth of Malaysian females begins earlier than the male counterpart.

63. HO CC

Overview of mycotoxins in the Asian Region

Proceedings of the First Asian Conference on Food Safety, (Zahara M, Normah A, Yeoh QL, Moy GG, Noraini MO, Harrison Aziz S and Abd Rahim M. ed.), 2-7 September 1990, Kuala Lumpur; Malaysian Institute of Food Technology, Kuala Lumpur, 1991; pp. 36-45.

This overview of mycotoxins in the Asian region covered contamination of foods by mycotoxins, particularly aflatoxins, sterigmatocystin, cyclopiazonic acid, cytochalasins, ochratoxins, yellow rice toxins (luteoskyrin, erythroskyrin, cyclochloroline), citreoviridin, toxic lactones (patulin, penicillic acid, rubratoxin), trichothecenes, and zearalenone produced by various species of *Aspergillus*, *Penicillium* and *Fusarium*. These are of importance to foods and animal feeds in terms of safety, production, storage, and international trade. Contamination of foods and feeds by toxic fungi and their mycotoxins will be discussed using data from surveys carried out in four geographical regions of Asia: tropical ASEAN countries, subtropical India, temperate China and Japan, and arctic Siberia. The discussion emphasised the impact of climatic variation, especially temperature and rainfall, on the differing severity of mycotoxin contamination in the four regions. Information on the contamination of foods and animal feeds by various toxic fungi, the levels of different mycotoxins present, and recorded episodes of chronic and acute toxicities in animals and human were presented. The special problem of mycotoxin contamination of Asian fungal-based fermented foods was also discussed. The paper emphasised the need for constant surveillance and control of mycotoxin contamination of foods and feeds in the Asian region, to protect human and animal health.

64. ISMAIL MN

Nutrition and sports

Paper presented at the Seminar "Sukan Malaysia IV". 30 June-3 July 1992, Johor Bahru

It is now recognised that diet significantly influences athletic performance and an adequate diet, in terms of quality and quantity, before, during and after training and competition is a vital component besides proper training and coaching. Diet has an impact on an athlete in many ways. Good nutrition plays an important role in the maintenance of health, thus allowing athletes to train and compete to one's full potential. However, it must be recognised that their "needs" vary with age, sex, nutritional status and types of sporting activities. This paper will attempt to highlight in general, some nutritional considerations and to present results of nutritional studies of national sportmen and sportswomen conducted recently.

65. ISMAIL MN

Survey of nutritional status and dietary lifestyle in Malaysia

Proceedings of the 14th International Congress of Nutrition, (Kim et al., ed.), 20-25 August 1989, Seoul, Korea; pp. 643-645.

In the absence of comprehensive nationwide food consumption survey, health indicators coupled with food balance sheets have often provided policy makers with indirect evidence of the overall nutritional status of the population. Current knowledge concerning nutritional problems in Malaysia based on nutrition surveys of selected communities revealed the existence of mild to moderate malnutrition amongst poor rural and urban communities. Some of the major nutritional deficiencies include low caloric intake, vitamin A and anaemia. In contrast, increasing affluence has provided growing evidence of disease associated with over-nutrition such as coronary heart disease, hypertension, diabetes and obesity. Changes in dietary habits amongst Malaysians has not been adequately studied although poor eating habits is said to have an influence in the ever increasing nutrition-related public health problems which are prevalent today, irrespective of social status. Several programmes has been implemented to help alleviate

poverty and do improve the overall nutritional status of the population. With the implementation of a comprehensive population policy to achieve a target of 70 million by the year 2100, it is envisaged that nutritionists have a vital and challenging task in educating Malaysians in order to achieve a better and improved quality of life for the present and future generations.

66. ISMAIL MN

Nutrition and sports performance

Paper presented at the Sports Science Seminar, National Sports Council, 8-10 April 1988, Johor Bahru

It is generally accepted that the nutritional requirement of active individuals is similar to that of sedentary individuals with the exception of additional energy and water to sustain the increased physical load. Although adequate nutrition for sporting activities could be achieved through a balanced diet, the regulation of energy expenditure is influenced by several factors such as, energy source of food, diet manipulation of pre-game meals and intake of nutrient supplements. The contribution of vitamins, minerals, carbohydrate and other essential nutrients in food is meaningless if "mileage has not been logged". The question that needs to be addressed is, if training is optimum, how nutrition could influence sports performance.

67. ISMAIL MN

A critique of the assessment of dietary energy requirements for Malaysia in the context of the national food and nutrition policy

Report of the Regional Expert Consultation of the Asian Network for Food and Nutrition on Food and Nutrition Planning, RAPA Report 1990/21, Bangkok, Thailand pp. 66-81, 1990

The amount of food needed by a population is one of the basic factors guiding economic, agricultural, developmental and political strategies in many countries. The 1981 consultation of energy and protein requirements commissioned by FAO/WHO/UNU dealt specifically with the latest information available for deriving estimates of energy and protein requirements of children and adults. This was published in the 1985 report. There are several important parameters that are needed to be assessed in order to justify energy requirement values for any given population, namely the total population size and its structure, body weights of children and adults, basal metabolic rates, physical activity level and the energy cost of different activities and number of pregnant women each year. Most countries do not have such information, or at best only certain data are available. Some of the parameters pertaining to Malaysia were briefly discussed.

68. ISMAIL MN

Nutrition country profile - Malaysia

Report submitted to FAO, Rome, Italy, 1990

The Food Policy and Nutrition Division of FAO has initiated a programme to construct nutrition profile of individual countries. The objective of this programme is to make readily available concise summaries of the food and nutrition situation with background information on food/health - related factors. This report briefly described the food consumption patterns of selected population between the years 1979 to 1989, as well as the nutritional status and health related factors of selected population between the years 1968 to 1986.

69. ISMAIL MN

Malnutrition and food consumption patterns in Malaysia

International Journal of Food Science and Nutrition, 43:69-78, 1992

In a rapidly developing country like Malaysia, problems related to nutrition present themselves with contrasting features. While health indicators such as the toddler mortality rate, incidence of low birthweight and food balance sheet data suggest an improving nutritional situation, direct nutrition assessment indicators show that chronic protein energy malnutrition is still common amongst children in rural areas and urban slums. Initial surveys of the adult urban population indicate about 10% prevalence of chronic energy deficiency in both sexes. Food consumption data revealed an average energy intake below the recommended daily intake for Malaysia in most age groups. Although death due to malnutrition is rare in Malaysia, it is known to cause considerable ill-health, impaired mental performance in children, loss of productivity in adults and an overall decline in quality of life. This paper reports the prevalence of malnutrition in the last two decades, the possible contributing factors and recommendations for alleviating the problems in Malaysia.

70. ISMAIL MN and ABDULLAH A

Nutrition education and research in the universities in Malaysia: An overview

Paper presented at the Seminar on collaboration in education in Health and Nutrition in S.E.A. and the Pacific, 6-8 September 1988, Brisbane, Australia

The importance of nutrition to national development has long been recognised although its impact in some developing countries has been questioned. Despite the fact that Malaysia is known to have a resource-rich economy, nevertheless, nutritionally speaking, we are unique in that, while under-nutrition still prevails in the rural areas, diseases of 'Western Civilization' are on the increase amongst the more affluent societies. Unlike most developed and some developing countries, nutrition and research at the universities in Malaysia is very much in its infancy stage. It was until 1979 that the first undergraduate course leading to a degree in Food Science and Nutrition was introduced. To date, training in nutrition especially at advanced levels, is still very limited and there is an urgent need to strengthen educational links with the more developed countries. Nutrition research has been varied in nature much of which are institutionalised depending on the funds available locally or abroad. This paper will attempt to highlight some of the problems related to nutrition education and research in the past and its present and future outlook on Malaysia.

71. ISMAIL MN and CHI CB

Energy balance studies in obese students

Proceedings of the Nutrition Society of Malaysia. 2:43-50, 1987

The energy balance of five male and eight female obese undergraduates was studied. Their energy intake was recorded by weighing the food consumed. The energy cost of typical activities was determined using the Douglas Bag technique and the daily energy expenditure was assessed using these figures combined with 24 hour activity diary. The mean body weight of male and female subjects was 88.6 ± 6.2 kg and 82.9 ± 15 kg, respectively. The daily energy intake and expenditure of male subjects were 2474 ± 616 kcal (10.4 ± 2.6 MJ) and 2127 ± 288 kcal (8.9 ± 1.2 MJ), respectively, with a positive energy balance of 347 kcal (1.4 MJ). By contrast, the daily energy intake and expenditure of female subjects were 1206 ± 309 kcal (5.0 ± 1.3 MJ) and 1880 ± 443 kcal (7.9 ± 1.8 MJ) respectively, with a negative energy balance of 674 kcal (2.8 MJ).

72. ISMAIL MN and KANDIAH M

Penggunaan data komposisi makanan dalam penyelidikan pemakanan dan kesihatan (The use of food composition data in health and nutrition research)

Proceedings of the Workshop for Users of Food Composition Data., (Khatijah I and Mohamad Nordin AK, ed.), 10-11 October 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1989; pp. 15-25.

The need for data on the composition of food, drink and food ingredients has given rise to various activities nationally as well as internationally. Food composition data play an important role in various aspects of human lives including evaluation of food intake, and menu planning for patients and specific institutions. These data are often used in the planning of food production and food and nutrition policy of a nation. In addition, the relationship between diet and degenerative diseases e.g. coronary heart disease, diabetes, hypertension, stroke and cancer has placed further demand on the need for more complete and accurate food composition data. This paper discusses the need, use and limitations of food composition data in health and nutrition research activities.

73. ISMAIL MN, WAN NUDRI WD and ZAWIAH H

Dietary intake, activity pattern and energy requirement of Malaysian sportmen

Paper presented at the SEA Games XV Seminar, August 1989, Kuala Lumpur

Seventeen members of the national sepak takraw squad undergoing centralised training participated in a comprehensive study to determine their daily food intake, activity pattern energy requirements. Food intake was recorded as a mean of 3-days weighed food intake and the nutrient contents were calculated using a local food composition table. The energy cost of standardised activities was determined by indirect calorimetry while time and motion study was used to estimate the daily energy expenditure of each subject. The mean daily energy intake was 2784 ± 373 kcal while the mean daily energy expenditure was 3004 ± 298 kcal, with a negative energy balance of 200 kcal. Intake of other nutrients were adequate when compared with the Malaysian RDI, with the exception of niacin. The results of the activity pattern study indicated that the subjects spent about 80% of the day doing light activities while 20% of the day

was devoted to their training programme comprising of moderate to heavy activities. More research is needed to validate these initial findings and to help establish dietary guidelines for Malaysian sportmen.

74. ISMAIL MN, WONG TS and ZAWIAH H

Anthropometric and food intake studies amongst Semai children

Journal of the Malaysian Society of Health, 6:19-25, 1988

Nutritional status of 111 Semai children from 13 selected villages at a resettlement scheme in Betau was assessed based on anthropometry and food intake studies. The results revealed varying degree of moderate to chronic malnutrition amongst preschoolers and children aged 7 to 10 years old. Based on a 24 hour dietary recall, the intake of most nutrients were adequate when compared to the Malaysian RDI (Recommended Daily Intake) with the exception of calories, niacin and vitamin A. Results obtained in this study and many others involving children in Malaysia demonstrated that, under the present dietary circumstances, it is the level of energy intake that limits growth. Future research should be directed towards improving dietary intake through appropriate intervention programmes.

75. ISMAIL MN and ZAWIAH H

Energy requirements of Malaysian students

Proceedings of the Nutrition Society of Malaysia, 3:63-72, 1988

Fifty-eight apparently healthy University students, 21 males and 37 females, were studied to assess their food energy intake and energy expenditure during sedentary and physical activities. The mean age for males and females was 22.8 ± 1.2 and 21.9 ± 1.2 years, height 1.66 ± 0.05 and 1.55 ± 0.06 m and weight 54.8 ± 6.0 and 47.1 ± 4.8 kg, respectively. The daily energy intake of each subject was recorded as a mean of 3-days weighed food intake. The energy cost of various activities was determined by indirect calorimetry and the mean daily expenditure was derived using this figure combined with a 3-day activity diary. The mean daily energy intake for male and female students was 2151 ± 371 kcal and 1590 ± 323 kcal, while the mean daily energy expenditure was 1860 ± 196 kcal and 1443 ± 166 kcal, respectively. The energy intake for male students was lower than the energy requirements (1530 kcal) for men engaged in moderate activities (Teoh, 1975) and that of FAO/WHO/UNU (1985) recommended value for male office clerk involved in light activity (1580 kcal). Similarly, the energy intake for female students was below the RDI for Malaysia (2000 kcal) and that recommended for a housewife in an affluent society (1990 kcal) and rural women in a developing country (2235 kcal) as suggested by FAO/WHO/UNU (1985). Although in both cases the mean energy expenditure did not exceed the mean intake, the results of this study suggest that the students were not physically very active. It may be useful to encourage students to participate in recreational activities which are known to be conducive to cardiovascular, physical and mental fitness.

76. ISMAIL MN and ZAWIAH H

Anthropometric assessment of adult Malaysians

Report submitted for the 6th World Food Survey, FAO, Rome, 1991

The FAO and WHO conducted a survey assessing world nutrition situation in conjunction with the Rowett Research Institute, Aberdeen. In recent years, the use of weight: height indices, the Quetelet's Index or Body Mass Index (BMI) have been advocated in assessing individuals or population nutritional status. This report presents data compiled from several research projects conducted by the Department of Food Science and Nutrition, UKM between the years 1984-1989, involving 1,647 adult males and 1,344 adult females between 20 to >70 years old. Despite its inherent limitations as being a non-representative national sample, the report may prove useful if interpreted with care and caution. Efforts toward conducting a national survey on adult population is vital, in order to derive figures that reflect the current nutritional status of adult Malaysians.

77. ISMAIL MN, ZAWIAH H, MARIAM A and JUNAIDAH RB

Body weight and body fat changes during the fasting month of Ramadan

Paper presented at the XIII International Congress of Nutrition, 18-23 August 1985, Brighton, U.K.

This study was conducted in an attempt to assess the effect of refraining intake of food and water from sunrise to sunset for a period of one month commonly practiced in an Islamic community. Anthropometric data and weighed dietary intake of adult males (n=14) and adult females (n=18) were recorded a week prior to fasting and compared with measurements taken during the last few days of the fasting month. Initial body weight and body fat content (mean \pm SEM) for men were 61.8 \pm 2.3 kg and 18.2 \pm 0.9% as compared to 61.3 \pm 2.5 kg and 16.4 \pm 1.0% during fasting while data obtained from women were 53.6 \pm 1.7 kg and 29.3 \pm 0.9% as compared to 52.9 \pm 1.8 kg and 28.4 \pm 1.0%, respectively. Energy intake recorded initially for men and women were 1933 \pm 136 kcal and 1360 \pm 123 kcal while intake during fasting month were 1766 \pm 116 kcal and 1380 \pm 78 kcal respectively. The results indicated slight decrease in body weight and body fat content while that of energy intake was within limits of individual variations.

78. ISMAIL N and SEOW CC

Traditional Malaysian intermediate moisture foods: preparation, properties and improvement

Proceedings of the International Symposium on Food Technology in Developing Countries, (Berry SK, Mohd Ismail AK and Asiah MZ, ed.), 3-5 September 1980, Kuala Lumpur; pp. 299-323.

The characteristic features of Intermediate Moisture Food (IMF) include a moisture content (usually 20-50% on dry basis) high enough to make the food ready-to-eat without the need for reconstitution, and a water activity (usually 0.6-0.9) low enough to ensure a reasonable degree of protection from bacteriological spoilage without the need for refrigeration or thermal processing. Since they do not require rehydration, they have relatively good shelf-stability, and they can easily and cheaply transported and distributed. Such foods could play a significant role in food and nutrition intervention

programmes especially in rural situations. IMF can be conveniently divided into two broad categories, viz high protein-high calorie, and low protein-high calorie IMF. The former group includes various types of IM meat products such as sambal daging (spiced meat), sambal udang kering (spiced prawn), and heko (prawn extract). Such foods are thought to be able to contribute to the alleviation of the protein-calorie malnutrition problem prevalent in the areas of many developing countries. Lempok (durian cake), dodol, pulut kacang (both glutinous rice cakes), halua masket, and candied nutmeg belong to the second category. Carbohydrates, mainly starch and sugars constitute the major components. The excessively sweet taste of some of these products obviously limit their intake and general acceptability. The chemical compositions (though not complete nutrient contents) of these IMF were tabulated. The production technology and the storage stability of these foods were also discussed in some detail in this report.

79. KANDIAH M

A review of the nutritional status of the Indian community in Peninsular Malaysia

The Family Practitioner, 5(3):39-43, 1982

The paper reviewed recent findings on the nutritional status of the Indian community so as to highlight the major problems faced by this community. The decline of toddler mortality rate over the years was said to be the least satisfactory amongst the Indians, incidence of infants born with low birthweights and perinatal mortality rate were found to be the highest amongst this ethnic group. Available scanty information on nutrition surveys of Indian communities showed a high prevalence of protein energy malnutrition, anaemia, vitamin A, thiamine and riboflavin deficiencies and helminthic infestations. The various contributory causes to the problem of malnutrition amongst the Indians were discussed. The author drew attention to the severity of the problem and called for urgent recognition and remedial measures from both public health and political sectors alike.

80. KANDIAH M

Kajian imek Rancangan Makanan Tambahan: pengetahuan dan sikap-sikap guru-guru dan ibu-bapa (Study of the impact of the school Supplementary Feeding Programme: knowledge and attitude of teachers and parents)

Proceedings of the Workshop on Food Habits of Primary School Children., (Zanariah J, Aminah A, Yunus J, Nawalyah AG and Sahari J, ed.), 23-24 August 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1988; pp. 51-69.

A study of the impact of the Supplementary Feeding Programme was carried out in selected rural schools in 2 districts in Peninsular Malaysia. This report presents results of studies carried out on aspects related to the knowledge, acceptance and attitude of the teachers and parents towards the Programme. The study has shown that most of the parents and teachers support the Programme. They also emphasised the importance of continuing the Programme in view of the benefits to the children as well as to the parents themselves. Several suggestions were put forth by the teachers to improve the Programme.

81. KANDIAH M**Effectiveness of the school supplementary feeding programme in improving the nutritional status, scholastic performance and school attendance of selected rural school children**

Proceedings of the Nutrition Society of Malaysia, 5:47-72, 1990

Twenty-one rural schools in two different districts, namely Sepang and Temerloh in Peninsular Malaysia were selected for the study. Primary school entrant children in 15 schools where the feeding programme was implemented were chosen to be the feeding group, and a comparable group of children in 6 schools which did not have the programme constituted the control group. In all, 600 children were included at the beginning of the study. These children were followed up longitudinally at 3-monthly intervals for two years, monitoring particularly the impact of the feeding programme on their nutritional status, dietary intake and food habits, school attendance and scholastic performance. A knowledge and attitude survey was also conducted among parents and teachers to study their perception and acceptance of the programme, as well as to solicit their views regarding its implementation and improvement, if necessary. At the termination of the study, a reduction in the prevalence of malnutrition was observed. From the commencement to the end of the second year of evaluation, a significant reduction was obtained for all nutritional indicators of the feeding group in both districts. The highest percentage of reduction in PEM was seen in the weight-for-age indicator (42.3% in Sepang and 47.7% in Temerloh). However, most of the biochemical parameters monitored did not show similar marked improvement. At the end of the study, school attendance rates among feeding group children in both districts was found to have improved. Scholastic performance, as assessed by marks obtained during end-of-term examinations, was suggestive of an improvement among children receiving the supplement, especially in arithmetic. Dietary analysis indicated that the total daily dietary intake of energy, protein and other nutrients improved with the addition of the meal supplement. The meal given in the school did not appear to be a substitute for regular meals at home. A KAP study carried out among parents and teachers revealed the programme to be acceptable, and one which needed to be continued. Recommendations for some improvement to the programme were also suggested by these respondents. Observations made while the feeding programme was in progress in the selected schools showed that little use was made of it to carry out nutrition and health educational activities. It is important that these aspects be given further emphasis to enable the programme to have a lasting impact on the food and nutrition habits of the children. The present study has shown that much needed dietary supplements delivered through such feeding programmes can make up for the nutritional deprivations experienced by needy children. The school supplementary programme does indeed have an important role in strategies concerned with alleviating protein-energy malnutrition among our rural school children.

82. KANDIAH M**Iron supplementation, mental ability and scholastic performance among rural primary school children**

Proceedings of the Nutrition Society of Malaysia, 8:9-15, 1993

The present study, an exploratory one, investigates the effect of 3-month iron supplementation on measure of IQ and school performance among iron-deficient anaemic (n=40) and non-anaemic (n=167) rural Malay school children. All subjects were treated for parasitic infestation before iron supplementation. They were then randomly

assigned to either an iron supplement or placebo group. Iron supplementation was carried out by oral treatment with ferrous gluconate at a dosage of 10 mg/kg/day equivalent to 2 mg elemental iron, based on the recommendations of the International Nutritional Anaemia Consultative Group 1984. The placebo was a sugar tablet with colour and appearance similar to the iron tablet. The revised version of the Wechsler Intelligence Scale for Children (WISC-R) was used to measure IQ while school performance measures were based on scores obtained for routine classroom examinations in languages (Malay and English) and in Mathematics. Iron treatment for a 3-month period produced significant increases in haematological parameters among the iron-deficient anaemic children. On the other hand, no significant increases in the mean values of these parameters were observed in the non-anaemic group treated with supplement or the placebo. On iron therapy, iron-deficient anaemic children appeared to have improved significantly in school achievement scores but not in IQ as has been previously observed in other studies. The results arising from this study are encouraging in that iron supplementation appears to have a beneficial effect on the learning process as measured by the school achievement scores. A more in-depth study is indicated to confirm these results.

83. KANDIAH M, LEE MCC, NG TKW and CHONG YH

Malnutrition in Malaria endemic villages of Bengkoka Peninsula, Sabah

Journal of Tropical Paediatric, 30:23-29, 1984

The nutritional status of 96 pre-school children and 61 women of child-bearing age in three poor and remote villages in the Bengkoka Peninsula, Sabah, East Malaysia were examined by a combination of anthropometric, biochemical and food consumption techniques. The majority of the inhabitants of the main village of Pantai were the Rungus, and practised the slash and burn type of subsistence farming. In the peripheral village of Taradas, the inhabitants were also mostly Rungus. Delima, another peripheral village studied, consisted mostly of the Bajaus who were mostly engaged in fishing. Results of the study, presented in detail, indicated that chronic protein-energy malnutrition and iron deficiency anaemia were serious nutritional problems in the communities studied. The interaction of malaria infection and helminthic infestation with nutrition were examined. Various recommendations were made to improve the health and nutritional status of the communities.

84. KANDIAH M and OOI GS

Infant feeding study: knowledge and attitudes of selected pregnant women

Malaysian Journal of Reproductive Health, 2(2):96-104, 1984

In an attempt to gain information on mothers' knowledge and attitudes towards infant feeding practices prior to delivery, a study was conducted on a group of antenatal women attending clinics at two semi-urban health centres near Kuala Lumpur. A total of 74 mothers in their third trimester of pregnancy were interviewed, from January to March 1983. The study revealed that while most mothers were aware of the immense benefits of breastfeeding, not all of them were prepared to provide wholly breast milk for their infants. Mixed feeding (breast milk and formula milk) appears to be the preferred method of infant feeding, especially among Chinese women, women from highest income groups, working women and multiparous mothers. Attitude statements on breastfeeding and supplementary feeding drew interesting responses. Ways of increasing

educational inputs not only to motivate mothers to breastfeed but also to provide correct information on infant nutrition have been recommended.

85. KHAIRUDDIN Y

“Sang Kancil” - care of urban squatters in Malaysia

World Health Forum, 3(3):278-281, 1982

The number of squatter settlements in Kuala Lumpur has risen dramatically in the last 10 years. The various problems continuously faced by these families include health, population, emotional stress, as well as preschool education and child care. Since children are sensitive indicators of social, economic, and health deprivation, particular attention was devoted to them. It was however recognized that their needs had to be considered in concert with those of the rest of the family, particularly the mother. The paper described the setting up Sang Kancil, an intervention programme that focused first on preschool education, then, after the programme had taken firm root in the settlements, on maternal and child care clinics, and finally on income-generating activities.

86. KHATIJAH I and MOHD NORDIN MS

Pengunaan data komposisi makanan dalam industri makanan (The use of food composition data in the food industry)

Proceedings of the Workshop for Users of Food Composition Data, (Khatijah I and Mohamad Nordin AK, ed.), 10-11 October 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1989; pp. 33-38.

Food composition tables have been in existence since the early part of the nineteenth century. There is a wide usage of food composition data for a variety of purposes. Food composition data are also encouraged to be used in the food industry. These data can assist the industry in the processing of food, formulation of food products, compliance with food regulations, and food labelling. The use of these data also facilitates healthy competition between producers in allied industries. A brief survey on the use of food composition data among various food industries in Kuala Lumpur was carried out. Results of the survey showed that only a few food producers make use of these data.

87. KHOO KL, TAN H and KHOO TH

Cardiovascular mortality in Peninsular Malaysia: 1950-1989

Medical Journal of Malaysia, 46(1):7-20, 1991

Mortality statistics of Peninsular Malaysia for the period 1950-1989 have been studied in relation to cardiovascular diseases, with particular emphasis on coronary heart disease as an important cause of death. It was observed that among six major disease groups reviewed, cardiovascular diseases which occupied third place as a cause of death in 1950 emerged as the number one killer during the 1970s and has remained so since (with exception in 1980). In contrast, infectious diseases which ranked first in 1950 dropped to fourth position in 1980. Between 1960 and 1980, mortality due to cardiovascular diseases was higher in males than in females. This tendency became less apparent during 1985-1989. With reference to race, the incidence of

cardiovascular deaths was highest in Indians followed by Chinese and Malays. Among the specific cardiovascular diseases, coronary heart and cerebrovascular diseases accounted for the main causes of mortality. Mortality due to coronary heart disease has increased by more than three fold over the last 40 years and is still rising. However, mortality incidence due to rheumatic heart disease and hypertension decreased during the same period. In 1965, mortality due to coronary heart disease was highest in the 55-59 age group. In recent years (1985-1989), it shifted to the older age group (i.e. 65-69). There was a tendency for higher mortality due to coronary heart disease in males compared to females. Indians had a higher mortality due to coronary heart disease than Chinese and Malays.

88. KHOR GL

Nutritional status of Malaysians

Paper presented at the Symposium on Amino Acids and Nutrition, 31 December 1981, Kuala Lumpur; 13 p.

The paper first briefly reviewed the various tools that may be used for the nutritional assessment of communities. Through a combination of anthropometric, biochemical, clinical and ecological studies, the complex interaction between environmental and social factors and the individuals in a community could be studied. Various studies carried out in the country were next reviewed, to present evidences of nutritional problems, emphasising on protein-calorie malnutrition, vitamin A deficiency and nutritional anaemia.

89. KHOR GL

The role of a co-ordinated food and nutrition policy in developing countries

Proceedings of the International Symposium on Food Technology in Developing Countries, (Berry SK, Mohd Ismail AK and Aisah MZ, ed.), 3-5 September 1980, Kuala Lumpur; Universiti Pertanian Malaysia, Serdang, 1982; pp. 389-401.

Malnutrition constitutes a part of the large problem of 'deprivation syndrom' which is characterised by poverty, lack of education, substandard living conditions, inadequate food, malnutrition and disease. In order to break this circle of deficiencies, multisectorial programmes which include socio-economic development, education, increased production and equitable distribution of food, and improvement in individual and environmental health are imperative. As these various programmes encroach into the responsibilities of a number of public and to a lesser extent, private agencies, the formation of a co-ordinated food and nutrition policy is a logical step. Such a policy is particularly desirable in developing countries especially in this era of generalized inflation resulting in price increases of basic goods and services. Governments tend to view food and nutrition problems as peripheral emergencies which can be solved by short-term measures such as supplementary feeding. These measures have often been undertaken by a sector only without overall integration. A better solution calls for multisectorial planning as a tool for intermediate and long-term efforts, especially in view of the fact that alterations in areas like agricultural production, education and environmental sanitation are not amenable to short-term change. The paper presented three models for the planning of food and nutrition policies and programmes namely, the systematic analysis approach, the nutrition-based development approach and the community nutrition approach. The need for a systematic analysis of the whole food and nutrition problem, effective

coordination, involvement at the grassroot level and continuous surveillance was emphasized.

90. KHOR GL

Malnutrition among Semai children

Medical Journal of Malaysia, 43(4):318-326, 1988

A comprehensive assessment of the nutritional status of the Semai children in Perak was undertaken. Anthropometric measurements of 1,180 children, biochemical analyses of blood and urine samples from 506, and dietary evaluation by weighing food intake of 30 preschool children were carried out. Widespread underweight and stunting were found with a relatively lower incidence among the infants and female adolescents. Iron deficiency anaemia affected a high percentage of the children, who also showed low excretory levels of urea nitrogen and poor hydroxyproline index indicating slow growth rate. Dietary intake was characterised by sub-optimal quantitative levels and a high reliance on tapioca tuber for calories and nutrients.

