final report

Consumer Nutrition and Health Survey in Malaysia with special Reference to Beef and Lamb Consumption

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BACKGROUND AND EXECUTIVE SUMMARY

Introduction to Malaysia

- Malaysia has a small population of 20.5 million who are predominantly Bumiputra (ethnic and indigenous Malays) with a smaller proportion of Chinese and Indians. The main religions are Muslim and Buddhism. Malaysians who are not Muslim still appear to be sensitive to Muslim ways, including food habits. Income differentials exist in many areas, particularly between rural and urban dwellers.

- Malaysia has a relatively robust economy with a promising medium-term outlook. Its economy fundamentals appear to be better than many of its regional neighbours. Growth for 1998 and 1999 are forecast to be between 1 and 3%.

- Agriculture contributes much less to the overall economy these days than twenty years ago. Principal agricultural products include palm oil, timber and rubber.

- Rice is still the main staple in the Malaysian diet, however its level of per capita consumption is declining. Information on food and nutrient intake is determined from food availability data as national dietary and nutrition surveys have not been conducted to date.

- The availability of cereals and grains has declined only slightly overall as the intake of wheat has increased while rice has decreased. Cereals contribute 50-60% of total calories on average although this is as high as 75% in remote and rural areas. The intake of sugar, fats and oils and animal products has increased significantly.

- Malaysia is expected to become the leading producer of 'Halal' foods worldwide. It has good packaging and safety standards and has official Halal certification status.

- Nutrient and food availability data suggest that percentage of energy supplied by fat has nearly doubled over thirty years.

- Non-communicable diseases of the circulatory system and cancers dominate mortality in Malaysia. Accidents are also a leading cause of death.

- Protein-energy malnutrition exists in many communities, particularly rural areas. Deficiencies in several micronutrients are quite widespread, especially in iron, iodine and vitamin A.

- The Malaysian government prohibits entry of any Halal meat that is shipped on the same container with pork. Separate food facilities (storage, cooking) are often used in major hotels and large food institutions for the preparation of Halal and non-Halal foods.

- National coordination of nutrition and health-related activities occurs through the Division of Health Education of the Ministry of Health. Malaysia does have its own recommended daily nutrient allowances, dietary guidelines and publishes nutrition education material. A survey of food and nutrient intake is being planned.

- Its future strategies include the implementation of the National Plan of Action for Nutrition of Malaysia (1996-2000). These include a Healthy Lifestyle Campaign, the development of a desirable dietary pattern and to investigate the expansion of food legislation policies to include nutrition labelling and health claims.

Survey background

- Although a number of surveys have been undertaken in Asian countries relating to consumer preferences, purchasing and consumption behaviours in relation to beef and lamb, there is very little known about how concerns for health and nutrition interface with consumption behaviour or how strongly attitudes, preferences and behaviours in this area are influenced by core cultural values.

- In western countries such as Australia, the United States and the United Kingdom where beef and/or lamb have traditionally been a mainstay of the diet, intakes have been falling over recent decades partly because of concerns with the role that diet, and particularly dietary fat, can play in influencing the risk of chronic diseases such as coronary heart disease, hypertension and certain cancers.

- In many Asian countries, particularly the wealthier, more economically advanced countries, including Malaysia, coronary heart disease, hypertension and certain cancers are now the major causes of death with rates in line with those of western societies. In other countries, concern with low iron intakes also affords an opportunity for promotion of beef and lamb but at this stage little is known about consumer perceptions in this area.

- In response to this, health authorities in these countries are turning their attention to the implementation of policies and strategies to reduce chronic disease. Thus dietary guidelines, education campaigns and intervention strategies to promote the more traditional low fat/high fibre diets are being developed in many Asian countries.

- Although meat consumption and imports to Asian markets generally continue to rise, there is evidence of a slowing of the increasing demand in some of the more advanced economies. An understanding of consumer health and nutrition knowledge and concerns, perceptions of the benefits and disadvantages of certain foods and sources of information about nutrition will enable the Australian beef and lamb industries to develop proactive and targeted strategies for positioning and marketing of Australian beef and lamb in the coming decades.

- This report presents data concerning food purchasing and consumption behaviours; attitudes to a range of food categories, knowledge and perceptions about risk factors for major chronic diseases; sources of nutrition information and cultural values in 468 respondents from Malaysia. The three major ethnic groups were represented (Malay, 168; Chinese, 174; Indian, 126).

- The same survey was also conducted in Japan, Korea and Taiwan and the results are reported in separate documents. A summary document comparing these three countries is also available.

The key findings from the study are outlined below:

- The average frequency of beef consumption for all Malaysians was just less than once a week for lunch and dinner. As might be expected, the higher income groups consumed more beef than lower income groups. The Malay group were the most likely to be in the highest intake group for both men and women. Sixty-one percent of Chinese and 73% of the Indians did not consume beef. Most of the Indians did not consume beef for religious reasons.

- Frequency of consumption of lamb in Malaysia was around once per fortnight for all respondents surveyed. Lamb was rated quite low on "liking" reflecting this but was rated higher on "health" although this rating was lower than the other protein sources. The Indian group were more likely to be in the highest consumers of lamb. Around half of the sample indicated that they did not consume lamb.

- Frequency of eating breakfast away from home was much higher than in many western nations and the rate was often higher than for dinner.

- For all three ethnic groups, freshness, price, food safety, taste and nutritional content were the most important factors influencing food selection. Taste and convenience were more important to men while weight control and cooking knowledge were more important to females.

- Seafood, soy and chicken outrated beef slightly in both the "liking" and "healthiness" scales, with beef rating similarly to pork. With a few exceptions, the rating of the "healthiness" of a food category mirrored closely the rating for "liking".

- The benefits of beef consumption were perceived to be related to energy/power/stamina issues, and to the supply of

protein. Iron was mentioned by only 1% of respondents. The major disadvantages of beef were seen as fat content and cholesterol. One major problem noted for beef among one quarter of Malay respondents was that beef was related to the onset of high blood pressure. This did not feature among the other ethnic groups nor significantly for the other protein-based foods.

- Contamination problems with E. Coli were mentioned by a small number of respondents (6%; mostly women). Mad cow disease was mentioned by 2% of respondents.

- For lamb, very few respondents listed advantages, however, protein was mentioned by 15%. Cholesterol and fat content were seen to be major disadvantages.

- When perceived benefits for beef/ lamb and their alternatives were grouped into eight to ten general categories, the responses mainly related to supply of specific nutrients good nutrition generally. The most common problems listed overall included high in fat or cholesterol and bad for health in general.

- A number of cultural values were examined in relation to beef and lamb consumption. Factors such as hedonism, self-direction and stimulation predicted higher consumption of beef. In contrast, lamb consumption was linked to higher conformity scores.

- In response to questions about health concerns and knowledge, respondents expressed high concern about health but a slightly lower concern with weight control issues. Most believed that the food they ate affected their health but the link between food intake and weight control was not perceived to be as close as in many western societies, particularly among the Chinese.

- Diet had a high profile as a risk factor for overweight, but was seen to be less important in the other major chronic disease conditions such as heart disease, iron deficiency and bowel cancer.

- When asked how important it was to know about nutrition, respondents felt it was "quite" important on average. About half felt they already had access to sufficient information.

- Most respondents said they would look to the media as a source of accurate nutrition information, followed by health professionals and family and friends. In line with this, most information seen in the past year had come from the media.

- The messages seen generally related to eating more vegetables and fruit, (and to a lesser degree calcium and iron) and less fat, cholesterol, salt, sugar and meat. Thus the messages were similar to those common in western countries.

- For the media, the major sources of information were television, newspapers and radio. Magazines were less popular sources overall, even among the in females.

- Some 92 men and 98 females remembered messages from the media with about two-thirds claiming to have taken some action to change their diet.

- Food choice is a complex behaviour influenced by a wide range of factors including amongst other things culture, food availability, media influences, attitudes, education, age and knowledge. This report summarises the effects of some of these individual influences on consumption. Multivariate analyses will identify the key predictors of consumption of, and liking for beef and lamb compared to alternative foods.

MALAYSIA AT A GLANCE

Country and population statistics

Gross Domestic Product.........	US$4,700 (1996) (1) US$10,750 per capita, purchasing power parity (1996) (2)
Real GDP growth	8.8% (1996); 7.6% (1997 est) (1)
Consumer Price Index	2.7% (1997) (3)
Agriculture % GDP	14% (1995 est) (4)
% employed in agriculture	21% (1996) (2)
Land area.................................	328,550 km² (2)
Arable land..............................	3% (2)
Population	20,491,303 (July 1997 est) (2)
Urban population....................	55% (1996) (5) (6)
Age distribution	0-14 years: 36% (M: 3.8 million; F: 3.6 million) 15-64 years: 60% (M: 6.2 million; F: 6.2 million) 65+ years: 4% (M: 0.4 million; F: 0.5 million) (1997 est) (2)
Life expectancy at birth..........	Total: 70 years Males: 67.1 years; Females: 73.2 years (1997 est) (2)
Population growth rate	2.15% (1997 est) (2)
Birth rate	26.9 births / 1,000 population (1997 est) (2)
Death rate	5.4 death / 1,000 population (1997 est) (2)
Infant mortality	23.2 deaths / 1,000 live births (1997 est) (2)
Fertility rate.............................	3.4 children born / woman (1997 est) (2)
Ethnic distribution..................	Malay and other indigenous 58%, Chinese 26%, Indian 7%, Others 9%
Religions.................................	Peninsular Malaysia: Muslim (Malays), Buddhist (Chinese), Hindu (Indians) Sabah: Muslim 38%, Christian 17%, Other 45% Sarawak: Tribal religion 35%, Buddhist and Confucianist 24%, Muslim 20%, Christian 16%, Other 5% (2)
Language.................................	Peninsular Malaysia: Malay (official), English, Chinese dialects, Tamil Sabah: English, Malay, Chinese (Mandarin and Hakka dialects predominate) Sarawak: English, Malay, Mandarin, numerous tribal dialects (2)
Literacy...................................	84% of population aged over 15 years Males: 89%; Females: 78% (1995 est) (2)
Health service ratio	2226 people per doctor (1994) (4)

(1) Department of Foreign Affairs and Trade (1997) (2) CIA (1998) (3) Ministry of Trade and Industry (1998) (4) United Nations (1997a) (5) United Nations (1997b) (6) FAO (1998).

Historic and current economic development

In the last twenty years, Malaysia has moved from an economy based primarily on agriculture to one based on intermediate manufacturing (7). It is the world's leading exporter of palm oil, and is a major producer of rubber and tin. In addition, it is a principal exporter of tropical hardwoods and has large petroleum and natural gas reserves. In the 1980's these substantial exports of primary products were equalled, and in 1987 superseded, by the export of a growing number of manufactured products.

Malaysia has had six five year economic plans and is currently in its seventh (1996-2000). It hopes to achieve 'developed country' status by the year 2020. The current five year plan was based on annual growth rates of 8% with a focus on transport, energy and telecommunications infrastructure and higher rates of value-added production. It also emphasises technical and vocational skill development and R&D investment leading to less reliance on foreign investment and technology in the industrial sector (7).

However, growth estimates have been revised downwards in the wake of the regional currency crisis which also troubled Malaysia. The five years to mid-1997 saw annual growth rates averaging 8%. In October 1998, the Government reduced its growth predictions to just 2-3%. Other sources predict growth for 1998 of just under 1%. Inflation was forecast to increase by 5% during 1998 (7, 8, 9).

Malaysia, is expected to recover more quickly in the medium term than many of its neighbours. It had relatively low international borrowings and the IMF concluded that it did not need external assistance at the time. Malaysia's domestic economy has still experienced some big depreciations however. The Malaysian ringgit fell sharply against the US dollar in January 1998 and the value of the Kuala Lumpur Stock Exchange lost almost 50% of its value (7).

In response to this situation, the Government has increased import duties particularly on luxury cars, construction materials and heavy machinery. Many large Government infrastructure projects have been postponed. The Government is encouraging people to buy locally-made goods and it is expected that demand for high-end luxury items will fall (8).

Food and agriculture

Malaysia consists of three areas, Peninsular Malaysia with eleven states and incoporating several islands, and Sabah and Sarawak in northern Borneo. These three broad regions have latitudes ranging from 1° and 7° N of the Equator bringing uniformly high temperatures and rain across all months. Temperature averages vary between 21°C and 32°C (10).

Despite this climate equity, relative geographical position has lead to discrepancies in development. Historically Peninsular Malaysia has been the hub of progress bordering one of the most prodigious trade routes in the Straits of Malacca. Sabah and Sarawak have traditionally been more isolated (10).

The west side of Peninsular Malaysia to the Straits of Malacca has been the most developed because of rich tin deposits and subsequent rubber plantations. The east coast however, is subject to the full force of the north-east monsoon from October to March. Sabah and Sarawak also experience this monsoon and have longer rivers and lowlands which are prone to flooding (10).

Food

The main crops in Peninsular Malaysia include palm oil and rice; in Sabah include subsistence crops, coconut and rice, and in Sarawak comprise pepper and some cocoa (2). In 1994, 52% of world palm oil was produced in Malaysia, most of it originating from Peninsular Malaysia. In 1995, Malaysia was 75% self-sufficient in rice production although poverty in rice-producing areas is high. Fruit production is expanding (10).

The total cattle population only increased by 10% from 1989-1998. However, beef and veal production increased by 75% to over 18,000 MT over the same period. Beef exports to Malaysia had more than tripled in the ten year period to 1996. Lamb and mutton experienced similar increases (6). This indicates that Malaysia experienced high increases in demand for beef and

reasonable sheepmeat demand increases before the regional financial downturn. However, the dollar value of US exports of red meat (fresh, chilled, frozen) to Malaysia fell by 40% from 1997 to 1998 (11). This could be due to the fall in the ringgit to the US dollar but may reflect income restraints more generally.

Agriculture

Agriculture produced the largest share of national income until the mid 1970s. This sector was dominated by the rubber industry. Agriculture's estimated contribution to overall GDP was 12% in 1997, up 3.5% from the previous year (12).

The percentage of the population involved in agriculture, forestry and fisheries was 21% in 1996 eclipsed by the manufacturing sector at 25% (2). Government policy has restructured the economy away from agriculture to the manufacturing sector with the accompanying shift in technical skills. Agricultural holdings are still small and this contributes to poverty in many rural areas.

Malaysia's other agricultural products include fish, fruits, pepper, livestock, cocoa and coconut. At present production of these minor commodities is low but they are regarded as important by the Government in Malaysia's attempts to diversify its export base. Deep-sea fishing and the aquaculture industry is expanding (10).