91. KHOR GL

Implications of population growth on demands for health resources: The case of Malaysia

The Takemi Program in International Health, Havard School of Public Health, Research paper No. 35, 1989

A Population Policy for Malaysia was promulgated in 1983 which recommended that the decline in the country's total fertility rate (TFR) be decelerated by 0.1 point every five years. In this manner, the TFR of 4.0 in 1980 is expected to stabilise at 2.05 in the year 2070, thereby producing a total population of 70 million in the year 2100. The main objective of the study was to project the magnitude of the requirements for health resources for alternative population growth trends in Malaysia for the period 1990-2005. The population increases were computed based on assumptions of various TFR schedules. The demands for the family health budget, rural health centers and clinics, government-trained nurse-midwives and doctors by the different rates of population growth were compared. The population projected by the Population Policy can be expected to expand further the young structure of the population. Together with women in the reproductive ages and the elderly, young children impose the greatest demands on medical and health care. Nutrition, child care, medical and public health, education and other necessities of life have to be "invested" in the children before the country can expect them to be productive in the labour force. A detailed estimate of the number of health facilities and health staff required was made in order to meet the needs of the population increase. It was noted that demographic predictions by themselves are useful only in projecting the needs for health or other resources at the aggregate or macro level. They are not sensitive enough to social, economic, political, and technological changes that affect the population at the micro level. Nevertheless, projections such as those undertaken in this study can provide useable information on the consequences of variant levels of fertility and mortality. In practice, population projections constitute a useful tool for the planning of demands for social and economic resources by males and females of different age group.

92. KHOR GL

Infant feeding practices in an urban squatter community

Malaysian Journal of Reproductive Health, 7(1):41-51, 1989

The pattern of infant feeding practice was studied among 71 Malay mothers in Kg. Sentosa, a squatter community in Kuala Lumpur. Breast milk only was provided by most mothers up to the fourth week, after which it was increasingly replaced by cow's milk. Ninety-five per cent of the working mothers and 54% of the full-time housewives had introduced bottle-feeding supplemented with precooked cereal and porridge by two months of age. Factors related to maternal employment, household income and occurrence of illness in child affect significantly the duration of exclusive breastfeeding. Variability in the timing of commencement and completion of weaning could be attributed partially only (42.1% and 26.8% respectively) to the household, maternal and child variables taken together. This seems to imply that personal reasons largely govern decisions related to feeding infants.

93. KHOR GL

Implications of birthweight on perinatal mortality

Paper presented at the Seminar: "Towards the Improvement of Quality of Life", Department of Human Development Studies, Universiti Pertanian Malaysia, December 1989

The present study addressed the following issues: (i) The significance of early neonatal mortality rate in the context of the country's declining rates for perinatal and infant mortality; (ii) The relationship between birthweight and early neonatal mortality rate; (iii) The implications of socio-demographic and biological factors on the incidence of low birthweight among Indians from the lower socio-economic strata. The perinatal mortality rate of Malaysia is relatively higher than that of most Asean countries. Until 1980s, it was the early neonatal mortality component of perinatal mortality rate that did not decline as fast as the stillbirth rate. Low birthweight is an important correlate of perinatal mortality. For babies with known birthweight, the Indians have the highest proportion of low birthweight. Unknown birthweight is most common among the Malays and if the occurrence is presumably more rampant in those rural areas with less satisfactory health care coverage, perhaps the prevalence of low birthweight of the Malay might be higher than that reported. Low birthweight has been shown to be closely associated with socio-economic factors such as maternal income, age, parity, and adequacy of ante-natal care. Maternal health status during pregnancy also contributes towards fetal growth and subsequent birthweight. Among the biological factors that were found to be related significantly to low birthweight among the Indians were the presence of oedema and the absence of glucosuria. Oedema is linked to hypertension disorders, which together with anaemia constitute the major ante-partum risks among Malaysia mothers. As for adequacy of ante-natal care, the chances of Indian women delivering low birthweight infants increases with the lack of such care. A large body of literature that illustrates the associations of sociobiologic factors with low birthweight is available, but the fundamental nature of the causes of total growth retardation remains poorly understood. It is difficult to distinguish between genetic, physiologic and environmental effects on birthweight.

94. KHOR GL

Dietary patterns of Malaysians: nutritional and health implications

ASEAN Food Journal, 6(2):52-57, 1991

The paper analysed the Malaysian dietary patterns that have evolved over the last two decades, from food availability data at the country level and from selected dietary surveys. Food balance sheet data for 1960's to the late 1980's showed a decline in the availability of complex carbohydrates and other fibre-rich products, accompanied by increased availability of sugar, plant oils and animal protein. Dietary studies of households and specific age groups were also presented. Epidemiologic evidence and mortality data were presented to show the prevalence of over-nutrition in certain segments of the population. The country is said to be at a nutritional cross-road in having the twin problems of under- and over-nutrition.

95. KHOR GL

The nutritional situation in metropolitan Kuala Lumpur, with focus on squatters

Southeast Asian Journal of Tropical Medicine and Public Health (Proceedings of the Asian Workshop on Nutrition in the Metropolitan Area, 11-14 September 1991, UPM, Serdang), 23(Supplement 3):17-30, 1992

Approximately 12% of the total population of 1.5 million in Kuala Lumpur City live in squatter settlements occupying about 7% of the city total area. The squatter settlements generally are provided with basic amenities such as piped water, toilet facilities and electricity. Health indicators for the overall population of Kuala Lumpur are better off than for the rest of the country; however, intra-city differentials prevail along ethnic and socio-economic lines. Malays and Indians have higher rates for stillbirths, and neonatal, infant and toddler mortality than the Chinese. The wide disparity in the socio-economic status between the advantaged and the poor groups in the city is reflected in the dietary practices and nutritional status of young children from these communities. The percentage of preschool children from the urban poor households with inadequate intakes of calories and nutrients is two to three times higher than those from the advantaged group. Compared to rural infants, a lower percentage of urban infants are breastfed. A lower percentage of Malays from the urban advantaged group breastfed, compared with the urban poor group. The reversed trend is found for the Chinese community. Growth attainment of young children from the urban poor is worse than the urban advantaged, though better than the rural poor. Health and nutritional practices implications related to both undernutrition and overnutrition are discussed, to illustrate the twin challenges of malnutrition in the city.

96. KHOR GL and GAN CY

Trends and dietary implications of some chronic non-communicable diseases in Peninsular Malaysia

Asia Pacific Journal of Clinical Nutrition, 1:159-168, 1992

Non-communicable diseases with dietary implications, ischaemic heart disease, diabetes mellitus and cancers of the breast and colon are discussed in relation to their prevalence and mortality rates in Peninsular Malaysia during the past few decades. The mortality rate due to diseases of the circulatory system has more than doubled

since 1970, deaths due to ischaemic heart disease being the major cause. The prevalence of diabetes mellitus has risen from 0.65% in 1960 to about 4% currently. The mortality risk for both ischaemic heart disease and diabetes is highest in the Indian compared to Malay and Chinese populations. The Chinese show the highest mortality rate for cancers of the breast and colon. This could reflect, partly, because more people especially in the urban areas are seeking treatment and improved diagnosis. Empirical dietary data indicate an increase in the prevalence of hypercholesterolaemia among urban adults and overweight among urban and rural adults. Aggregate data from food balance sheets indicate increased availability of energy intake from fats and oils, sugar, and animal products, with concomitant decline in available energy from plant products. Continued public health education on the important linkage between diet and disease is called for.

97. KHOR GL and GEORGE J

Incidence of low birthweight in an urban squatter community

Proceedings of the Nutrition Society of Malaysia, 3:54-62, 1988

Records from the Sang Kancil Maternal and Child Health Clinic in Kampung Sentosa, Kuala Lumpur were compiled and analysed. Based on data for the period 1981-1986, the incidence of low birthweight (< 2500 g) (LBW) among the Indians was found to average 43.2% as compared to 24.2% and 12.7% for the Malays and Chinese respectively. The mean birthweight of the LBW infants for the three ethnic groups ranged between 2176 to 2326 g. The incidence of LBW was found to correlate significantly with maternal age among the Malays only. In comparing the weight gain of the LBW cases with their high birthweight (HBW) (> 3500 g) counterparts for the first six months, it was revealed that the Malay and Chinese LBW infants showed catch-up growth after the first month and thereafter, put on more weight monthly than the HBW cases. However, Indian LBW infants were found to be heavier than their HBW counterparts later, i.e. after the fifth month. Due to the limited total number of LBW cases included in the analysis, these results can be considered as preliminary and further study, especially pertaining to cultural influences on antenatal and infant care, is being undertaken.

98. KHOR GL, TEE ES and KANDIAH M

Patterns of food production and consumption in the ASEAN region

World Review of Nutrition and Dietetics, 61:1-40, 1990

The Association of Southeast Asian Nations (ASEAN) consists of the peninsular and the archipelago parts of Southeast Asia. Established in August 1967, ASEAN originally comprised of Indonesia, Malaysia, Philippines, Singapore and Thailand; Brunei Darussalam became the sixth member in 1984. This paper discusses the trends and issues related to food production and consumption with nutritional implications in the ASEAN region. The production of major food staples in countries in the region for 1984 was first discussed. The trends in crop production increases from 1980-84 were also examined. The authors analysed the available food balance sheet data for the two decades 1961-1984 to examine the availability of several nutrients in the ASEAN countries, including calories, protein and fat. The patterns of consumption of major food staples and trends in food trade were also discussed. The authors next discussed the nutritional implications of population increase and food production in countries in the ASEAN region.

99. KHOR HT

Nutrition and cancer

Proceedings of the the First Scientific Conference of the Nutrition Society of Malaysia, (Chong YH and Mohd Ismail N, ed.), 1 March 1986, Kuala Lumpur; Nutrition Society of Malaysia, Kuala Lumpur, 1986; pp. 38-43.

Epidemiological data indicate strong correlations between nutrient imbalance and high cancer incidence for specific organs. Animal studies confirmed these observations and implicated certain dietary factors in the development of cancer at several sites. Cancer is believed to develop in stages and dietary factors can influence the carcinogenic process either at the initiation and/or at the promotion stage. Dietary lipids have been implicated by epidemiological studies as a risk factor in the carcinogenesis of the mammary gland, colon, pancreas and prostate in humans. Animal studies have shown that a high fat diet significantly increased the incidence of mammary cancer and colon cancer induced by chemical carcinogens in rats compared to a low fat diet. However, high fat diets containing unsaturated oils increased the cancer incidence to a much greater extent compared to high fat diets containing saturated fats. The difference in tumour response between unsaturated oils and saturated fats is due mainly to the level of essential fatty acids in the fats and oils. Dietary lipids act mainly on the promotion stage of the carcinogenic process. However, dietary lipids may promote the development of cancer at different sites with the same or different mechanisms. Several possible mechanisms are discussed in view of more recent discoveries. Other dietary factors such as vitamins and minerals were also shown to be involved in cancer development in laboratory models. The possible mode of action of these dietary factors with respect to cancer development is reviewed.

100. KING J and ASHWORTH A

Changes in Infant Feeding Practices in Malaysia: An Historical Review

London School of Hygiene and Tropical Medicine (Occasional Paper No. 7), London, 1987.

The first few sections of the paper described briefly some early (before 1950) reports of traditional early weaning practices, and infant welfare services and milk distribution programmes and their impact on infant feeding practices. The paper next reviewed reports on infant feeding practices among the Malays, Chinese and Indians during the 1940-64 period. The third part of the paper dealt with the infant feeding patterns from 1965 to 1985. Besides discussing the prevalence and duration of breastfeeding, other topics dealt with include patterns of breast milk supplementation and several determinants of infant feeding practices.

101. KIYU A and ZAINAB T

Iodine deficiency disorders in Sarawak, East Malaysia

Report of the Workshop on Malaysian Case Studies on Food and Nutrition Interventions. National Committee on the ASEAN-New Zealand Inter-Institutional Linkage Programme. Kuala Lumpur; 1993; pp. 33-46.

The report reviewed various aspects of the problem of iodine deficiency disorders in Sarawak, especially with regards to the magnitude, etiology, control programmes and

related legislations. Several studies carried out since the 1970's by various investigators were reviewed and the findings tabulated. In spite of the limitations of the studies, they did show the distribution, prevalence and severity of IDD. As of 1990, 16 of the 27 districts, and 4 additional sub-districts, mainly in the interior regions of the State, were identified as goitrous. There was however no information on the trend of IDD prevalence in the State. The goitre seen in the State was primarily caused by insufficient iodine in the diet. Cassava was thought to be a possible contributory factor in communities which depend heavily on this root crop. Iodised salt distribution commercially and through the rural government clinics have been started as control strategies. The appropriateness and effectiveness of the control programmes need to be reviewed as the problem remains of considerable magnitude.

102. LIM CL

Traditional Malay Foods: A Review

Bulletin of the Research Institute for Food Science, Kyoto University, Kyoto, 1989

The review commenced with a description of the Malay cuisine, the staple food and side-dishes, as well as various ingredients used in the cooking. Various fruits eaten for dessert or used as raw materials for the preparation of desserts, snacks, cakes, pickles and other processed foods were next described. The author described the preparation and consumption of a wide variety of traditional cakes and desserts in the Malay diet. The major part of the review dealt with several processed foods which have been subjected to some special treatment beyond mere seasoning and/or cooking. The 12 foods described were of fruit/vegetable (palm sugar, fruit or vegetable pickle, fermented rice, tapioca or durian), meat (spiced shredded meat) and fish (fermented shrimp, salt-cured fish, fish and prawn crackers, pickled fish, brined shellfish, shrimp paste, fish sauce) origin. A detailed description was given of the method of processing and consumption of each of these foods.

103. LIM G

Indigenous fermented foods in Southeast Asia

ASEAN Food Journal, 6(3):83-101, 1991

There are many food fermentations practised in different countries in the West and East and often long associated with the social and cultural history of the people. The indigenous fermented foods that result from such fermentations are varied and over time became the traditional fermented foods of the respective countries or regions. This paper reviewed the indigenous fermented foods of the Orient, particularly those of Singapore and some Southeast Asian countries. Four groups of indigenous fermented foods were discussed, namely alcoholic beverages, foods, flavouring agents, and miscellaneous. For each of these groups, the author discussed the preparation and usage of these foods.

104. LO EKC

Epidemiology of cardiovascular diseases in Malaysia

Journal of the Malaysian Society of Health, 6(1):8-13, 1988

Development and progress has brought changes to the ecological system and the epidemiology of diseases in Malaysia. Incidence of communicable diseases has fallen, while that for non-communicable diseases like cardiovascular diseases (CVD), accidents, cancers and drug dependence has risen. Lack of reliable statistics and good epidemiological studies have hampered the understanding of CVD in Malaysia. Available data, however, indicate a rising trend of CVD, which rank first in the 10 principal causes of deaths and third in the 10 principal causes of admissions in 1983. The estimated incidence of CVD for 1983 is 32.2 per 10,000 population, with an overall case fatality rate of 10.5%. The mortality due to CVD has risen from 3.0% to 27.9% of total medically certified and inspected deaths for 1965 and 1983 respectively. The epidemiology of CVD was described in terms of disease type, age, sex, and race. Risk factors that are modifiable were discussed. Multifactorial approach to primordial prevention of CVD was advocated, and current activities contributing to CVD prevention and control in Malaysia were listed.

105. MAFAUZY M, WAN MOHAMAD WB, YASMIN ANUM MY, MUSALMAH M and MUSTAFA BE

The prevalence of endemic goitre in Kelantan, Malaysia

The Medical Journal of Malaysia, 48(1):64-70, 1993

A large-scale study was undertaken in the state of Kelantan, to determine the prevalence of goitre. A total of 2,450 subjects above the age of 15 years selected from 31 localities in the state and examination for goitre was done using the technique of Perez. The state was divided into 3 areas — coastal area (area 1), inland area (area 2) and the area in between the coast and the inland area (area 3). The overall prevalence of goitre was 36.8% and the prevalence in areas 1, 2 and 3 were 23.0%, 35.9% and 44.9% respectively and ranged from 6.9% in a locality in area 1 to 59.7% in a locality in area 3. In all areas, the prevalence was higher in females than in males. The prevalence of grades I, II and III goitres were 21.5%, 1.0% and 0.5% respectively in area 1, 33.6%, 1.5% and 0.7% respectively in area 2 and 41.7%, 2.2% and 1.0% respectively in area 3. Amongst age groups, goitre prevalence was highest in the 36 to 45 years age group in area 1 (33.9%), in the 15 to 25 years age group in area 2 (39.6%) and in the 26 to 35 years age group in area 3 (54.3%). In all the areas, goitre prevalence was lowest in the above 56 years age group. We concluded that the prevalence of goitre was high in Kelantan and there were regional differences in the prevalence rate within the state.

106. MAHATHEVAN R

Nutrition for workers in developing countries

Bulletin of the Public Health Society, 14:18-23, 1980

Workers should be adequately nourished to meet their total health needs, including any special demands of their work and their total living needs. An ideal would be for a worker to receive a sufficiently high wage to enable him to purchase adequate diet for himself and his family. In practice this ideal is seldom achieved. Constraints may be economics, when wages are low, geographical when the place of work is a great distance from the home and transport is inadequate. But the most important impediment is educational, when food habits are hygienically unsound associated with cultural and traditional beliefs. The paper reviewed the dietary requirements of workers. The discussion also dealt with measures to improve the diet of workers. The paper

dealt with in some detail the establishment of a canteen at the working site as a possible effective measure.

107. MAMAT S

Peranan Majuternak di bidang perusahaan tenusu dalam meninggikan taraf kesihatan kanak-kanak (The role of Majuternak's dairy development towards improving child health)

Proceedings of the Seminar on Supplementary Feeding Programme in Malaysia, 16-17 January 1980, Kuala Lumpur; pp. 49-57.

Efforts in improving the nutritional and health status of the younger generation are investments on the human resources development which will contribute to the improvement of quality of life at present and upgrade the quality of manpower in the future. With this in mind, various pre-school and school supplementary feeding programmes had been implemented; these were briefly reviewed in the paper. Most of the children under the various schemes had been provided solid food or hot meals and the provision of milk was done on a rather limited scale. It was suggested that the School Milk Programme be planned with the ultimate objective of full coverage of primary school children to be attained within a specified time. An assessment of the proposed Programme, including its financial involvement, the estimated coverage of children, and stages of development was made. The role of the National Livestock Development Authority or Majuternak in the implementation of such a Programme was explored. Such involvement could be considered as Majuternak's indirect yet positive contribution towards improving child health and the development of human resources for the overall national development.

108. MANDERSON L

Roasting, smoking and dieting in response to birth: Malay confinement in cross-cultural perspective

Social Science and Medicine, 15(B):509-520, 1981

In humoral medical theory, physiological changes including pregnancy and confinement are known to alter the humoral balance of the body. Behavioral and dietary precautions must be invoked to protect the women's health in a state of physical as well as magical vulnerability. The most part of the paper described the practice of such restrictions by Malay women following parturition. Most of the data presented were collected from studies of 278 women from 5 states of Peninsular Malaysia, carried out from 1978 to 1979. According to humoral pathology, Malay women believe that pregnancy is a hot state, and with parturition heat is lost and the woman moves to a state of excess cold. Hence during the postpartum period of 40-44 days, care should be taken to restore the woman to a state of equilibrium. Her diet and behavior is thus prescribed to this effect. The author described in detail some of such behavioral practices, especially puerperal roasting and smoking. In addition, there were extensive dietary restrictions. Cold foods, including most fruits and vegetables were generally avoided, whereas hot foods were prescribed. Numerous other foods, classified as cold foods, oily foods, sharp foods, itchy fishes and windy foods were also frequently encountered as dietary taboos. Similar behavioral and dietary restrictions were seen in other cultures in Southeast Asia, such as amongst Chinese, Indians, Thais, and Burmese, as well as other parts of the world. Finally, the paper examined these confinement practices cross-culturally to explain the rationales of such practices.

109. MANDERSON L

Traditional food beliefs and critical life events in Peninsular Malaysia

Social Science Information, 29(6):947-975, 1981

Traditional food beliefs during some critical life events of Malaysians were studied. Data were collected from interviews of 278 women, the majority of whom were Malays, from 5 states in Peninsular Malaysia. It was observed that the majority of food restrictions were imposed during the periods of sickness and physiological change, and relate to hot-cold and other classifications of food (windy, itchy, poison and sharp foods). Whilst the excessive consumption of certain classified foods may cause ill health, hot and cold food may be used to ameliorate discomfort or to treat illness, usually in accordance with the principle of the treatment of opposites. Biological and physical changes were thought to affect the hot-cold balance of the body and were thus treated by adjustment of the diet to redress the balance. The paper discussed in some detail the dietary (as well as behavioural) practices during pregnancy, confinement, menstruation, and circumcision. Women were found to be particularly affected by food restrictions. Dietary constraints were marked during the puerperium but traditionally the diets of pregnant and menstruating women were also restricted. Men, on the other hand, were relatively free from such constraints, although Malay boys were also subjected to proscriptions, similar to those observed by newly-delivered mothers, following their circumcision. The implications of such food restrictions were also discussed.

110. MANDERSON L

Traditional food classifications and humoral medical theory in Peninsular Malaysia

Ecology of Food and Nutrition, 11:81-93, 1981

Humoral medical theory is believed to have reached Malaysia through Unanic, Ayurvedic and Chinese medical traditions. Today, prime evidence of this theory remains in the classification of foods as hot and cold, and less frequently as wet and dry, that relate to the reputed effects of the foods on the body. Additionally, foods may be classified as windy, sharp, itchy and poison. Foods may be prescribed or avoided according to diagnosis of an individual's health status or physiological state. This paper examined the extent of knowledge of such traditional food classifications and associated dietary prescriptions in contemporary Malaysia. Data were derived from studies of 278 women of the three major ethnic groups, from 5 state in Peninsular Malaysia, carried out in 1978-1979. It was observed that a total of some 100 separate foods were classified as hot by respondents, and there was considerable consensus regarding the general application of this classifier. Hot foods including animal protein foods, fried foods, condiments and spicy dishes, herbal preparations and a few local fruits, notably durian and rambutan. Another one-hundred odd foodstuffs and preparations were classified as cold, most of which were fruits and vegetables. In both these classes of foods, there was general agreement across ethnicity regarding initial classification, grading and the effect of the food on the body. It was also observed that these classifications could be predicted by their nutritive value, since those foods deemed cold tended to have a higher water content, less protein, lower fat, lower carbohydrate content and fewer calories. In addition, 90 foods were classified as windy foods, 51 as sharp foods, 87 as itchy, and 93 were said to be poisonous foods. Aside from these, many foods were neither classified as hot or cold or necessarily ascribed balanced, bland or neutral properties.

111. MANDERSON L

Bottle feeding and ideology in colonial Malaya: the production of changes

International Journal of Health Services. 12(4):597-616. 1982

The paper was to provide documentation of the historical developments that led to the wide acceptance of bottle feeding in Colonial Malaya (today Peninsular Malaysia and Singapore). Condensed milk was already marketed in the country from the late 19th century. Infant formula was available from the turn of the century and was widely advertised, first in the English-language press and later also in the vernacular presses. At the same time, other social and cultural factors served to discourage breastfeeding. There were changes in ideas regarding ideal body weight for both women and infants, and regarding infant care and diet; these diets were presented in the mass media. In addition, maternal and child health clinics, established in the 1920s to reduce the high infant mortality rate, both propagated popular beliefs about infant weight and supplied milk and educated women to artificially feed their infants. It was thus shown that industry, the media, and the medical profession together have promoted, if not always intentionally, bottle feeding rather than breastfeeding. Bottle feeding as an ideal, if not a reality, was thus well established before the intensive promotion of milk products by multinational corporations that followed the political independence of the Colony.

112. MANDERSON L

Infant feeding practice, market expansion, and the patterning of choice, Southeast Asia, 1880-1980

Proceedings of Food Conference 1982. (Theng CY, Kwik WL and Fong CY, ed.), 16-20 May 1982, Singapore; Singapore Institute of Food Science & Technology, Singapore. 1982; pp. 267-273.

Some of the social, structural and economic (especially commercial) factors which have influenced infant feeding practice over the past century were examined. The marketing of milk into Southeast Asia was traced from the time of the establishment of permanent European settlements in the region. By around 1910, fierce competition had developed amongst milk companies, represented by all major industrialized milk-producing countries. The frequency of advertising reflected the intensity of this competition. Besides direct advertising, corporations were also promoting their products through government and voluntary agency infant health programs. Soon the medical community drew attention to the association between the high infant mortality rates and artificial feeding. However, tin and powdered milk were said to be provided to mothers through government health clinics, such as the maternal and child health clinics. This was thought to have affected attitudes towards infant feeding practice, encouraging the use of such products. Ideas regarding infant weight, the female figure, and motherhood had also influenced women's decision-making regarding method of infant feeding. In addition, rapid economic and structural changes had had a profound impact on women and the family, creating an environment which discouraged prolonged lactation and which left many women with little choice but to bottle feed. It was however pointed out that the paucity of data of changing infant feeding practice in Southeast Asia precludes our understanding of the relative impact of these various factors or of the processes by which individual women decide the method of feeding their infants.

113. MANDERSON L

'These are modern times': infant feeding practice in Peninsular Malaysia

Social Science and Medicine, 18(1):47-57, 1984

This paper examined key sociological factors that might predict the frequency and duration of breastfeeding and weaning patterns. The data analysed were collected during semi-structured interviews with 278 women presenting at Maternal and Child Health Clinics in five states in Peninsular Malaysia from 1978-1979. The findings appeared to suggest that whilst the majority of women still breastfed, their propensity to do so, and to do so for a prolonged period, appeared to relate to and thus be influenced by the general social and cultural environment. Standard socio-economic indices such as income, education and the occupation of both the woman and her husband did not seem to relate directly to infant feeding and were generally not statistically significant indicators of infant feeding practice. However general effects of modernisation, industrialisation and development, indicated in the data by state, appeared to be significant. Again depending on residence, the data suggested that the supplementation of breast milk with artificial milk was increasingly common, and that also women increasingly use commercially manufactured as well as home-made weaning foods. The details of infant feeding choice however remain obscure. One of the shortcomings of the study was said to be related to the method of collection of data, and serve to highlight the need for detailed ethnographic studies to better explore the variability and complexity of the patterns of infant feeding.

114. MAT ISA A and TEE ES

The status of aflatoxin research in Malaysia

Country Report presented at the First Technical Consultation of ASEAN Mycotoxins Experts, Malaysian Agricultural Research and Development Institute, Serdang, 3-8 December 1984, Kuala Lumpur

The report gives a review of the research on aflatoxins carried out in Malaysia, discusses the problem of aflatoxin contamination in several food and agricultural produces, and looks into the measures taken to control the problem. Aflatoxin research in the country has been concerned mainly with studies into the occurrence of this mycotoxin in local foodstuffs. Various studies carried out by the IMR in the 1960's and 70's are reviewed. Data from more recent studies, those in the 1980's are tabulated to give an idea of the extent of the contamination problem. The review shows that the screening work so far carried out has not been sufficiently extensive to give an accurate and overall picture of the aflatoxin contamination problem in the country. There is thus a need for a more extensive and systematic screening programme for all susceptible commodities in order to understand and evaluate the extent of the problem. Efforts should be made to identify the stage(s) of contamination by the toxin so that the problem could be more effectively tackled. Such studies can then assist the drawing up of control and regulatory measures for aflatoxin control which are currently lacking in the country.

115. MCKAY DA

Nutrition, infection and Development: a ten year follow-up of children in Ulu Terengganu

Proceedings of the Third Asian Congress of Nutrition, (Didin S Sastrapradja, Soenartono Adisoemarto and Setijati Sastrapradja, ed.), 6-10 October 1980, Jakarta; pp. 603-611.

During the 1968-1969 period, detailed anthropometric, clinical, infectious, and socio-demographic data collected in a longitudinal study of the preschool-age children in ten relatively remote villages in the Ulu Terengganu district had shown that these children were faced with various nutritional and health problems (McKay & Lim, 1971; McKay et al, 1971 and McKay, 1971). Ten years later, in 1979, the same cohort was traced to re-determine their developmental status. Several tests of cognitive skill were given to the surviving cohort, and several aspects of the changing community, family, and child health were also assessed. It was observed that early childhood nutrition, indicated by weight and height, appeared to be a notable antecedent of later mental ability, although various environmental interactions were also involved. It was thus suggested that research and intervention efforts should focus on defining and enriching the total environment relevant to healthier child development. Clearly, good nutrition and freedom from major infections were important, closely inter-related components in the environment.

116. MD YUNUS J

Metodologi kajian amalan makanan murid sekolah rendah (Methodologies for studies of food habits of primary school children)

Proceedings of the Workshop on Food Habits of Primary School Children, (Zanariah J, Aminah A, Yunus J, Nawalyah AG and Sahari J, ed.), 23-24 August 1988, Kuala Lumpur: ASEAN Sub-Committee on Protein, Kuala Lumpur, 1988; pp. 70-88.

The paper described the statistical procedures employed to select the sampling units for the study, the primary school children. The required data were obtained from the children using prepared questionnaire forms, suitably coded for computerisation. Appropriate forms were also prepared for collection of data on the condition of canteens, foods sold and the cost of the foods. Data obtained were analysed using the SAS programme.

117. MEGAT BURHAINUDDIN MAR

Manpower development for national food and nutrition programme in Malaysia

Proceedings of the SEAMEO-TROPMED 2nd Seminar on Nutrition, (Pongpaew P, Sastroamidjojo S, Prayurahong B, Migasena P and Rasad A, ed.), 20-21 March 1989, Jakarta, Indonesia; Mahidol University, Bangkok, 1990; pp. 383-390.

The paper highlights the main nutritional issues in the country and the major intervention programmes implemented. The current situation on human resource development was next discussed, in relation to these programmes and activities. Finally, future developments in man power development were discussed in relation to future trends in health-care delivery system development in the country.

118. MOHAMAD NORDIN AK

The nutritional aspect of fast food in Malaysia

Paper presented at the Malaysian Institute of Food Technology Seminar on Mass Catering and Fast Food, 26 February 1983, Kuala Lumpur; 16 p.

In Malaysia, the more than 100 fast food outlets offer fried chicken, burgers, pizzas and satay. A study was conducted to determine their popularity through questionnaires, in order to know the contribution of such fast foods intake. Proximate composition of samples of these foods were also analysed in the laboratory. Result obtained were discussed in relation to contribution to daily nutrient intake, cost, as well as stability of nutrients during processing.

119. MOHAMAD NORDIN AK and MOHD NASIR A

Intake and popularity of Malaysian franchised fast foods

Proceedings of the Nutrition Society of Malaysia, 4:19-24, 1989

A survey covering 200 households in the vicinity of fast food establishments was carried out through questionnaires. Analysis revealed that 84% of the respondents frequented such places only once or less than once a month. The most popular fast food outlet was Kentucky Fried Chicken, followed by McDonald's and A & W. The taste, cleanliness of the premise and their location, are the major factors considered by the respondents frequenting such establishments. The foods offered by the fast food outlets were perceived not to be harmful to health and believed to contain high protein with fair to high energy. Television and newspapers played an important role in promoting fast foods in Malaysia. The present trend of patronage showed that the nutritional implication of fast foods in the country is still minimal. Awareness, however, should be cultivated to maintain patronage to that of the present level, especially when the frequency would likely to increase if the price of the foods offered was cheaper.

120. MOHD SHAM K, ZULKIFLI I and LAILANOR I

Nutritional status of children of various Orang Asli communities in Peninsular Malaysia

Akademika, 7:69-74, 1989

An anthropometric study of 566 Orang Asli children (276 boys and 290 girls) below 10 years of age was conducted in 28 villages in 7 separate areas in Peninsular Malaysia. Using below 2 standard deviations of the NCHS median as the cut-off, it was found that 56% of these children were underweight and 65.7% were stunted. Using the reference mid-upper arm circumference values of Wolanski, it was found that 41.8% had low mid-arm circumference. The data in each of the areas visited varied. It was concluded that the prevalence of malnutrition is very high among the aborigines of Peninsular Malaysia. Nutritional status of children below 6 months was generally better, probably due to the predominance of breastfeeding. However, more and more mothers were turning to sweetened condensed milk for their babies, and the older children were fed diets consisting mainly of tapioca and low in calorie and protein. The report emphasized the importance of coordinating the various units in the Department of Orang Asli so that there are greater interactions and exchange of information for the betterment of the aborigines.

121. MOHD YUSOF L

Analysis of the constraints prevailing in applied food and nutrition programmes and examination of the role of supplementary foods in community nutrition

Proceedings of the 2nd ASEAN Workshop on Food Habits, (Foo LC and Chong YH, ed.), 7-11 July 1979, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1982; pp. 75-81.

Recognizing that nutritional status is influenced by several factors, such as economic, socio-cultural, education, etc., an integrated approach was adopted to raise the health standard of the community. The approach consisted of a four prong strategy, which included improved economy and food production, education activities, health and sanitation activities, and supplementary feeding programmes. The launching of the AFNP in 1969 as a pilot project in Kuala Langat, Selangor, was described. Plans for the expansion of the Programme to other areas, development allocation and operating expenditure were outlined. Evaluation studies of some of these Programmes were reported. The constraints prevailing in the AFNP were discussed. The objectives of supplementary feeding programmes in the country were pointed out. The implementation of school supplementary feeding schemes was described in some detail.

122. NARIMAH A

Magnitude of cardiovascular diseases in Malaysia and its dietary relevance

Report of the Workshop on Malaysian Case Studies on Food and Nutrition Interventions, National Committee on the ASEAN-New Zealand Inter-Institutional Linkage Programme, Kuala Lumpur; 1993; pp. 47-51.

There is adequate clinical and epidemiological evidence to indicate that cardiovascular disease, especially coronary heart disease, is becoming a very important (if not the most important) health problem in Malaysia. The magnitude of the problem extends to social and economic implications. Several factors have been identified as posing as risks to coronary heart disease, many of which are amenable to change because they are related to lifestyle. One of these is diet, and it is possible to characterise the kind of diet that predisposes to, and one that prevents a heart attack. The dietary recommendations for prevention of CHD can also hold good for the prevention of other diseases notably cancer, hypertension and diabetes.

123. NAWALYAH AG

Nutrient needs and supplements

Proceedings of the Nutrition Society of Malaysia, 3:1-6, 1988

To a nutritionist, supplements are considered as something 'extra' that a healthy person can do without. Only in certain physiological condition or stresses as in a pregnant/lactating woman, an adolescent during the 'growth spurt' period or an individual with an illness, are the needs for certain nutrients increased. When the diets of these individuals are inadequate to meet the increased nutrient demands, then certain vitamin or mineral supplements are necessary in order to prevent nutrient deficiencies and their negative health effects. Appropriately, these nutrient supplements should be prescribed by a qualified health/medical personnel. Self-diagnosis and self-prescription should never be encouraged at any time. An overdose

of certain vitamins, especially the fat-soluble vitamins A and D, minerals (especially calcium) can lead to toxic side-effects. This can happen when these supplements are easily available from pharmacies, sales persons, friends or even the corner grocery store. Children's supplements with their attractive packaging, shapes, colours and flavours will surely tempt children to take more than the dosage recommended. Another concern is the price of the supplements which are only affordable by the middle and upper income groups, whereas the occurrence of vitamin-mineral deficiencies are mostly among the lower income groups, who least can afford supplementation.

124. NAWALYAH AG, MAZNAH I and AZIDAH M

Iron deficiency anaemia and its effects on the working capacity of rural women in the Bagan Datoh district Perak

Presented at the Seminar "Towards the improvement of Quality of Life". Department of Human Development Studies, Universiti Pertanian Malaysia, Serdang, December 1989

The objective of the study was to evaluate the iron status of women workers from rural villages and estates. Possible causative factors were investigated. The iron status of the subjects was correlated with their working capacity in terms of earnings. A total of 89 women from 5 villages and 97 women from 2 estates in the Bagan Datoh District, Perak, was selected. The respondents were individually interviewed using questionnaires to obtain information on their socio-economic background, health status, and dietary intakes for three days. About 2 ml of blood was taken from each respondent and several haematological parameters determined. The rates of absorption of iron from the respondents' diet samples were measured by the *in vitro* method of Miller et al. (1981). The respondents were found to belong to 4 categories according to their iron status: (1) severely anaemic; (2) mildly anaemic; (3) iron deficient; and (4) normal. Overall, the incidence of anaemia amongst Malay women studied was found to be 7.8%, whilst that of Indian women was 50.5%. Their calorie, protein and iron intakes were found to be unsatisfactory. Percentage absorption of iron from their diets was found to be very low i.e. 1-3%. It is suspected that the presence of inhibitors of iron absorption was high in their diets, whilst enhancers of iron absorption were lacking. Other causative factors such as health status, multiple pregnancies, close spacing between pregnancies, abortions and other dietary habits could bring about a poor iron status in women. With regards to working capacity, non-anaemic women were found to have a significantly higher yields per working day, compared to anaemic women. Thus iron-deficiency anaemia in a working women can be a liability not just to herself, but also to her family and community.

125. NAWALYAH AG, MAZNAH I, POH SC and AZIDAH M

A study of iron status and working productivity of women estate workers

Department of Human Development Studies, Universiti Pertanian Malaysia, Serdang, 1989

The objective of this study was to assess the iron status of women estate workers and to determine the relationship between iron-deficiency anaemia and the working capacity of the respondents. Blood samples of the respondents were tested for values of haemoglobin, hematocrit, and mean corpuscular volume (MCV) as screening tests and for values of serum iron, total iron binding capacity (TIBC) and percentage (%) transferrin saturation as confirmatory tests. Information on socio-economic background,

the dietary intakes of respondents and their collection of rubber latex were obtained through questionnaires. The number of respondents studies were 36 women from Glengowrie estate, 32 women from Semenyih estate, and 32 women from Connemara estate making a total of 100 respondents, mostly Indian women. Results obtained showed that the incidence of low iron status is a common occurrence amongst the respondents especially from the Semenyih estate. An analysis of their daily food intakes showed that the overall intake of their foods was inadequate in total-calories, iron and ascorbic acid. The iron intake of the respondents from Semenyih Estate was only 17.74 g per day while the amount recommended for Malaysian female adults is about 28 g per day. From the results of this study, the daily collection of rubber latex (in terms of Ringgit) were compared between the severely anaemic, moderately anaemic and non-anaemic subjects from the three estates. The severely anaemic respondents were found to be at a disadvantage in that they earned less than an average of RM2.00 per day or about RM50.00 for a (25 - day tapping) month than non-anemic workers. Earnings of respondents with moderate anaemia were not as badly affected.

126. NAWALYAH AG, MAZNAH I and ROKIAH MY

Status semasa kantin-kantin sekolah rendah di Malaysia serta bahan-bahan makanan yang terdapat di kantin-kantin sekolah (Current status of canteens in primary schools in Malaysia and foods available in these canteens)

Proceedings of the Workshop on Food Habits of Primary School Children., (Zanariah J, Aminah A, Yunus J, Nawalyah AG and Sahari J, ed.), 23-24 August 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1988; pp. 109-119.

The objective of the study was to understand the current status of canteens in primary schools in Peninsular Malaysia and to identify the problems in the management of these canteens. The study involved interviews with the canteen operators using prepared questionnaires in order to obtain information on the canteens, prices of foods sold in the canteens, and other relevant information. The researchers also carried out an objective evaluation of the cleanliness of the canteens and the surroundings. Results of the study showed that the overall condition of the canteens in urban areas were better than that of canteens in rural schools. The building of most school canteens need to be renovated in order to improve the management of these premises, especially with regards to storage, preparation, packaging and sale of food. With regard to facilities, it was found that sinks for washing of hands were lacking in most canteens, except for schools in the Kuala Lumpur area. Other facilities, such as chairs, tables, crockery, and food covers were in satisfactory condition. On the whole, garbage disposal and the surrounding of the canteens were satisfactory. Price tags were however rarely seen in the canteens studied. The prices of several foods sold in school canteens in various districts were compared and discussed.

127. NG TKW

Current food and nutrition situation in Peninsular Malaysia

Proceedings of the 3rd ASEAN Food Habits Workshop, 1-4 December 1980, Bangkok, Thailand; ASEAN Sub-Committee on Protein, Bangkok, 1980; pp. 43-45.

The paper highlighted the nutrition situation in Peninsular Malaysia, covering aspects such as food availability and food consumption, current nutritional problems, and food habits and their effects on nutrition. The review showed that inspite of availability of an excess of calorie and protein over requirements at the national per capita level,

the energy and fat consumption in rural households appear to be low while childhood malnutrition remained an important problem. It was emphasised that besides family income, the food beliefs and food practices of the mother will determine not only the type of food she eats, but also that which is given to her infant or young child. Much governmental effort are put into intervention programmes and where the education of the mothers/school children and the introduction of new food to the community are involved, a good understanding of the food habits of the people is necessary.

128. NG TKW

Palm olein as the predominant fat in the diet of Malaysians - some major nutritional considerations

The Family Physician, 1(2):43-46, 1989

The bulk of refined palm oil enters the Malaysian food system as RBD palm olein, which is mainly used as a cooking or frying oil. When consumed through this manner, RBD palm olein constitutes the predominant fat in the diet of Malaysians. In this role, RBD palm olein provides approximately 11-20 energy % in rice-based Malaysian diets, and thus serves as an important source of energy. In such diets, the amount of EFA supplied by RBD palm olein is estimated to be about 2 energy % which is sufficient for minimum daily EFA needs. Apart from cooking oil, the "invisible" or unseparated fats in the diet provide additional EFA, approximately doubling the dietary EFA availability and thus providing a margin of safety. Currently, our knowledge of the dietary impact of palm oil on serum cholesterol or heart disease risk is incomplete. Available evidence from feeding trials conducted in humans, although not entirely scientific in a few cases, indicates that palm oil is at least non-hypercholesterolaemic. This inference is supported by the recent hypocholesterolaemic effects reported for two important components of palm oil, viz. oleic acid and tocotrienols.

129. NG TKW

Edible oils and fats in the Malaysian diet: the role of RBD palm olein

Proceedings of the Seminar on Advances in Food Research III in Malaysia., (Suhaila M and Azizah O, ed.), 19-20 November 1990, Serdang; Universiti Pertanian Malaysia, Serdang, 1990; pp. 157-169.

In the half century, edible oils and fats in the diet have remained a fascinating topic among nutrition scientists. The important function of these major dietary components are: (a) serve as a source of energy, (b) required for cell structure and membrane functions, (c) provide essential fatty acids (EFA) for cell structure and prostaglandin synthesis, (d) enhance the flavour of food and promotes a feeling of satiety, and (e) acts as a vehicle for fat-soluble vitamins, have been established. However, there are certain issues regarding dietary fats that have remained controversial or are still largely unresolved. Among these issues include the safety of excessive polyunsaturated fatty acids, the status of trans-fatty acids as dietary components, optimal levels of omega-3 fatty acids and last but not least, the dietary influence of palm oil on cardiovascular risk. The purpose of this paper is to report the amounts, types and source of edible oils and fats in the nation's food supply, and in the diets of certain rural communities and urban population groups. Particular attention shall be focused on refined, bleached and deodorised (RBD) palm olein, the liquid fractionation product of palm oil, which is currently featured prominently in the diets of the majority of Malaysians.

130. NG TKW

Recent advances in palm oil research: contributions from Malaysian researchers

Proceedings of the Nutrition Society of Malaysia, 8:63-74, 1993

This article highlights the studies carried out by Malaysian researchers on the dietary impact of palm oil on human health during 1985-1992. Of relevance was the work by Ng TKW at the IMR Kuala Lumpur on the classical nutrition criteria (digestibility, absorbability and utilisation) for processed palm oil and its fractions, palm olein and palm stearin, which were published in 1987 and 1988. Ng's group at the IMR later conducted 2 important palm olein feeding trials in humans, the results of which were published in 1991 and 1992. In the first study, it was found that palm olein, when consumed as the major dietary fat in typical Malaysian diets, did not raise blood cholesterol levels in normocholesterolemic subjects. In the second study, Ng et al. observed favourable effects of palm olein compared with the much-extolled olive oil which is said to be an important part of the protective "Mediterranean diet". Meanwhile, Sundram and co-workers at PORIM demonstrated in normocholesterolemic humans that dietary palmitic acid is hypocholesterolemic relative to myristic acid plus lauric acid, an observation reported earlier in a monkey model by Hayes' group at the Brandeis University, United States. Concurrently, Honstra and Sundram also reported that a maximal replacement of the habitual fats in the Dutch diet with palm oil did not raise plasma cholesterol levels, but increased plasma concentrations of the "protective" HDL3 and Apo A-1, and decreased plasma levels of the risk factor lipoprotein(a). Significant contributions in palm oil research were also made by Khor's group at the University of Malaya, and by Gapor and colleagues of PORIM who painstakingly isolated a tocotrienol-rich fraction from palm oil and making this material available to researchers worldwide.

131. NG TKW, KHALID H, LIM JB, LYE MS and ROSHIDA I

Nonhypercholesterolemic effects of a palm-oil diet in Malaysian volunteers

American Journal of Clinical Nutrition, 53:1015S-1020S, 1991

The effects on serum lipids of diets prepared with palm olein, corn oil, and coconut oil supplying ~75% of the fat calories were compared in three matched groups of healthy volunteers (61 males, 22 females, age 20-34 y). Group I received a coconut-palm-coconut dietary sequence; group II, coconut-corn-coconut; and group III, coconut oil during all three 5-wk dietary periods. Compared with entry-level values, coconut oil raised the serum total cholesterol concentration > 10% in all three groups. Subsequent feeding of palm olein or corn oil significantly reduced the total cholesterol (-19%, -36%), the LDL cholesterol (-20%, -42%) and the HDL cholesterol (-20%, -26%) concentrations, respectively. Whereas the entry level of the ratio of LDL to HDL was not appreciably altered by coconut oil, this ratio was decreased 8% by palm olein and 25% by corn oil. Serum triglycerides were unaffected during the palm-olein period but were significantly reduced during the corn-oil period.

132. NOOR LAILY AB, TAKESHITA YJ and MAJUMDAR PK

Trends in high risk births in Peninsular Malaysia in the decade following the implementation of the National Family Planning Programme (1967-1977)

Malaysian Journal of Reproductive Health, 1(2):120-126, 1983

The paper presented the trends in high risk births in Peninsular Malaysia in the first decade (1967-1977) following the implementation of the National Family Planning Programme. The study was based on data published annually in the Vital Statistics Report of the Department of Statistics. High risk births were defined arbitrarily as those that are 4th or higher order and those occurring to mothers under 20 or 35 years and over. The proportion of higher order births declined from 49.8% to 35.4% and the proportion of births to mothers under 20 declined from 10.2% to 8.2%. For mothers 35 years of age and over the decrease in mortality was from 15.0% to 13.0%. This decrease in mortality rates appeared to be, in part, due to an increased awareness of family planning. This decline also coincided with the decline in neonatal, infant and maternal mortality rates during the same period. This effect appears to hold true for all the three major ethnic groups and is consistent with the objectives of the National Family Planning Programme. The authors called for further research in this area to establish a more direct causal link between reduction in high risk births and decrement in mortality rates. This was felt essential in order to provide sufficient feedback for future family planning and maternal and child health programmes.

133. NOOR LAILY AB, TAKESHITA YJ, MAJUMDAR PK and TAN BA

The changing ethnic patterns of mortality in Peninsular Malaysia: 1957-79

Malaysian Journal of Reproductive Health, 1(1):S113-S146, 1984

The improvement in life chances in Peninsular Malaysia since independence has been remarkable. There have been gains in the life expectancies for males and females in the 22 years from 1957-1979. Clearly, there is still room for continued improvement since not all ethnic groups are at the same level in 1979. Furthermore, Malaysia as a whole is still behind Singapore, among the ASEAN countries, and South Korea and Japan, among the more developed countries in Asia. This paper was aimed at documenting the vast improvement in mortality that Malaysia (specifically Peninsular Malaysia) has experienced since Independence and identify any significant gaps that remain within the context of this experience.

134. NORIMAH AK and ABU BAKAR AWANG AH

Food intake and anthropometric status of diabetics attending Universiti Kebangsaan Malaysia patient clinic

Proceedings of the Nutrition Society of Malaysia, 8:16-22, 1993

A study to determine the food intake and anthropometric status of diabetics attending the UKM out-patient clinic was carried out. Seventy-three diabetics (36 males and 37 females) comprising Malay, Chinese and Indian patients were involved. Food intake was evaluated using 24-hour dietary recall while weight, height, tricep skinfold and arm circumference measurements were taken to determine the anthropometric status. The mean energy and vitamin A intakes of the subjects were below the recommended dietary allowance. On the other hand, the mean intakes of protein, calcium, iron and

vitamin C were above the recommendations. The carbohydrate, protein and fat contribution to total calories ranged from 55-59%, 17-18% and 23-28% respectively. Sixty-two percent of the diabetics were overweight while 47% and 51% had tricep skinfold and arm circumference above the WHO standard.

135. NORIMAH AK and ROGAYAH Y

Nutritional knowledge and food intake of first year students at Universiti Kebangsaan Malaysia, Bangi

Proceedings of the Nutrition Society of Malaysia, 5:79-84, 1990

The evaluation of nutritional knowledge and food intake were carried out on 153 first-year students of the Universiti Kebangsaan Malaysia (UKM), Bangi. The study showed that 98% of the students had good nutritional knowledge; there was no significant difference between sex and ethnic groups. However, a significant difference ($p < 0.05$) in nutritional knowledge was observed between subjects from the Arts and Science streams. The three-day dietary records of the male subjects showed that their mean energy, protein, thiamin, niacin, vitamin C and iron intakes were higher than the Malaysian recommended dietary allowance (RDA). A similar dietary pattern was also seen in the female subjects except that the mean iron intake was lower than the RDA.

136. O'HOLOHAN DR

Nutritional advice for cardiac patients

Nutrition Research, 12(Supplement 1):S69-S83, 1992

Since the earliest times the physician has been expected to accompany all medical treatment and advice, both immediate and long term, with specific dietary or nutritional advice. The wheel has turned almost full circle from the days of Hippocrates. For thousands of years nutritional or dietary measures in some form or another dominated medical treatment. For a century since the discovery of pathogenic microorganisms, diet has been regulated to a minor, if still necessary, role. This attitude prevailed up to the decade after World War II. Now that near mastery has been achieved over the microorganisms there is growing impatience with the seeming inability of the medical sciences to win equal success with the so-called modern "epidemic" of coronary heart disease (CHD). The proponents of the still unproven hypothesis that dietary fat intake plays a major causal role in the development of atherosclerosis and CHD received unexpected support, principally in the USA, when research reports, eagerly given wide publicity by interests in the US edible vegetable oil industry, suggested that the saturated fats of the so-called "Tropical Oil", meaning palm and coconut oils, presented a particular health hazard, i.e. were atherogenic. Apart from presenting the case that the dietary fat-CHD relationship is casual rather than causal, this paper will suggest that even if the hypothesis were valid, the use of palm oil in the diet would have an anti-atherogenic effect because of the inherent qualities peculiar to palm oil and that if the hypothesis is invalid, then dietary advice to cardiac patients should be primarily directed towards any underlying disease of metabolism, clinical obesity or unhealthy lifestyle which might further embarrass an already compromised patient.

137. ONG CL

Some aspects of the health status of selected primary entrants pupils in Butterworth

Dissertation submitted to the University of Malaya in part fulfillment for the Degree of Master of Public Health, 1980

Some aspects of the health status of 310 Malaysian primary school entrants aged 6-7 years, from the three ethnic group were studied in relation to some socio-economic factors of their parents. Two urban schools in Butterworth were selected for the study. Heights and weights were measured and examined for signs of nutritional deficiency for vitamins A, B and C, as well as other specific health problems. It was observed that the Indians were the worst off in anthropometric measurements. They were also economically the poorest and had the largest family size. Higher income children had better growth achievement than that of poorer children, irrespective of their ethnic group.

138. OO SL, CHANG P and CHAN KE

Toxicological and pharmacological studies on palm vatee

Nutrition Research, 12(Supplement 1):S217-S222, 1992

Palm vatee was tested for acute toxicity in young albino mice and Sprague-Dawley rats. The animals were fed daily doses (250, 500, 1000 or 2500 mg/kg) of palm vatee in refined, bleached and deodorized palm olein for 30 days. Time-matched controls consisted of untreated or olein-treated animals. Results indicated that treated rodents did not exhibit any physical abnormalities or unusual behaviour. However, some sluggish motor activity was manifested. Interestingly, treated mice gained weight significantly whereas treated rats grew normally over the 30-day period. In anaesthetized cats, palm vatee produced inconsistent, minor fluctuations in the mean arterial pressure and heart rate, but variable responses were also obtained with injections of olein alone. The authors concluded that palm vatee, in extremely high doses, did not appear to produce appreciable adverse effects in the animals used.

139. OOMMEN TT

Makanan tambahan di sekolah (School supplementary feeding)

Proceedings of the Seminar on Supplementary Feeding Programme in Malaysia, 16-17 January 1980, Kuala Lumpur; pp. 35-41.

School supplementary feeding programmes serve not only nutritional purposes but also educational on the various aspects of food and nutrition and could aid in training the young for desirable social behaviour. The history of school feeding programmes in the country was briefly traced from the time immediately after the Second World War to those currently being implemented by the Ministry of Education. The programme in 1980 covered all the districts in the State in Peninsular Malaysia, all the districts in the Residencies of Sabah and all the districts in the Divisions of Sarawak. 6,403 primary schools were covered, benefiting a total of 665,700 pupils at a total cost of RM19,975,000. "Balanced" snacks, based on various menus making use of local foodstuff were provided to these pupils for 150 days in that years. The needs, benefits and some problems involved in implementing the programmes were highlighted. It was emphasized that

the technological, administrative and human behaviour aspects of the programmes should be considered as an interrelated and inter-dependent system.

140. OSMAN A, KHALID BAK, TAN TT, WU LL and NG ML

Protein energy malnutrition, thyroid hormones and goitre among Malaysian aborigines and Malays

Asia Pacific Journal of Clinical Nutrition, 1:13-20, 1992

The relationship between malnutrition, goitre and thyroid hormones was studied among Aborigines and Malays in Ulu Langat. Fifty Aborigines aged greater than 7 years were selected randomly for anthropometric, clinical and hormonal assessment. Fifty Malays of similar age from the nearby Malay village were chosen as controls. The Aborigines had a higher prevalence of malnutrition and goitre compared to the Malays. The prevalence of goitre was 26.5% amongst Aborigines and 19.6% among the Malays. All the nutritional indexes measured were significantly different between the two communities, especially among females. The differences corresponded to significant differences in levels of thyroid-stimulating hormone (TSH) measured using a highly sensitive TSH assay. By univariate analysis the increase in TSH corresponded to the decrease in body mass index (BMI). On the other hand, no association was found between BMI and goitre. No thyroid autoantibodies were detected and all subjects were clinically euthyroid and had normal thyroxine and triiodothyronine levels. However, consumption of cassava conferred a four-fold risk of developing goitres. The high prevalence of goitres in malnourished subjects in this region which is not known to be iodine deficient could be due to cassava consumption.

141. OSMAN A, KHALIDA M, AZMAN AB, JAMIL R, TAN TT, WU LL, SAKINAH SO and KHALID BAK

Iodine content in drinking water not an important determinant of endemic goitre

Asia Pacific Journal of Clinical Nutrition, 2:115-118, 1993

The prevalence of goitre was determined in several communities: 2 Aboriginal settlements in the jungle, 2 rural areas in Pahang, and 2 in Kuala Lumpur City. A total of 1,419 subjects were studied. Urine specimens were collected randomly among the participants. Drinking water from various sources such as river and spring, and water from gravity feed systems was also collected to determine the iodine content by using the Sandell-Kolthoff reaction method. The results were compared to that of Kuala Lumpur City. It was found that the prevalence of goitre in rural areas was between 20 and 70% depending on village, ethnic group, age and gender. The interior parts of the jungle where Aborigines lived was moderately endemic with goitre prevalence of more than 20% and urinary iodine content of 2.0-5.0 ug I/dl. A nearby Malay traditional village which was studied had mild endemic (prevalence 10-30% and urinary iodine content 5.0-10.0 ug I/dl) while a Felda Malay resettlement scheme and Kuala Lumpur City did not have endemic goitre. Endemic goitre in rural areas was associated with low iodine content in drinking water. Even though Kuala Lumpur had low iodine content in its drinking water there was no endemic goitre, indicating that other factors were more important.

142. OSMAN A, SUHARDI A and KHALID BAK

Ukuran anthropometri kanak-kanak Melayu keluarga mewah di Taman Tun Dr Ismail Kuala Lumpur (Anthropometric measurements of Malay children of affluent households in Taman Tun Dr Ismail, Kuala Lumpur)

The Medical Journal of Malaysia, 48(1):76-82, 1993

This study was done to determine the anthropometric measurement patterns of Malay children from wealthy families in Malaysia and to make a comparison with NCHS reference population. A population of 900 children aged between 3-12 years old from Taman Tun Dr Ismail, Kuala Lumpur (TDI), were examined but only 871 of them were eligible for the study. Weight, height, mid-arm circumference and skin fold thickness were measured. The increment pattern of anthropometric measurements of TDI children was quite similar to NCHS except for having a lower median weight for age and height for age. There was prepubescent increase in skin fold thickness in both sexes, followed by a midpubescent decrease and a pubescent increase. The study indicated that Malay children from a wealthy background have growth rates comparable to children in the West, hence NCHS percentile charts are suitable as a reference for comparing the nutritional status of Malay children in Malaysia.

143. OSMAN A, ZARINA S and KHALID BAK

Socioeconomic, social behaviour and dietary patterns among Malaysian aborigines and rural native Malays

The Medical Journal of Malaysia, 46(3):221-229, 1991

The socioeconomic, social behaviour and dietary pattern of 100 Aborigines and Malays, aged 7 years and above from Kuala Pangsoon, Selangor, were studied by using pretested questionnaires. The individual dietary intake was estimated using 24-hour recall for 3 days. The household food consumption pattern was evaluated using food frequency questionnaires. There was no difference in the total income per month for both communities, as well as the educational attainment of the head of household and property ownership. The proportion of smokers among the Aborigines and Malays was almost similar (33%) but the percentage of heavy smokers was higher among Aborigines compared to Malays. One third of the Aborigines regularly consumed alcohol. The main energy source for both communities was rice, sugar and cooking oil whilst fish and eggs were the main sources of protein. More than 50% of the Aborigines consumed tapioca or tapioca leaves at least once a week compared to less than 20% among the Malays. There was no significant difference in the intake of energy, protein and carbohydrate between the 2 groups. However, the Aborigines take consumed less fats and iron compared to the Malays. The differences in terms of smoking, drinking habit and dietary intake may determine the distribution of disease in both communities.

144. PARAMESHVARA DEVA M

Aspects of nutrition and child development in Malaysia

Journal of the Psychiatric Association of Thailand, 26(3):27-30, 1981

Among the numerous factors affecting the health of the child and thereby that of the community and country, the one of perhaps greatest importance in today's developing world is that of nutrition. The paper discussed briefly the various nutrition problems

of children in Malaysia and the intervention programmes implemented to combat malnutrition, especially the Applied Food and Nutrition Programme.