Malaysia is expected to become the leading producer of 'Halal' foods worldwide. It has good packaging and safety standards and has official Halal certification status (11).

Food and nutrient intake

Food consumption

Food availability data, derived from production, import and export data, indicate that Malaysians have available, on average, 21% more kilojoules than two decades ago. The increase derives mostly from fat and oils, animal products and sugar (6).

In the absence of national food consumption surveys, it is only possible to describe food intake trends based on several selected studies carried out in the last decade.

In general, rice constitutes the main staple in the Malaysian diet although current trends indicate a decline in consumption (6). Increased intake of other cereals, namely wheat, maintained the contribution of cereals to total calories between 50-60%. Per capita availability of animal foods has increased steadily (6).

In a study carried out in rural and urban communities, it was reported that cereals contributed 52% of total energy, followed by fats and oils (17%), fish and all meat (11%), sugar (10%), fruits and vegetables, nuts and pulses (4%) each and roots and tubers (2%). In East Malaysia, cereals, mainly rice, constituted 70-74% of total energy intake of the Kadazan and other natives living in upland areas and coastal plains. These studies not only revealed variations in food intake between geographic regions/areas but also among urban and rural populations (13).

Nutrient intake

National nutrition surveys have not been conducted in Malaysia to date although one is planned for 1999 subject to the availability of adequate funding.

Many studies in impoverished areas of Malaysia investigating nutrient status have been carried out. Most show that children, adolescents, pregnant women and the elderly are below the RDI for energy, protein and some micronutrients (eg. 14, 15).

FAO figures from 1994 indicate that the availability of protein has remained steady over thirty years to 1992 while fat availability has nearly doubled to 32% and carbohydrates have decreased. The amount of animals foods has also increased markedly over this period (16).

Nutrient intakes of nearly 400 urban government office workers was investigated in one study. Percentage of energy from carbohydrates, fat and protein averaged 56%, 30% and 14% respectively. Total calorie intake in this group was 1710 kcal (17).

National health profile

The major causes of mortality in Malaysia are non-communicable diseases. Infant and maternal mortality rates continue to decline. Life expectancy is continuing to increase (18).

Non-communicable diseases

Epidemiologic data show that rapid socioeconomic development in the country has brought about increasing prevalence of obesity, diabetes, cardiovascular and circulatory disease and cancers, such that cardiovascular disease and cancer are now the leading causes of death in Malaysia (18).

Among the main ethnic groups in Peninsula Malaysia, the Indians have consistently higher levels of mortality from ischaemic heart disease (IHD) and diabetes compared to Chinese and Malays. In 1988 the mortality rate for IHD in Indians was 53/100,000 whereas those for Chinese and Malays were 27 and 13 per 100 000 respectively.

Overall, death rates from circulatory disease rose from 24.1 per 100, 000 in 1970 to 55.2 in 1989.

Serum cholesterol has increased in Malaysian men aged 25-55 years from an average of 185 mg/dl in the 1960s to 230 in the 1980s. Indians have the highest levels of the ethnic groups as do those in urban areas compared to rural groups.

The rate of increase in cancer deaths has not been as rapid as that for CHD. The increase may be, in part, due to more people seeking treatment and better diagnosis. Thirty per cent of cancer deaths are due to tumours of the digestive organs and the peritoneum. Chinese and Indians have higher mortality rates for stomach cancer (3.9 and 3,6/100 000) than Malays (0.5). Colon cancer deaths are more frequent among the Chinese (3.3/100 000) followed by Indians (1.9) and Malays (0.4). Among the risk factors for cancer of the digestive organs is contamination with aflatoxin.

Overweight occurs in a significant proportion of the population. It is low in poorer, rural areas but a recent study of families living in a low-cost housing scheme showed 45% to be overweight. The few studies done in urban areas indicate that about one quarter to one third of adults are overweight.

Communicable diseases

Diet related communicable diseases are still a problem. In 1993, the incidence rate per 100,000 population for cholera, dysentery, food poisoning, typhoid and parathyroid fever and viral hepatitis was 5, 1, 8, 7 and 3 respectively.

Mortality in children

Mortality rates in children are often used as indicators of nutritional status for infants and young children. Infant, toddler and maternal mortality rates have declined dramatically in Peninsular Malaysia since the country gained independence in 1957. The IMR declined from 76 in 1957 to 13 in 1989. Over the same period TDR (1-4 years) declined from 11 to 1 and maternal mortality fell from 3.2 to 0.2. However, rates from around the country are highly variable and data on East Malaysia is sparse.

Undernutrition

The major nutrient deficiencies in the country are protein-energy malnutrition amongst children, chronic energy deficiency in adults and deficiencies of several micronutrients, namely iron, vitamin A and iodine. Nutrition studies carried out in different parts of the country have shown that frank nutrient deficiencies are rare. Nevertheless, moderate undernutrition is widespread especially in rural communities and mainly affects young children and pregnant women.

Protein-energy malnutrition in children

Underweight and stunting occur in significant proportions of pre-school and school-aged children. A Nutrition Surveillance Program conducted by the Ministry of Health, involving approximately 1.2 million children, found that, in seven states in 1985-86, the proportion of children below 60% of the Harvard weight/age standard was only 1.1%; the prevalence of moderate underweight (between 60-79% of standard) was 16%, below one year, 29% between 1 and 4 years and 38% at 5-6 years. Besides this tendency of increasing rates of moderate undernutrition as age increases, considerable variation across states was noted.

More recent studies in 1993, showed that 0.46% of children below 5 years were severely underweight and 22.8% moderately underweight. There was thus only a slight improvement in the situation in the 1985-86 survey and the 1990 study where 0.5% and 24.5% of children below 4-5 years were severely and moderately underweight respectively (19).

The percentage of low birth weight has increased slightly from 8.2% in 1990 to 8.3% in 1992 (20).

Underweight (and overweight) in adults
The information available for adults is not representative of the whole population, however, a compilation of data obtained in urban areas in recent years shows that about 50% of males and 40% of females can be classified as normal in terms of having a BMI between 20 and 25; about 22% are underweight (BMI< 20), and about 28% of men and 34% of women are overweight (BMI> 25). Mean body weight is higher than that of the Malaysian reference value of 55kg for males and 50kg for females, and increases with age, in all groups except the elderly, and in all three main ethnic groups.

Changing food habits and sedentary lifestyle are likely to be responsible for the increasing prevalence of overweight in urban middle-income groups. Studies on food consumption in rural areas conducted in the last five years generally show low energy intakes closely linked with poverty. Lack of nutrition knowledge has also been shown to restrict food intake among some pregnant and lactating women.

Micronutrient deficiencies

Anaemia
Several studies on anaemia in Malaysian children have been carried out since the 1950's. Results of large-scale surveys reported in the last twenty years show that the highest prevalence rates of anaemia are often found in the first two years of life and range from 30-60% in Sarawak, from 15-30% in Sabah and from 12-83% in Peninsular Malaysia. A decrease in prevalence has occurred since the 1950s. The main causes are considered to be inadequate supplementary feeding and poor weaning practices, resulting in lack of iron, protein and other nutrients. Intestinal helminthiases and malaria contribute to the problem in some communities.

Anaemia in pregnancy was recognised by early Malaysian investigators as a major cause of maternal mortality and one of the main complications of pregnancy. In the 1950s and 1960s, about 77% of pregnant women were found to be anaemic.

Microcytosis attributed to iron deficiency was seen in 76% of cases and macrocytosis attributed to folic acid and vitamin B12 deficiency, in most of the remaining cases. Studies in the 1980s found low levels of serum folate in approximately 60% of pregnant women and low levels of RBC folate in 30%. Serum iron, serum ferritin and transferrin saturation were low in 50-60% of cases; serum protein in about 30%. The prevalence of anaemia ranged from 30-60% depending on the ethnic group.

The percentage of pregnant women attending government antenatal clinics with haemoglobin levels below 9% has been reduced from 5.4% in 1990 to 5.0% in 1993 (19).

Vitamin A
In the 1970s and early 1980s, several large surveys found approximately 10% of cases of xerophthalmia amongst primary school and preschool children in two states in the Peninsula. In Sarawak, this rate ranged from 2-38% of children under 7 years depending on the ethnic group. For all the Sarawak communities, there was an increasing prevalence with increasing age, peaking at 4-6 years. In the most recent surveys, serum vitamin A levels below 20ug/dl were found in about 10% of primary children and pre-school children. The sample size was small, however.

Dietary studies in the early 1980s showed that the consumption of vitamin A rich animal foods and fruits and vegetables to be poor and much lower than averages estimated from food balance sheets. It is therefore likely that even though the numbers of frank xerophthalmia found is small, subclinical vitamin A deficiency may affect a considerable proportion of rural communities.

Iodine Deficiency Disorders
The problem of endemic goitre in Malaysia has been documented since the 1930s. Low levels of iodine in water and salt and low consumption of seafood are considered the main determinants. Goitrogens in cassava, consumed in great quantities by some hill tribes in Sarawak when supplies of rice are exhausted, may also play a role in some groups. Goitre is found more frequently in females.

A 1982 review of studies in Sarawak since the 1950s, showed goitre to be endemic in 12 of the states 25 districts mainly in the inland areas with rates varying from 30-

80%. In 1982, legislative changes increased the availability of iodised salt by banning import of non-iodised salt. However, a 1988 survey still identified problems with the local production, distribution and availability of iodised salt. Iodisation of water supplies has been tried with encouraging results.

Socioeconomic factors that could affect the nutritional status of the population

Macroeconomic environment and nutrition

Malaysia is a multicultural and multiracial society with a relatively stable political environment. It has a free enterprise system, a fairly stable economy currently, a high per capita income, and low unemployment compared to many of its neighbours. The current economic downturn may see food expenditure decrease in the short-term but most economic commentators believe that the fundamentals are there for a good recovery at least in the medium term (8).

Food security

In 1950, agriculture accounted for about 59% of the total national output and it declined to about 32% in 1960 and further declined to 22.8% in 1980 and 18.7% in 1990.

The share of agriculture in total export earnings has likewise declined as the manufacturing sector has gained strength. Certain constraints found in the agricultural sector had given rise to concern about its capacity and resilience for the future and led, in the early 1980s to the idea of evolving an Agricultural Policy to formulate steps and measures to sustain growth in the agricultural sector. Thus the National Agricultural Policy was introduced in 1984 to modernise and revitalise the sector.

Retail and distribution issues

Wholesalers are generally located in urban areas. These businesses are mainly family owned and have very good financial support. The pioneers in retail marketing in Malaysia were the 'Provisions Stores'. These stores carry a large variety of inventories to meet the needs and wants of consumers. They are mostly family owned and are sporadically located in every residential township, catering for the rural population. They operate on low overheads. Supermarkets, mini-markets and convenience stores are replacing the old traditional forms of retailing in the urban areas. These are modern air-conditioned outlets which carry a variety of local and imported food products. The supermarkets (comparable to Australia) serve the higher and middle classes, while the mini-markets and the convenience stores cater for the working people who have difficulty shopping in normal hours. There is active competition amongst these three retail sectors. The majority of Australian foods are sold in supermarkets. It is common to carry out in-store promotions and most of the supermarkets are up to date with organising such promotional programs.

Multinational (trading companies) importers have adequate and up to date storage facilities. They are well equipped with cold rooms and chilling units for perishables. These companies handle the sales, marketing warehousing and distribution of food products throughout all towns in Malaysia.

Communication

Television is the main medium of communication. There are five television network stations in Malaysia. Two channels are government owned and the rest are all privately owned. The main government channel has national coverage and reaches all areas of East and West Malaysia. The other networks do not have full national coverage.

Advertisements for food products are extensively broadcast on all networks. There are a few food companies who sponsor special programs on television and sponsorship of sporting events by food companies is common. The main forms of promotion for food products are carried out by advertisement in the newspaper, radio, television, videos and movies. There are also a large number of billboards, direct mail, coupons and community related projects to supplement the main advertising mechanism. Advertising agencies assist the food companies with appropriate promotional strategies. Most of the multinational advertising agencies have representation in Malaysia.

Socio-cultural factors

Malaysia's population has been growing at an average of 2.5% per annum from 8.4 million in 1960 to over 20 million in 1997.

The country has made great strides in improving the well-being and quality of life of the population. The per capita income increased from $950 in 1966 to $10,750 in 1996. There has also been a reduction in income disparities. Owing to the rapid economic progress and a small population base, population growth has not cause demographic pressures as yet. With increasing industrialisation, the rate of urbanisation has increased from 25% in 1960 to 55% in the mid 1990s and is expected to rise further to over 70% by 2020.

Malaysia is a multiracial country and each race celebrates their respective festivals. The Malays (Bumiputras) celebrate Hari Raya (end of Ramadan month), the Chinese celebrate the commencement of their lunar calendar, the Indians celebrate Deepavali and Christmas is celebrated by the others.

The majority of the population in Malaysia is Muslim requiring adherence to Halal regulations. Pork, or any by-products from the pig, is not accepted by the Muslim religion. Halal is a process of slaughtering livestock of any kind in accordance with Muslim religious rituals. These regulations are currently enforced on offal and meat products derived from cattle, buffalo, sheep, goat and poultry meat.

The Malaysian government prohibits entry of any Halal meat that is shipped on the same container with pork. It must be noted that in Malaysia, major hotels and supermarkets use separate facilities for the storage and preparation of Halal and non-Halal foods. These facilities cover kitchen utensils, storage compartments and serving plates. If meat or canned meat products are sold to Malaysia, it must have Halal certification. In some cases it may be more economical for the meat exporters to use the Australian abattoirs approved by the Malaysia Veterinary Authority.

Policy issues, regulations and national initiatives

National food and nutrition policy

Malaysia released its National Plan of Action for Nutrition of Malaysia, 1996-2000 in 1995 (21). The plan has the following objectives:

- incorporate nutritional objectives, considerations and components into development policies and programmes
- improve household food security
- protect consumers through improved food quality and safety
- prevent and manage infectious diseases
- promote breastfeeding
- care for socioeconomically disadvantaged and nutritionally vulnerable
- prevent and control specific micronutrient deficiencies
- promote appropriate diets and health lifestyles
- assess, analyse and monitor nutrition situation.

Other policies of relevance to the area are the New Economic Policy (NEP), the National Education Policy, the National Population Policy and the National Social Welfare Policy.

Dietary guidelines

Nutritional and dietary guidelines are developed by the Ministry of Health. The most recent set (1997) adopted by the Ministry focus on prevention and control of diet-related diseases (22). A Daily Food Selection Guide in the form of a food pyramid has also been developed. The Dietary Guidelines include major headings with minor explanatory points supporting each guideline - the major guidelines are:

- Eat a variety of foods
- Balance the food you eat with physical activity
- Choose a diet with plenty of cereals and legumes
- Eat more fruits and vegetables
- Choose a diet low in fat and cholesterol
- Choose a diet low in sugar and salt
- Drink plenty of plain water
- Eat clean and safe foods
- Encourage and support breastfeeding

Food regulations, quality and safety

The core of the Malaysian regulatory system for food is the Food Act of 1983 and the Food Regulations of 1985. Several amendments have been made to the regulations in response to the needs of the food industry, the consumer and new knowledge gained. Several codes of

practice and guidelines available cover a variety of areas including food hygiene, export of frozen, cooked prawns, processing and refining of palm oil and sale of food in school canteens. There is also a code of practice for hawker / street foods.

The Food Quality Control Unit of the Ministry of Health is the central agency in charge of food safety. The general objective of the Unit is to help protect the public against health hazards and fraud in the preparation, sale and use of food. The Unit also strives to motivate and promote safe and hygienic preparation, handling and sale of food in all sectors of the food industry. The Unit also motivates the public and provides consumers with adequate information on the importance of eating safe and quality food.

Premises inspection remains the main activity of the food quality program with a new approach incorporating the hazard analysis critical control point system introduced in 1989. Other activities of the Unit include food standard development, import and export control and development of specific codes of practice in a variety of areas.

The approach to nutrition labelling and health claims on food packaging is currently similar to that in Australia but is under consideration.

Programs and interventions

The 'Healthy Lifestyle Campaign' is coordinated by the Division of Health Education in the Ministry of Health. They have an extensive mass media campaign as part of their health education approach. This Division also coordinates the nutrition and health education activities in hospitals through Health Education Units represented in all states.

The National Plan of Action for Nutrition of Malaysia: 1996-2000 (21) mentioned on the page before provides many of the objectives and strategies for nutrition and health promotion. Programs include:

Healthy lifestyle campaign
* promote activities of the Healthy Lifestyle Campaign in schools

Dietary habits
* propose the development of a national desirable dietary pattern to help in the planning for appropriate food supply and production

Food legislation
* expand the requirements for nutrition labelling based on the Codex standards in the Food Act 1983 and Food Regulations 1985 further
* Expand the provisions in the Food Act 1983 and Food Regulations 1985 further to regulate health claims and advertisements beyond those required for special dietary needs.

The Ministry of Health provides supplements containing iron, folic acid and B-complex to pregnant women and has done so for many years. There are no specific large-scale programs for iron supplementation to pre-school children.

INTRODUCTION

With increasing westernisation of diet, lifestyle and health profiles in Asian countries a thorough understanding of the policy environment, trends in health, nutrition and food intake and consumer attitudes in Asian markets is needed to underpin development of effective medium and long-term marketing strategies for the Australian beef and lamb industries.

To this end, the MRC (now MLA) funded CSIRO Human Nutrition to undertake a study to identify:

- past and current trends in food and nutrient intake and health status in the Asian region;
- socioeconomic predictors of change;
- health and nutrition policies that could impinge on the future marketplace for Australian beef; and

- consumer and health professionals attitudes to a range of foods, current eating practices, knowledge about the links between diet and health as well as sources of information about food and nutrition.

A consumer survey was undertaken in Malaysia in June/July 1998 among the three major ethnic groups of Malays, Chinese and Indians.

Consumer surveys were also undertaken in three key markets - Japan, Korea and Taiwan in September/October 1996 and the summary results for these three countries are available in separate reports.

METHOD

The survey instrument was designed, translated and analysed in Australia under the auspices of the Consumer Science Program of CSIRO Human Nutrition as outlined below.

Data was collected in June / July 1998 through face-to-face household survey by professional market research companies as detailed below using a predetermined sampling frame.

Sampling

The sample was selected using a randomised, stratified design according to the demographic characteristics listed in Table 1. One respondent per household was specified and households were

selected at random from two target cities. The two cities surveyed were Kuala Lumpur and George Town.

Two attempts at locating a suitable interview participant were specified for each household after which another household in the immediate vicinity was chosen.

The three ethnic groups were to be evenly sampled from Kuala Lumpur. However, there are fewer Indians who live in George Town so sampling according to age, gender and working status were the only criteria used in this city.

Table 1. Sampling frame for each ethnic group and city (target numbers in brackets).

City	Ethnicity	Gender	Age	Working status
Kuala Lumpur (300)	Malay (100)	Men (50)	18 - 30 (17)	
			31 - 45 (17)	
			46 - 60 (16)	
	Chinese (100)	Women (50)	18 - 30 (17)	Working (8)
				Non working (9)
			31 - 45 (17)	Working (8)
				Non working (9)
	Indian (100)		46 - 60 (16)	
George Town (150)	no requirement	Men (75)	18 - 30 (25)	
			31 - 45 (25)	
			46 - 60 (25)	
		Women (75)	18 - 30 (25)	Working (12)
				Non working (13)
			31 - 45 (25)	Working (12)
				Non working (13)
			46 - 60 (25)	

Questionnaire design

The questionnaire was arranged into five sections (see Appendix 1). The first section contained items relating to general demographics which were used by the interviewer to determine if the potential respondent complied with the demographic criteria for participant inclusion. The demographics were also used for comparative purposes.

The second section contained questions about shopping, cooking and eating habits and perceptions about selected food categories including their frequency of consumption at lunch and dinner (including their consumption away from home), whether respondents liked eating those foods, how healthy they perceived those foods to be and the positive and negative perceptions of those foods. The questionnaire concentrated on beef and lamb and their alternatives, chicken, pork, seafood, soy-based foods and eggs but included some other major food categories for comparison.

The strict Muslim portion of the population would have been offended if they were to be asked about their pork perceptions and consumption, so the interviewers were instructed to ask about their rice perceptions and intake instead.

Section three contained items about attitudes toward general health and weight control. Questions regarding the role of the media, health professionals and retail sectors of the food industry in shaping food and nutrition knowledge and the effect of this on behaviour of consumers were also included. Questions regarding the level of concern about selected chronic disease states and factors that might influence their occurrence. Some questions were also included to identify aspects of personality or cultural background previously shown to influence health behaviour.

The final section contained an expanded demographics list including education, occupation, income, religion, self-reported height and weight, and household type.

Translation and pilot testing

Three language versions of the questionnaire were created, Bahasa Malay, Chinese and English. The Bahasa and Chinese versions were back-translated according to standard procedures. This involved a second translator, naive to the English version, translating these versions back into English. The original and second English versions were checked for any discrepancies and modified accordingly. The checking procedure also involved a pilot testing component with Australian residents of Malaysian origin to check for concept clarity in the second language. The documents were modified as required. One single questionnaire schedule was generated where each question used all three languages

Data collection

Briefing

Extensive briefing notes for the interviewers were written to accompany the questionnaire. These explained the process of asking and recording with each question and clarified any concepts within each question for each interviewer. This would help to minimise any differences between interviewer styles. Each interviewer was bilingual in English and Bahasa or English and Chinese.

The sampling of households was also specified. These briefing notes were translated into Bahasa and checked by the Malaysian pre-test interviewer. English and Bahasa versions were generated. Show cards were made for a few of the questions to clarify response scales for the easier for the interviewers.

interview participants and to make it

Interviews

A market research company located in Malaysia was contracted to perform the interviews. The interviews were conducted from early June until mid-July 1998. Each interview lasted for about forty-five minutes.

Translation of free responses

Some of the questions allowed the respondent to list, in their own words, responses to the items. These were translated into English and any concept difficulty clarified. This data was entered into a text storage program designed in-house which electronically matched the numerical data records with the text records. The database program used was SIR.

The final sample consisted of 468 respondents with the characteristics shown in Table 2.

Table 2. Final sample characteristics.

Total respondents	468
City of interview	
Kuala Lumpur (KL)	67%
George Town (GT)	33%
Gender	
Male	49%
Female	51%
Ethnicity	
Malay	36%
Chinese	37%
Indian	27%
KL: Malay	35%
Chinese	32%
Indian	33%
GT: Malay	38%
Chinese	47%
Indian	15%
Age	
18 - 30	33%
31 - 45	35%
46 - 60	32%
Working status	
Working	59%
Not working	41%
Hours worked	
Part-time <15 hours	2%
Part-time 15-30 hours	2%
Full-time >30 hours	51%
House duties	29%
Home business <30	3%
Home business >30	4%
Student	11%

The frequency of consumption of beef and lamb; alternative protein sources such as chicken, pork (or rice for Muslim people), seafood, eggs, soy and dairy foods as well as fruits and vegetables was assessed on a weekly scale both to give an average for the country as a whole and the various demographic groups as well as individuals. The data below summarises the average frequencies and notes demographic variations where these occurred. Individual data were used to categorise respondents into high, medium or low beef and lamb consumers for comparison to attitudinal data which is discussed at a later stage in the report.

It is important to note that the numbers of people who answered the pork question were quite small overall. All Muslims were asked about rice consumption which excluded about half of the respondents. However, there appeared to be a greater extent of interviewer and respondent sensitivities

to pork than originally envisaged so that about one third of the sample provided an answer for pork (n=117).

The average frequency of consumption of ten selected foods or food categories for both lunch and dinner are shown below in Figure 1.

Frequency of beef consumption was just under once a week for lunch and for dinner. On average, the higher and income groups consumed more beef than lower income groups. Seafood, chicken and soy were the most frequently consumed sources of protein. Malays, males and those aged between 18 and 30 consumed beef the most often (Figures 2, 3,4).

Lamb was consumed at a rate of around once per fortnight for all Malaysians. Indians consumed lamb the most often (Figures 2, 3,4).

Figure 1. Average weekly frequency of consumption of selected foods at lunch and dinner for all Malaysians.
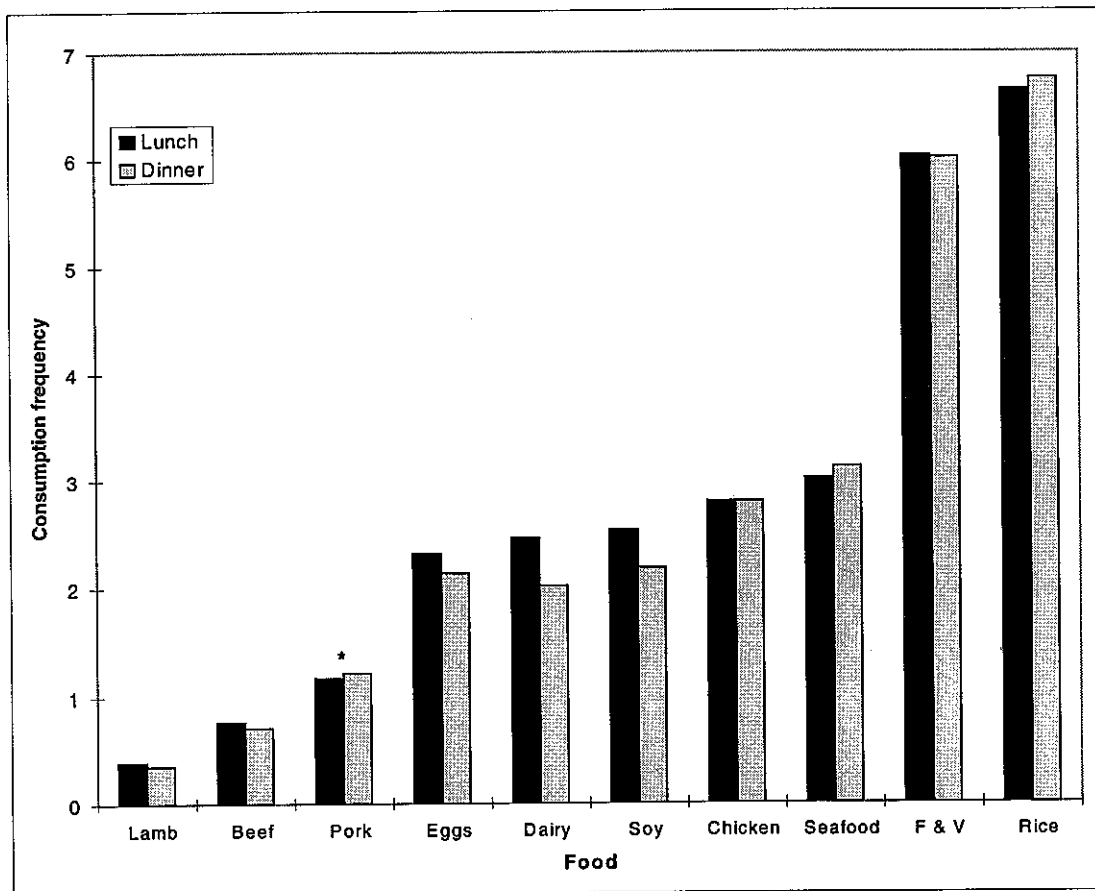
* For Figures 1, 2, 3 and 4 pork data is for 117 respondents only. Bar height may therefore overestimate 'average' consumption as many Malaysian respondents are non-users.