145. PRABHA JOGINDER SINGH, CHEW GE and JOHN R

Infant health care practices - a study in three communities

The Medical Journal of Malaysia, 36(3):166-170, 1981

A cohort of 90 infants, mostly Malays, born in March in 1979 in Kedah, Pahang and Malacca were followed up to determine the feeding practices, preventive health care and medical care practices during infancy. It was observed that a high proportion of the infants studied continued to be breastfed until six months. Compared with the findings reported by other workers for urban areas, the incidence of breastfeedings in the rural areas studied was said to be higher and the duration of breastfeeding was longer. It was however found that the practice of early introduction of solids was similar to that practiced by urban mothers. It was felt essential that mothers needed to be made aware of delaying introduction of solids, as early as during the antenatal period. The remaining of the paper dealt with the preventive health care and medical care practices of the mothers of these infants.

146. PRATHAPA SENAN C

A study of the status of a Tamil community

Dissertation submitted to the University of Malaya in part fulfillment for the Degree of Master of Public Health, 1980

The health status of the Selangor River Division of the Sungei Buloh Estate in the Kuala Selangor District was studied. Several aspects were covered, including characteristics of the population, the available health facilities, infant feeding and weaning habits and the general nutritional status of the population, food supply, cost and production, as well as the available recreational and transport facilities. Of the total 50 households in the Division, 5 were selected for 24 hour recall dietary survey and 25 for the maternal and child health survey, carried out by personal inquiry, observation and questionnaire. It was reported that there was a lack of knowledge on infant and toddler feeding, and household diets were deficient in minerals and vitamins. There was a need for intensive health education and for creation of awareness of the existing problems. The government health services should be expanded to include the estate population. It was felt that the general distrust among the workers and thus a lack of cooperation and motivation had to be resolved before any community projects could be carried out.

147. GURESHI AA, GURESHI N, WRIGHT JJK, SHEN Z, KRAMER G, GAPOR A, CHONG YH, DeWITT G, ONG ASH, PETERSON DM and BRADLOW BA

Lowering of serum cholesterol in hypercholesterolemic humans by tocotrienols (palmvitee)

American Journal of Clinical Nutrition, 53:1021S-1026S, 1991

A double-blind, crossover, 8-week study was conducted to compare effects of the tocotrienol-enriched fraction of palm oil (200 mg palmvitee capsules/day) with those of 300 mg corn oil/day on serum lipids of hypercholesterolemic human subjects (serum

cholesterol 6.21-8.02 mmol/L). Concentrations of serum total cholesterol (-15%), LDL cholesterol (-8%), Apo B (-10%), thromboxane (-25%), platelet factor 4 (-16%), and glucose (-12%) decreased significantly only in the 15 subjects given palmvitee during the initial 4 weeks. The crossover confirmed these actions of palmvitee. There was a carry over effect of palmvitee. Serum cholesterol concentrations of seven hypercholesterolemic subjects (>7.84 mmol/L) decreased 31% during a 4-week period in which they were given 200 mg gamma-tocotrienol/day. This indicates that gamma-tocotrienol may be the most potent cholesterol inhibitor in palmvitee capsules. The results of this pilot study are very encouraging.

148. QURESHI RU

Food consumption, nutritional status and nutritional concerns in selected countries of the Asia-Pacific region

Proceedings of the 2nd Scientific Conference of the Nutrition Society of Malaysia, (Tee ES, Chong YH and Mohd Ismail N, ed.), 28 February 1987, Kuala Lumpur; Nutrition Society of Malaysia, Kuala Lumpur, pp. 1-17.

Food production in various countries of the Asia-Pacific Region has progressed satisfactorily during the last decade. The production of total cereals which constitute a major part of the diets of this Region grew at an annual rate of 3.8% and that was well ahead of the annual rate of population growth during the same period. The availability of total dietary energy in comparison with the normative requirement increased from 92.6% to 106.6% in the developing countries of the Region as a whole. Inter-country variations, however, show that a number of countries have not yet reached their levels of normative requirement of dietary energy, let alone nutritional adequacy. In the developing market economies of the Far East, although the proportion of the under-nourished had decreased, the actual number still remains over 300 million people. The concerns arising from this analysis will be discussed in this paper explaining the nutritional adequacy targets for production and the efforts which could be mobilized to combat malnutrition in the region.

149. RAJ AK

Life style diseases in Malaysia

Proceedings of the 2nd Annual Australian Tropical Health & Nutrition Conference 1990, (Gardiner W, Marks G and Barnes A, ed.), October 1990, Brisbane, Queensland; Tropical Health Program, Australia, March 1991; pp. 28-39.

With the development and expansion of the health services and introduction of various health programmes, coupled with the marked improvement of socio-economic development of the population, the health status of Malaysians can be seen to have improved over the years. There has been a steady reduction of infectious and preventable diseases. On the other hand, there has been an emerging trend in the relative increase of "lifestyle" diseases among adults. As is found in most other countries with similar problems of transition in disease patterns, this is mainly due to changing lifestyles of the population due perhaps to the process of rapid urbanisation and industrialisation, work patterns, occupation, behaviour and habits and changes in family structure. These changes in lifestyles have resulted in a changing pattern of disease trends in the country. Cardiovascular diseases have become the principal medically certified cause of mortality and morbidity in Malaysia. There is also an increasing trend in the number of cancer cases in the country. Some of the measures undertaken by the government to

control some of the factors influencing the emergence of lifestyle diseases were summarised, including the "healthy lifestyle" campaign.

150. RAMPAL L

Nutrition and tropical diseases: educational aspects in Malaysia

Southeast Asian Journal of Tropical Medicine and Public Health, 14(1):78-81, 1983

This report highlighted some of the educational aspects of nutrition and tropical diseases. Health conditions in most of the countries in this region has improved, but not at the same pace as the progress in medical sciences. The slow progress in tackling this problem has been partly due to the failure of understanding psycho-social, cultural and economic patterns. Many of the health workers and educators who are involved in the control of tropical diseases emphasize on practice rather than research. Due emphasis should be given to training and research in health education involving not only the professionals and auxiliary staff but also political leaders, policy makers and community leaders at grassroot level.

151. ROHANI MA

Food practices of secondary school students in Kuala Terengganu

Project report submitted in partial fulfillment of the requirements for the Degree of Bachelor of Science (Human Development), Universiti Pertanian Malaysia, 1988

The objective of the study was to examine the food practices of students from two types of ethnic schools namely a Chinese and a Malay medium school in Kuala Terengganu. A sample of 50 Chinese and 50 Malay students from Form 4 Science classes were chosen randomly. The results of this study indicated that the food practices, attitudes and nutritional knowledge among the respondents were good. There was no significant relationship between food practices and the background of the respondents. However, there was a significant relationship between the gender of the respondent and mother's employment with food practices at home. The level of knowledge on food nutrition did not show a significant relationship with food practices. This indicates that the respondents possessed a high level of nutrition education but they did not practise good eating habits. Their attitude towards food habits did not indicate any influence on food practices of the respondents. A significant relationship between knowledge on nutrition and the attitude of the respondents towards food habits was obtained. There was no significant difference between the food practices of the Chinese and the Malay teenage respondents. The overall results showed that although the respondents had a high nutritional knowledge and a positive attitude towards eating habits, their actual food habits were unsatisfactory.

152. ROSLINA R

Household nutritional practices in a land development scheme in Kajang

Project report submitted in partial fulfillment for the requirements for the Degree of Bachelor of Science (Human Development), Universiti Pertanian Malaysia, 1988

A study on the nutritional practices of 52 households and background factors affecting them was carried out in the Sungai Merab Land Development Scheme Kajang.

Selangor. Information was obtained using a set of questionnaire and observations made by the investigator. Findings of the study showed that the age of the husbands ranged between 28 to 80 years while the age of the wives was between 26 to 67 years. Seventy six percent of the husbands and 45% of the wives completed primary school. The main occupation of the household heads was rubber tapping. Forty eight percent of the households had between 4 to 6 members, the average household size was 6 persons. The mean monthly household income was \$666.52 with 6% of the households reported a monthly income of less than \$300.00. The mean percentage of expenditure on food was 34% ie about \$200. Thirty nine percent of the respondents spent between 31 to 40% of their monthly income on food. Based on the frequency of food intakes it can be seen that the foods regularly consumed were rice, wheat flour products, fish, leafy vegetables and milk. Results also showed that over 70% of the respondents washed meat, vegetables and fruits before and after cutting them. All the respondents have proper facilities such as food cabinet and enclosed container for storing their cooked food. Almost half of the respondents (46%) still believed that certain foods such as meat and fruits should be prohibited for women who had just delivered. All the respondents were found to grow vegetables and fruits for home consumption but only 81 percents of them kept poultry or other livestock.

153. ROZIA HANIS H, FOO LC, DHALI WAL SS and MUSTAFFA E

The epidemiology of endemic goitre in selected villages in Kedah

Proceedings of the 2nd Scientific Conference of the Nutrition Society of Malaysia, (Tee ES, Chong YH and Mohd Ismail N, ed.), 28 February 1987, Kuala Lumpur; Nutrition Society of Malaysia, Kuala Lumpur, pp. 18-24.

Goitre examination, using the technique of Perez, was performed on 1075 subjects aged 5 years and above in 7 villages in Kedah - Kampung Berangan, Bukit Batu, Kubang, Belantik and Tanjong in the district of Sik, Kampung Banggol Saga in the district of Baling, and Kampung Pulau Sayak, a coastal village in the district of Kuala Muda. The overall goitre prevalence was 35.1%. A regional pattern was noted with the highest goitre (overall and visible) prevalence in the innermost villages. No visible goitre was seen in Pulau Sayak, a village along the coast. In all regions, goitre prevalence was consistently higher in the females than the males; regional differences, however, tended to be greater than sex differences. Within villages, the distribution of goitre is influenced by age and sex; in general, goitre prevalence was about the same for males and females up to the age of 25 years, thenceforth it was higher in the females than the males. In the innermost villages, all or almost all households presented with at least a case of visible goitre, a situation that has not changed since the 1930's when the first documentation of the condition appeared in the literature.

154. RUSLI N

An inquiry into some aspects of food beliefs and food practices among Malay antenatal attendees on Penang Island

Dissertation submitted to the University of Malaya in part fulfillment for the Degree of Master of Public Health, 1983

Food beliefs and practices among 94 Malay antenatal clinic attendees at 4 health facilities on Penang Island were studied. The study was based on 16 food items, grouped into energy-providing (rice, bread and sweetened condensed milk), protein providing (meat, eggs, Chubb Mackerel, cockles and salted fish) and mineral/vitamins-providing

(spinach, kangkong, tapioca shoot, gourds, pineapple and papaya) and others (coffee and black pepper). Using the questionnaire-interview approach, response to food beliefs was based on a simplified scale of beneficial, neutral or harmful, whilst for food practices, a yes or no response was obtained. Results were presented separately for the non-pregnant, pregnant and post-partum periods. Findings were discussed in relation to other similar studies in Peninsular Malaysia. The need for health education for these Malay antenatal attendees with regards to food beliefs and practices during pregnancy and confinement was emphasized.

155. RUZITA A, THEVAMALAR K, MOHD AZEMI BMN and SEOW CC

Processed foods - nutritional pros and cons

Proceedings of the 2nd Scientific Conference of the Nutrition Society of Malaysia, (Tee ES, Chong YH and Mohd Ismail N, ed.), 28 February 1987. Kuala Lumpur; Nutrition Society of Malaysia, Kuala Lumpur, pp. 65-68.

The nutritional value of processed foods is a subject of much concern to the public. All too often, the layman has a prejudice against processed foods incalculated largely by misconceptions and misinformation, fed at times even by the mass media. It cannot be denied that some of the negative reactions of consumers towards processed foods have a sound scientific basis, but it is equally obvious that many others are spawned from the emotional rather than the factual. The fact remains that processed foods will continue to thrive along with the increasingly sophisticated demands of modern society. It is essential, therefore, for the facts to be differentiated from the fallacies in order to allay the fears of the consumers. This paper endeavours to provide a rational discussion of the nutritional pros and cons of processed foods which will hopefully lessen the confusion among the public.

156. SAFIAH MY

The healthy lifestyle campaign and its nutrition component

Report of the Workshop on Malaysian Case Studies on Food and Nutrition Interventions, National Committee on the ASEAN-New Zealand Inter-Institutional Linkage Programme. Kuala Lumpur; 1993; pp. 52-60.

Improved socio-economic conditions in the country has contributed to increasing affluence leading to rapid changes in the lifestyle of its people. There is an increasing trend of the incidence of diseases related to lifestyle and behaviour. The Ministry of Health had taken a major step in launching the Healthy Lifestyle Campaign in May 1991 to educate the public on those diseases and the need to change their lifestyle. It is a six year campaign which emphasizes a different theme every year, and commenced with cardiovascular disease in 1991. This paper gave an overview of the CVD campaign and highlighted the nutrition components. Various aspects of the Campaign were summarised including objectives, activities of the campaign, and evaluation of the programme.

157. SAHARI J

Usaha-usaha Kementerian Pendidikan bagi meningkatkan taraf pemakanan murid-murid sekolah (Efforts of the Ministry of Education to improve the nutritional status of school children)

Proceedings of the Workshop on Food Habits of Primary School Children., (Zanariah J, Aminah A, Yunus J, Nawalyah AG and Sahari J. ed.), 23-24 August 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1988; pp. 31-50.

The Ministry of Education has carried out various programmes to improve the nutritional status of school children. Nutrition education is one of these efforts and is aimed at providing these children with the knowledge to choose foods for health and improve their food habits. The School Feeding Programme is carried out to provide food supplements to primary school children, especially those in the rural areas and from the lower socio-economic groups as an immediate and temporary measure. Other programmes which have been implemented include the School Milk Programme, Applied Food and Nutrition Programme and the School Canteen Guide. This paper describes the main features of these programmes and makes various recommendations for further improvement of the nutritional status of school children.

158. SARIMAH M

The flow of applied food and nutrition information among housewives in Mukim Tanjung 12, Kuala Langat, Selangor

Project report submitted in partial fulfillment for the requirements for the Degree of Bachelor of Science (Human Development), Universiti Pertanian Malaysia, 1988

This study aims to determine, among 90 households in Mukim Tanjung 12, (1) the level of applied food and nutrition adoption and its' relationship with selected independent variables; (2) the sources of information utilized and the methods of dissemination and; (3) the pattern of the information flow. The findings revealed that the majority of the households have adopted the applied food and nutrition practices since 17 years ago. However, one-tenth were still either at the awareness stage or were unaware. The level of applied food and nutrition adoption was significantly related to age, membership in development agencies, family size and income. The main sources of information for the households were the Health Department followed by electronic media and printed media. The primary modes of information were through talks/speeches, method demonstration and via the electronic media. The pattern of food and nutrition practices information flow involves one-way and two-ways communication, both for seeking and receiving information. On the whole, the level of the practices were moderately high. The results revealed that the level of the food and nutrition practices were related negatively to age and positively related to membership in development agencies. Base on the study it was suggested that: (1) the performance of applied food and nutrition approached be improved, (2) the method of presenting information be upgraded and (3) better cooperation need to be worked out between the agencies which are involved in food and nutrition project in order to disseminate the information more effectively.

159. SITI AISHAH A

Information flow, knowledge, attitude and practices on maternal and child health among Orang Asli in Bukit Kemandol, Kuala Langat

Project report submitted in partial fulfillment of the requirements for the Degree of Bachelor of Science (Human Development), Universiti Pertanian Malaysia, 1988

This study was aimed at determining the flow of information and status of knowledge, attitudes and practices pertaining to maternal health among Orang Asli in Bukit Kemandol. Specifically, this study attempted to identify (i) sources of information, (ii) how the information was obtained, (iii) problems faced in getting information, and (iv) status of knowledge, attitudes and practices pertaining to maternal and child health among the group of Orang Asli. Fifty eight Orang Asli mothers with children under six years were selected for the study. Data were gathered through interviews based on a questionnaire. Three main sources were used by the Orang Asli mothers in Bukit Kemandol is obtaining information about maternal and child health. They were the health officer of the mobile clinic, husband or their children and 'Tok Bomoh'. Generally, information was obtained while the women were receiving health treatment. Information conveyed by the 'Tok Bomoh' was indirectly given through giving advice to the respondents when they are under treatment, or directly when the respondents asked for his help. The Health Officer from the mobile clinic provided education with the aid of posters before the respondents were given treatment. It was observed that the respondents preferred the demonstration method in addition to the explanations given by the Health Officer because it helped them to comprehend the messages. The respondents did not have difficulties in getting health information from the 'Tok Bomoh'. However, information from the health officer posed some problems in terms of the adequacy of the information and the infrequent visits by the health officer. The knowledge level and attitudes of the mothers was found to be satisfactory. However, health practices were found to be less satisfactory. This may be influenced by socio-economic background of the respondents.

160. SITI MARIAM A

***Pengambilan zat ferum and asid askorbik siswi tahun pertama UPM, Serdang Selangor* (Iron and ascorbic acid intake of first year female students of Universiti Pertanian Malaysia, Serdang, Selangor)**

Project report submitted to Universiti Pertanian Malaysia in partial fulfillment of the requirement for the Degree of Bachelor of Science (Human Development), 1983

Forty five (10%) of the first year female students of Universiti Pertanian Malaysia, Serdang, were chosen randomly for a study of the intake of iron and ascorbic acid. Most of these students were Malays, and were aged between 18 to 20 years. Analysis of the food served by each residential college and the amount of food taken by each subject was carried out using a food composition table. All the subjects were found to have iron intake of less than the recommended dietary allowance (RDA). However only 25 of the students had an intake of less than two-third of the RDA. Seventeen of the students were deemed to have an insufficient ascorbic acid intake. The food served by the college was found to meet RDA for both nutrients. The insufficient intake of iron and ascorbic acid could thus be the result of taking an insufficient amount of foods which contain these two nutrients.

161. SITI MIZURA S and TEE ES

Boric acid and its determination in foods

Proceedings of the Seminar on Advances in Food Research III in Malaysia, (Suhaila M and Azizah O. ed.), 19-20 November 1990, Serdang; Universiti Pertanian Malaysia, Serdang, 1990; pp. 178-187.

The first part of the paper discussed the properties of boric acid, its uses and abuses, dietary sources, daily dietary intake (DDI), body burden and physiology of boric acid. The effects of high intakes of boric acid on human and some poisoning cases were briefly described. The second part of the paper presented results of an evaluation of three methods of analysis of boric acid in foods. These methods are titrimetric method using mannitol and two colorimetric procedures based on reactions with carminic acid or curcumin. All the three procedures were carried out on four selected foods namely agar-agar strips, pickled mango, noodles and prawns for repeatability, sensitivity and recovery determinations. The accuracy of the methods was studied using an NBS Standard Reference Material. Various parameters studied have shown that the curcumin method is the most reliable and hence would be the method of choice for boric acid determination in foods.

162. SITI MIZURA S, TEE ES and CHONG YH

Lead content of selected Malaysian foods

ASEAN Food Journal, 3(1):25-29, 1987

Considerable amount of attention has been directed towards determining the levels of lead in foods and beverages, since these are important sources of lead exposure. However, there have been few studies into the extent of lead contamination of Malaysian foods. A total of 80 food items from 11 food groups were studied. Samples were analysed using the organic extraction and spectrophotometric procedure. A fair amount of variation in lead level between multiple samples of a food item as well as between food items were observed, with levels ranging from 0 to 9.69 ppm. However, most foods were found to contain less than 2 ppm of lead, which is a common legal limit for lead content of foodstuffs for many countries. Results obtained are indicative of the contamination level in the foods studied.

163. SITI NOR Y

Pengetahuan dan amalan terhadap pemakanan di kalangan pelajar-pelajar tahun pertama Universiti Pertanian Malaysia (Food and nutrition knowledge and practices among first year students of Universiti Pertanian Malaysia)

Project Report submitted to Universiti Pertanian Malaysia in partial fulfillment of the requirements for the Degree of Bachelor of Science (Human Development), 1984

The objectives of the study included the determination of knowledge and practices of food and nutrition among 100 (equal numbers of male and female) first year students of Universiti Pertanian Malaysia, and to identify factors that affected these knowledge and practices. Information were obtained using a designed questionnaire mailed to the selected respondents. The factors studied included sex, previous experience in Home Science subjects, and type of schools attended.

164. SUNDRAM K

Inhibitory effect of palm oil on cancer progression

ASEAN Food Journal, 4(3):87-91, 1989

Female Sprague Dawley rats were treated with the chemical carcinogen, dimethyl benz anthracen and fed diets containing 20% crude or processed palm oils and compared with corn and soyabean oils. It was found that tumour incidence was more rapid and enhanced in the polyunsaturated corn and soyaben oil fed rats compared to the palm oil group. Tumour yield in all three palm oil diets was also significantly lower than either corn or soyabean oil diets. It was suggested that the inhibitory effects observed for palm oil could be due to the carotenoids (in crude palm oil) and tocopherols and tocotrienols present in these oils acting as natural anti-oxidants.

165. SUNDRAM K, KHOR HT and ONG ASH

Unexpected nutritional properties of palm oil and palm olein

Proceedings of the 2nd Scientific Conference of the Nutrition Society of Malaysia, (Tee ES, Chong YH and Mohd Ismail N, ed.), 28 February 1987, Kuala Lumpur; Nutrition Society of Malaysia, Kuala Lumpur, pp. 58-64.

The nutritional effect of palm oil and palm olein was studied in the rat model. Palm oil and palm olein feeding did not alter the membrane fluidity, measured as the cholesterol/phospholipid molar ratio in rat blood platelets, in comparison to corn oil and soyabean oil diets. The arachidonic acid content in the platelet phospholipid was significantly increased in rats fed palm oil, palm stearin diets. Prostacyclin PGI₂ was significantly increased in rats fed palm oil, suggested a less thrombotic state. Measurement of plasma cholesterol and lipoprotein cholesterol levels indicated no adverse effect due to palm olein feeding. Low density lipoprotein cholesterol was reduced while the ratio of HDL cholesterol/total cholesterol was significantly elevated in palm olein fed animals. Cancer studies provided evidence for increased tumour progression in rats fed polyunsaturated diets. Rats fed crude palm oil had a longer latency period prior to tumour progression than animals on corn or soyabean oil diets. Tumour yield was significantly lower in rats fed different palm oil diets.

166. SUPRAMANIAN V and SUPRAMANIAN A

Survey of family planning and breastfeeding practices in a military community

Journal of the Malaysian Society of Health, 3(1):18-24, 1982

A questionnaire survey on breastfeeding (and family planning) was carried out among 100 wives of Malay servicemen who had a live birth in 1979 and registered in the Ministry of Defence Family Clinic. It was found that 64% of the infants were being breastfed. However, 32% of these were supplemented by bottlefeeds since birth. Solid foods were introduced too early in life - 82% during the first 3 months of life. The most popular solid food was Nestum. Only one mentioned giving a home-made solid food.

167. SURIAH AR and AZHAR A

Nutritional and health status of the elderly at the old folks home

Journal of the Malaysian Society of Health, 6(1):14-18, 1988

A study of 3 ethnic groups of old folks was carried out at Rumah Sri Kenangan, Cheras. Subjects consisted of 9 Malays, 29 Chinese and 30 Indians. Their age ranged from 50-89 years old. Data from the 24-hr dietary intake revealed that they were adequate in all the nutrients studied except for vitamin A, riboflavin and niacin, when compared with the Malaysian RDI. Anthropometric measurements indicated that the Indian subjects were heavier, with 10% of them being obese. Sixty-three percent of elderly were found to be underweight. Overall, the elderly groups were not anaemic or hypertensive but when looking at individual race, the Indians were found to be more anaemic, hypertensive and diabetic compared to other races. Biochemical assessments of the elderly under study indicated adequate protein intake where the urea:creatinine ratio were found to be more than 6 but when comparing race, 50% of the Malays had poor protein intake.

168. TAN DTS

The anti-thrombotic and lack of atherosclerotic effects of palm oil

Proceedings of the 2nd Scientific Conference of the Nutrition Society of Malaysia, (Tee ES, Chong YH and Mohd Ismail N, ed.), 28 February 1987, Kuala Lumpur; Nutrition Society of Malaysia, Kuala Lumpur, 1987; pp. 51-57.

Dietary long chain saturated fatty acids have been found to promote arterial thrombosis in rats. Palm oil (PO), containing 50% saturated fatty acids (mainly palmitic acid) however was found not to follow this general rule. When compared with a control diet containing 5 energy % of sunflowerseed oil (SO), a diet containing 50 energy % of physically refined palm oil (PO.R) actually lowered the arterial thrombosis tendency. Alkali-refined palm oil (PO.N) appeared to be more effected than PO.R. Rabbits which have been fed on a 32 en% PO-diet (> 18 months) was found to develop less atherosclerosis than animals fed diets containing various unsaturated oils (sunflowerseed oil, linseed oil, olive oil and fish oil). These beneficial effects of PO are possibly linked to the formation of the pro- and antithrombotic prostanoids and in the function of blood platelets.

169. TAN DTS, KHOR HT, LOW WHS, AHMAD A and GAPOR A

Effect of a palm-oil-vitamin E concentrate on the serum and lipoprotein lipids in humans

American Journal of Clinical Nutrition, 53:1027S-1030S, 1991

The effect of a capsulated palm-oil-vitamin E concentrate (palmvitee) on human serum and lipoprotein lipids was assessed. Each palmvitee capsule contains ~18, ~42, and ~240 mg of tocopherols, tocotrienols, and palm olein, respectively. All volunteers took one palmvitee capsule per day for 30 consecutive days. Overnight fasting blood was taken from each volunteer before and after the experiment. Serum lipids and lipoproteins were analysed by using the CHOD-PAP method. Results showed that palmvitee lowered both serum total cholesterol (TC) and low-density-lipoprotein cholesterol (LDL-C) concentrations in all the volunteers. The magnitude of reduction of

serum TC ranged from 5.0% to 35.9% whereas the reduction of LDL-C values ranged from 0.9% to 37.0% when compared with their respective starting values. The effect of triglycerides (TGs) and HDL-C was not consistent. Results obtained showed that the palmvitee has a hypocholesterolemic effect.

170. TAN LH

Malnutrition, health resources and education in Peninsular Malaysia

Institute of Southeast Asian Studies Occasional Paper no. 69, Maruzen Asia, Singapore, 1982.

The book is divided into four chapters. In the first chapter, the author introduced the study by drawing attention to the severity of the problem of malnutrition, and the emphasis that the Malaysian Government has placed in tackling the problem. The second and largest chapter various data, both indirect and direct indicators of nutritional status, in an attempt to present a comprehensive assessment of the malnutrition situation in the country. The complexity and multiplicity of causes of malnutrition was discussed, with particular reference to the rural Malay communities. The third chapter attempted to elucidate the traditional Malay medical health system and examined the existing modern health care system. A alternative health care system which was thought to be more responsive, with respect to the criteria of access and acceptability, to the rural Malay population was proposed. Within the framework of the proposed alternative system and its recommendation, the next chapter discussed the implications for nutrition education with reference to the planning and programme at the micro-community level. In the concluding chapter, the question of how effective and to what extent nutrition education could contribute to overcoming the complex malnutrition problems amongst the rural Malays was discussed.

171. TAN YK

Endemic goitre in the State of Sarawak, Malaysia

Proceeding of the Workshop on Cassava Toxicity and Thyroid: Research and Public Health Issues, (Delange F and Ahluwalia R, ed.), 31 May-2 June 1982, Ottawa, Canada; pp. 64-68.

Based on the findings of various investigations in Sarawak, Malaysia, 12 of the State's 25 districts have been identified as goitrous, with varying rates of prevalence and occurring mainly in the inland areas. It was estimated that there were at least 20,000 cases of endemic goitre in the State, representing about 1.5% of its total population. The condition was caused primarily by insufficient iodine in the diet, whilst cassava consumption could be another contributory factor in some areas. These aspects of the prevalence and etiology of the endemic goitre in Sarawak were reviewed in this paper. Control programmes using iodized salt, and more recently using iodized oil injections and the utilisation of iodinated fitted into the existing gravity-fed village water supply were also discussed. The need for a clear understanding of this public health problem, its true magnitude, causes, and consequence was emphasized. It was envisaged that these lines of research would establish a long-term programme towards the effective treatment and prevention of endemic goitre and its associated problems in the country.

172. TEE ES

Sugar and overnutrition

Paper presented at the Malaysian Dental Association Seminar on Sugar and Dental Health, 28 February 1981, Kuala Lumpur

World sugar consumption for 1970 has been estimated to be 57 g per capita per day (or 21 kg per person per year). In some of the wealthier countries, a staggering figure of 164 g per capita per day (or 60 kg per person per year), making up 27% of the total daily calorie intake, has been estimated. Malaysians, with a per capita daily intake of 86 g (or 31 kg per capita per year) is fast catching up with these countries. In most countries, this increase in sugar consumption has taken place at the expense of other foods rich in essential nutrients. Besides the resulting inevitable hazard of nutritional deficiency, a high consumption of sugar has been known to be a contributory factor in the causation of several diseases, the so-called diseases of affluence, such as dental caries, obesity, coronary heart disease and diabetes. It is therefore of utmost importance that measures be taken to check the upward trend in sugar consumption. Public awareness of the inherent danger of overconsumption of sugar has to be constantly instilled.

173. TEE ES

Nutritional Anaemias: Spectrum and Perspectives with Relevance to Malaysia

Specialist and Reproductive Research Centre, National Population and Family Development Board Malaysia, Kuala Lumpur, 1984.

This review attempts to present a comprehensive picture of the whole spectrum of the nutritional anaemia problem. A clear definition of what nutritional anaemias are and the haemopoietic nutrients involved are first given. The various factors involved in and/or related to a balance of these nutrients in the "normal" individual are then discussed, encompassing such aspects as how these nutrients are stored in the body, through what channels the body loses them, the efficiency with which the body absorbs them from the diet, and the daily requirements for these nutrients. Following this, factors that could bring about an imbalance, i.e. resulting deficiency, are discussed. The methods of diagnosis and measurement of such deficiencies are then elaborated. The review also discusses current understandings on the deleterious effects these deficiencies could have on the body and health. Finally, it deals with the intervention measures that may be taken to control or alleviate such deficiencies in the community. In all these areas, wherever appropriate, recent findings and advances have been discussed. In those areas where Malaysian studies have been reported, relevant data have been reviewed in some detail. It is hoped that through the 324 references included, out of which 52 are reports of local investigators, the review can provide a clear understanding of the work done in the country in the overall perspectives of recent knowledge on the problem of nutritional anaemia, and provide the appropriate references for further reading and pursuance.

174. TEE ES

Micro-computer analysis of food consumption data using an electronic spreadsheet

ASEAN Food Journal, 1(3):143-145, 1985

Using a conventional calculator, the amount of repetitive calculations required to analyse the data of a food consumption study can be rather tedious. The paper

describes the use of general purpose spreadsheet (electronic worksheet) programme in a micro-computer for the purpose. A template worksheet is first created with all the required formulae built into it. To analyse the collected data, only the quantities of foodstuffs reported to be consumed need be entered. Automatic recalculation of the required values may then be executed rapidly. Important considerations in adopting the procedure are the amount of random access memory, storage capacity available in the micro-computer system, as well as the spreadsheet used. The number of nutrients that may be analysed would have to be adjusted according to the available hardware and software. In spite of its limitations, for those who have no access to large computers or the services of a programmer, the method may be useful in the analysis of food consumption data from small scale studies.

175. TEE ES

Status, resources and needs for food composition data: a Malaysian report

Proceedings of the 1st ASIAFOODS Conference, (Rand W, Stuckey A, Valyasevi A and Tontisirin K. ed.), 17-21 September 1984, Bangkok; Institute of Nutrition, Mahidol University, Bangkok, 1985; pp. 65-67.

The Malaysian Food Composition Table Project was initiated by the IMR in 1980, with funding from the ASEAN Protein Project. The Project is currently being carried out with the collaboration of UPM and MARDI, and coordinated by the IMR. The first output from the Project is Preliminary Food Table prepared by the IMR in 1982. Although progress on the systematic analysis of foods has not been entirely satisfactory, substantial amounts of new data have been accumulated. Several factors, including the shortage of manpower and the problems encountered with the methods of analysis, contribute to the slow progress of the Project. There is a need for greater emphasis on the importance of food composition data. Greater involvement and a more definite commitment by researchers in the country is required. Technical and financial assistance should continue to be made available for the continuing generation of good quality data, and the compilation of such data. This report presents the status of the food composition data project in the country, the resources available, and future needs in order to arrive at a comprehensive and updated Malaysian Food Composition Table.

176. TEE ES

Susu sebagai suatu bahan makanan tambahan di sekolah (Milk as a supplementary food in schools)

Paper presented at the School Milk Project Seminar 1985, 29 April 1985, Kuala Lumpur

Various studies in Malaysia have shown that school children in the country continue to be afflicted by some forms of nutritional deficiencies. It is to be expected that as a result of poor nutrition, concentration and learning capability, and eventually scholarstic achievement of these children would be adversely affected. It is clear that some forms of supplementary feeding to these children would be greatly beneficial to them. The resulting improvement in nutritional status would lead to improved alertness and learning capability, as well as in better attendance rate in schools. The choice of food supplement would have to take into consideration several factors, and would depend a great deal on prevailing local conditions. Milk has been selected for supplementation to the diet of our primary school children, through the School Milk Project officially launched by the Ministry of Education in 1983. As a food, milk is unique in that it is almost a complete single food. It is a good source of quality protein, calcium, riboflavin

and to a certain extent, vitamin A. It is not a new food item in our diet. Milk as a school supplementary food would enable the feeding programme to be properly controlled with regards to its quality and quantity. It could minimise cost and effort with regards to transport, storage and serving of the supplementary food. Furthermore, the school milk programme could help develop a milk-drinking habit among our children.

177. TEE ES

Advances in nutrition research in Malaysia

Proceedings of the Seminar on Advances in Food Research in Malaysia., (Suhaila M. Mohd Nasir A and Mohamed Ismail AK, ed.), 6-7 May 1986, Serdang; Universiti Pertanian Malaysia, Serdang, 1986; pp. 153-159.

Nutrition research in Malaysia dates back to the beginning of the century, when investigations into the etiology and pathology of beri-beri were actively pursued. Following this pioneering work in the Institute for Medical Research, studies into other vitamin deficiencies and nutritional disorders were carried out, together with several other institutions in the country. Studies into xerophthalmia, rickets, pellagra, angular stomatitis, protein-energy malnutrition, nutritional anaemia and iodine deficiency goitre have been documented for various communities. In the 1980's, nutrition research in Malaysia took on new dimensions. Various other institutions in the country took on greater participation in nutrition research. There has been wider coverage of communities, and nutrition studies took on greater depth and scope. Advances in methodologies in many areas of research are also clearly evident. Furthermore, there is a definite change in the trends in nutrition research, with the change in the pattern of nutritional diseases in the country. This paper gives an overview of nutrition research in Malaysia, from the beginning of the century to the first half of this decade. Changes or advances over the years in each area of research are discussed.

178. TEE ES

Nutrition research in the eighties: Institute for Medical Research

Proceedings of the Seminar on Advances in Food Research in Malaysia., (Suhaila M. Mohd Nasir A and Mohamed Ismail AK, ed.), 6-7 May 1986, Serdang; Universiti Pertanian Malaysia, Serdang, 1986; pp. 33-39.

This report describes briefly various nutrition research studies completed recently (in the 80's), as well as those that are being carried out, in the Institute for Medical Research. Research themes cover a wide variety of topics, and are geared towards food and nutritional problems that are of relevance to the country. In the assessment of the nutritional status of communities, recent studies include that of 14 rural villages in Peninsular Malaysia, and two other smaller studies in Sabah. These are comprehensive studies, employing a combination of clinical, anthropometric and biochemical measurements, as well as studies into the socio-economic characteristics and food consumption and pattern. Other studies of food consumption and pattern carried out include a comparative study of Chinese New Villages, Malay Kampung and Indian Estates, and a study of knowledge and attitude of a group of pregnant women regarding infant feeding practices. Investigations into specific nutrient deficiencies include a study of nutritional anaemia in pregnancy and one characterising the endemic goitre problem in Kedah. In the area of nutrition and parasitic infestation, a study on ascariasis, trichuriasis and malnutrition is being carried out. Another on-going study is aimed at evaluating the nutritional impact of the school supplementary

feeding programme. On the overnutrition problem, a study that will be completed soon examined the prevalence of coronary risk factors among middle-aged executives in the Kuala Lumpur area. Studies into the nutrient composition of foods is another important area of study in the Institute. Work on the compilation of a Malaysian Food Composition Table is continuing, as well as nutritional studies on Malaysian processed palm oil. Another aspect that is given emphasis is food safety, and a study into the problem of lead contamination of a variety of foods was recently completed.

179. TEE ES

Poverty, nutrition and health

Paper presented at the ISIS First National Conference on Poverty, 6-7 January 1986, Kuala Lumpur

Millions of people in the world are suffering from protein-energy malnutrition, iron and vitamin A deficiency. Such colossal numbers have not been effectively reduced, partly because the twin problems of poverty and inequity - important causes of hunger and malnutrition - have worsened in many countries. Studies in Malaysia have also shown the close association between poverty and malnutrition. Income has been known to influence the amount of money spent on food, as well as the types of foods purchased. Various examples are given to show that a rise in income may mean more and better food available to a household. Examples of mortality rates, indicators of health status of communities, have also shown that these are closely related to economic well-being. There is in fact a vicious cycle, intensifying the problems of poverty, malnutrition and ill-health. However, a national rise in per capita income does not necessarily lead to nutritional and health improvement. The unequal distribution of income, and the various factors influencing food consumption, especially nutritional knowledge, may result in the unavailability of nutritious foods to the most needed. There has been increased awareness that malnutrition, although a health problem, affects and is affected by all efforts to promote national development. A good deal of attention has thus been directed to nutrition planning and the inclusion of food and nutrition strategies in overall national development planning as an approach to solving the malnutrition problem.

180. TEE ES

Status pemakanan murid-murid sekolah rendah (Nutritional status of primary school children)

Proceedings of the Workshop on Food Habits of Primary School Children., (Zanariah J, Aminah A, Yunus J, Nawalyah AG and Sahari J, ed.), 23-24 August 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1988; pp. 14-30.

Nutritionists have been giving particular attention to the malnutrition problem amongst children, including school children. These children in a stage of rapid growth and nutrient requirements are high. This paper discusses the problems of undernutrition affecting primary school children. Using a combination of clinical examination, anthropometric measurements, biochemical analysis and studies into food consumption and pattern, nutrition surveys in the country have shown that moderate malnutrition is still a problem prevalent among rural primary school children. Growth retardation, especially stunting, anaemia and vitamin A deficiency are the main nutritional problems encountered. This situation gives rise to various deleterious effects to the children, and can adversely affect the school performance. Undernutrition can lower the concentration, capability to study and school achievement. In order to

overcome these nutritional problems, intervention programmes that are being implemented, such as the School Feeding Programme and School Milk Programme have to be intensified and their implementation monitored. More importantly, there is a need to intensify efforts at nutrition education aimed at inculcating good food habits among children when they are in and out of school. In addition, it is important to obtain data on the nutritional status of school children such as weight and height, systematically and on a routine basis.

181. TEE ES

Current status of food composition data generation and compilation in Malaysia

Proceedings of the ASEAN Workshop on Food Data System, 25-27 October, 1989, Bangkok, Thailand: ASEAN Interim Project Management Committee on Protein, Bangkok, 1989; pp. 110-122.

This report Discusses food composition data generation and compilation activities in Malaysia, particularly those carried out in the last 5 years. During this period, the collaborative programme between the Institute for Medical Research (IMR), the Malaysian Agricultural Research and Development Institute (MARDI), Universiti Pertanian Malaysia (UPM) and Universiti Kebangsaan Malaysia (UKM) completed the analysis of a wide variety of foods, based on an agreed project protocol, sampling procedures, analytical methods, and data compilation. Towards the end of 1988, sufficient data were generated for the publication of an up-dated Food Table. With nutrient composition of 783 raw, processed and cooked foods, this latest edition of the Table is the most comprehensive thus far available in the country. In full cognizance of the need for continuous interaction between food composition data generators and users, a workshop for data users was organized in late 1988, with the objective of maximizing the distribution and effective use of food composition data. Participants also made recommendations for future work in food composition data generation and compilation. Work on the programme is continuing, and current activities place emphasis on providing further input and refinement to the database established. These include analysis of selected nutrients such as carotenoids and vitamin A, cholesterol, dietary fibre and available carbohydrates, as well as improvements to the management of food composition data. Although the programme has achieved an important stage of development, there is still much to be done in order to further improve the food composition database in the country. These include improvement of analytical techniques and quality of data, analysis of new foods in the market, and studies into other nutrients and non-nutrients that have not been given sufficient attention. The management of food composition data and related information need to be greatly improved for more efficient data storage, update and retrieval.

182. TEE ES

Systematic development of national food composition data: a guideline

Proceedings of the ASEAN Workshop on Food Data System, 25-27 October, 1989, Bangkok, Thailand: ASEAN Interim Project Management Committee on Protein, Bangkok, 1989; pp. 21-39.

Information on the composition of foods is the essential basis for the quantitative study of nutrition and its application in the treatment and management of disease, and the provision of appropriate diets for individuals or population groups. In view

of the growing need for quality food composition data, there has been a worldwide interest in the generation and compilation of such data. Similarly, in ASEAN, each member country has put in some effort improve its national food composition database. With the realization that past activities have been largely uncoordinated, there has been emphasis on the need for systematic development of national food composition data system. This paper aims at providing some guidelines for developing such a system. The first step in the establishment of such a systematic programme would be the setting up of a national working group, with membership comprising of data users, generators and compilers. The group should then identify the objectives and goal of the programme, and draw up a plan of action. Since some information on food composition data already exists in the country, the first stage in this plan would be to carry out a thorough review and evaluation of this information. This would enable the identification of the work to be carried out in the second stage, that is the generation of new data. All data obtained, either from the literature or newly generated, would then be compiled for publication. The systematic execution of these stages of the programme would facilitate the setting up of a comprehensive food composition data system which is more meaningful and useful. Each of these stages are discussed in this paper, taking into consideration the existing situation and constraints in countries in the region.

183. TEE ES

The twin faces of malnutrition in Malaysia

Proceedings of the SEAMEO-TROPMED 2nd Seminar on Nutrition, (Pongpaew P, Sastroamidjojo S, Prayurahong B, Migasena P and Rasad A, ed.), 20-21 March 1989, Jakarta, Indonesia; Mahidol University, Bangkok, 1990; pp. 61-27.

Various health indicators such as life expectancy at birth, and infant, toddler and maternal mortality rates have been improving steadily over the years, since the country gained independence. Recent studies in various parts of the country have shown that the nutritional status of Malaysians have been improving over the years. Due to the tremendous socio-economic development and parallel improved health care, serious malnutrition has largely been eradicated, although mild to moderate undernutrition exists in various rural and urban underprivileged communities. On the other hand, this rapid development has brought about changes in food consumption patterns and life styles, and a resultant different nutritional problems, namely those associated with overnutrition. Significant proportions of the affluent segments of the population are now known to be afflicted with various risk factors of coronary heart disease. Nutrition activities in the country would therefore have to be directed to both faces of malnutrition. Tackling the undernutrition problems remains as priorities for the nation, while particular attention is also been given to overnutrition and chronic diseases.

184. TEE ES

Carotenoids and retinoids in human nutrition

Critical Reviews in Food Science and Nutrition, 31(1/2):103-163, 1992

Since the discovery of vitamin A as a fat-soluble growth factor in the early part of the century, research into carotenoids and retinoids has attracted the attention of many scientists. These two groups of compounds are still being actively studied all over the world since many gaps in knowledge exist and new frontiers are being pursued. Recent

developments in studies into the possible roles of carotenoids and retinoids beyond their classical functions in vision have created a great deal of excitement in the biomedical community. This review covers a wide range of topics pertaining to these two closely related compounds. Particular emphasis is given to the functions of these compounds and their roles in human nutrition. Various aspects of vitamin A deficiency and studies on carotenoids and retinoids in cancer development and prevention are reviewed in some detail.

185. TEE ES and CAVALLI-SFORZA LT (editors)

Food and Nutrition in Malaysia: Assessment, Analysis and Action

Institute for Medical Research, Kuala Lumpur, 1993.

This publication is the Malaysian country paper prepared for the FAO/WHO International Conference on Nutrition 1992. The Paper is presented in 4 sections. Chapter 1 describes the nature and dimensions of nutrition and diet-related problems in the country, while a description and analysis of factors affecting the nutritional status are given in Chapter 2. Chapter 3 describes the current policies, programmes and interventions carried out to overcome the nutritional problems. Recommendations for future action to further improve the nutrition situation in the country are given in the final chapter of this Paper.

186. TEE ES, KANDIAH M, JAAFAR A, KANDIAH V, MOHD RUSLI Z, KULADEVAN R and ZULKAFLI H

Nutritional anaemia in pregnancy: a study at the Maternity Hospital, Kuala Lumpur

Malaysian Journal of Reproductive Health. 2(1):32-50. 1984

The study presents recent data on the prevalence and pattern of nutritional anaemia in the Maternity Hospital, Kuala Lumpur. A total of 309 pregnant women in their third trimester, of Malay, Chinese and Indian origin from the lower socio-economic strata were randomly selected for the study. Haematological indices (including Hb, PCV, MCHC, and TRBC), serum iron, transferrin saturation and ferritin, serum folate as well as protein and albumin were determined. Based on Hb and PCV values, 30-40 percent of the women could be considered anaemic; approximately 50 percent of them presented with unsatisfactory serum iron, transferrin saturation and ferritin values; 60.9 percent had low serum folate levels; and about 30 percent may be considered to be of poor protein nutriture. Anaemia in the study population was seen to be related mostly to iron and to a lesser extent, folate deficiency. Haematological, iron, folate and protein status was observed to be the poorest amongst the Indian women, better in the Malay group and generally the best amongst the Chinese women. Birth records of 169 of these women revealed that all of them had live births. Nearly all the infants were delivered by normal vaginal delivery (NVD). The mean gestational age was 38.6 weeks. One of the infants had a birthweight of < 2.0 kg; incidence of low birthweight, < 2.5 kg, was 8.3 percent. Although there was a trend of deteriorating haematological, iron and protein status of women from the 0, 1-3 and > 4 parity groups, these differences were not statistically significant.

187. TEE ES, KANDIAH M and ROZIA HANIS H

Food consumption and habits in rural Malaysian villages: recent findings and some thoughts for improvements

Proceedings of the 4th ASEAN Food Habits Workshop, (Roestamsjah, Tsauri S and Karossi TA, ed.), 29 November-4 December 1982, Yogyakarta, Indonesia: ASEAN Sub-Committee on Protein, Indonesia, 1982; pp. 239-249.

Findings of studies in Mersing, Johore (1981), Bengkoka Peninsula, Sabah (1982) and Baling, Kedah (1982) were reported. A total of 301 households were visited and enquiries made into the food beliefs and practices amongst the infants, pre-school children and women during pregnancy, post-partum and lactation. The consumption patterns of foodstuffs in these households were determined and the amounts quantitated. The post-partum women were seen to be the group with the most serious food avoidances and restrictions. Although there appeared to be less food taboos during pregnancy and lactation, these women did not supplement their diets with the essential foods to cater for the additional nutritional needs during these crucial periods of their lives. There were also no serious food taboos for the young children, but their nutritional needs did not get much attention either. Although some of the respondents had a fair knowledge of the need for nutritious foods, food consumption patterns of the households indicated a monotonous dietary intake and a lack of the essential foods. Findings obtained point to the need for serious thoughts on intervention and remedial actions. Some possible measures for improvement were briefly discussed.

188. TEE ES and KHOR GL

Overview of country nutritional status

Proceedings of the the First Scientific Conference of the Nutrition Society of Malaysia, (Chong YH and Mohd Ismail N, ed.), 1 March 1986, Kuala Lumpur: Nutrition Society of Malaysia, Kuala Lumpur, 1986; pp. 7-24.

The country has undergone tremendous socio-economic development since it gained Independence. Health indicators such as life expectancy at birth, and infant, toddler and maternal mortality rates have been improving steadily. Food Balance Sheet data also indicate increases in per capita availability of protein and calorie. These data show that the nutritional status of Malaysians have been improving over the years. However, due to the problem of inequity, such national data do not reflect the existence of considerable variations in the nutritional status of different communities in various parts of the country. Indeed, recent studies have indicated that considerable amount of mild to moderate malnutrition occurs in various poverty rural and urban communities, although severe protein-energy malnutrition is not frequently reported. Major nutritional deficiency problems encountered by various segments of the population will be highlighted.

189. TEE ES and LIM CL

Carotenoid composition and content of Malaysian vegetables and fruits by the AOAC and HPLC methods

Food Chemistry, 41:309-339, 1991

The beta-carotene of forty vegetables and fourteen fruits were determined using the AOAC open-column (magnesia and Hyflo Super Cel mixture) chromatographic method and compared with a newly developed reverse-phase HPLC method, in which carotenoids were separated isocratically on an octadecylsilane (C18) column using a ternary mixture of acetonitrile, methanol and ethyl acetate. Results obtained showed that the AOAC method gave falsely elevated for samples containing alfa-carotene, as well as those with very low beta-carotene concentrations. On the other hand, the HPLC method successfully separated and quantitated the major carotenoids present; namely, lutein, cryptoxanthin, lycopene, gamma- and alpha-carotenes in addition to beta-carotene. the carotenoid composition of most of the green vegetables was rather consistent, comprising only lutein and beta-carotene. In contrast, there was no clear pattern of carotenoids present in the other vegetables and fruits, where several other carotenoids were detected in varying proportions. The vitamin A activity, expressed as ug of retinol equivalent (RE), was calculated on the basis of all pro-vitamin A carotenoids (cryptoxanthin, gamma-, alpha- and beta-carotenes) detected. Most of the green leafy vegetables, including several local vegetables, had high RE. Several green non-leafy and other vegetables were found to have low and medium RE. None of the fruits studied may be said to have high vitamin A activity. RE calculated on the basis of results from the AOAC method was found to be erroneously low for samples with significant proportions of pro-vitamin A carotenoids other than beta-carotene, and falsely elevated for those with alpha-carotene. Total carotenoids concentrations can be estimated by taking absorbance readings of sample extracts directly in a spectrophotometer or by the HPLC method. The study clearly shows that the HPLC method would give a more complete picture of the carotenoid composition as well as a more accurate quantitation of the vitamin A value of the vegetables and fruits. The nutritional significance of the findings is obvious since these foods are important sources of vitamin A for the majority of the communities in the country.

190. TEE ES and LIM CL

Re-analysis of vitamin A values of selected Malaysian foods of animal origin by the AOAC and HPLC methods

Food Chemistry, 45:289-296, 1992

Vitamin A values of 40 foods of animal origin from various food groups and several processed foods were studied using a newly developed reverse-phase, high-performance liquid chromatography (HPLC) method. Carotenoids and retinol were separated isocratically on an octadecylsilane (C18) column using a ternary mixture of acetonitrile, methanol and ethyl acetate. Two detectors connected in series were used to detect and quantify carotenoids simultaneously at 436 nm and retinol at 313 nm in a single chromatographic run. All samples were also simultaneously determined using the Association of Official Analytical Chemists (AOAC) open-column (alumina) chromatographic method. The AOAC method was found to give significantly higher retinol contents in the foods studied, due to the presence of other pigments that gave falsely elevated absorbance readings. Although there was no statistically significant difference in beta-carotene contents given by the HPLC and AOAC methods, there were more food with higher results given by the latter method. Beta-carotene contents were generally low; only in seven foods did the carotene contribute more than 50% of the total vitamin A value. The contribution of other provitamin A carotenoids is probably insignificant. Thus, the total vitamin A activity of these foods was mainly contributed by retinol. The proposed HPLC method has been shown to be applicable to the determination of carotenoids in vegetables and fruits, as well as to the determination of carotenoids and retinoids in foods of animal origin.

191. TEE ES and SITI MIZURA S

Selected Food Toxicants

National Scientific Research and Development Council Malaysia, Kuala Lumpur, 1984.

Three toxicants, felt to be most relevant and pressing for attention are reviewed in this publication. These are aflatoxins, lead and N-nitroso compounds. The publication is aimed at providing the intending investigator with a fairly comprehensive review of these toxicants. A total of 260 publications have been reviewed, and efforts have been made to include recent publications, and wherever possible local studies on these toxicants. Aflatoxins, a fungal toxin discovered in the early 1960's, is one of the most potent carcinogen known to man. Since the toxin has been found to be harmful to a wide variety of animal life and to isolated human cells and creating problems of health as well as social and economic significance, it is clear that all efforts should be made to reduce the level of this mycotoxin in our foods. Aflatoxins have been studied by investigators in Malaysia soon after their discovery. Our understanding of the contamination problem to the local foods is however largely inadequate. Lead is one of the oldest metals known to mankind. As a result of the extensive mining, smelting and refining, as well as the production and use of lead-based products, there has been considerable contamination to the environment, to the food we eat, the water we drink and the air we breathe. The toxicity of the metal has been well documented. With increasing industrialization and urbanization of the country, it can be anticipated that lead intoxication will become an increasing problem in Malaysia. Extensive studies have shown the presence of nitroso compounds in various human foods, air, water supply and the working environment. Studies on the modes of formation of nitrosamines have led to a search for the occurrence of precursors to the nitroso compounds, the nitrates, nitrites and amines, and the finding that these occur far more extensively and at greater concentrations than the preformed nitrosamines. To date, some 130 N-nitroso compounds have been examined for carcinogenicity and at least 120 of them have been found to be strong carcinogens. In Malaysia, few studies have been carried out on the nitroso compounds. The levels of nitrosamines and their precursors remain largely unknown.

192. TEE ES, SITI MIZURA S, ANUAR A, KULADEVAN R, YOUNG SI, KHOR SC and CHIN SK

Nutrient composition of selected cooked and processed snack foods

Pertanika, 12(1):15-25, 1989

Nutrient composition of 27 cooked snack foods and 19 processed snacks was determined. The cooked foods were mostly cereal based, made from wheat flour, rice or rice flour, and almost all of them were traditional Malaysian kuih or dishes. The processed snacks studied were chocolate, cereal, tuber, fish and prawn products. The levels of 19 nutrients were tabulated, expressed as per 100 g edible portion. Selected nutrients in each serving or packet of the foods were also presented. The paper is intended as a contribution to the knowledge on nutrient composition of local snack foods, for which information is still greatly lacking. The number of foods studied is only a fraction of the total number available. More work in this area will have to be carried out, to meet the increasing demand for such data.

193. TEE ES, SITI MIZURA S, KULADEVAN R, YOUNG SI and KHOR SC

Nutrient composition of Malaysian marine fishes

ASEAN Food Journal, 3:67-71, 1987

Duplicate samples of 50 species of marine fishes, from 31 families, commonly available in the local markets were studied for their nutrient composition. Moisture, protein, fat and ash were determined, from which carbohydrate and energy content were calculated. Five minerals, viz. calcium, phosphorus, iron, sodium and potassium were analyzed. The vitamins assayed were retinol and carotene, thiamine, riboflavin, niacin and ascorbic acid. Results obtained were tabulated, grouped according to the families of the fishes. A separate table listed the names of the fishes in Bahasa Malaysia. There did not appear to be large variations in the proximate composition of the fishes, except for fat. Minerals and vitamins, although showing larger variations between the different species, also exhibited similar general trends. These fishes, with their high nutritive value are considered important items in the diet of many communities in the region. It is important to continue to take steps to ensure that these foods are made available to the poor who need them most - at prices they can afford.

194. TEE ES, SITI MIZURA S, KULADEVAN R, YOUNG SI, KHOR SC and CHIN SK

Nutrient composition of Malaysian freshwater fishes

Proceedings of the Nutrition Society of Malaysia, 4:63-73, 1989

Twenty species of freshwater fishes, belonging to 9 families, were obtained from various sources for analysis. Proximate composition, 5 minerals (calcium, phosphorus, iron, sodium and potassium), and 5 vitamins (retinol equivalent, thiamine, riboflavin, niacin and vitamin C) were determined by methods established by this Division. Results are tabulated with the English, Bahasa Malaysia and scientific names of the fishes. The least variations were observed for levels of protein, phosphorus, potassium, niacin, and energy in the fishes. Thiamine, riboflavin, retinol equivalent and fat content of the fishes showed larger variations. Nutrient content of these freshwater fishes appeared rather similar to those obtained for 50 species of marine fishes previously reported by the authors. Graphs showing comparison of some of the nutrients are presented.

195. TEINBOON P, WAZIR NA and NIMSAKUL S

An assessment of the nutritional status of children (1-5 years) of paddy growing community Village Sawah Sempadan Block B and I, Kuala Selangor District, Peninsular Malaysia

Dissertation submitted to the University of Queensland and Universiti Kebangsaan Malaysia, in partial fulfillment of the requirements for the Degree of Master of Community Nutrition, 1984

A community diagnosis was made to determine the nutritional status of children (1-5 years) of a Malay community in the rice-growing village of Sawah Sempadan Block B and I in the district of Kuala Selangor. The community comprised of 115 households with a population of 605. Forty of these households, with children 1-5 years were selected for detailed study on their socio-economic status, health, food consumption and production. These children (total=51) were examined for their nutritional status using clinical, anthropometric and biochemical methods. Stools of these children

were also examined for parasitic infestations. Results of the study were presented in detail in the report. Various statistical analysis of the variables studied were also carried out. The malnutrition found in the children was described as mild to moderate, associated with iron-calorie deficiency and was thought to be due to low nutrient intake, maldistribution of the food within the household, low household income, large household size and poor sanitation. It was felt that the findings could be used as a basis for the nutrition and health planning of the village.

196. TEO PH, CHONG YH and MOHD ZAINI AR

Coronary risk factors among Malaysian male executives in two urban areas

Proceedings of the Nutrition Society of Malaysia, 3:24-31, 1988

Four hundred and six Malaysian executives and professionals in two urban areas were screened for coronary risk factors. They comprised 44% Malays, 45% Chinese, 9% Indians and 3% other ethnic groups with ages ranging from 25-54 years of age. Risk factors surveyed included hypertension, hypercholesterolemia, smoking, obesity, diabetes, high-density lipoprotein cholesterol, hypertriglyceridemia and hyperuricemia. Risk factors were found to be widely prevalent with more than half (51.5%) of the sample having or more risk factors. Malays had a significant higher prevalence of hypercholesterolemia, overweight, obesity, low HDL cholesterol, hypertriglyceridemia and hyperuricemia when compared to Chinese. Risk factor levels in the subjects studied were comparable to those for western industrialised societies.