Figure 2. Average weekly frequency of consumption (lunch + dinner) by ethnic group.
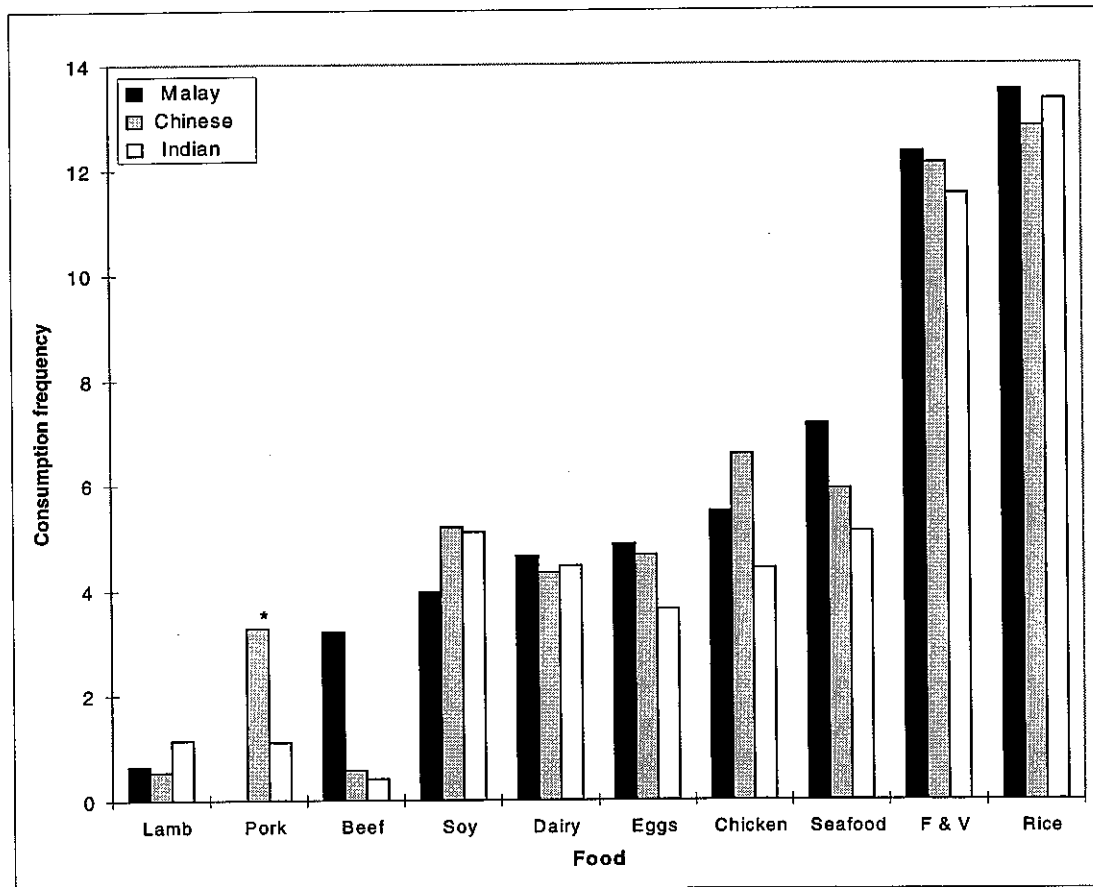
Figure 3. Average weekly frequency of consumption (lunch + dinner) by age group.
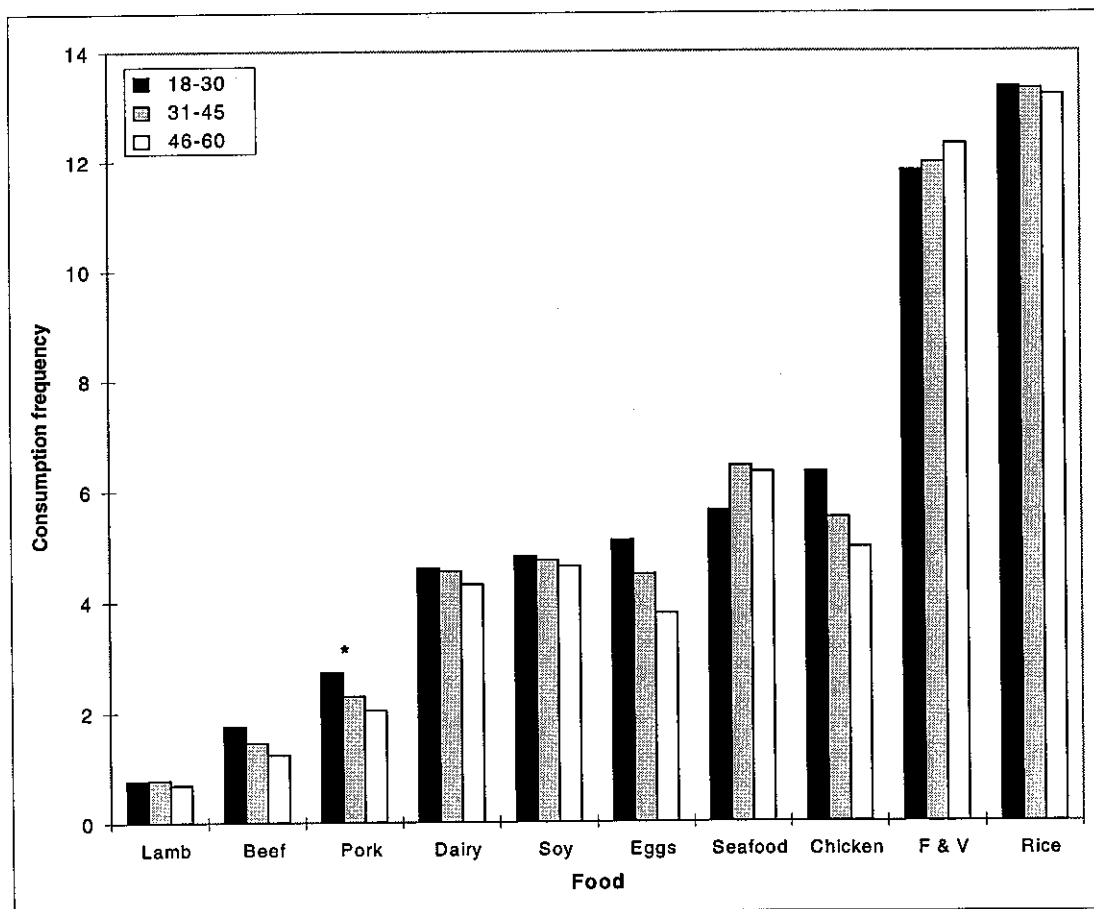
Figure 4. Average weekly frequency of consumption (lunch + dinner) by gender.
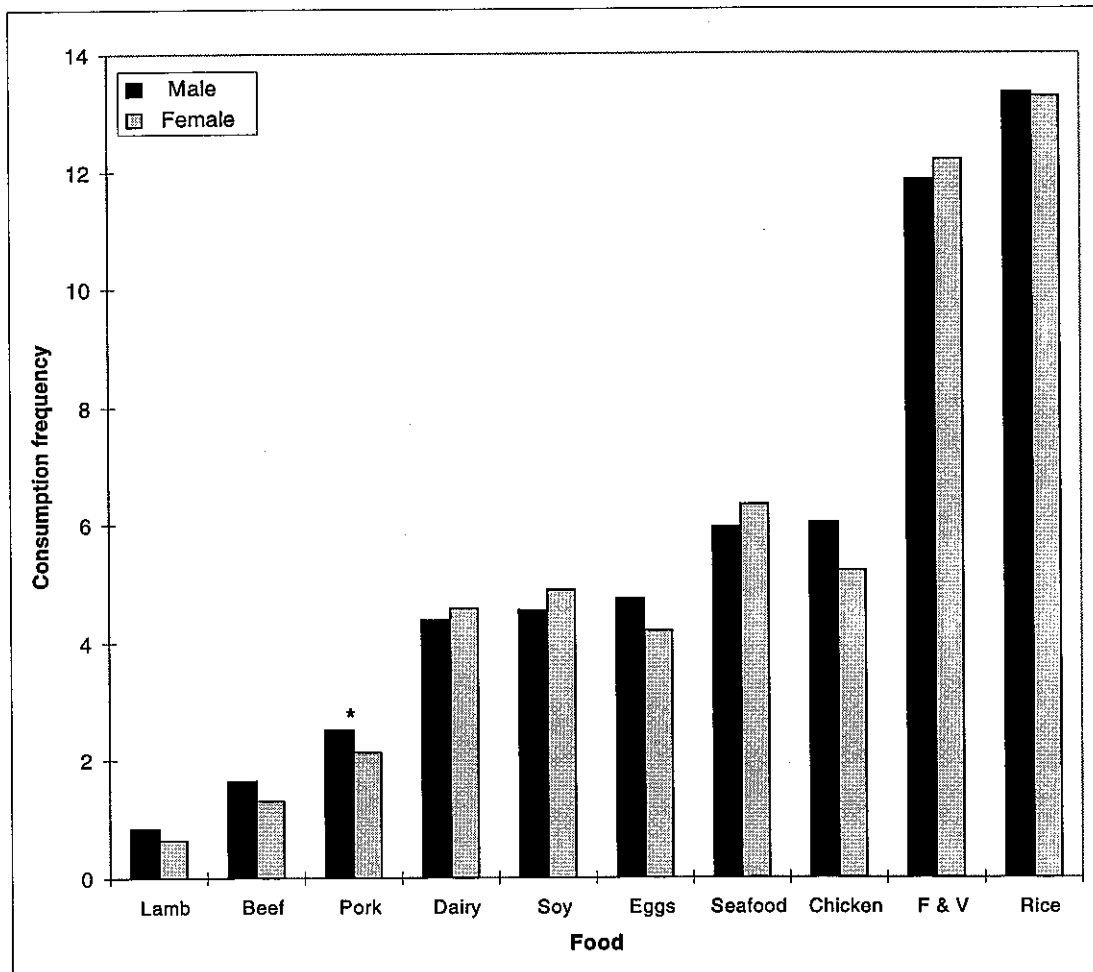
Demographic distribution of beef and lamb consumption.

Individual beef consumers were grouped into frequency categories by tertiles. The first group never consumed beef, and the highest category consumed beef two or more times per week.

Beef

Almost half of the Malaysian males and females never consumed beef. The trends for age, education and income were not strong in the males and females from the highest consuming group.

The biggest demographic trends were for ethnicity and religion. The Malay group were the most likely to be in the highest intake groups for both men (68%) and women (71%). The Chinese and Indian groups were much less likely to be in this intake group. Religion, which is strongly related to ethnicity in Malaysia, was also strongly related to beef intake. Muslims were the most likely to be higher beef consumers followed by Christians.

Hindus, for religious reasons, were nearly all in the 'never eat' group.

Beef was consumed the most frequently in George Town with 41% men from George Town in the high frequency group compared to 29% men from Kuala Lumpur. There were no city differences among the women in the highest frequency category (KL: 32%, GT: 29%). This may actually be a true difference between cities, because even though these differences may have been accounted for by the differences in ethnic proportions across the two cities (see Table 1), the differences were not noted between the women from each city.

Lamb

The same tertiles of intake were used for lamb as for beef. More than half of the males and females were in the 'never eat' group. Age, income and education level did not markedly affect consumption pattern.

Ethnicity and religion were important in determining lamb intake. More Indians

were in the highest intake category for lamb in both men (39%) and women (25%). The Chinese were the least likely to be in the highest intake category (M: 13%, F: 6%). Those of the Hindu religion were the biggest consumers of lamb.

The men (28%) and women (21%) from Kuala Lumpur were more likely to be in the highest consuming category than those from George Town (M:11%, F: 4%). However, this may be more of an effect of ethnicity as Indians were higher consumers (see Figure 2) and they were unrepresented in the George Town sample.

Demographic variation in consumption of alternative protein sources

Pork
Pork consumption was divided into two groups low (1 or less per week) and high (2 or more each week). The numbers of people who answered the pork intake question were quite small overall so reliable trends of intake could not be determined (see page 6 for explanation). However, of those who answered the pork intake question, the Chinese were the most likely to be in the high intake category for both men (32%) and women (29%).

Seafood
Forty-seven percent of men and women who lived in George Town were in the highest seafood intake category, consuming seafood eight times per week or more. Men and women aged over thirty were also more likely to be in the highest intake category. Income and education trends were inconsistent for both men and women. Malay men (43%) and women (46%) were more likely to be higher seafood consumers.

Chicken
There were more high frequency consumers from Kuala Lumpur (M: 42%, F: 30%) than in George Town (M: 29%, F:26%). For men there were more high frequency consumers in the youngest age group (48%) but a smaller age effect in women. There was a clear effect of education in women with those receiving a tertiary education among the highest consumers. This was the same for the men although less marked. There was no effect of income. Chinese men and women were the highest consumers of

the three ethnic groups (consuming chicken once per day or more). Those who followed the Buddhist faith consumed chicken the most frequently.

Soy products
Soy products were consumed the most frequently in George Town and more frequently by working women. There was a marked age trend in women with younger women in the highest consumption group. Chinese and Indian men and women were part of the high consumption group more often than the Malays. There were no strong education, income or religion trends.

Eggs
The number of people in the highest frequency of egg consumption group did not vary greatly between George Town and Kuala Lumpur for women but the men from Kuala Lumpur were more likely to be high egg consumers. Those men and women who were not working were more likely to eat more eggs. Clear income, education and religion trends did not emerge although male-Malays were the most likely to have a higher egg consumption than the other males. This trend in ethnicity did not emerge for women, although Indian women were less likely to be in the highest egg consumption group.

Dairy products
Residents from George Town and younger men were more likely to be in the highest consumption group for dairy products (six times or more each week). Clear education and religion trends did not emerge for dairy products. Those in the lowest income bands were the most likely to be in the highest consuming categories. This income difference was less clear for women, although those women whose household income was the highest were the least likely to be high dairy consumers.

Fruits & vegetables
For fruits and vegetables, frequency of consumption was consistently high across all demographic groupings. The type of food frequency scale used was chosen to better estimate consumption of protein-based foods and so the intake for fruit and vegetables was clustered at the high end. Further analysis undertaken as for other categories would not be meaningful or useful.

As well as assessing frequency of consumption of selected foods, a number of questions were asked relating to food shopping practices, eating out and influences on food purchasing.

Shopping frequency

The average number of times Malaysian respondents shopped for food averaged 2.6 times a week. The number of days that respondents shopped for food according to their degree of responsibility for food preparation is shown below in Table 3.

Figure 5 below shows the average number of days spent shopping by ethnicity and gender. On average those women aged over 46 years shopped the most often for food and young Chinese women shopped the least often among all female groups. All of the men tended to shop less often for food, particularly the older Indians. Malay men tended to shop the most often for food across all ages.

Table 3. Frequency of shopping by responsibility for shopping (days per week).