197. THEVENDRAN U and FATIMAH A

Nutrient supplements

Proceedings of the 2nd Scientific Conference of the Nutrition Society of Malaysia. (Tee ES, Chong YH and Mohd Ismail N, ed.), 28 February 1987, Kuala Lumpur: Nutrition Society of Malaysia, Kuala Lumpur, 1987; pp. 74-78.

Health and nutrition is a topic of great concern to many. The public is faced with much information on the role of synthetic supplements in promoting health. Today, consumers also have a wide range of synthetic nutrient supplements readily available for their use. It is well documented that under normal circumstances, the body requirements for nutrients are more than adequately met in the daily diet from a wide variety of wisely selected foods. However, for those on unbalanced diet, during pregnancy, elderly people who do not eat well, and the chronically ill, there may be a need for nutrient supplementation. But for the great majority of people, a well balanced and varied diet remains the best protection against nutrient deficiencies and the money expended on nutrient supplements might be better spent on wisely selected and nutritive foods.

198. TING MM

Subjective health status of low-cost flat dwellers in Kampung Kerinci, Kuala Lumpur

Project report submitted to Universiti Pertanian Malaysia in partial fulfillment for the requirements of Bachelor of Science (Human Development), 1990

A study on the subjective health status of low-cost flat dwellers was carried out in Kampung Kerinci, Kuala Lumpur. The objective of this study was to identify the subjective health status of low-cost flat dwellers and its relationship to demographic and socio-economic factors, and to housing conditions. Other than this, the relationship between health status as assessed by symptoms and chronic illness on the one hand and subjective health status as assessed by the Nottingham Health Profile (NHP) on the other was also studied. One hundred housing units were randomly chosen and every member in the household who was more than 16 years old was interviewed using a precoded questionnaire. Out of the 249 Malay respondents interviewed, 71.9% stayed in PKNS ("Perbadanan Kemajuan Negeri Selangor"/Selangor Development Corporation) low-cost flats and 28.1% stayed in DBKL ("Dewas Bandaraya Kuala Lumpur"/City Hall of Kuala Lumpur) flats. Most of the respondents were between 16 to 25 years old (39.4%), educated up to Form 5 (39.9%), and had an income per capita per household of \$140-\$280 per month. The majority of the respondents were satisfied with the housing conditions except for the problem of excessive noise and the lack of space in the flats. From the results, all the demographic and socio-economic factors (age, sex, family size, income per capita, education and occupation) showed significant differences in some sections of the NHP. The significant differences shown in the variables of household income per capita and education were confounded by age, whereas the significant difference shown in the variable of occupation was confounded by sex. However, the demographic and socio-economic factors (age, sex, education, occupation and income per capita) examined did not show any significant relationship with symptoms experienced in the past two weeks. For chronic illnesses, among the socio-economic and demographic factors, only age showed a significant relationship. It was found that when number of symptoms or chronic illnesses increased, the subjective health status (NHP) got worse. The difference between the number of symptoms reached a significant level of $p < 0.05$ in all the sections of the NHP. The same was observed for the number of chronic illnesses. As a whole, the subjective health status of low-cost flat dwellers in Kampung Kerinci ranged from good to bad depending on demographic and socio-economic factors and housing conditions.

199. TONTISIRIN K

The nutrition situation and nutrition action programs in four ASEAN countries

ASEAN Food Journal, 1(4):162-168, 1985

The paper provided background information about the nutrition situation and the nutrition programmes in four ASEAN countries, namely Indonesia, Malaysia, Philippines and Thailand. The report was based on published data obtained from the library and by correspondence, as well as information collected during visits to each of the countries. Visits were paid to persons and institutions involved in delivery of nutrition and health services, including the ministries of health, universities, and community and other organisations. Field visits were also made to observe the implementation of action programmes at the community level in these countries. The prevalence and severity of the nutritional problems in each country, as well as the intervention programmes implemented were separately presented and discussed. The author also made several recommendations for close collaboration in training, research and the exchange of information among ASEAN countries.

200. UMA DEAVI A

A pilot school health survey to study the incidence of common disorders in primary school children and the role of teachers in the school health service

Medical Journal of Malaysia, 41(1):4-11, 1986

A pilot school health survey was carried out in 6 schools in Gombak district, Selangor. Schools were stratified into urban and rural and then into Chinese, Tamil and National Type schools and primary school children were selected by systematic random sampling. Selected students were subjected to a general health appraisal including vision and hearing tests by teachers, nurses and finally a medical officer. The findings of all three examiners were then compared taking the results of the medical officer as the indicator of accuracy. The findings of the survey indicated that the problems of school children were similar to those reported by other workers and by MCH Division of the Ministry of Health, namely dental caries, head lice, malnutrition, skin infections and visual disability. Other problems like skeletal deformity and abnormalities of heart, lung, speech and behaviour were extremely uncommon and formed only 1.5% of the total. The majority of the teachers perceived the School Health Service as a joint effort between the Ministry of Health and Education and agreed that they had a role to play in the SHS. Many teachers also indicated a willingness to carry out the various tasks in the SHS.

201. VERGHESE F

Kesihatan kanak-kanak sebelum bersekolah dan sudah bersekolah (Health of the pre-school and the school child)

Proceedings of the Seminar on Supplementary Feeding Programme in Malaysia, 16-17 January 1980, Kuala Lumpur; pp. 27-34.

The paper reviewed the School Health Service and health of the pre-school and school child in the State of Melaka. There being no special health service for the pre-school child, health personnel had to visit kindergartens run by KEMAS and some of the private ones. The number of such centres covered in 1979 and the common conditions treated or referred for were tabulated. Similar tables for the rural primary schools (covered by the Ministry of Health) and the urban school (by the Municipality) for the year 1978 were presented. Comments were made on the table presented. The author pointed out and discussed the seemingly few cases of anaemia and undernutrition amongst the pre-schools and the rural schools whilst the percentage reported for the urban schools was very much higher. Some of the problems faced in attempting to provide good school health services were pointed out, including some of the inadequacies in the School Supplementary Feeding Programme.

202. WADSWORTH GR

Weights and blood pressures of women who attend family planning clinics in Sarawak

The Medical Journal of Malaysia, 36(3):148-150, 1981

A total of 1966 records of weight (and 500 records of blood pressure) from the records of the Medical Department in Kuching for the past few years were extracted and analysed. Ethnic composition of the women and the mean weight of each ethnic group

were tabulated. Results were compared and found to be greater than those reported by Anderson (1978) and an unpublished report of the Medical Department, Sarawak. It was suggested that analysis of the records of women who repeatedly attend the family planning clinics would provide information of trends in the mean weight of these women over an appreciable length of time. These trends could be more valuable as indicators of fluctuations with season and over longer periods, in the availability of food.

203. WAN ABDUL MANAN WM

Nutritional status and adult literacy: a study in two rural kampungs

Proceedings of the 2nd Scientific Conference of the Nutrition Society of Malaysia, (Tee ES, Chong YH and Mohd Ismail N, ed.), 28 February 1987, Kuala Lumpur: Nutrition Society of Malaysia, Kuala Lumpur, 1987; pp. 25-35.

A study was carried out in two kampungs in Ulu Terengganu to assess the nutritional status and literacy of the adult population. The collected data included anthropometric measures and socio-economic variables of the subjects (N=107) under study. The subjects were also asked to sit for the indicator of literacy test which was designed by the author. Results of the study indicated that a large number of the subjects were poor (~80%), lacking in education (~50%), illiterate (~50%) and landless (25%). About 30% of the subjects were malnourished according to their body mass index cut-off point. Statistical analysis showed that literacy was significantly associated with income ($p < 0.001$) and nutritional status ($p < 0.01$). The level of education also proved to be a significant factor in relation to nutritional status of the subjects. This study concluded that literacy should be considered as an important indicator in assessing the nutritional status of adults in rural or semi-literate communities.

204. WAN ABDUL MANAN WM and LOW HC

Malnutrition in Penang island kampung children

Proceedings of the Nutrition Society of Malaysia, 4:35-44, 1989

A cross-sectional evaluation of nutritional status was conducted among preschool children (N = 483) from eight kampungs in Penang island. Anthropometric results indicated that a substantial number of children suffered from chronic to moderate malnutrition. The proportion of children with height and weight for age below standard ($< - 2$ S.D. NCHS standard) were 59.3% and 27.0% respectively. Mid-upper arm circumference and tricep skinfold thickness also showed the prevalence of measurements below the 5th percentile standards (15.6% and 20%). Sixty-seven per cent of the children were found to have a caloric intake below the Malaysian RDA. Haemoglobin levels indicated that 42.0% of the subjects were nutritionally anaemic (Hb < 11.0 g/dl).

205. WONG CK

Infant feeding patterns in a rural chinese community in kampung Sungai Klau, Raub, Pahang Darul Makmur

Project report submitted to Universiti Pertanian Malaysia in partial fulfillment of the requirements for the Degree of Bachelor of Science (Human Development), 1991

Infancy is a period of extremely rapid growth. An adequate intake of nutrients is essential for optimal growth, health and development during this critical period. Aspects included in this study were the extent breast milk was given to the infants, the duration of breastfeeding, the incidence of prop-feeding, when babies were weaned and the types of weaning food given. An assessment was made of the relationship between these practices and several demographic and socioeconomic factors. All the respondents were involved in agriculturally related occupations. The main crop grown was cocoa. The study included all the fifty-one families with infants. The study found that 58.8% of the children had been breastfed for an average of three and a half weeks. However, 83.3% of the children were introduced to infant formulas at birth. About 40.8% of the children were propped, that is their bottle routinely placed on a pillow during feeding. Weaning foods, the most common of which was the commercial cereals, were introduced averagely just before three months of age ($\bar{X}=2.9$ months). More than one third had already begun weaning by two months of age. Analysis of data using Spearman Rho, non-parametric test revealed that there was no significant correlation between incidence of breastfeeding and type of family, number in the household, number of children, mother's age, mother's education, mother's work status, family income and father's occupation. However, the duration of breastfeeding was associated with mother's age ($r=0.44$, $p<0.05$), whether the mother worked outside the home or not ($r=-0.03$, $p<0.05$), and number of children ($r=0.44$, $p<0.05$). Other mothers, mothers who were not working and those with more children tended to breastfeed longer. A significant negative correlation was found between family income and age at which weaning foods were introduced ($r=-0.30$, $p<0.05$): the richer they are, the earlier they tended to introduce the weaning food. Mothers who were more inclined to practice prop-feeding were working mothers ($r=0.27$, $p<0.05$), those who had fewer years of education ($r=-0.27$, $p<0.05$), mothers with more children ($r=0.35$, $p<0.05$) and more household members ($r=0.28$, $p<0.05$). Prop-feeding can cause babies to choke and increase the risk of death. Infant health and nutritional education programmes are needed to promote the breastfeeding practices, to prolong the duration of breastfeeding, to remind the community about risk of prop-feeding and the early introduction of weaning food.

206. WONG ML

A comparative study of breastfeeding in the two main ethnic groups in the Ulu Langat and Gombak districts in Selangor

Dissertation submitted to the University of Malaya in part fulfillment for the Degree of Master of Public Health, 1982

The incidence and duration of breastfeeding in relation to age, parity, income and occupation was studied compared among 48 urban and 49 rural Malay mothers, and between the former and 51 urban Chinese mothers. The views of the mothers on breastfeeding and their reasons for not breastfeeding or discontinuing breastfeeding were studied. The study also aimed assessing the awareness of the mothers towards the advantages of breastfeeding. These mothers were interviewed while attending the antenatal sessions or child health sessions in the MCH clinic, midwife clinic or subhealth clinic of the Ulu Langat and Gombak districts. Incidence of breastfeeding was said to be very high among the rural Malay mothers, low in the urban Chinese, and 'quite high' among the urban Malay mothers. Rural Malay mothers were seen to have breastfed for the longest period, followed by urban Malays. No association was observed between the incidence of breastfeeding and age, parity, occupation, income and educational status of the rural Malay. However, it was the low income urban Malay mothers who breastfed longer. The Malays had more knowledge of the advantages of breastfeeding, whilst a shockingly high proportion of the urban Chinese were said to be ignorant of the fact. It was emphasized that education on

breastfeeding should be promoted in the health clinics and attention focused on clarification of doubts and misconceptions of breastfeeding.

207. YAP SB

A study of the prevalence of endemic goitre in an inland Iban community, Sarawak

The Medical Journal of Malaysia. 40(3):243-246. 1985

Eight longhouses were selected randomly for a goitre survey in the Entabai area of the 6th Division, Sarawak. A total of 645 subjects were examined and a goitre prevalence of 46.4% was found for subjects 15 years and above. The females had a higher rate of 69.5% as compared with their male counterparts with 24.4%. Below the age of 15 years, prevalence was low and there was not much difference between the two sexes. After the age of 15 years, the prevalence among the females increased from 40% to almost 80% by the age of 25 years. The males, on the other hand, showed a decrease in prevalence after the age of 15 years and levelled off at about 30%. The females also had much larger goitres than males. About 43% of the households surveyed consumed iodised salt but the rates tend to fluctuate according to supplies. There was however no direct correlation between goitre prevalence and consumption of iodised salt.

208. YAP SH

Food habits and dietary pattern among preschool children

Project report submitted to Universiti Pertanian Malaysia in partial fulfillment of the requirements for the Degree of Bachelor of Science (Human Development), 1990

The food habits of forty Chinese preschool children studying in Ai Xin Kindergarten in Serdang were studied to ascertain their nutritional adequacy, food preferences and food intake frequency. Their dietary patterns in relation to socio-economic factors (family size, birth order, household income, mothers' educational level and nutritional knowledge), and mothers' food preferences were also assessed. The intakes of calories, calcium, iron, retinol/vitamin A, and vitamin B1 were less than 75% of the Recommended Daily Allowances for Malaysians, while the intake of vitamin C was more than 300%. Children generally preferred food such as fruits, cereals, milk and milk products, meat, and soft drinks. Cereals (rice) were the most frequently taken food, while milk and milk products were the least. Household income, mothers' educational level, and nutritional knowledge influenced significantly the children's nutrient intakes. The food intake frequency of children was influenced linearly by family size ($r=0.41$, $p<0.005$) and birth order ($r=0.34$, $p<0.05$). There was a significant correlation between the mothers' and the children's food preferences ($r=0.42$, $p<0.01$). Generally, the children's nutritional intake could be improved. Socio-economic factors was found to play a major role in influencing the food habits and dietary patterns of the children.

209. YU SY

Research, development and distribution of high-protein low-cost food supplement in Malaysia

Proceedings of the 10th ASEAN Workshop on High-Protein Low-Cost Food Supplement, 1-7 December 1980, Bangkok, Thailand; ASEAN Sub-Committee on Protein, Bangkok, 1980; pp. 53-59.

The paper described various research and development activities undertaken by the Malaysian Agricultural Research and Development Institute (MARDI) and Universiti Pertanian Malaysia (UPM) to develop high-protein low-cost foods. Utilising mainly locally-available resources, various cookies and noodles were developed by MARDI for use in child-care centres and the Maternal and Child Health Clinics in the country. UPM emphasised on the improvement of the more traditional protein foods including various fish products such as keropok (fish crackers), salted-dried fish and fish sauce.

210. ZAHARA M (EDITOR)

ASEAN Food Habits: Final Report of the ASEAN Food Habits Project (1985-1989)

ASEAN Sub-Committee on Protein, Kuala Lumpur, 1989.

The ASEAN Sub-Committee on Protein identified food habits as a major contributor to the quality of food intake and the state of nutrition of communities in ASEAN. The Food Habits Project was thus implemented to increase understanding of the role of food habits in the improvement of the nutritional status in the ASEAN region so that policies and programmes could be more effectively designed and implemented. The Project aimed to: (1) document, review, analyse and exchange available data and information on food habits; (2) develop common sets of data on food and nutrition for use in the region; and (3) undertake relevant studies on food habits of several communities. The Project brought together food scientists, nutritionists, social scientists, policy makers and anthropologists, in its effort to improve the nutritional status of the population, by optimising the utilisation of existing food resources through the improvement of food habits. The report describes the projects undertaken by each member country, in line with the objects of the Project. The studies carried out in Malaysia were focussed on the school children. The impact of the school feeding programme, implemented by the government to improve the health and nutritional status of rural children and children of the urban poor. Another study investigated the eating habits of children in schools, the types and nutritional value and adequacies of foods sold in school canteens, the condition of the school canteens, including the hygiene and sanitation aspects. A project to systematically compile a food composition database was also carried out.

211. ZAINAB MH and ABDULLAH A

Status report on weaning foods

Report No. 246, Food Technology Division, MARDI, Serdang, 1982

The report described the types of weaning foods available in the Malaysian market. There are two major groups, viz. dry cereals, of which a wide variety is available including rice, oatmeal, barley, mixed cereal and high protein cereals, and instant strained and junior foods. Foods of the latter group are the more convenient forms: they require only to be warmed up. They are however also more expensive. The dry cereals are cheaper and are readily available in the rural areas. There are many varieties to choose from, but the selection of the foods to give a balanced diet to the infant is crucial. Although not so convenient as the strained and junior foods, they are still easily prepared: it involves only the addition of warm water or milk. The nutrient composition of these foods were tabulated in the report and the nutritional value of these nutrients was discussed. The availability and cost of these foods were also considered.

212. ZAINOL ABIDIN M

Fatty acid composition of some of the Malaysian fresh water and marine fishes

Project report submitted to Universiti Pertanian Malaysia in partial fulfillment of the requirements for the Degree of Bachelor of Food Science and Technology, 1980

A total of 9 species of Malaysian fish, including 6 fresh water and 3 marine, were analysed for their lipid content. They were found to contain lipid in the range of 1.1 to 2.4% which was not affected by the storage temperatures and times employed. Fatty acid composition of the oil of these fishes was determined by gas chromatography. It was found that all the fish species contained 16:0 acid as their predominant fatty acids. The oil of marine fish were found to contain higher proportion of 20:5 and 22:6 acids but were low in 18:2, 18:3 and 20:4 acids when compared with freshwater fish. The effect of storage temperatures (0-5 C and -17 C) and times (3 days to 4 weeks) on the changes in fatty acid composition was also examined. A decrease in 18:3 fatty acid and an increase in 20:4, 20:5 and 22:6 fatty acids was observed during storage under these conditions. The changes in fish quality during storage were monitored by measuring the TBA number. A comparison in terms of shelflife quality between the processed (degutted and beheaded) and whole fish was also carried out.

213. ZAINUN CA

Development of weaning food based on rice (*Oryza sativa*)

Project Report submitted to Universiti Pertanian Malaysia in partial fulfillment of the requirements for the Degree of Bachelor of Food Science and Technology, 1984

A low-cost high nutritional weaning food was successfully formulated. Two formulations, with rice flour as the basic ingredient were prepared. The formulations contained either full fat soya flour or mung bean flour. They were enriched with skimmed milk. Chemical analysis indicated that this newly developed rice-based weaning food had reached the level of the standard weaning food composition. Amino acid analysis showed that it had a higher quality protein compared to rice, soya or mung bean protein. Sensory evaluations showed that the product was comparable to the commercially available weaning food in terms of colour, flavour, texture and overall acceptability. Alterations of these properties were not pronounced on storage. Other aspects of the product considered were cost, processing, storage and self-life properties.

214. ZAITUN Y and TERRY RD

Anthropometric characteristics of rural elderly females in Malaysia

Ecology of Food and Nutrition, 26:109-117, 1991

The purpose of this paper is to report selected anthropometric measurements of 305 healthy ambulatory Malay females 55 years and older from two sub-districts in Negeri Sembilan. A variety of measurements were taken, and used in several formulas to further describe the anthropometric characteristics of the sample. The mean height of the sample was 147.2 cm. Both standing and sitting heights declined significantly with age. There was considerably less decline in arm span with age, and the correlation knee height and age was not significant. The mean body weight for the entire sample was 49.8 kg and the mean body mass index (BMI) was 22.9 kg/m². Both body weight and BMI declined with age. Values for body weight and BMI were highly correlated. Although

over one-third (38.4%) of the respondents were classified in the overweight category, the prevalence of over-weight declined with age. In contrast, about one-fourth (24.6%) of the sample were classified in the under-weight category, and the prevalence of under-weight increased with age. Both the waist hip circumferences tended to decline with age, while waist-hip ratio (WHR) tended to increase with an increase in body weight and BMI. Such correlations indicate that increases in body fat may have been distributed more in the abdominal area of the body than in the hip area. The right and left arm circumferences were significantly and negatively correlated with age. Similarly, age was negatively correlated with arm muscle circumference (AMC), mid-arm muscle area (MAMA), both right and left triceps skinfold thickness and mid-arm fat area (MAFA). The negative correlation between age and measurements of upper arm anthropometry suggests a decline of these indicators with aging. Thus, age was significantly related to changes in many of the anthropometric characteristics of the elderly Malay females in this sample. These age-related changes may be a function of biological, secular, and/or methodological variation.

215. ZAITUN Y and YEO DBB

Selected nutritional indicators and health-related characteristics of a sample of elderly Chinese

Proceedings of the Nutrition Society of Malaysia, 8:49-62, 1993

Selected anthropometric measurements, frequency of food intake, self-perception of health status and selected health-related characteristics of elderly Chinese members of selected Senior Citizens Associations in the Klang Valley were examined. The sample consisted of 27 males and 23 females who were 55 years of age or above. Data were collected by personal interviews using specially-designed questionnaires. Selected anthropometric measurements were also collected from the sample. The findings revealed that the mean height of the males was 165.5 cm and that of the females was 154.4 cm. The mean weight of the males and females 67.1 kg and 57.0 kg respectively. A number of significant correlation was found between selected anthropometric measurements and socio-demographic variables. Data on frequency of food intake revealed that rice was most frequently consumed followed by green vegetables and fruits, while butter, beef, fruit juices and soft drinks were foods least frequently consumed. The self-assessment of health showed that more than half of the respondents (64%) perceived their present health status as good. Of the six ailments common to the elderly, high blood pressure and arthritis were the most frequently reported i.e. by 34% and 32% of the elderly respectively. A majority of the respondents (78%) reported taking at least one type of medication. On the whole, the assessment of selected indicators of nutritional and health status among elderly Chinese revealed several differences and trends.

216. ZANARIAH J

Supplementary food programmes for children in Malaysia

Paper presented at the Workshop on Home and Village Prepared Supplementary Foods in Asia, 28-30 October 1983, Bangkok; 14 p.

Supplementary feeding programmes are aimed to achieve the end goal of improving the nutritional status of selected groups in as short time as possible. The paper reviewed briefly the various programmes for children in the country. This included school supplementary feeding programmes through balanced snacks prepared from prescribed

menus using local foodstuffs. Various supplementary foods developed by the Food Technology Division of MARDI especially for preschool children were also described.

217. ZANARIAH J

Food and nutrition planning in Malaysia and possible contribution of the agricultural sector

Report No. 224, Agricultural Product Utilisation Division, MARDI, Serdang, 1980

Malnutrition is a problem inter-dependent on multiple factors such as poverty, accessibility to health services, agriculture production, income distribution, etc. This paper outlined the food and nutrition programmes and various aspects of the relationship between nutrition improvement and the contributions of the agricultural sector. Nutritional deprivation has many adverse effects such as the lowering of resistance to infectious diseases leading to a high rate of mortality among children, affecting mental and physical development and productivity and the span of working life. Development in the agricultural sector is one of the keys to economic and social progress for a developing country and has much to offer to combat malnutrition problems.

218. ZANARIAH J

Nilai pemakanan sayur-sayuran (The nutritive value of vegetables)

Report No. 241, Agricultural Product Utilisation Division, MARDI, Serdang, 1981

Vegetables contain protein, carbohydrate, vitamins, minerals and other nutrients. The nutritional importance of vegetables may be seen from two factors, viz their nutrient and the amounts they are consumed. Nutrient composition of vegetables vary with varieties and the conditions in which they were grown. Examples of nutrient composition of some common vegetables were given. Each of the nutrients were discussed in relation to their importance to the body. The effects of processing on these nutrients were also discussed.

219. ZANARIAH J

Nilai pemakanan buah-buahan tempatan (Nutritive value of local fruits)

Teknologi Makanan, 1(1):25-30, 1982

The paper reviewed briefly the vitamin and mineral content of some popularly consumed local fruits. Amongst the local fruits, banana, papaya, pineapple, orange, rambutan and durian are the most consumed and are important sources of vitamin C. Banana, papaya and pineapple are easily grown surrounding the houses and they fruit throughout the year. These fruits are also inexpensive in the markets. Papaya and banana are suitable for the consumption of children and can become important sources of vitamin A and C which may be lacking in their daily diets. Aside from being eaten fresh, these fruits may be made into beverages, cakes and other products.

220. ZANARIAH J

Infant feeding practices in Segamat, Johore

Report No. 271, Food Technology Division, MARDI, Serdang, 1983

Poor infant feeding practices and their consequences are one of the world's major problems and a serious obstacle to social and economic development. A study of infant feeding practices of several urban and rural areas of Segamat District was carried out. This was part of a larger study of the food intake trend of the population in the district, carried out in 370 households. Out of this total, 36 households from the town area, and 44 in the kampongs were found to have children below the age of 2 years. These were taken as sample of the study of infant feeding practices. The prevalence of breastfeeding was studied in relation to monthly household income, educational level of the mothers, and whether the mothers were working or not. Supplementary feeding practices of these children were also investigated.

221. ZANARIAH J and MAMOT S

Kesihatan dan pemakanan sebagai satu mata-pelajaran biologi (Health and nutrition as a subject in biology)

Paper presented at the Seminar on Pendidikan Biologi Kebangsaan, 16-17 March 1983, Kuala Lumpur

The teaching of health and nutrition in school is as important as the other science subjects. The subjects are of direct relevance to the health and nutrition status of the students, as well as that of their family members. Various aspects which are related to food chemistry, physiology, food microbiology, and community health should also be taught in school. The paper provided some suggestions and guidelines on the teaching of these various subjects. Topics covered included the various nutrients in foods and their functions, the food sources of these nutrients, nutrient requirements, food processing and food safety.

222. ZANARIAH J and MD YUNUS J

Kajian arahaliran pengambilan makanan penduduk di kawasan-kawasan bandar dan luar bandar di Pendang, Kedah (Study of the food intake trend of urban and rural dwellers in Pendang, Kedah)

Report No. 270, Food Technology Division, MARDI, Serdang, 1983

A survey of the food intake trend of 303 subjects (household occupants) in Pendang, Kedah was carried out. The intake of foods in the various food groups was studied in relation to ethnic groups, household income, household size, education level of the heads of household. Findings obtained for the urban and rural households were compared. The report presented findings on the frequency of consumption of food items, the average cost of foods, sources of foods, and the consumption of processed foods.

223. ZANARIAH J, MOHD HASHIM and ABU KASIM

Food consumption and food optimization system in a padi-growing area in Malaysia-Pendang, Kedah

Report of the 4th ASEAN Workshop on Food Habits. (Roestamsjah, Tsauri S and Karossi TA, ed.), 29 November-4 December 1982, Yogyakarta, Indonesia: ASEAN Sub-Committee on Protein, Indonesia, 1982; pp. 179-192.

A total of 303 households in Pendang district, 145 households from the town area and 158 from the rural areas, were selected by stratified multistage random sampling for the study. Race structure of these households was approximately 80% Malays, 14% Chinese, 5% Indians and 4% others (mainly Thais). The basic economic structure of the district was agriculture and about 50% of the labour force was involved with agriculture. Further analysis of the occupation of the heads of the households showed that 40% of the Malays were predominantly engaged in agriculture (mainly padi growing and rubber tapping), 74% of the Chinese and all the Indians were doing business. Examination of the income pattern of the households revealed that 22% of the Malays and 5% of the Chinese had an average monthly income of <\$200. It was found that more of the heads of households in the rural areas than those in town areas had no education, and families with incomes of less than \$600 per month had breadwinners without formal education or only primary education. The average household spent about three fifths of their incomes for purchasing foodstuffs. Several possible farm projects that could be successfully integrated in the farming system were discussed such as the planting of fruit trees and vegetables, rearing of poultry and livestock, cash crop farming, and fish culture. It was felt that such activities could supplement the income as well as improve the food consumption of the population in the area.

224. ZANARIAH J and NAZARIFAH I

Nilai pemakanan makanan tradisional (Nutritive value of traditional foods)

Teknologi Makanan, 2(1):39-44, 1983

The paper reviewed the chemical composition and nutritive value of several traditional foods in the country. These foods include those prepared from various sources, such as fish (budu, pekasam, belacan, cencaluk, ikan masin), cereals (tapai pulut, samsu, tuak), fruits (tempoyak, toddi, pisang salai, asam limau), vegetables, including legumes and roots (kicap, taucu, tempeh, tapai ubi) and eggs (salted eggs). Proximate composition, some vitamins and minerals of some of these foods were tabulated and discussed. The discussion also dealt with the improvement of the nutritional value and the processing methods of these foods.

225. ZANARIAH J, NOOR REHAN A and ROSNAH O

Amalan makanan murid-murid sekolah rendah (Food habits of primary school children)

Proceedings of the Workshop on Food Habits of Primary School Children., (Zanariah J, Aminah A, Yunus J, Nawalyah AG and Sahari J, ed.), 23-24 August 1988, Kuala Lumpur; ASEAN Sub-Committee on Protein, Kuala Lumpur, 1988; pp. 89-108.