	Average
Mainly responsible	3.3
Equally responsible	2.8
Somewhat responsible	1.5

Figure 5. Average number of days per week spent food shopping according to ethnicity, age and gender.
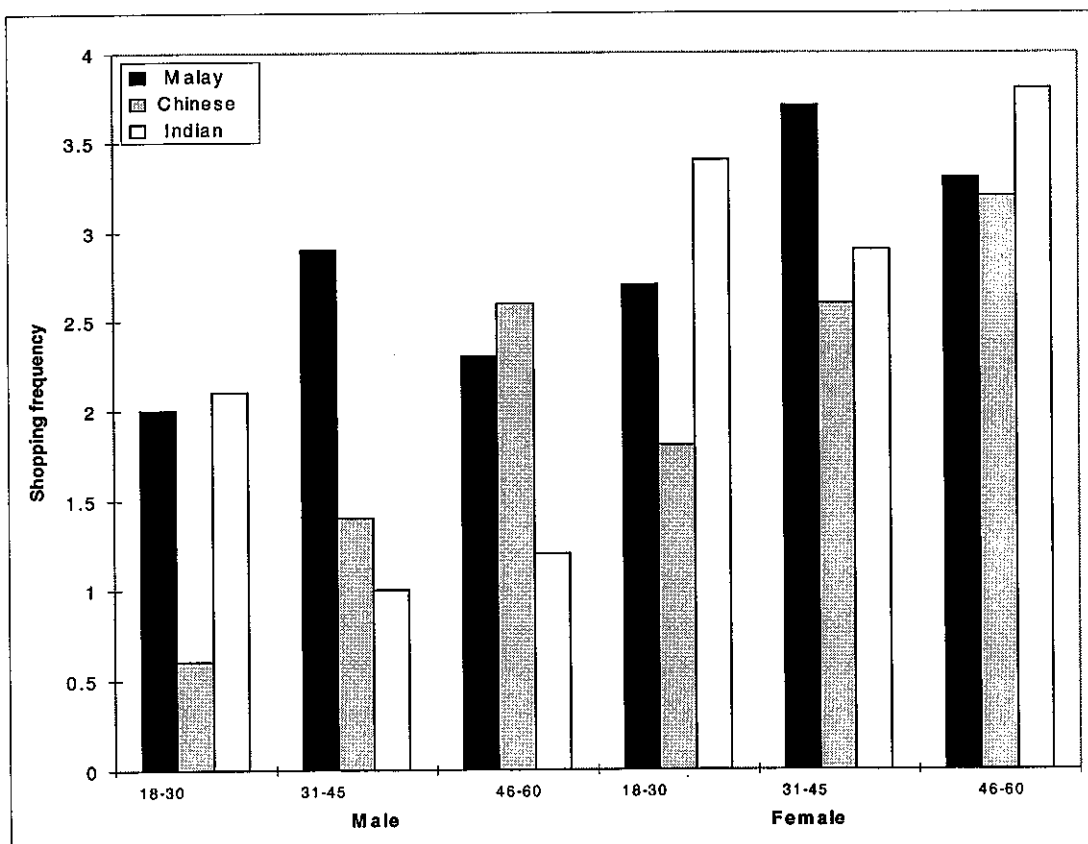
Figure 6. Average number of meals eaten away from home according to ethnicity.
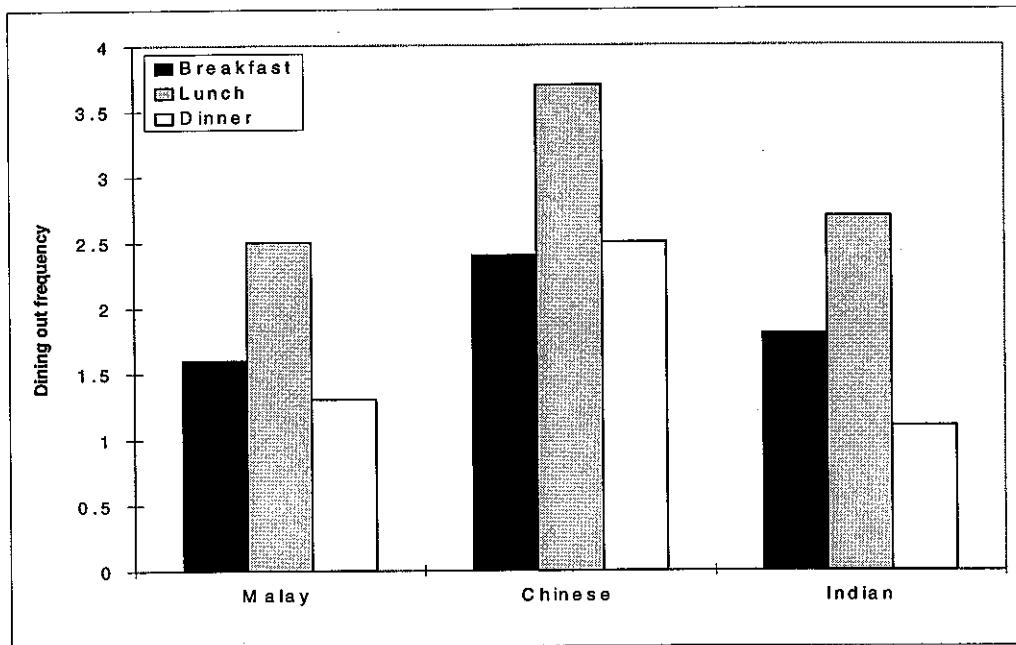
Figure 7. Average number of meals eaten away from home according to age, gender and working status.
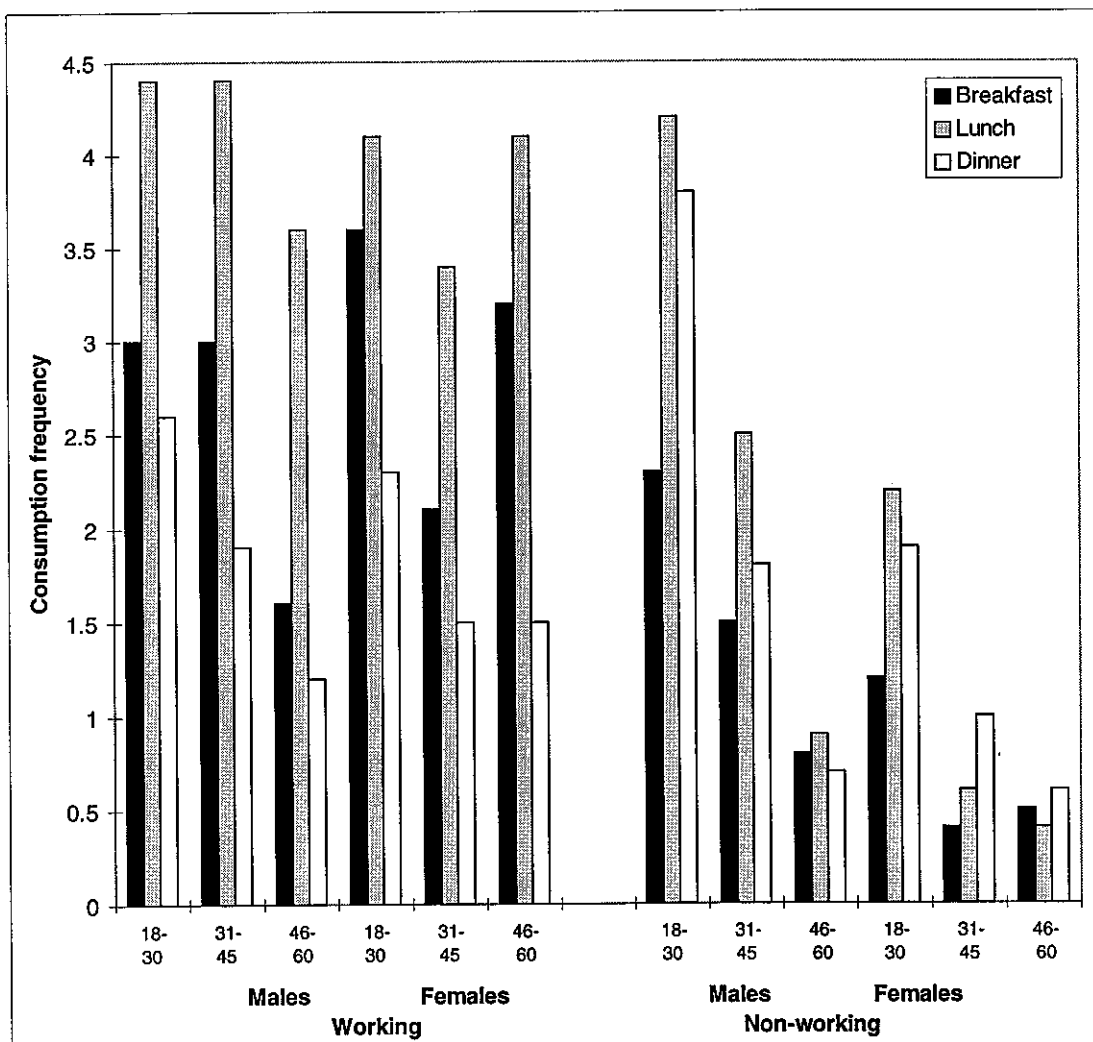
Meals eaten away from home in the average week

The effects of ethnicity, age, gender and working status on the number of meals eaten away from home each week are shown in Figures 6 and 7 (previous page). Food eaten away from home was defined as food that was purchased as well as eaten away from home.

Lunch is the meal most frequently eaten away from home in all three ethnic groups (Figure 6). However, the Chinese reported eating both breakfast and dinner away from home more often than either the Malays or Indians. This was also found in the Taiwan sample and may reflect a cultural tradition, with breakfast particularly. It is interesting to note that in the Malay and Indian cases breakfast was eaten away from home more often than dinner unlike in Western nations. For the Chinese the rate was equally high for breakfast and dinner.

Those respondents who were working clearly consumed more meals away from home (Figure 7). Younger respondents generally reported eating more meals away from home each week for all meal categories.

Food choice factors

Respondents could choose the five factors (out of fifteen) they considered to be the most important when making food selections. The relative percentages are shown in Figure 8 by ethnicity.

For all three ethnic groups, freshness, price, food safety, taste, and nutritional content were the most important factors influencing food selection. There were few differences between men and women overall although more men chose taste (59% vs 50%) and convenience (24% vs 15%) and more women chose weight control (18% vs 10%) and cooking knowledge (17% vs 10%).

When the less important influences were considered some ethnic differences were noted. More Malay respondents chose chemical free, and more Chinese selected convenience as factors important in the food choice process.

Figure 8. Percentage of Malay, Chinese and Indian respondents selecting each food choice factor (descending order of popularity by Malays).
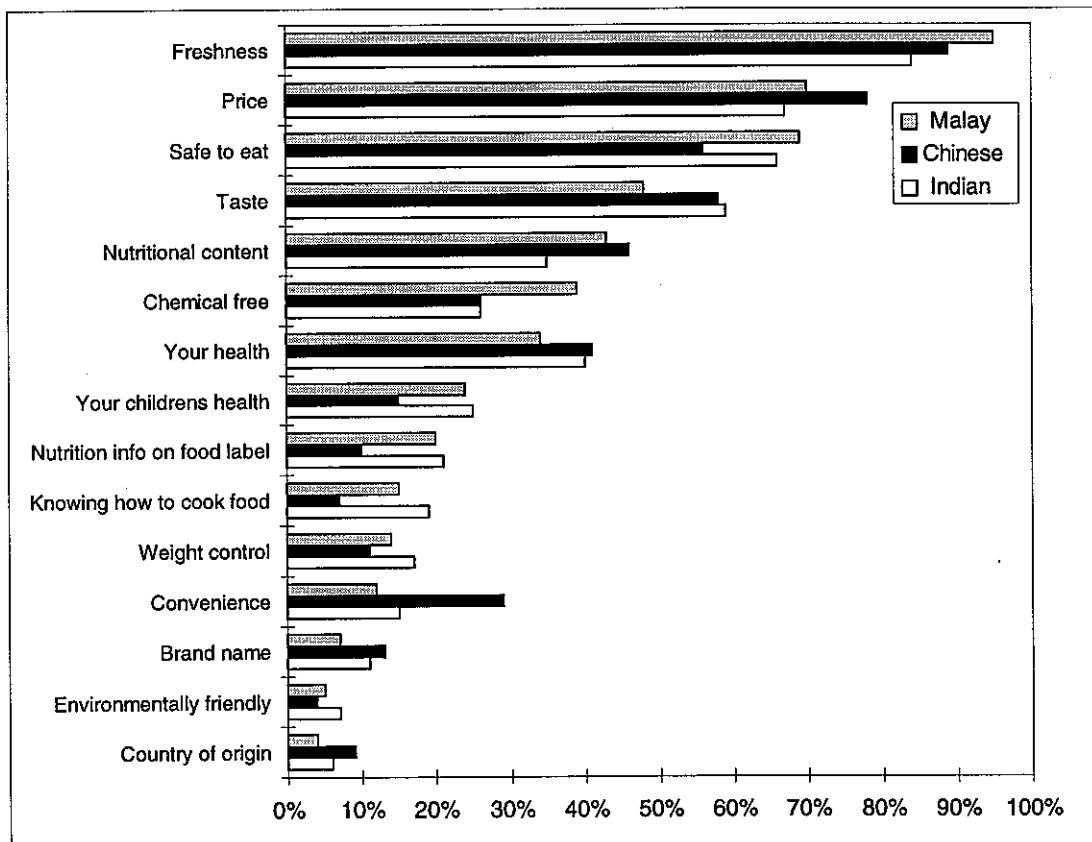
Respondents were asked to indicate on a five-point scale how much they liked eating a particular food and how healthy they believed that food was with 5 the highest rating for liking or perceived healthiness. If they did not eat a particular food a liking score was not requested. The rates of non-eating for the ten foods examined in each ethnic group are shown below in Table 4.

Substantial numbers of respondents in each ethnic group indicated that they did not consume lamb. These people were excluded from the liking scale responses.

Large numbers of Chinese and Indian respondents did not consume beef. Belief in the Hindu religion where the cow is a sacred animal is one of the major reasons for low levels of beef consumption by the Indian group.

The average ratings for those respondents who did give a liking rating (ie. those who did not record a "do not eat" or missing value) and the perceived healthiness rating are shown in Figure 9. Figure 10 shows the difference between the liking and healthiness ratings for the ten foods in each ethnicity.

Table 4. Frequencies and percentages of respondents not consuming foods by ethnicity.

	Malay	Chinese	Indian
Eggs	1%	3%	4%
Soy products	4%	1%	2%
Beef	5%	61%	73%
Dairy products	8%	11%	12%
Chicken	2%	3%	2%
Seafood	2%	6%	6%
Fruit and vegetables	0	0	0
Lamb	48%	52%	40%
Pork *	0	4%	19%
Rice	0	0	0

* Note that these percentages are derived from the 117 respondents who provided an answer for the pork question.

Eggs, dairy, seafood, chicken and soy all outrated beef in both the "liking" and "healthiness" scales (see Figure 9 overleaf). Lamb, pork and beef rated at the scale mid-point or lower on both "liking" and "healthiness" scales. Beef and pork rated much better in terms of "liking" compared to the "healthiness" perception.

With a few exceptions, the rating of the "healthiness" of a food category mirrored closely the rating for "liking" and this can be seen more clearly in Figure 10. The Chinese rated beef higher on healthiness when compared to the liking scale than either Malays or Indians. All three ethnic groups rated lamb higher for health. Seafood, pork and chicken were liked more than they were perceived to be healthy.

Figure 9. Average difference between liking and perceived healthiness ratings for the ten foods (ratings based on those respondents who did indicate a response for that food).
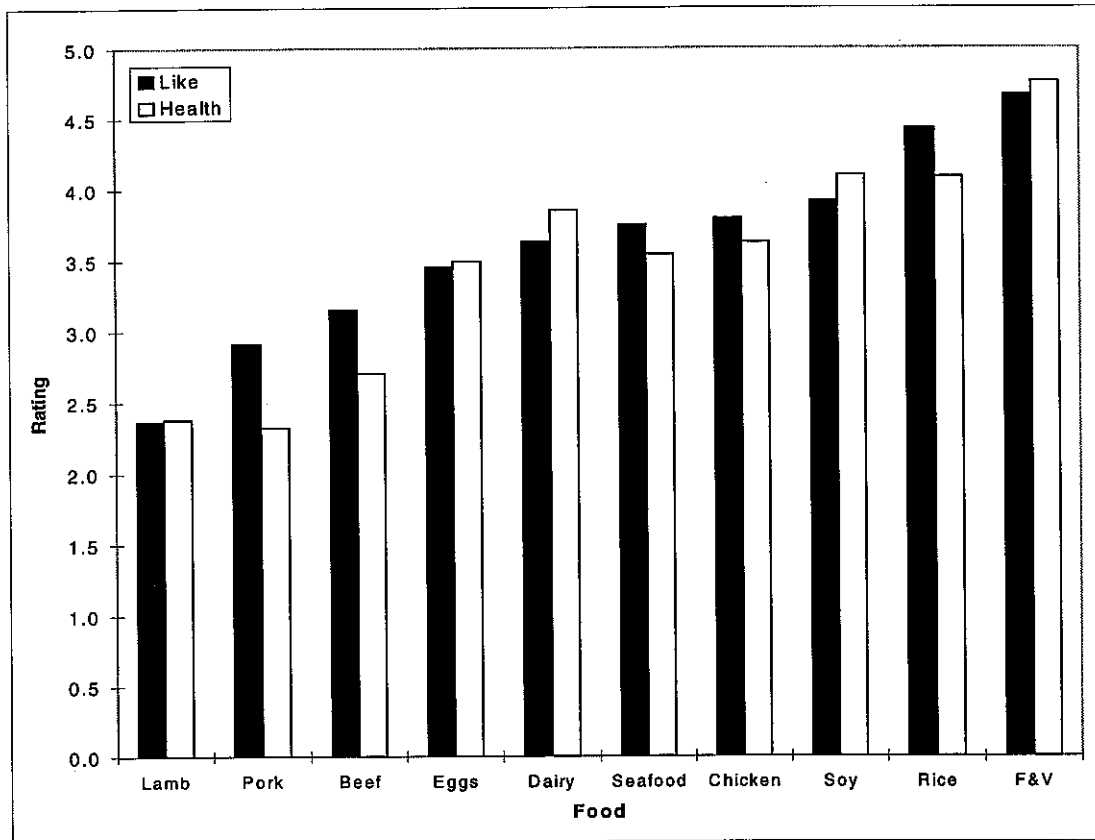
Figure 10. Average difference between liking and healthiness ratings for the ten foods. (all ratings based on those respondents who did indicate a response for that food; numbers are given if groups size is less than 60).
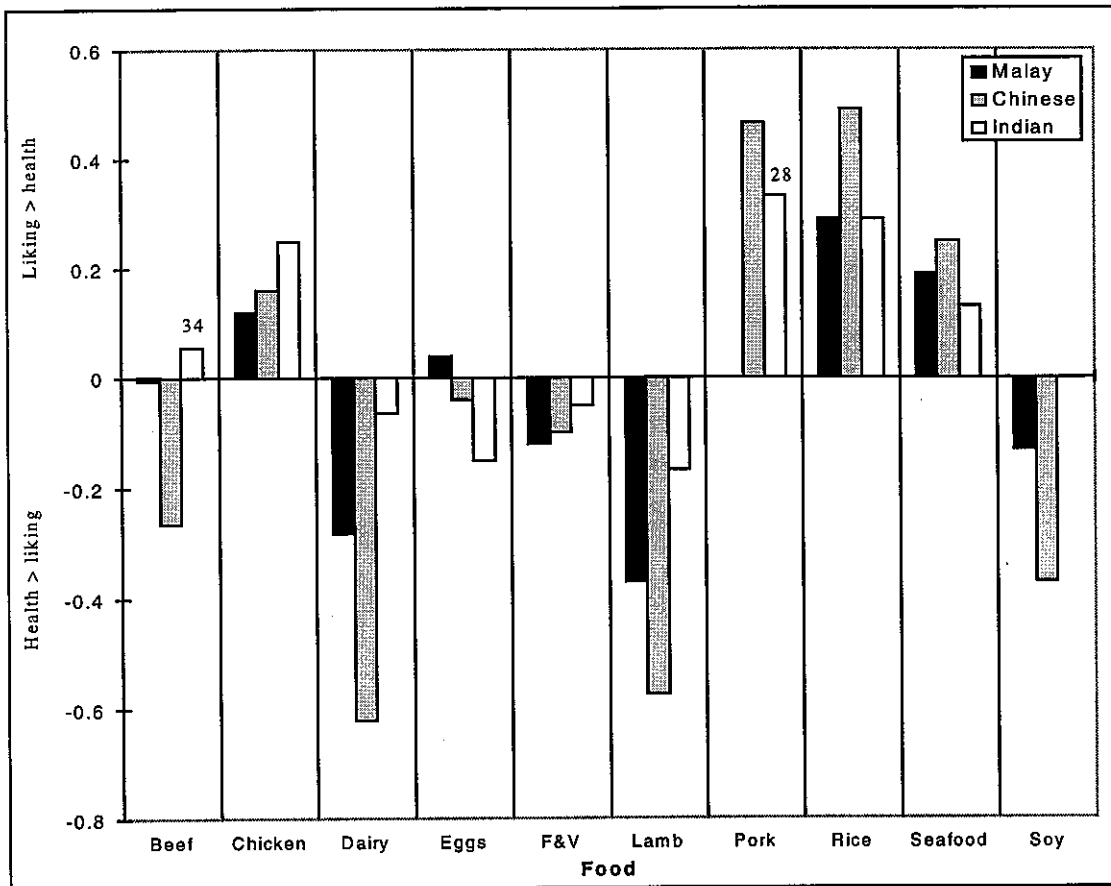
Demographic variations in liking ratings

Beef

Beef was rated higher on "liking" by people from George Town and by men, particularly those aged less than 45 years. There was no consistent trend with education or income. Sixty percent of the Muslim men and 39% of the Muslim women were in the highest liking category. All other religions had less than 15% of respondents in the highest liking category. The Malays were the significantly more likely than either the Indians or the Chinese to be in the highest liking category. The Indians were the most likely to be in the "do not eat" category as most were Hindu, however many of the Chinese also reported that they did not consume beef.

Lamb

Many of the respondents reported that they did not eat lamb at all. Of those who reported eating it, few were in the highest liking category overall. Fewer of those from Kuala Lumpur were in the non-eating group. There were inconsistent trends for ethnicity, income and education but the Hindus were the least likely to be in the non-eating group.

Pork

As few people overall (n=117) answered the pork liking, health and intake questions. Of these who did, the younger males reported liking pork more. There were no consistent occupation or income trends.

Chicken

For chicken, there were no differences in liking between those from Kuala Lumpur or George Town. There was a strong age trend for men, those who were younger reported liking chicken the most. There were no age trends for the women. There were inconsistent trends for education and occupation although more of the Muslims and Malays were in the highest liking category.

Seafood

For seafood, there was an equal rating across cities for men but more women from George Town were in the highest liking category than those from Kuala Lumpur. Those who were younger and those who were of the Muslim faith were more likely to be in the highest liking group. Ethnicity trends supported this.

Soy products

The men from George Town were more likely to be in the highest liking category, while there were no city differences among the women. There was a strong age-trend for the men where those who were older reported liking soy more. There were no age differences for the females. Other trends according to income, religion and education were not apparent. More of the Malay males reported liking soy the most but this ethnicity trend was not evident amongst the women.

Eggs

Eggs were more popular in Malaysia with people from George Town.. Education, age and income did not have a big effect. Those of the Muslim faith reported liking eggs more than all other religions. This trend was supported by the ethnicity data, where Malays were the most likely to report a high liking for eggs.

Dairy products

For dairy products, those from George Town reported a higher liking. Those men with a higher income were less likely to be in the highest liking category, but this did not hold for women. Those who followed a Chinese religion were the least likely to give dairy foods a high liking rating.

Fruit and vegetables

Fruits and vegetables were rated equally for liking across cities but rated higher in women and in higher educated men. Apart from these differences, there were no other demographic variations.

Demographic variations in healthiness rating

Beef

For beef, there were major differences across cities for perceptions of healthiness of beef. In George Town 43% of men rated beef highly on the health scale compared to only 18% in Kuala Lumpur. For women a higher rating was given by 40% in George Town but only 26% in Kuala Lumpur. Age and education did not markedly affect perception of healthiness although there was a trend for the score to increase with age in women.. Muslim and Malay men and women were the most likely to be in the highest health rating group.

Lamb

For lamb, few people gave lamb a high rating and there were no marked demographic differences. Those from Kuala Lumpur were more likely to give lamb a low health rating.

Pork

The numbers of respondents rating pork were not great enough to establish clear demographic trends.

Chicken

Chicken was rated higher on healthiness in George Town but the differences were smaller among the women. Older women rated it higher than younger women and there was a tendency for higher income groups to rate it as healthier. However, differences were not marked. Muslim men and women rated chicken higher on healthiness than all other religious groups and this was supported by the ethnic analysis with Malays, especially among the Malay men.

Seafood

For seafood, ratings for perceived healthiness were higher among men from George Town but the women rated seafood quite similarly across the two cities. Muslim men and women were more likely to rate seafood high in healthiness. The Chinese tended to give seafood lower ratings.

Soy products

Soy products were highly rated on the healthiness scale overall although those men and women from George Town were more likely to rate them higher on healthiness. Older men tended to perceive that soy products were healthier than younger men, but this trend was inconsistent for the women.

Eggs

Many more people from George Town rated eggs higher on health than those from Kuala Lumpur (Men - KL: 41%, GT: 75%; Women - KL: 51%, GT: 71%). There were no trends for income, age or education. Those who were Muslim and Malay were the most likely to rate eggs highest on health.

Dairy products

Dairy products were rated more highly on health by those from George Town and those who had higher incomes. Those who were Muslim males or Buddhist females perceived dairy products to be very healthy.

Fruit and vegetables

Fruits and vegetables were rated equally high for healthiness across all demographic groups.

BENEFITS OF AND PROBLEMS WITH SPECIFIC FOODS

In this section of the questionnaire, respondents were asked to give up to three benefits and problems related to specific foods.

For each food type, the open-ended responses were categorised for cross - demographic comparison.

The responses by major categories are shown in Table 5 and are followed by comments on key demographic variations and differences across people who are high or low consumers of the food.

Overall free responses

Benefits

More than half of the responses about the benefits from foods concerned the supply of specific nutrients, followed by nutrition in general (21%). "Good for overall health", or specific parts of the body (like bones, eyes etc), were also important .

Problems

More than half of the responses addressed the issues of fat and cholesterol. "Bad for health" or weight were also important concepts. Food contamination was less of a concern (4%).

Table 5. General categories of responses for all Malaysians for the benefits / problems of foods.

BENEFITS	Number	%
Supplies nutrients	2094	59%
Nutritious	747	21%
Good for health/ vitality	431	12%
Sensory issues	124	4%
Convenient	53	1%
Low in ...	46	1%
Other	55	1%
TOTAL	3550	100%
PROBLEMS		
High fat/cholesterol	3305	55%
Bad for health/ weight	1441	24%
Digestion/allergy problems	388	6%
Contamination/disease	229	4%
Sensory issues	98	2%
Religion / ethics	70	1%
Other	399	7%
TOTAL	5990	100%

Benefits

The major benefits of beef were perceived to be its role as a protein source and as a source of energy/ stamina/ power or strength (see Tables 6, 7, 8)

- **supplies protein** was stated by 21% of people. Younger men and women gave this response more often. Indian men and women were half as likely to give this response as those Malay or Chinese respondents. Those with a higher intake of beef gave this response the most often in both men and women.

- **energy / power / stamina**: this group of responses was given by 15% of men and women. Men aged from 18 - 30 were slightly less likely to give this response than all other age groups including women. For both sexes, the Malay respondents were four times as likely to give this response. High consumers of beef were more likely to give this response than low consumers, particularly among the males.

Problems

The major problems noted were the perception that it was high in cholesterol, fat content and that it was bad for blood pressure and arteries (see Tables 9, 10, 11).

- **high cholesterol content**: this was named more often by men aged 30-45 than older men and all women. This was mentioned much more often by the Chinese than either the Malay or Indian respondents for both men and women. It was also mentioned more often by those who consumed beef once a week (medium intake).

- **fat content**: Ten percent of respondents considered this to be a problem. Younger men and women were more likely to mention this than older respondents. Malay men and women, together with Indian women mentioned this the most frequently. Those with a higher intake of beef were more likely to mention this problem.

- **Bad for blood pressure / heart / arteries**: Nearly all of the responses coded for this item were "high blood pressure" as can be seen in Table 9. In general, this issue concerned older respondents more than younger ones. The Malay men and women mentioned this much more often than all other ethnic groups and indeed among the women they were the only ones to mention "high blood pressure". This ethnic difference and major concern was not seen for many of the other protein-based foods, including lamb. Those who ate beef once a week or more often showed the highest level of concern.

Table 6. Benefits of eating beef (responses included in each category and numbers of people giving those responses).