Studies were carried out to understand the food habits of primary school children, including information on purchase of food using pocket money, foods brought from home.

types and prices of foods and drinks sold in canteens, the condition of the canteens, as well as socio-economic and other background information of the children. Foods sold in the canteens were also analysed for proximate composition and other nutrients. About 200 schools in Peninsular Malaysia from the northern, central, eastern and southern regions were studied, including schools in Kedah, Selangor, the Federal Territory, Terengganu and Johore. From each school, about 72 pupils were randomly selected from each of the standards one to six. Data on food habits from more than 14,000 school children were thus collected.

226. ZANARIAH J, NOOR REHAN A and ROSNAH O

Amino acid and other nutrient composition of some Malaysian freshwater fish

Proceedings of the Nutrition Society of Malaysia, 3:32-41, 1988

Ten freshwater fish such as carps, featherback, gouramy, snakehead and tilapia were analysed for proximate composition and amino acid composition. The protein content was about 16% for most species. Amino acid composition shows that freshwater fish contained high quality protein when compared with the FAO/WHO reference proteins. Freshwater fish also contained a high level of the essential amino acid, lysine, exceeding that found in hen egg, human milk and our staple food, rice. The vitamin and mineral compositions of freshwater fish were tabulated and briefly discussed in this report.

227. ZANARIAH J and YUNUS J

Food intake trend of the population in the urban and rural areas - Segamat, Johore

Report No. 227, Food Technology Division, MARDI, Serdang, 1983

The survey was carried out to study the food intake trend of the population of the district of Segamat. Collection of data was made by personal interview with a household member, usually the homemaker or head of household using a precoded questionnaire. Information about food expenditures, frequency, received as gifts or home produced were acquired for the determination of the dietary pattern of the households. Data on general characteristics of the households were also collected. A total of 370 households were studied. 200 of these were in the town areas and 170 of them were from 14 kampungs selected from 3 mukims. Results obtained were presented separately for the town and rural areas, as well as for the three major ethnic groups.

228. ZANARIAH J, YUNUS J, AMINAH A, NAWALYAH AG and SAHARI J

Highlight of the food habits surveys of primary school children in Peninsular Malaysia

Proceedings of the 7th ASEAN Workshop on Food Habits, 19-21 June, 1989, Penang; ASEAN Sub-Committee on Protein. Kuala Lumpur, 1990; pp. 50-65.

Since food habits are formed while the children are young, it is appropriate that their eating habits, especially when they are at school, should be observed and corrected. Studies were thus carried out to obtain information on the eating habits of the children at school and to review the types of foods being sold in the school canteens. The studies were collaboratively carried out by the Food Technology Division of MARDI.

Food Science and Nutrition Department of Universiti Kebangsaan Malaysia and the Department of Human Development of Universiti Pertanian Malaysia, with the cooperation of the Ministry of Education. One hundred and eight-four schools in Johore, Selangor, Terengganu, Kedah and the Federal Territory were randomly selected and a total of 14,018 students were surveyed. Data on the pocket money, expenditure patterns, eating habits and the consumption of processed snacks were obtained by interviewing the students. The prices and types of foods sold and the conditions of the school canteens were evaluated. Most of the common foods sold were analysed for their nutrient compositions. The amount of pocket money a student received was limited and most of the students surveyed received 30 to 50 cents per day. With the limited amount of pocket money, school canteens should provide suitable quantity of nutritious and wholesome foods for the students. Primary school children are indeed very young ranging in age between 6 to 12 years old. They need to be guided in the proper selection of nutritious foods. In order for the school canteens to meet the child's nutritional needs, food items must be selected for their nutritive values and served hygienically, as well as in sufficient quantities.

229. ZAWIAH H, NORLIDA MD and ISMAIL MN

Prevalence of malnutrition amongst preschool children in the FELDA scheme

Journal of the Malaysian Society of Health, 5(1):85-88, 1985

The study was carried out to assess the nutritional status of 111 preschool children aged 4-6 years residing at Sungai Behrang and Sungai Klah FELDA schemes. Anthropometric data revealed moderate to chronic malnutrition in both the locations although the prevalence was higher in the former. Based on the 24-hour recall, the intake of most of the nutrients with the exception of protein, thiamine and vitamin C were below the Malaysian RDI. Biochemical assessment of the children indicated poor physical growth of some 49% of the children in Sungai Behrang and 43% at Sungai Klah where their hydroxyproline index were found to be less than 1.5.

230. ZAWIAH H, TAN AK and ISMAIL MN

Nutritional status and food consumption pattern among adolescents

Paper presented at the 6th European Nutrition Conference, 25-28 May 1991, Athens, Greece

The objective of this study is to evaluate food intake and nutritional status among adolescent. A total of 109 male students residing in the Royal Military College were studied. Parameters assessed include anthropometric measurements, 3-days weighed food intake and haemoglobin analysis. Their mean body weight and height were lower than NCHS standard but were comparable to their Singapore counterparts at the 50th percentile. Calorie intake revealed that 76% of the subjects (13-15 yrs) and 65% (16-18 yrs) were consuming energy below the Malaysian Recommendation Dietary Intake (RDI) of 2450 kcal and 2580 kcal, respectively. Contribution of protein, fat and carbohydrate to total energy intake were 12%, 28% and 60%, respectively. The mean intake were adequate, however, about 36% or 40 subjects from both age-group were below RDI. Protein from animal source contributed less than 50% of total intake. In general, intake of other nutrients were below RDI especially, intake of calcium, vitamin B2 and niacin. Haemoglobin levels were about the accepted level of 12 g/dl. It is evident from this study that the intake of nutrients had failed to meet the demands of an adolescent for an optimum growth.

abstracts

part 2

**RESOURCE
MATERIALS**

231. CHIA A

Kawalan kalori kearah kehidupan yang sihat (Control calories towards good health)

Office of the Director of Medical and Health Services, Selangor Darul Ehsan, Shah Alam, 1993.

The booklet is a simple guide for the control of caloric intake, to prevent obesity. It provided data on the calorie content of several popular foods and drinks. Some guidance is given on how to plan a balanced diet, based on the caloric content of foods. A sample menu during the fasting month and its calorific value is given. The duration of various activities/exercises required to use up 100 Kcal is also tabulated.

232. CHONG YH

Food and nutrition for health and fitness

Paper presented at the National Seminar on *Kercergasan Seumur Hidup - Ke Arah Meninggikan Hasil Kerja*, 23-24 July 1983, Pulau Pinang; 7 p.

There is no magic formula or a single source of food that will contribute to health, fitness and longevity. The secret lies in choosing a balanced diet selected from as wide a variety of foods as possible and an understanding of basic food groups for the purpose of supply of energy, body-building and for body protection. In addition, there is a need to eat moderately and to exercise regularly. The paper gave some guidelines on arriving at a balanced diet. Emphasis was placed on overnutrition and diseases associated with affluence, such as obesity, hypertension, coronary heart disease, cancer, and dental caries. To achieve fitness and health, it was emphasized that one has to "avoid wrath, sloth and gluttony".

233. MALAYSIAN PALM OIL PROMOTION COUNCIL

Basic background information on palm oil

Malaysian Palm Oil Promotion Council, Kuala Lumpur, 1991.

The booklet serves as a useful, easy to read guide to various nutritional aspects of palm oil. Aspects covered include the food uses of palm oil, role of palm oil in the diet, hydrogenation of oils, vitamins A and E in palm oil, and some highlights of palm oil research. Some questions and answers about palm oil are listed in the second section of the booklet. In the third section, some facts on palm oil are listed, including composition of the oil, functional properties and health benefits of palm oil.

234. MALAYSIAN PALM OIL PROMOTION COUNCIL

Palm oil: a guide for users

Malaysian Palm Oil Promotion Council, Kuala Lumpur, 1993.

The booklet provides readers with an overview of palm oil and its uses. The facts are clearly presented and illustrated with numerous photographs and charts. The main chapter deals with the "versatility and technical advantages of palm oil. Other

chapters deal with a brief description of the palm oil industry, processing, transportation and handling of the oil. The glossary at the back of the booklet provides explanation for many technical terms used in the industry.

235. MEDICAL & HEALTH DEPARTMENT NEGERI SEMBILAN

Makanan dan anak anda - panduan pemakanan untuk anak berumur 1-3 tahun **(Food and your child - nutrition guide for children 1-3 years)**

Medical and Health Department Negeri Sembilan, Seremban, 1988.

The leaflet is a simple food and nutrition guide for the feeding of young children 1-3 years. A chart of the three food groups is given and the amounts recommended daily are given in household measures. Several tips on child feeding are also given. The leaflet also emphasized the importance of bringing the children to the clinics to be weighed.

236. MEDICAL & HEALTH DEPARTMENT NEGERI SEMBILAN

Makanan tambahan untuk anak puan yang berumur 5-6 bulan (Supplementary food for infants 5-6 months)

Medical and Health Department Negeri Sembilan, Seremban, 1988.

The leaflet is a simple guide for giving supplementary food to infants 5-6 months of age. A chart of the three food groups is given and the amounts recommended daily are given in household measures. Two simple menus are given for preparing rice porridge with anchovies and spinach and rice flour porridge with egg and pumpkin. Several tips on giving supplementary foods to infants are also listed.

237. MEDICAL & HEALTH DEPARTMENT NEGERI SEMBILAN

Makanan pepejal untuk anak puan yang berumur 10-12 bulan (Solid foods for infants 10-12 months)

Medical and Health Department Negeri Sembilan, Seremban, 1988.

The leaflet is a simple guide for preparing solid foods for infants 10-12 months of age. A chart of the three food groups is given and the amounts recommended daily are given in household measures. Two simple menus are given for preparing rice porridge with anchovies and spinach and rice flour porridge with egg and pumpkin.

238. MEDICAL & HEALTH DEPARTMENT NEGERI SEMBILAN

Hadiah paling berharga untuk anak puan - susu ibu (The most valuable gift for your infants - breast milk)

Medical and Health Department Negeri Sembilan, Seremban, 1989.

The booklet is a guide for health staff in carrying out health and nutrition programmes. Various aspects of breastfeeding are covered in this booklet, including the importance of breastfeeding, colostrum, preparations during pregnancy, ways to

breastfeeding, overcoming problems encountered, and infant feeding by working mothers. To improve comprehension, each explanation is accompanied by drawings.

239. MEDICAL & HEALTH DEPARTMENT NEGERI SEMBILAN

Panduan makanan untuk ibu yang menyusukan anak (Nutrition guide for mothers breastfeeding their infants)

Medical and Health Department Negeri Sembilan, Seremban, 1989.

The leaflet explains the need for a balanced diet, comprising foods from the three food groups and sufficient quantity of water, for lactating mothers. Three sample menus are given, with quantities in household measures.

240. MEDICAL & HEALTH DEPARTMENT NEGERI SEMBILAN

Panduan makanan untuk ibu mengandung (Nutrition guide for pregnant mothers)

Medical and Health Department Negeri Sembilan, Seremban, 1989.

The leaflet highlights the importance of good nutrition for pregnant mothers. Mothers are advised to eat balanced meals, comprising foods from the three food groups. Three sample menus are given, with quantities in household measures.

241. MINISTRY OF EDUCATION AND MINISTRY OF HEALTH MALAYSIA

Garis Panduan Kantin Sekolah (School Canteen Guideline)

Ministry of Education Malaysia & Ministry of Health Malaysia, Kuala Lumpur, 1989.

The school canteen can be an important place for obtaining knowledge and developing attitudes and practices on food and nutrition, food hygiene and safety, as well as social habits and practices amongst children. In recognition of this important role of school canteens, this guideline has been developed to provide guidance to school principals and canteen operators in the management and administration of the canteen and in providing efficient service. They have to be responsible for all matters pertaining to the canteen, particularly the following: (a) the school canteen building, facilities and equipment; (b) cleanliness of the canteen, facilities and its surrounding; (c) wholesomeness of the food and drink; (d) overall safety of the canteen; (e) attitude and behaviour of the canteen operator and its workers; (f) quality and appropriateness of the foods and drinks sold, with regards to their nutritional value, price and other aspects; (g) management and administration of the canteen. The chapter on the quality and appropriateness of foods in canteens listed the foods that are encouraged to be sold, namely (a) cooked foods such as rice, nasi lemak, mee, meehoon, etc; (b) fruits; and (c) drinks such as hot drinks, especially those prepared with milk, and fruit juices. Foods that are not encouraged to be sold in school canteens include drinks with excessive sugar, flavoured drinks, drinks with added colourings and synthetic flavours. Foods and drinks that are not permitted to be sold include (a) those contravening the 1985 Food Regulations; (b) carbonated drinks; (c) sweets, chocolates and cream biscuits; (d) preserved fruits; (e) snacks such as crackers; (f) foods that are shaped like toys or are accompanied with toys; (g) cigarettes and foods that contain alcohol; and (h) foods that have exceeded the expiry date.

242. MINISTRY OF HEALTH MALAYSIA

Nutrition education through maternal and child health clinic

Ministry of Health Malaysia, Kuala Lumpur, 1979.

The booklet is a guide to health staff for carrying out nutrition education activities through maternal and child health clinics. The health centre is recognised as an appropriate venue for carrying out nutrition education activities, which should include group talks, food preparation and cooking demonstrations, as well as individual advice to mothers attending the centres and follow up of priority cases through home visits. The booklet lists the various materials to be prepared for these activities and focuses mainly on procedure for preparing various recipes and amounts to be given to young children.

243. MINISTRY OF HEALTH MALAYSIA

Code of Ethics for Infant Formula Products

Ministry of Health Malaysia, Kuala Lumpur, 1985.

On the initiative of the Ministry of Health Malaysia, a Malaysian Code of Ethics for Infant Formula Products was first introduced in the country in July 1979, with the cooperation of the milk industries operating in the country. In the light of experiences gained, the Code was revised in 1983. To further improve the implementation of the code, a second revision was carried in 1985. The aim of the Code is to assist in the provision of safe and adequate nutrition among Malaysian infants by the protection and promotion of breastfeeding and to ensure adequate standards and proper use of infant formula products when required. Various aspects are covered by the Code, including marketing, distribution and product information of infant formula products and provides guidelines of the code of conduct for the health professions/personnel as well as company personnel in hospitals, clinics and maternity homes.

244. MINISTRY OF HEALTH MALAYSIA

Healthy Lifestyle Campaign. Cardiovascular Diseases Training Module for Paramedic

Ministry of Health Malaysia, Kuala Lumpur, 1991.

The booklet is a training guide to be used by health personnel involved in the implementation of the Healthy Lifestyle Campaign launched by the Ministry of Health Malaysia in 1991. In the introductory chapter, the background of the Campaign is described, giving the objectives, implementation strategies and the role of health staff in the Campaign. The first theme of the Campaign was coronary heart disease (CHD). The booklet described in some detail the 5 main factors contributing to CHD, namely smoking, faulty nutrition and obesity, lack of physical activity, hypertension, and stress. For each of the risk factors, suggestions are given for carrying out the training. A series of questions are given at the end of each chapter to gauge the understanding of the trainee.

245. MINISTRY OF HEALTH MALAYSIA

Fakta untuk Kehidupan (Facts for Life)

Ministry of Health Malaysia, Kuala Lumpur, 1992.

This book contained important information for the well being of the mother and child. The information should be disseminated to all members of the community to provide them with basic information for caring the mother and child. Thirteen important messages were contained in this book, some of which pertain to nutrition. These messages include importance of breastfeeding and appropriate supplementary foods and monitoring the weight of the child. Some of the other topics covered include importance of birth spacing, ante-natal visits, immunisation, diarrhoea, childhood diseases, and AIDS. The book provided detail discussions and examples for each of the messages.

246. MINISTRY OF HEALTH MALAYSIA

A guide to a healthy heart

Ministry of Health Malaysia, Kuala Lumpur, 1992.

This is a 12-page booklet, printed in English and Bahasa Malaysia, as a simple guide to the public. The booklet explains the causes of coronary heart disease, namely high blood cholesterol, smoking, high blood pressure, and other factors. Five main steps to be taken to prevent CHD were highlighted, namely dietary alteration, exercise, control blood pressure, weight control and stop smoking. A Chinese and Tamil version of the booklet is also available.

247. MINISTRY OF HEALTH MALAYSIA

Healthy lifestyle campaign: exercise, high blood pressure, diabetes, nutrition, tension and smoking

Ministry of Health Malaysia, Kuala Lumpur, 1992.

These are a series of 6 leaflets distributed by the Ministry of Health as part of the campaign to promote a health lifestyle. Each leaflet is dedicated to a main factor in coronary heart disease, namely exercise, high blood pressure, diabetes, nutrition, tension and smoking. The leaflet on nutrition highlights 3 approaches towards reducing risk to CHD, namely reduce intake of calorie from fats and sugar, reduce intake of cholesterol, reduce intake of salt. The importance of maintaining an ideal body weight and eating a variety of foods is emphasized.

248. MINISTRY OF HEALTH MALAYSIA

Kasih ibu (Mother's love)

Ministry of Health Malaysia, Kuala Lumpur, 1992.

This 15 minutes video documentary discusses the importance of breast feeding, ways to breastfeed successfully, and the nutritional needs of a lactating mother. The importance of a balanced diet, comprising a variety of foods from the three food groups was emphasized.

249. MINISTRY OF HEALTH MALAYSIA

Living with diabetes

Ministry of Health Malaysia, Kuala Lumpur, 1992.

This 20-page booklet provides a simple guide to the public on how to cope with diabetes. The first few pages explain the nature, signs and symptoms of diabetes. Treatment procedures and ways to control diabetes were explained. Dietary considerations are given emphasis. The booklet is presented clearly, illustrated by numerous drawings and photographs.

250. MINISTRY OF HEALTH MALAYSIA

Pemakanan - akibat kekurangan zat makanan (Nutrition - consequences of undernutrition)

Ministry of Health Malaysia, Kuala Lumpur, 1992.

This is a 15 minutes documentary on nutrition, contained in a video tape distributed by the Ministry of Health Malaysia on various health topics. The video discussed the components of a balanced diet and gave examples of foods for breakfast, lunch and dinner. The consequences of the following nutrient deficiencies were discussed, namely protein-energy malnutrition, deficiencies of vitamins A, B, C, D and K and iron and iodine deficiency. The signs and symptoms of these deficiencies were and the food sources of these vitamins were discussed.

251. MINISTRY OF HEALTH MALAYSIA

Pemakanan bayi (Infant nutrition)

Ministry of Health Malaysia, Kuala Lumpur, 1992.

This documentary is contained in a 9-minutes video discussing the nutritional needs of babies and young children. The importance of breast feeding was emphasized. From the age of 5 months onwards, the infants have to be provided with supplementary foods, in addition to breast milk. The importance of a balanced diet for young children, comprising a variety of foods from the three food groups was emphasized. Methods of preparation of these foods and the amounts of foods to be given to the young children were explained.

252. MINISTRY OF HEALTH MALAYSIA

Healthy Lifestyle Campaign: Food Hygiene (Prime Messages and Supporting Information Manual)

Ministry of Health Malaysia, Kuala Lumpur, 1993.

The booklet is a training guide to be used by health personnel involved in the implementation of the Healthy Lifestyle Campaign for 1993. Four main messages to be imparted to the public were (1) choose safe food; (2) choose clean food premises; (3) prepare and handle food properly to produce safe food; and (4) store food under

proper conditions. The booklet provided detail discussions and examples for each of the prime messages.

253. MINISTRY OF HEALTH MALAYSIA

Kempen Cara Hidup Sihat 1994: Promosi Kesihatan Kanak-Kanak (Healthy Lifestyle Campaign 1994: Promotion of child health) (Information for health staff)

Ministry of Health Malaysia, Kuala Lumpur, 1994.

The book is a training guide to be used by health personnel involved in the implementation of the Healthy Lifestyle Campaign for 1994, the theme of which was "Promoting Child Health". The programme focused on 4 main topics, namely immunisation, child growth, early child development and accidents. In the chapter on child growth, 6 main messages were to be conveyed to parents to assist them prevent undernutrition amongst children. These messages touched on importance of weighing the child, breastfeeding, appropriate supplementary feeding and nutritional needs of children. The book provided detail discussions and examples for each of the prime messages.

254. MINISTRY OF HEALTH MALAYSIA

Pertumbuhan kanak-kanak (Child growth)

Ministry of Health Malaysia, Kuala Lumpur, 1994.

This booklet provides guideline on appropriate nutrition for physical and mental development of the child. Six main messages are covered in this booklet, including importance of weighing the child, breastfeeding, appropriate supplementary feeding and nutritional needs of children. These messages are presented in an interesting manner and illustrated with various colourful drawings.

255. MOHD IDRIS HZA, MOHAMMAD ML and NORMAH H

Tanaman bijian (Cereals and legumes)

Dewan Bahasa dan Pustaka, Kuala Lumpur, 1982.

The book (in Bahasa Malaysia) was written specifically for students in agricultural science, and could serve as a useful reference to agricultural officers, the modern farmers and others interested in plant science. It is divided into three sections. The first dealt with the botany, agronomy and management of cereals and legumes. Aspects such as harvesting, processing and storage of grains were discussed. The last section, which should be of interest to workers in food science and nutrition, dealt with the nutritive value of cereals and legumes, and the processing of these into various foods.

256. NUTRITION ADVISORY COMMITTEE

Health, nutrition & palm oil: a compilation of documented facts on the nutritional effects of palm oil

Nutrition Advisory Committee, Washington, DC, 1990.

This booklet is a compilation of 16 facts on the nutritional effects of palm oil, prepared, assembled and reviewed by several renowned nutritionists in the United States and Canada. The compilation has been published in full or in part in some 30 papers in international scientific journals and reports, and cited in full at the end of the booklet.

257. NUTRITION ADVISORY COMMITTEE

Health, nutrition & palm oil: a compilation of documented facts on the nutritional effects of palm oil (2)

Nutrition Advisory Committee, Washington, DC, 1990.

This booklet is the second compilation on the nutritional effects of palm oil. It is based on a review carried out by a group of professional scientists from a range of appropriate disciplines and endorsed by a group of renowned nutritionists in Europe. The review is presented as 14 facts, with full listing of the 59 references cited.

258. PUBLIC HEALTH INSTITUTE, MINISTRY OF HEALTH MALAYSIA

Buku Panduan Pendidikan Pemakanan (Guide Book for Nutrition Education)

Ministry of Health Malaysia, Kuala Lumpur, 1987.

The guide book contains two main sections. The first section is a series of 8 lecture topics on nutrition, while the second section gives several sample recipes for feeding young children. The lecture topics include basics of nutrition and balanced diet, breastfeeding, nutritional needs of young children and school children, growth chart, and nutrient deficiencies. For each topic the information given include target audience for the talk, objectives, suggested audio-visual aids and main points for the talk. The second section gives various practical guides for feeding young children, including detailed recipes, nutrient content of menus and preparation procedures.

259. PUBLIC HEALTH INSTITUTE, MINISTRY OF HEALTH MALAYSIA

Gaya Hidup Cergas (Healthy Lifestyle)

Public Health Institute, Kuala Lumpur, 1992.

A healthy lifestyle that gives emphasis to the following 5 aspects will bring about benefits to the physical and mental health of individuals: a regular exercise programme, a healthy dietary pattern, maintenance of ideal body weight, stop smoking, and control of stress. A healthy and fit individual is able to carry out daily activities with greater efficiency which in turn results in increased work productivity. This booklet explains the importance of the above mentioned 5 aspects to various chronic diseases such as coronary heart disease, diabetes and hypertension. It also provides guidelines, illustrated with drawings and pictures, on ways to practice the 5 important aspects.

260. PUBLIC HEALTH INSTITUTE, MINISTRY OF HEALTH MALAYSIA

Modiul Pemakanan Untuk Kakitangan Kesihatan (Nutrition Module for Health Staff)

Ministry of Health Malaysia, Kuala Lumpur, 1992.

This book is a revised version of a training manual first prepared by the Ministry of Health in 1987. Prepared primarily for nursing staff, the book can also be modified to suit the needs of other categories of staff. The module contains 5 topics, namely (1) monitoring child growth, (2) management of undernourished children, (3) nutritional advice for children, (4) encouraging breastfeeding, and (5) presenting nutrition messages. For each topic, two booklets are prepared, one for the tutor and the other for the trainee. Each topic is also divided into several teaching/learning sessions, and includes objectives, activities, and suggested time for each activity.

261. TEE ES

An Annotated Bibliography of Nutrition Research in Malaysia: Supplement (1979-1984)

ASEAN Sub-Committee on Protein, Kuala Lumpur, 1984.

This compilation is a supplement of the first compilation of annotated bibliography of nutrition research in Malaysia over the period 1900 to 1979. The supplement covers studies carried out from 1979 to 1984. A total of 322 publications and their abstracts are included. The abstracts are grouped according to 13 subject headings. These include general studies on the food and nutrition situation in Malaysia, the various nutrition surveys carried out, investigations into the various nutritional disorders in the country, studies of nutrients and toxicants in foods, the socio-cultural aspects of food and nutrition, diets and dietary requirements, and nutrition intervention measures. A subject and author index are included at the end of the compilation. The publication serves as a convenient and useful guide to researchers in identifying and utilising research papers related to his field of interest.

262. TEE ES

Health living through proper nutrition and diet

Paper presented at the MMA Public Forum on "Health and Physical Fitness", Institute for Medical Research, Kuala Lumpur, 21 June 1986, Ipoh

Malaysians today are exposed to a barrage of "nutrition" advice - through magazines, books and newspapers, and on television. These may serve as potential and valuable means of nutrition education. Unfortunately, they include many over-simplistic interpretations and semi-truths, as well as misleading inferences and false representations. This situation has caused considerable concern to health professionals. It is thus the duty of the nutritionist to play his role in providing the correct nutrition information to the consumer. This talk is divided into two parts. The first deals with the basic concepts of a balanced diet, and emphasizes the importance of such a diet. It aims at reassuring the consumer that family meals planned with familiar foods can be pleasing and satisfying, and can supply ample nutrients. The second part discusses current understanding on the role of nutrition in various degenerative diseases, particularly coronary heart disease and cancer. It is aimed at

pointing out some facts and fallacies regarding these diseases. There is indeed a great deal of research activity in this field. However, information about specific dietary factors is generally inconsistent or incomplete, and are not sufficient to serve as a basis for the recommendation of specific dietary supplements for the prevention or cure of these diseases. It is emphasized that prudence in dietary choices and food habits offers the best reasonable approach to modifying the nutritional component of our increasingly complex environment and pattern of life-style.

263. TEE ES

Diet and nutrition in relation to health and fitness

Paper presented at Fitness Seminars of Various Ministries and Government Departments, Institute for Medical Research, Kuala Lumpur, 1993

Proper nutrition and diet is the foundation for good health and fitness. The body should be well-nourished with foods containing five groups of key nutrients needed for vital body functions and maintain health, namely carbohydrates, fats, protein, minerals and vitamins (and in addition, water and fibre). These nutrients are required to work together as a team, and a diet which contains all of them in the proper quantities constitutes a balanced diet. Nutritional imbalances result in malnutrition, namely nutritional deficiencies and excesses. Although serious undernutrition has largely been eradicated, mild to moderate nutritional deficiencies exist in various rural and urban underprivileged communities in the country. On the other hand, the rapid development in the country has brought about changes in food consumption patterns and lifestyles, and resultant problems of overnutrition and associated chronic diseases. Over-eating, combined with an urban lifestyle of decreased physical activity has led to the problem of obesity which is associated with a number of major illnesses and reduced life expectancy. Diet and nutrition, particularly fats and cholesterol, play a key role in the development of coronary heart disease (CHD). Examination of serum lipid levels is required to assess risk to CHD. The disease is largely preventable through proper dietary habits and physical exercise. Available evidences suggest that cancers of most sites are influenced by dietary patterns. However, the data are not sufficient to quantitate the contribution of diet to the overall cancer risk or to determine the percent reduction in risk that might be achieved by dietary modifications. Although it is not possible to specify a diet that would protect everyone against all forms of cancers, several general dietary guidelines have been put forth. The rise of these chronic diseases in recent years has brought about an increased interest in "health foods" and nutrient supplements, which have been claimed to be able to provide precection and cure. Available data, however, are not sufficient to justify the use of specific dietary supplements for these purposes.

264. TEE ES, MOHD ISMAIL N, MOHD NASIR A and KHATIJAH I

Nutrient Composition of Malaysian Foods

ASEAN Sub-Committee on Protein, Kuala Lumpur, 1988.

This compilation is the result of a collaborative programme between four institutions, namely the Division of Human Nutrition of the Institute for Medical Research, the Food Technology Division of the Malaysian Agricultural Research and Development Institute, the Faculty of Food Science and Biotechnology of Universiti Pertanian Malaysia, and the Department of Food Science and Nutrition of Universiti Kebangsaan Malaysia.

Financial assistance for the systematic analytical programme was obtained under the ASEAN Food Habits Project, which was funded by the ASEAN-Australian Economic Co-operation Programme, and managed by the ASEAN Sub-Committee on Protein: Food Habits Research and Development. This edition of the Food Composition Table is the most comprehensive thus far available in the country. The Table presents nutrient composition for 783 foods, out of which 580 items are raw and processed foods. Data for 203 cooked foods are also tabulated, which include a variety of traditional Malaysian meals, dishes and “kuih”, as well as a number of the so-called “fast-foods”. Explanatory notes on the Table and description of cooked foods are included in the compilation. Indexes of foods according to the common names, Bahasa Malaysia names as well as their scientific names are also provided.