96 **protein** 59 protein 37 high in protein 71 **source of energy/ strength/ power/** **stamina** 66 energy 2 energise 2 strong body 1 a lot of energy 12 **nutritious / basic food /staple** 7 nutrients 5 nutritious 8 **healthy/good for body** 4 healthy 2 good for health 2 healthy body 7 **builds body/muscle/growth/children** 5 helps growth 2 build up body	5 **iron** 4 iron 1 rich with iron 3 **makes / enriches blood** 3 increases blood **OTHER** 5 vitamins 1 source of B complex 1 delicious 1 taste 1 good for bones 5 fat 1 high fat 1 create variety of food 1 good for mental 1 appetite 7 carbohydrates 1 high in carbohydrate 2 metabolism 1 low protein 1 if eat beef it will recover from injury instantly

Table 7. Benefits of beef for all respondents and in males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
protein	21	21	21
source of energy/strength/power/stamina	15	15	15
nutritious / basic food /staple	3	2	3
healthy/good for body	2	1	2
builds body/muscle/growth/children	2	3	0
supplies carbohydrate, sugar	2	2	2
supplies fat	1	1	2

Table 8. Benefits of beef in males and females across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
protein	23	21	19	24	18	20
source of energy/strength/power/stamina	11	18	17	16	13	16
builds body/muscle/growth/children	7	3	0	0	0	0
nutritious / basic food /staple	3	1	1	5	1	4
iron	3	0	0	4	0	0
healthy/good for body	3	0	1	1	1	4
vitamins	0	4	0	3	1	0
supplies fat	0	0	3	3	1	1
supplies carbohydrate, sugar	0	3	3	0	1	4

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
source of energy/strength/power/stamina	33	4	7	28	7	9
protein	26	22	11	26	21	13
nutritious / basic food /staple	5	0	0	9	0	0
builds body/muscle/growth/children	4	4	0	0	0	0
healthy/good for body	2	1	0	3	0	3
vitamins	2	1	0	2	0	1
supplies fat	1	0	2	5	0	0
makes / enriches blood	1	0	0	2	0	0
iron	0	2	0	0	2	1
supplies carbohydrate, sugar	0	1	5	0	1	4

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
source of energy/strength/power/stamina	4	18	32	1	26	31
protein	14	23	31	10	26	33
builds body/muscle/growth/children	1	5	5	0	0	0
nutritious / basic food /staple	1	3	3	0	4	8
healthy/good for body	1	0	3	0	6	3
vitamins	0	3	3	0	2	3
supplies fat	1	0	1	0	0	5
makes / enriches blood	0	0	1	0	0	3
iron	0	3	1	2	2	0
supplies carbohydrate, sugar	3	0	1	3	0	0
good for metabolism	0	3	0	0	0	1
good for circulation/heart/blood pressure	10	3	0	0	0	0
good for brain/ contains DHA	0	0	0	0	2	0

Table 9. Problems with eating beef (responses included in each category and numbers of people giving those responses).

94 high cholesterol content 72 high in cholesterol 22 cholesterol **46 fat content** 24 high in fat 20 fat 1 a bit fat 1 oily **45 bad for blood pressure/heart/arteries** 42 high blood pressure 3 leads to heart attack **15 religion; ethics** 15 religious restrictions **13 causes overweight/ too many calories** 11 easy to get fat 1 high calories 1 over weight	**OTHER** 2 expensive 1 freshness 1 difficult to get fresh beef 1 difficult to digest 1 not digested 3 skin irritation 2 allergy 1 feel headache 1 not good for health if take always 1 very bad for health 1 dislike taste 1 too much protein is not healthy 1 much frozen meat being sold 1 diseases 1 poisonous 2 not for old people 1 the meat I find is quite hard 1 soft 5 heats the body

Table 10. Problems with beef for all respondents and in males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
high cholesterol content	20	21	19
bad for blood pressure/heart/arteries	10	11	9
fat content	10	9	11
religion; ethics	3	3	4
causes overweight / too many calories	3	1	4
heats body	1	2	0

Table 11. Problems with beef in males and females across age, ethnic and intake categories (responses given by at least 2 % of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
high cholesterol content	19	29	15	20	18	20
fat content	16	3	8	20	8	4
bad for blood pressure/heart/arteries	5	12	15	6	7	13
heats body	3	4	0	0	0	0
causes overweight / too many calories	1	1	1	6	4	3
religion; ethics	1	3	4	3	4	5
allergy/diarrhoea/stomach upset	1	1	1	0	4	0
expensive	0	0	0	0	2	0
tough / dry / chewy / hard	0	0	3	0	0	0

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
bad for blood pressure/heart/arteries	25	4	0	24	0	0
high cholesterol content	21	30	7	18	26	13
fat content	14	7	5	16	5	12
causes overweight / too many calories	1	2	0	6	2	4
allergy/diarrhoea/stomach upset	1	1	2	1	2	0
tough / dry / chewy / hard	1	0	2	0	0	0
heats body	1	3	2	0	0	0
expensive	0	0	0	2	0	0
religion; ethics	0	2	7	0	9	3

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
high cholesterol content	19	30	20	14	30	21
religion; ethics	5	0	0	8	0	0
fat content	4	10	16	7	15	15
bad for blood pressure/heart/arteries	4	15	19	0	19	16
causes overweight / too many calories	2	3	0	1	4	9
heats body	2	3	3	0	0	0
allergy/diarrhoea/stomach upset	0	8	0	2	0	1
expensive	0	0	0	0	2	1
bad for the elderly	0	3	0	0	0	1

Benefits

The major benefits of lamb were perceived to be that it provided protein and was good source of energy and power (see Tables 12, 13, 14).

- **protein:** was mentioned the most often by the Chinese respondents and those with a higher intake (once a week or more often).

For other benefits the numbers were not sufficient enough to allow further demographic emphasis.

Problems

The major problems were perceived to relate to a perception that lamb was high in cholesterol, fat and that it was bad for blood pressure and arteries (see Tables 15, 16, 17).

- **high cholesterol content:** was cited more often by those aged over 30 years and by Chinese men and Chinese and Indian women. It was mentioned nearly twice as often by those with higher intakes of lamb (once a week or more).

- **fat content:** This was mentioned slightly more often by females overall, particularly those females aged less than 45 years. For the women, those who were Malay or Indian were twice as likely to mention this problem as those who were Chinese. The Malaysians who ate lamb once per week on average were more likely to cite fat content as a problem, rather than those who consumed lamb more or less often.

Table 12. Benefits of eating lamb (responses included in each category and numbers of people giving those responses).

72 protein
63 protein
9 high in protein
37 source of energy/ strength/ power/ stamina
33 energy
1 gives strength
1 strong body
16 nutritious / basic food /staple
9 nutrients
7 nutritious
11 warms body / good in winter
11 heats up the body
10 supplies carbohydrate, sugar
10 carbohydrate

7 iron
7 iron
1 makes / enriches blood
1 adds blood
OTHER
1 high magnesium
2 vitamins
1 high vitamin E
3 tasty
2 good for health
1 healthy body
3 fat
2 low fat
1 body building
1 less cholesterol
1 satisfaction
3 good for appetite
1 medicine for headaches

Table 13. Benefits of eating lamb in all respondents and in males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
protein	15	15	16
source of energy/strength/power/stamina	8	7	8
nutritious / basic food /staple	3	4	3
iron	2	2	1
warms body / good in winter	2	2	3
supplies carbohydrate, sugar	2	2	3

Table 14. Benefits of lamb in males and females across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
protein	16	13	16	16	16	16
source of energy/strength/power/stamina	8	9	4	5	7	13
nutritious / basic food /staple	5	3	3	4	1	5
iron	4	1	0	1	0	3
vitamins	3	0	1	0	0	0
warms body / good in winter	1	4	1	0	2	5
supplies fat	0	1	3	0	0	0
supplies carbohydrate, sugar	0	3	3	0	1	7

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
protein	10	21	13	9	23	16
source of energy/strength/power/stamina	9	8	4	14	6	4
nutritious / basic food /staple	9	1	0	8	1	0
supplies fat	2	0	2	0	0	0
vitamins	1	1	2	0	0	0
warms body / good in winter	0	3	4	5	1	1
supplies carbohydrate, sugar	0	0	7	2	0	6
iron	0	4	0	0	4	0
tasty	0	0	4	0	1	0
builds body/muscle/growth/children	0	0	2	0	0	0
improves appetite	0	0	4	0	1	0

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
protein	8	18	28	10	25	22
source of energy/strength/power/stamina	3	9	14	4	13	19
supplies carbohydrate, sugar	0	0	8	1	0	11
nutritious / basic food /staple	2	4	8	2	6	3
supplies fat	0	0	6	0	0	0
tasty	0	0	4	0	0	3
iron	1	2	4	0	5	0
warms body/ good in Winter	2	4	2	1	3	8
builds body/muscle/growth/children	0	0	2	0	0	0
satiety	0	0	2	0	0	0
improves appetite	0	2	2	1	0	0
minerals	0	0	2	0	0	0
vitamins	1	2	2	0	0	0
low in fat	1	0	0	0	0	3
healthy/good for body	1	0	0	0	3	0

Table 15. Problems with eating lamb (responses included in each category and numbers of people giving those responses).

105 high cholesterol content 76 high cholesterol 29 cholesterol **52 fat content** 25 a lot of fat 25 fat 2 oily **43 bad for blood pressure/heart/arteries** 33 high blood pressure 9 bad for heart 1 meat could cause heart disease **9 not tasty** 7 dislike lamb 1 not delicious 1 the taste is very funny	**8 causes overweight / too many calories** 6 fattening 2 calories high **OTHER** 1 expensive 5 don't like the smell 1 causes epilepsy 1 cramp 1 headache 1 high allergy 3 should not eat too much 1 not suitable for health 1 poisons the body 1 too hard 6 heats the body

Table 16. Problems with lamb in all respondents and in males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
high cholesterol content	23	22	23
fat content	12	9	14
bad for blood pressure/heart/arteries	9	8	10
causes overweight / too many calories	2	2	2
not tasty	2	2	2

Table 17. Problems with lamb for males and females and across age and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
high cholesterol content	19	27	21	16	23	29
fat content	11	5	11	15	18	9
bad for blood pressure/heart/arteries	5	8	12	14	6	11
causes overweight / too many calories	3	0	3	3	1	1
not tasty	0	1	5	3	1	1
smell	0	1	3	1	0	1
heats body	0	4	0	0	2	1

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
high cholesterol content	16	30	20	17	24	28
bad for blood pressure/heart/arteries	12	2	13	14	2	14
fat content	10	7	11	17	7	19
causes overweight / too many calories	2	1	2	1	1	3
allergy/diarrhoea/stomach upset	2	1	0	0	1	0
not tasty	1	4	0	1	4	0
should not eat too much/bad for you	0	0	2	2	1	0
heats body	0	1	4	2	1	0
smell	0	2	2	0	1	1
tough / dry / chewy / hard	0	0	2	0	0	0

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
high cholesterol content	17	28	30	13	39	30
bad for blood pressure/heart/arteries	4	5	22	7	13	16
fat content	6	14	10	9	23	19
should not eat too much/bad for you	0	0	2	1	0	3
smell	2	0	2	1	2	0
allergy/diarrhoea/ stomach upset	2	0	2	1	0	0
tough / dry / chewy / hard	0	0	2	0	0	0
causes overweight / too many calories	2	4	0	0	3	5
heats body	1	4	0	1	2	3
expensive	0	0	0	0	2	0
not tasty	4	0	0	2	2	0

Benefits

Of those who completed an intake for pork, few people mentioned any benefits. The benefits mentioned the most frequently were that it was a source of protein and that it provided energy and stamina (see Tables 18, 19, 20).

Problems

The major problems with pork were perceived to be its fat and cholesterol content (Tables 21, 22, 23).

- fat content was a problem mentioned by more often by younger males and older females. The Chinese respondents were also the most likely to mention both fat and cholesterol as an issue for pork.

Table 18. Benefits of eating pork (responses included in each category and numbers of people giving those responses).

30 protein 20 protein 10 high in protein 24 source of energy/ strength/ power/ stamina 21 energy 2 become strong 1 power	OTHER 1 iron 3 tasty 2 flavour 1 easy to cook 1 healthy 1 not hungry for long time 1 heat 1 carbohydrate 1 medicine for blood in vomit

Table 19. Benefits of pork in all respondents and for males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
protein	6	6	7
source of energy/strength/power/stamina	5	4	5

Table 20. Benefits of pork for males and females across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
protein	7	8	4	6	8	5
source of energy/strength/power/stamina	4	8	1	3	6	7
tasty	0	4	0	0	0	1

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
protein	1	14	0	0	17	3
source of energy/strength/power/stamina	0	8	5	0	10	6
tasty	0	3	0	0	1	0

	INTAKE OF MEN (%)		INTAKE OF WOMEN (%)	
	Never eat	Eat	Never eat	Eat
protein	3	9	7	7
source of energy/strength/power/stamina	3	6	6	4
tasty	1	2	0	1

Table 21. Problems with eating pork (responses included in each category and numbers of people giving those responses).

41 fat content
27 fat
12 a lot of fat
2 oily
29 high cholesterol content
20 high cholesterol
9 cholesterol
11 poisonous / bacteria / parasites
3 bacteria
3 dirty
1 contain toxin
1 contaminated
1 if the pork is sick it will affect the person

1 poison pork if not recognised by the government
1 worms
OTHER
1 lard difficult to digest
1 difficult to digest
1 pimples
4 fattening
4 not good for health
1 dislike
1 dislike pork
3 heart problem
1 high blood pressure
1 uric acid
1 no vitamin

Table 22. Problems with pork for all respondents and in males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
fat content	8	9	8
high cholesterol content	6	6	7
poisonous / bacteria / parasites	2	3	1

Table 23. Problems with pork for males and females across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
fat content	12	9	7	6	6	11
high cholesterol content	4	4	9	8	5	8
poisonous / bacteria / parasites	4	4	1	1	1	1
causes overweight / too many calories	0	1	0	1	2	0
should not eat too much/bad for you	0	0	3	1	0	1
bad for blood pressure/heart/arteries	0	0	0	1	2	0

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
fat content	1	19	5	0	13	10
high cholesterol content	0	12	4	0	17	3
poisonous / bacteria / parasites	0	7	2	0	4	0
should not eat too much/bad for you	0	2	0	0	2	0
not tasty	0	0	2	0	1	0
bad for blood pressure/heart/arteries	0	0	0	0	4	0

	INTAKE OF MEN (%)		INTAKE OF WOMEN (%)	
	Never eat	Eat	Never eat	Eat
fat content	8	13	9	6
high cholesterol content	7	5	7	7
poisonous / bacteria / parasites	2	5	0	3
should not eat too much/bad for you	0	2	0	2
causes overweight / too many calories	1	0	2	1
bad for blood pressure/heart/arteries	0	0	2	0

Benefits

The main advantages of chicken were that it was its protein content and that it was a source of energy and strength (Tables 24, 25, 26).

- **protein:** was named by 27% of men and 35% of women, with higher rates at older ages for women and younger ages for men. Chinese men and women frequently mentioned this benefit and those with an intake exceeding 5 times per week (medium and high groups) mentioned protein the most often.

- **source of energy/ strength/ power/ stamina:** was named more often by men (28%) than women (18%). This was a popular response for those males aged between 31 and 45 Malay men and women were also the most likely to mention energy and stamina as a benefit. There were no clear difference among intake categories, although there was a slight trend for those who had higher intakes to mention this.

Problems

Few concerns were mentioned for chicken, although cholesterol and fat content were mentioned the most often (Tables 27, 28, 29).

- **high cholesterol content:** was named by 22% of men and 15% of women. The Chinese men and women frequently mentioned this problem and those with the highest level of intake mentioned cholesterol the most often.