Appendix

ASEAN-New Zealand Inter-Institutional Linkages Programme (IILP)

ASEAN-NEW ZEALAND INTER-INSTITUTIONAL LINKAGES PROGRAMME (IILP)

At the 1987 ASEAN-Zealand Dialogue, high priority was placed on the development of a programme to reflect the cooperative nature of the partnership between the ASEAN and New Zealand. As a result of this Dialogue, the Inter-Institutional Linkages Programme or IILP was launched in November 1990. The overall objective of the IILP is the establishment of ongoing sustainable linkages among ASEAN and New Zealand institutes in academic, professional, scientific and commercial spheres. The countries involved in the Programme are the six ASEAN countries of Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, and Thailand, and New Zealand (a total of seven).

The overall objective is to be achieved through implementation of five specific projects, each involving interested institutions from each country. For each project there is one Key Institution in each country. The Key Institution takes a lead role, but with cooperation and involvement from associate institutions. Specific activities undertaken are directed at achieving a network of cooperation and exchange among ASEAN, within each ASEAN country, and with New Zealand. The important aspects of the Programme are the development of working partnerships between the Key Institutions, the flexibility of project content and the potential for encouraging multi-disciplinary approaches both within and between projects.

Five specific projects, each with its own clear objective, are being implemented within the overall programme objective. These Projects and their objectives are:

Project 1 - Ethnobotany: The sharing of library resources in ethnobotany and providing services to other projects as required.

Project 2 - Sustainable Rural Development: The creation of forum leading to the preparation and dissemination of technical training materials designed to promote sustainable rural development.

Project 3 - Forest Rehabilitation: The development of a resource base for the rehabilitation of degraded forest and waste lands.

Project 4 - Agro-Industrial Development: The development of a resource base for agro-industrial development of rural-based industries (involving fruits, vegetables, and ornamentals) including social and environmental implications.

Project 5 - Food, Nutrition and Health: The development of resource materials for the promotion of food, nutrition and health.

The Key Institutions for each project selected one of them to be the overall Project Coordinator. The Coordinator plays a lead role in facilitating the smooth and timely implementation of the work plan and activities, monitoring and reviewing the activities and ensuring effective communication to achieve both program and project objectives.

The Programme is planned for implementation up to 1995. It is funded by the Ministry of Foreign Affairs and Trade of New Zealand, with support coming from each of the participating countries.

IILP PROJECT 5

FOOD, NUTRITION AND HEALTH PROMOTION

Participants in the International Conference on Nutrition (ICN) which was held in Rome in December 1992 noted that despite considerable progress in the recent decades, the world still falls short of the goal of adequate food, nutrition and health for all. But they also pointed out that eradicating hunger and malnutrition is within the reach of mankind. The ICN produced a World Declaration on Nutrition and Plan of Action for Nutrition. The overall objectives set forth in these documents are ensuring continued access by all people to sufficient supplies of safe foods for a nutritionally adequate diet, achieving and maintaining health and nutritional well-being of all people, achieving environmentally sound and socially sustainable development to contribute to improved nutrition and health and eliminating famines and famine deaths.

Project 5 of the IILP has for its specific objective the development of resource materials for the promotion of food, nutrition and health. Adequate food, proper nutrition and good health are necessary inputs in the development of any country.

Project 5 identified the following outputs of their collaborative efforts: directory of institutions and resource persons involved in food, nutrition and health; abstracts of publications on food, nutrition and health promotion from 1980 - 1991; and selected case studies on food, nutrition and health. In addition to the development of these resource materials, Project 5 conducts national meetings and training programs, shares its expertise with government and non-government organizations and participates in national and international conferences in food, nutrition and health.

Together with the World Health Organization, IILP Project 5 will chair a workshop on "Food, Nutrition and Health Promotion in Asia and the Pacific" during the 15th International Congress on Nutrition in Australia.

Project 5 member countries are working on case studies of selected food, nutrition and health projects in school. These studies are as follows:-

1. Monitoring of the school feeding system in Brunei Darussalam
2. Malaysian case study on school supplementary feeding program
3. The school food programme in New Zealand
4. Two-way link between home and school in promoting nutrition in the Philippines
5. Towards healthier eating in school tuckshops in Singapore
6. Improvement of nutritional status of school children through agriculture activities: a long-term study in Thailand

Project Coordinator:

DR CECILIA A FLORENCIO
Project Coordinator
College of Home Economics
University of the Philippines Diliman
Quezon City, Philippines 1101.

Key Institution representatives/national coordinators:

Ms Yeo Sock Sian
Nutritionist
Ripas Hospital
P.O.Box 821
Bandar Seri Begawan 1908 Cnr.
Brunei Darussalam

Dr Christine Thomson
Senior Lecturer
Department of Human Nutrition
Chemistry 2 Building
Union & Castle Street
University of Otago
P.O.Box 56
Dunedin, New Zealand

Dr Roestamsjah
Div for Scientific & Technological Services
Research & Development Centre
for Applied Chemistry
Indonesia Institute of Sciences
Bandung, 40135
Indonesia

Mrs Tan Wei Ling
Deputy Director
Food and Nutrition Department
Bilik 3, Level 4,
Institute of Health
226 Outram Road
Singapore 0316

Ms Zahara Merican
Food Technology Research Center
Malaysian Agricultural Research
& Development Institute
P.O. Box 12301, GPO
50774 Kuala Lumpur
Malaysia

Dr Vichai Tanphaichitr
Director
Research Centre and Graduate
Program in Nutrition
Faculty of Medicine
Ramathibodi Hospital
Rama 6 Road, Bangkok 10400
Thailand

Dr Cecilia A. Florencio
Dean & Professor of Nutrition
College of Home Economics
University of the Philippines Diliman
Quezon City 1101
Philippines

author index

A

ABD RAHIM M 2, 6, 55, 63
 ABD SHUKOR AR 15
 ABDUL RAHMAN W 1
 ABDUL SALAM B 8
 ABDULLAH A 70, 211
 ABDULLAH AR 2
 ABIDIN H 3
 ABRAHAM SCE 56
 ABU BAKAR AWANG AH 134
 ABU KASIM 223
 ADINAN H 4
 AHLUWALIA R 171
 AHMAD A 169
 AHMAD MUSTAFFA B 5, 6
 AISAH MZ 89
 ALINI M 7
 AMINAH A 8, 9, 10, 11, 80, 116,
 126, 157, 180, 225, 228
 ANUAR A 192
 ARMSTRONG MJ 12
 ARMSTRONG RW 12, 13
 AROKIASAMY JT 14
 ASHWORTH A 100
 ASIAH MZ 50, 78
 ASIS RA 53
 AZHAR A 167
 AZIAH H 62
 AZIDAH M 124, 125
 AZIZAH O 129, 161
 AZMAN AB 141

B

BARNES A 149
 BAUTISTA OK 15
 BENT B 24
 BERRY SK 50, 78, 89
 BHUYAN AH 53
 BRADLOW BA 147
 BUTZ WP 49, 61

C

CAVALLI-SFORZA LT 16, 185
 CHAN ASE 13
 CHAN KE 138
 CHAN MKC 24
 CHANDRASEKHARAN N 17
 CHANG P 138
 CHEE HL 18, 19, 20

CHELLADURAI J 21
 CHELLADURAI N 21
 CHEN PCY 22, 23, 24, 25, 26, 27, 28
 CHEN ST 25, 29, 30, 31, 32, 33
 CHEW GE 145
 CHI CB 71
 CHIA A 231
 CHIN SK 192, 194
 CHONG YH 4, 10, 34, 35, 36, 37, 38,
 39, 40, 41, 42, 43, 44, 45, 46, 56,
 83, 99, 121, 147, 148, 153, 155,
 162, 165, 168, 188, 196, 197, 203,
 232
 COTTRELL RC 47

D

DAHLAN W 40
 DAVANZO J 48, 49, 61
 DELANGE F 171
 DELFINA MT 62
 DEWITT G 147
 DHALI WAL SS 153
 DIDIN S SASTRAPRADJA 34, 115

E

EDMUND G 50

F

FATIMAH A 7, 51, 52, 53, 197
 FONG CY 31, 112
 FONG T 24
 FOO LC 56, 121, 153
 FOO YM 54

G

GAN CY 96
 GAPOR A 147, 169
 GARDINER W 149
 GEORGE J 55, 97
 GEORGE R 56
 GOBIR S 57

H

HAAGA J 58, 59, 60
HABICHT JP 48, 49, 61
HAMIDAH A 62
HARDIN S 25
HARRISON AZIZ S 2, 6, 55, 63
HENDERSON BE 12
HO CC 63

I

ISMAIL MN 64, 65, 66, 67, 68, 69, 70,
71, 72, 73, 74, 75, 76, 77, 229, 230
ISMAIL N 78

J

JAAFAR A 186
JAMIL R 141
JOHN R 145
JUNAIDAH RB 77

K

KAMARIAH ELLI AY 62
KAMSI AH J 7
KANDIAH M 46, 72, 79, 80, 81, 82,
83, 84, 98, 186, 187
KANDIAH V 186
KAROSI TA 187, 223
KHAIRUDDIN Y 85
KHALID BAK 140, 141, 142, 143
KHALID H 131
KHALIDA M 141
KHATIJAH I 33, 54, 72, 86, 264
KHOO KL 87
KHOO TH 87
KHOR GL 88, 89, 90, 91, 92, 93,
94, 95, 96, 97, 98, 188
KHOR HT 99, 165, 169
KHOR SC 192, 193, 194
KING J 100
KIYU A 25, 101
KOSIYACHINDA S 15
KOWSUWAN T 53
KRAMER G 147
KULADEVAN R 186, 192, 193, 194
KWIK WL 31, 112

L

LAILANOR I 120
LEE CC 24
LEE MCC 83
LIM CL 102, 189, 190
LIM G 103
LIM JB 131
LIM KE 54
LIM PPE 26
LO EKC 104
LOW HC 204
LOW WHS 169
LYE MS 131

M

MAFAUZY M 105
MAHATHEVAN R 106
MAIMAH S 62
MAJUMDAR PK 132, 133
MALAYSIAN PALM OIL PROMOTION
COUNCIL 233, 234
MAMAT S 107
MAMOT S 221
MANDERSON L 108, 109, 110,
111, 112, 113
MARIAM A 77
MARIMUTHU T 17
MARKS G 149
MAT ISA A 114
MAZNAH I 124, 125, 126
MCKAY DA 115
MD YUNUS J 116, 222
MEDICAL & HEALTH DEPARTMENT
NEGERI SEMBILAN 235, 236,
237, 238, 239, 240
MEGAT BURHAINUDDIN MAR 117
MIGASENA P 53, 117, 183
MINISTRY OF EDUCATION MALAYSIA
AND MINISTRY OF HEALTH
MALAYSIA 241
MINISTRY OF HEALTH MALAYSIA
242, 243, 244, 245, 246, 247, 248,
249, 250, 251, 252, 253, 254
MOHAMAD NORDIN AK 33, 54, 72,
86, 118, 119
MOHAMED ISMAIL AK 177, 178
MOHAMMAD ML 255
MOHD AZEMI BMN 155
MOHD HASHIM 223
MOHD IDRIS HZA 255
MOHD ISMAIL AK 50, 78, 89

MOHD ISMAIL N 4, 10, 42, 99, 148,
153, 155, 165, 168, 188, 197, 203,
264
MOHD NASIR A 119, 177, 178, 264
MOHD NORDIN MS 86
MOHD RUSLI Z 186
MOHD SHAM K 120
MOHD YUSOF L 121
MOHD ZAINI AR 196
MOY GG 2, 6, 55, 63
MUSALMAH M 105
MUSTAFA BE 105
MUSTAFA E 153

N

NARIMAH A 122
NAWALYAH AG 9, 80, 116, 123,
124, 125, 126, 157, 180, 225, 228
NAZARIFAH I 224
NG ML 140
NG TKW 44, 46, 83, 127, 128, 129,
130, 131
NIMSAKUL S 195
NOOR LAILY AB 132, 133
NOOR REHAN A 225, 226
NORAINI MO 2, 6, 55, 63
NORIMAH AK 9, 134, 135
NORIMAH K 10
NORLIDA MD 229
NORMAH A 2, 6, 55, 63
NORMAH H 255
NUTRITION ADVISORY COMMITTEE
256, 257

O

O'HOLOHAN DR 136
ONG ASH 147, 165
ONG CL 137
ONG FPT 24, 27
OO SL 138
OOI GS 84
OOMMEN TT 139
OSMAN A 140, 141, 142, 143

P

PARAMESHVARA DEVA M 144
PETERSON DM 147

POH SC 125
POJAMARN T 53
PONGPAEW P 53, 117, 183
PRABHA JOGINDER SINGH 145
PRATHAPA SENAN C 146
PRAYURAHONG B 53, 117, 183
PUBLIC HEALTH INSTITUTE, MINISTRY
OF HEALTH MALAYSIA 258,
259, 260

Q

QURESHI AA 147
QURESHI N 147
QURESHI RU 148

R

RAJ AK 149
RAMOSO TL 57
RAMPAL L 150
RAND W 175
RASAD A 53, 117, 183
ROESTAMSJAH 187, 223
ROGAYAH Y 135
ROHANI MA 151
ROKIAH MY 126
ROSELINA K 10
ROSHIDA I 131
ROSLINA R 152
ROSTAH O 225, 226
ROZIA HANIS H 45, 46, 153, 187
RUSLI N 154
RUZITA A 155

S

SAFIAH MY 156
SAHARI J 9, 80, 116, 126, 157, 180,
225, 228
SAKINAH SO 141
SARIMAH M 158
SASTROAMIDJOJO S 53, 117, 183
SAUYAH A 11
SEOW CC 78, 155
SETIJATI SASTRAPRADJA 34, 115
SHEN Z 147
SITI AISHAH A 159
SITI MARIAM A 160
SITI MIZURA S 46, 161, 162, 191,
192, 193, 194

SITI NOR Y 163
 SOENARTONO ADISOEMARTO 34, 115
 SOENOEADJI 15
 STUCKEY A 175
 SUHAILA M 129, 161, 177, 178
 SUHARDI A 142
 SUNDRAM K 164, 165
 SUPHAKARN V 40
 SUPRAMANIAN A 166
 SUPRAMANIAN V 166
 SURIAH AR 167

T

TAKESHITA YJ 132, 133
 TAN AK 230
 TAN BA 133
 TAN DTS 168, 169
 TAN H 87
 TAN LH 170
 TAN TT 140, 141
 TAN YK 171
 TANPHAICHITR V 40
 TAOPRASERT Y 57
 TARIQ AR 7
 TEE ES 10, 46, 98, 114, 148, 153, 155, 161, 162, 165, 168, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 197, 203, 261, 262, 263, 264
 TEINBOON P 195
 TEO PH 46, 196
 TEOH ST 24
 TEOKUL W 53
 TERRY RD 214
 THENG CY 31, 112
 THEVAMALAR K 155
 THEVENDRAN U 197
 TING MM 198
 TONTISIRIN K 175, 199
 TSAURI S 187, 223

U

UMA DEAVI A 200

V

VALYASEVI A 40, 175

VERGHESE F 201

W

WADSWORTH GR 202
 WAN ABDUL MANAN WM 203, 204
 WAN MOHAMAD WB 105
 WAN NUDRI WD 73
 WAZIR NA 195
 WONG CK 205
 WONG ML 27, 206
 WONG TS 74
 WRIGHT JJK 147
 WU LL 140, 141

Y

YAP SB 24, 25, 28, 207
 YAP SH 208
 YASMIN ANUM MY 105
 YEO DBB 215
 YEOH QL 2, 6, 55, 63
 YOUNG SI 192, 193, 194
 YU MC 12
 YU SY 209
 YUNUS J 9, 80, 116, 126, 157, 180, 225, 227, 228

Z

ZAHARA M 2, 6, 55, 63, 210
 ZAINAB MH 211
 ZAINAB T 101
 ZAINOL ABIDIN M 212
 ZAINUN CA 213
 ZAITUN Y 214, 215
 ZANARIAH J 4, 9, 80, 116, 126, 157, 180, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228
 ZARINA S 143
 ZAWIAH H 8, 73, 74, 75, 76, 77, 229, 230
 ZULKAFLI H 186
 ZULKIFLI I 120

A

- Aborigines
 - dietary patterns of 143
- Aborigines
 - maternal and child health among 159
- Aborigines
 - nutritional status of 74, 90, 120, 140
- Aborigines
 - prevalence of goitre among 141
- Adolescents
 - nutritional status of 230
- Adolescents
 - plasma lipid profiles of 7
- Aflatoxins
 - and food safety 3, 114, 191
- Agricultural production
 - and nutritional problems 36
- Amino acid composition
 - of freshwater fish 226
- Anaemia
 - and work productivity 124, 125
- Anaemia
 - in estate workers 125
- Anaemia
 - in school children 82
- Anaemia
 - prevalence of 124, 173, 186
- Analysis of
 - food consumption data 174
- Anthropometry of
 - aborigine children 74
 - adults 76
 - children 37, 142
 - communities 62
 - diabetics 134
 - rural elderly females 214
 - school children 137
- Anti-thrombotic effects
 - of palm oil 168
- Applied food and nutrition programme
 - 121, 158
- ASEAN Food Habits Project 210
- Athletic performance
 - and nutrition 35, 34, 66

B

- Balanced diet 52, 232
 - for lactating mother 248
 - for young children 251
 - importance of 197, 250, 262, 263

- Bibliography of nutrition research 261
- Birthweight
 - and perinatal mortality 93
 - distribution and trends 45, 49, 97
- Body fat and weight changes
 - during Ramadan 77
- Boric acid
 - in foods 161, 191
- Bottle feeding
 - reasons for 111, 112
- Breastfeeding
 - and hospital practices 29
 - and socio-economic structures 16
 - decline of 59, 111, 112, 113
 - guide to 238, 239
 - importance of 21, 31, 61, 238, 245, 248, 251, 253, 254
 - in Malaysia 58, 60
 - in urban communities 16, 92
 - knowledge of 84
 - prevalence of 100, 145, 166, 205, 206, 220
 - promotion of 206, 260
 - versus bottle-feeding 31

C

- Caloric intake
 - and obesity 231
- Cancer
 - and nutrition 99
 - inhibition by palm oil 164
 - prevention 14
 - risk factors of 14, 99
- Canteens
 - foods sold in 225
- Cardiovascular diseases
 - epidemiology of 87, 104, 122
 - prevention of 244
- Cardiovascular risk
 - of palm oil 44
- Carotenoids
 - analysis of 189
 - in human nutrition 184
 - in vegetables and fruits 189
- Cereals and legumes
 - nutritional value of 255
- Cereals
 - in weaning foods 211
- Chicken meat
 - fat and cholesterol in 11

Child growth
 measurement of 254
 Child health
 promotion of 253
 Childhood malnutrition 37
 Children
 anthropometry of 37, 74
 cholesterol in 42
 feeding guide for 235
 feeding programmes for 216
 food intake of 74
 health problems and needs of 30
 nutritional needs of 242, 253, 254
 nutritional status of 33, 37, 90, 120, 142, 195
 Cholesterol level
 in adults 42
 in children 42
 Chronic non-communicable diseases 96, 104
 prevention of 149, 156, 259
 Code of ethics for infant formulae 243
 Communities
 dietary intake of 222, 223
 nutritional status of 183, 203
 Cooking methods
 effect on fat and cholesterol content 11
 Coronary heart disease 87
 and diet 42, 122
 prevention of 149, 156, 244, 246, 247
 risk factors of 196

D

Dairy development
 and child health 107
 for school children 5
 Diabetes
 guideline for 249
 Diabetics
 anthropometric status of 134
 food intake of 134
 Diet
 and coronary heart disease 42, 122
 Dietary fats and oils 7, 128, 129, 131
 Dietary guidelines 232, 262, 263
 Dietary intake/pattern
 nutritional and health implications of 94
 of aborigines 74, 143

 of adolescents 230
 of communities 8, 65, 68, 69, 143, 148, 152, 187, 222, 223, 227
 of diabetics 134, 249
 of elderly 167
 of infants and toddlers 32
 of plantation workers 17
 of preschool children 53, 208
 of school children 9
 of sportsmen 73
 of students 75, 135, 151, 160
 of urban squatter community 19
 Dietary restrictions
 during confinement 108, 109
 reasons for 110

E

Elderly
 nutritional status of 167, 214, 215
 Endemic goitre
 and iodine in drinking water 141
 control of 171
 in Sabah 27
 in Sarawak 22, 26, 28, 101, 171, 207
 prevalence of 105, 140, 141, 153, 171
 Energy balance in obesity 71
 Energy expenditure of students 75
 Energy requirements
 estimations of 67, 75
 Estates
 nutrition and health in 17
 Ethnic patterns of mortality 133

F

Fast foods
 nutritional implications of 118, 119
 Fasting
 and effects on body weight and body fat 77
 Fatty acid composition
 of freshwater fish 212
 of marine fishes 212
 Fermented foods 102, 103
 Folate deficiency in pregnancy 51
 Food and nutrition knowledge 163
 Food and nutrition planning 117, 217

- Food and nutrition policy 89
- Food beliefs 110
 - and critical life events 109
 - during confinement 108
 - in pregnancy 154
- Food composition data 264
 - generation and compilation 175, 181, 182
 - in diet counselling 54
 - in food industry 86
 - in nutrition research 72
 - uses of 54
- Food consumption data
 - calculation of 174
- Food habits
 - nutritional implications of 4
 - of communities 154
 - of preschool children 208
 - of primary school children 225
 - of school children 116
 - of students 151
 - of school children 228
- Food hygiene
 - promotion of 252
- Food intake
 - see* Dietary intake
- Food needs and supplies 36
- Food production and consumption in ASEAN 98
- Food safety 2, 191
 - and aflatoxins 114
 - control of 50
 - role of academia in 6
 - role of food industries 50
 - role of government agencies 50
- Food sources of nutrients 250
- Freshwater fish
 - nutritional value of 194, 226
- Fruits
 - nutritional value of 219

G

- Guideline
 - for appropriate diet 262, 263
 - for breastfeeding 248
 - for compilation of food composition data 182
 - for diabetics 249
 - for feeding young children 258
 - for mothers and child 245
 - for nutrition education 242, 258, 260

- for prevention of coronary heart disease 244, 246, 247
- for promotion of child health 253
- for promotion of food hygiene 252
- for school canteens 241
- to healthy dietary pattern 259

H

- Health and nutrition education 221
- Health care in Malaysia 20
- Health needs and problems of children 30
- Health resources
 - and population growth 91
 - to overcome malnutrition 170
- Health services in British Malaya 18
- Health status
 - in British Malaya 18
 - of aborigines 159
- Healthy lifestyle
 - promotion of 156
- High risk births 132
- High-protein low-cost food supplement 209
- Household nutritional practices 152

I

- Infant and toddler feeding 32, 60
- Infant feeding practices 32, 58, 60, 100, 112, 113, 145, 220
 - in a rural community 205
 - in an urban squatter community 92
 - knowledge of 84
- Infant formula
 - code of ethics for 243
- Infant health care practices 145
- Infant mortality rates 48
- Infant nutrition policy 58
- Infants
 - feeding guide for 236, 237
 - nutritional needs of 251
- Inhalants and nasopharyngeal carcinoma 12
- Intermediate moisture foods 78
- Iodine deficiency disorders
 - also see* Endemic Goitre
 - control programmes for 101
 - in Sarawak 101, 207
 - prevalence of 105, 153

Iron deficiency anaemia
also see Anaemia
 and work productivity 125
 effect on working capacity 124
 in pregnancy 51

Iron supplementation
 in school children 82

L

Lead in foods 162, 191

Life style diseases 149

Lipid profiles
 influence of dietary fat 7
 of adolescents 7

M

Manpower development
 for food and nutrition programmes 117

Marine fishes
 nutritional value of 193

Methodology
 for boric acid analysis 161
 for lead analysis 162
 for studies of food habits 116

Milk
 as a supplementary food in schools 176

Mortality
 due to coronary heart disease 87
 ethnic patterns of 133

Mycotoxins
also see Aflatoxins
 toxicity of 63

N

Nasopharyngeal carcinoma
 risk factors for 12, 13

Nitroso compounds 191

Nutrient deficiencies
 signs and symptoms of 250

Nutrient intake
see Dietary intake

Nutrient supplements 52, 123, 197, 263

Nutrition
 and athletic performance 35
 and cancer 99

and child development 144
 and poverty 179
 and sports 64, 66

Nutrition education
 for health staff 260
 guideline for 242, 258
 importance of 150
 to overcome malnutrition 170

Nutrition guide
 for children 235, 245
 for infants 236, 237
 for lactating mothers 239
 for mothers 245
 for pregnant mothers 240

Nutrition
 in ASEAN 199
 in Malaysia 34, 38, 43, 127, 185

Nutrition intervention programmes 40, 185, 199, 217

Nutrition knowledge
 of students 135

Nutrition research 70, 177, 178
 bibliography of 261

Nutrition surveys
 in Sabah 24, 39
 of aborigines 23, 90
 of communities 46, 57, 83, 88, 115, 120, 146, 177, 195, 203, 204, 215
 of school children 200
 of urban communities 198

Nutritional advice
 for cardiac patients 136

Nutritional anaemia
also see Anaemia
 in pregnancy 186
 prevalence of 173

Nutritional needs
 and agricultural production 36
 of children 254, 258, 260
 of infants 251
 of lactating mother 248
 of workers 106

Nutritional status
 assessment of 170
 of aborigines 23, 74, 90, 120, 140
 of adolescents 230
 of children 33, 37, 195
 of communities 34, 38, 39, 40, 43, 46, 65, 69, 79, 88, 115, 127, 146, 148, 170, 183, 185, 188
 of elderly subjects 215
 of flat dwellers 198
 of preschool children 53, 57, 83, 201, 204, 229

- of rural communities 203
- of school children 81, 137, 157, 180, 200, 201
- of squatters 95
- of the elderly 167
- of urban children 56, 142
- Nutritional value
 - of cereals and legumes 255
 - of cooked and processed snacks 192
 - of fast foods 118
 - of freshwater fish 194, 226
 - of fruits 219
 - of marine fishes 193
 - of palm oil 41, 47, 128, 130, 131, 136, 165, 233, 234, 256, 257
 - of palm vatee 147
 - of processed foods 155
 - of snacks 10
 - of traditional foods 224
 - of vegetables 15, 218
 - of weaning foods 211, 213

O

- Obesity
 - and energy balance 71
 - in children 33
 - in students 71
 - prevention of 231
- Oils and fats
 - in the Malaysian diet 129

P

- Palm oil
 - and cancer inhibition 164
 - and cardiovascular risk 44
 - in the diet 128, 129
 - information on 233, 234
 - nutritional value of 41, 47, 128, 130, 131, 136, 165, 168, 233, 234, 256, 257
 - research 130
 - effect on lipid profiles 7, 131
- Palm vatee
 - effect on serum lipid 147, 169
 - nutritional value of 147
 - pharmacological studies 138
 - toxicological studies 138
- Perinatal mortality and birthweight 93

- Plantations
 - nutrition and health in 17
- Population growth
 - and health resources 91
- Poverty and nutrition 179
- Pregnancy
 - anaemia in 51, 186
- Preschool children
 - dietary pattern of 208
 - food intake of 53
 - nutritional status of 53, 57, 83, 201, 204, 229
- Prevention of obesity 231
- Primary Health Care in Sarawak 25
- Processed foods
 - nutritional value of 155
- Protein-energy malnutrition
 - in urban children 56

R

- Retinoids
 - in human nutrition 184
- Rice flour
 - in weaning food 213
- Risk factors
 - for cancers 14
 - for nasopharyngeal carcinoma 12, 13
 - for coronary heart disease 196

S

- Salted fish
 - and nasopharyngeal carcinoma 12, 13
- Sang Kancil programme 85, 97
- School canteen
 - guideline 241
 - importance of 241
 - foods sold in 126
- School children
 - anaemia in 82
 - consumption of snacks 9, 10
 - dietary pattern of 9
 - food habits of 116, 225, 228
 - milk programme for 5
 - nutritional status of 137, 157, 180, 200, 201
- School health service 200, 201
- School milk programme 5, 107, 176
- School supplementary feeding programme 1, 121, 139

evaluation of 80, 81
 Serum lipid
 effect of palm vatee on 169
 Snacks
 consumption by school children
 9, 10
 nutritional value of 10, 192
 Socioeconomic correlates
 of birthweight 49
 Soybean oil
 effect on lipid profiles 7
 Sportsmen
 dietary intake of 73
 activity pattern of 73
 Squatters
 nutritional status of 95
 Street vending
 control of 55
 Students
 food and nutrition knowledge of
 135, 163
 food intake of 75, 135, 160
 food practices of 151
 Sugar
 and overnutrition 172
 consumption of 172
 Supplementary feeding
 for infants and young children
 145, 166, 236, 245, 251, 253,
 254
 Supplementary feeding programme 216,
 220

T

Teaching of health and nutrition 221
 Traditional foods 102, 103
 nutritional value of 224
 Training in nutrition 70
 Training module
 for coronary heart disease
 prevention 244

U

Urban children
 nutritional status of 56, 142
 Urban communities
 coronary risk factors in 196
 nutritional status of 198
 Urban squatter community
 birthweight in 97
 care for 85

food intake in 19
 infant feeding practices in 92

V

Vegetables and fruits
 carotenoids in 189
 Vegetables
 nutritional value of 15, 218
 traditional 15
 Vitamin A
 analysis of 190
 values in foods 190

W

Weaning foods
 rice-based 213
 types of 211
 use of 113
 Weight trends in women 202
 Workers
 nutritional needs of 106