- **fat content:** This was cited more often by older men. Among the men, the Chinese mentioned fat the most often, while clear ethnicity trends were not as apparent for the women. Those with lower intakes of chicken tended to name fat content as a problem, especially among the women.

Table 24. Benefits of eating chicken (responses included in each category and numbers of people giving those responses).

144 protein
  90 protein
  54 high in protein
 	
111 source of energy/
  strength/power/stamina
  93 energy
  9 become strong
  5 strong body
  3 high energy
  1 makes body active
 	
21 nutritious / basic food/
  staple
  8 nutrients
  6 nutritious
  5 high in nutrition
  1 good for someone
  1 so used to eating it
 	
20 tasty
  14 good taste
  5 delicious
  1 nice to eat
 	
18 healthy/good for body
  10 good for health
  7 healthy body
  1 good for the lungs
 	
14 vitamins
  12 vitamins
  2 a lot of vitamins
 	
12 supplies fat
  11 fat
  1 more fat
 	
10 supplies carbohydrate,
  sugar
  10 carbohydrate
	OTHER
	  1 easy to eat
	  1 easy to munch
	  5 low in fat
	  2 good lean meat
	  1 difference in food
	  1 doesn't heat body too
	    much
	  1 increase blood
	  2 for children
	  2 muscle building
	  1 for growth
	  1 to build body
	  2 children love it
	  1 all races like it
	  1 everyone likes
	  1 good for heart
	  1 not hungry for long
	    time
	  2 extra power of mind
	  2 soft
	  1 juicy
	  1 meat is fine and tender
	  1 add the appetite
	  1 metabolism
	  2 strong antibodies
	  5 low in protein
	  1 less of carbohydrate
	  4 calcium
	  4 iron
	  1 has high iron
	  1 easily digested
	  1 easy to cook
	  1 easy to prepare
	  1 strong bones
	  1 cheaper if compare to
	    other things
	  1 easy to buy
	    1 easy to get

Table 25. Benefits of chicken for all respondents and in males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
protein	31	27	35
source of energy/strength/power/stamina	23	28	18
nutritious / basic food /staple	5	5	4
tasty	4	5	3
healthy/good for body	4	4	4
vitamins	3	3	3
supplies fat	3	2	3
low in fat	2	3	0
supplies carbohydrate, sugar	2	2	2
builds body/muscle/growth/children	1	2	1

Table 26. Benefits of chicken for males and females across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
protein	30	27	24	33	35	37
source of energy/strength/power/stamina	19	37	27	15	20	20
healthy/good for body	8	1	3	3	4	5
nutritious / basic food /staple	5	4	7	4	5	3
supplies fat	4	1	0	6	1	3
builds body/muscle/growth/children	4	1	0	0	0	3
tasty	3	9	4	5	4	0
iron	3	0	0	4	0	0
calcium	3	0	0	0	2	0
low in fat	3	3	4	0	0	0
vitamins	1	4	3	4	1	5
popular/children like it /family like it	0	1	0	1	2	0
supplies carbohydrate, sugar	0	4	3	1	1	4

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
source of energy/strength/power/stamina	32	29	20	24	17	13
protein	20	33	27	32	44	28
nutritious / basic food /staple	10	2	4	7	4	0
healthy/good for body	5	2	5	6	2	3
supplies fat	4	1	0	5	2	3
vitamins	2	2	4	0	7	3
builds body/muscle/growth/children	2	1	2	0	2	0
iron	1	1	0	2	1	0
tasty	1	3	14	0	0	10
low protein	1	1	0	0	4	0
popular/children like it /family like it	0	0	2	2	0	1
calcium	0	2	0	1	0	1
mouth feel (soft, tender, chewy)	0	0	2	1	0	1
cheap	0	0	2	0	0	0
available	0	0	2	0	0	1
low in fat	0	7	2	0	0	0
versatile / variety of foods	0	0	2	0	0	0
light/fresh/refreshing/cooling	0	0	2	0	0	0
supplies carbohydrate, sugar	0	1	7	0	2	4

Table 26. continued.......

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
source of energy/strength/power/stamina	27	25	30	18	18	20
protein	20	32	29	25	40	43
nutritious / basic food /staple	4	5	7	5	4	1
healthy/good for body	1	5	6	4	3	4
low in fat	0	4	6	0	0	0
tasty	6	5	5	4	4	0
vitamins	1	5	2	2	4	4
supplies carbohydrate, sugar	2	2	2	3	1	1
supplies fat	2	2	1	2	6	3
builds body/muscle/growth/children	1	4	1	1	1	0
low protein	1	0	1	2	1	0
popular/children like it /family like it	0	2	0	0	1	3
iron	1	2	0	1	0	3
calcium	0	4	0	1	0	1
available	0	2	0	0	0	1
easy to eat	0	2	0	0	1	0
versatile/ variety of foods	0	2	0	0	0	0

Table 27. Problems with eating chicken (responses included in each category and numbers of people giving those responses).

84 **high cholesterol content** 44 cholesterol 34 high cholesterol 6 skin contains cholesterol 82 **fat content** 46 fat 26 high fat 4 oily 3 fats in the skin 3 oily skin 25 **causes overweight/ too many calories** 24 put on weight 1 high calories 9 **bad for blood pressure/heart/arteries** 5 high blood pressure 3 bad for heart 1 chicken skin is bad for the heart	**OTHER** 2 injection of chemicals 1 antibiotic injection 1 chemical content 3 expensive 2 allergy 1 side effect 1 itchy 1 skin diseases 1 will cause cholesterol 1 eat less 1 dislike taste 3 chicken got poison 1 eating old chicken will cause disease 1 sickness 1 diabetes 2 cancer 3 heats body 2 meat is heating 1 energy problem

Table 28. Problems with chicken for all respondents and males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
high cholesterol content	18	22	15
fat content	17	15	19
causes overweight / too many calories	5	5	5
bad for blood pressure/heart/arteries	2	2	2
chemicals/pesticides/hormones/antibiotic	1	2	0
allergy/diarrhoea/stomach upset	1	0	2
poisonous / bacteria / parasites	1	0	2

Table 29. Problems with chicken for males and females across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
high cholesterol content	22	23	20	16	13	16
fat content	8	13	23	22	17	20
causes overweight / too many calories	5	3	8	9	4	4
bad for blood pressure/heart/arteries	3	0	3	1	4	1
poisonous / bacteria / parasites	0	0	1	1	0	4
heats body	0	1	3	1	1	0
chemicals/pesticides/hormones/antibiotic	0	1	4	0	0	0
allergy/diarrhoea/stomach upset	0	0	0	0	1	5

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
fat content	15	19	7	23	16	19
high cholesterol content	12	30	21	10	21	14
causes overweight / too many calories	6	3	7	3	7	6
bad for blood pressure/heart/arteries	4	0	2	1	4	1
chemicals/pesticides/hormones/antibiotic	2	2	0	0	0	0
allergy/diarrhoea/stomach upset	0	0	0	5	1	0
expensive	0	0	2	1	0	1
poisonous / bacteria / parasites	0	1	0	1	2	1
causes cancer	0	0	0	0	2	0
heats body	0	0	5	0	0	3

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
fat content	20	9	13	20	25	13
high cholesterol content	19	21	24	13	12	22
bad for blood pressure/heart/arteries	2	2	1	1	6	0
heats body	2	2	0	0	3	0
causes overweight / too many calories	1	7	8	3	9	6
poisonous / bacteria / parasites	1	0	0	3	1	0
chemicals/pesticides/hormones/antibiotic	1	2	2	0	0	0
allergy/diarrhoea/stomach upset	0	0	0	1	4	1
expensive	0	2	0	0	3	0
too much sugar/CHO; not for diabetics	0	2	0	0	0	0

Benefits

The major benefits of seafood were the supply of specific nutrients including protein, iron, vitamins and calcium (Tables 30, 31, 32).

- **supplies protein:** was given by one quarter of all people; rates were higher in those aged over 30 years. Malay women and those who had the highest levels of intake (more than once per day) were also likely to mention protein as a benefit

- **supplies iron:** There appeared to be a common perception that seafood was a good source of iron. This was also supported by the free responses to the risk factors for iron deficiency (see Table 69). This was a common benefit listed by the Chinese respondents.

- **supplies vitamins:** Those who had a higher intake of seafood, together with those who were Chinese, particularly the Chinese females, gave this response the most often.

- **supplies calcium:** was given mainly by the Chinese.

Problems

The most popular responses were the perception that seafood was high in cholesterol and that people were often allergic to it (Tables 33, 34, 35).

- **high cholesterol content:** this was cited more often by older men and women aged 31-45. The Chinese men and women were twice as likely to mention cholesterol and those men who had a low intake of seafood also mentioned this.

- **allergy/ diarrhoea/ stomach upset:** This was most frequently cited by older men and women and by women with a lower intake of seafood.

Table 30. Benefits of eating seafood (responses included in each category and numbers of people giving those responses).

117 protein 71 protein 44 high in protein 2 fish protein **63 iron** 54 iron 9 high in iron **41 vitamins** 19 vitamins 13 high in vitamins 9 vitamins (type specified) **31 nutritious/ basic food /staple** 11 nutrients 8 nutrition 7 high in nutrition 4 high in nutrients 1 normal to eat **34 calcium** 29 calcium 5 high calcium 1 source of calcium **23 source of energy/** **strength/power/stamina** 16 energy 4 strong 3 strong body **18 minerals** 9 Iodine 6 minerals 3 contains zinc	**16 healthy/good for body** 6 healthy 5 good for your body 4 good for health 1 makes you feel fit **15 tasty** 8 tasty 3 delicious 3 good to eat 1 eat it for enjoyment **OTHER** 1 fibre 1 fast cooked food 1 good for bones 1 strengthens bones 1 strong gums 1 easy to get 3 good for skin 1 good for eyes 1 fat 3 less fat 3 no fat 4 a lot of varieties 1 can cook in different ways 7 fresh 7 increases blood 1 good for muscles 5 good for mental level 2 soft 1 tender 1 carbohydrate 3 protein low 3 salt 1 good for bruises 1 main course dish

Table 31. Benefits of seafood for all respondents and males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
protein	25	25	25
iron	14	13	14
vitamins	9	10	8
calcium	7	8	6
nutritious / basic food /staple	7	5	8
source of energy/strength/power/stamina	5	5	5
minerals	4	5	3
tasty	3	3	3
healthy/good for body	3	4	3
light/fresh/refreshing/cooling	2	2	1
makes / enriches blood	2	2	1
low in fat	1	1	2
versatile / variety of foods	1	0	2
good for brain / contains DHA	1	0	2

Table 32. Benefits of seafood for men and women across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
protein	19	29	27	23	27	26
iron	12	17	11	14	10	18
calcium	9	12	4	4	5	11
vitamins	8	13	8	8	11	5
minerals	8	5	1	6	2	0
nutritious / basic food /staple	7	4	5	9	6	9
healthy/good for body	4	4	3	0	6	4
light/fresh/refreshing/cooling	3	1	1	4	0	0
makes / enriches blood	3	4	0	0	2	0
low in fat	1	0	1	0	1	4
low protein	1	0	3	0	0	0
source of energy/strength/power/stamina	0	9	5	10	4	0
tasty	0	5	3	6	2	0
versatile / variety of foods	0	0	0	5	0	0
good for skin/beauty/eyes	0	0	1	3	0	0
good for brain / contains DHA	0	0	0	3	1	1

Table 32. continued………

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
protein	27	27	20	32	20	23
nutritious / basic food /staple	11	1	4	15	2	6
iron	9	19	11	6	24	12
source of energy/strength/power/stamina	7	2	5	5	0	10
vitamins	6	14	7	6	11	7
calcium	5	13	5	1	11	7
healthy/good for body	4	2	5	3	2	4
makes / enriches blood	4	2	0	2	0	0
low protein	4	0	0	0	0	0
minerals	1	7	7	1	5	3
low in fat	1	0	2	1	0	4
light/fresh/refreshing/cooling	1	0	5	0	0	4
tasty	0	0	11	1	0	9
good for bones / teeth / osteoporosis	0	0	4	1	0	0
good for skin/beauty/eyes	0	0	2	1	1	0
good for brain / contains DHA	0	0	0	1	2	1
mouth feel (soft, tender, chewy)	0	0	2	0	0	1
OTHER	0	1	4	0	1	0

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
protein	20	20	34	17	22	36
iron	14	11	14	17	14	12
vitamins	9	8	12	6	8	10
source of energy/strength/power/stamina	0	5	10	1	5	7
healthy/good for body	0	3	8	3	4	3
nutritious / basic food /staple	6	3	7	8	6	9
calcium	8	12	5	11	5	3
minerals	4	7	4	1	6	1
low in fat	1	0	1	1	1	2
tasty	0	7	1	6	3	1
makes / enriches blood	0	5	1	0	3	0
good for brain / contains DHA	0	0	0	1	1	2
versatile / variety of foods	0	0	0	3	1	1
light/fresh/refreshing/cooling	3	3	0	1	3	0
OTHER	1	3	0	1	0	0

Table 33. Problems with eating seafood (responses included in each category and numbers of people giving those responses).

94 high cholesterol content 71 high cholesterol 23 cholesterol **54 allergy/diarrhoea/stomach upset** 43 skin irritation 10 allergy 1 easy to get ill **23 poisonous / bacteria / parasites** 12 toxins 6 hepatitis B 3 poisonous meat 1 diseases 1 not good if not fresh **19 bad for blood pressure/heart/arteries** 19 high blood pressure **9 fat content** 8 fat 1 oily food

OTHER 1 expensive 1 hard to get at times 4 high calories 1 bad for health 1 not healthy if take too much 1 quite dislike 1 has to be clean 1 Uric acid 1 bad for gout 1 pollution 2 diabetes 2 cancer 2 too much iron leads to cancer 2 more acid 2 too much of iron 1 pimples will come out 1 H.I.V.

Table 34. Problems with seafood for all respondents and men and women (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
high cholesterol content	20	22	18
allergy/diarrhoea/stomach upset	11	9	14
poisonous / bacteria / parasites	5	4	5
bad for blood pressure/heart/arteries	4	4	3
fat content	2	2	2
OTHER	1	2	1

Table 35. Problems with seafood for men and women across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
high cholesterol content	16	24	25	14	28	13
poisonous / bacteria / parasites	7	4	3	6	6	4
allergy/diarrhoea/stomach upset	5	9	12	11	13	17
bad for blood pressure/heart/arteries	4	3	7	3	4	4
fat content	1	1	3	3	1	3
causes cancer	1	0	1	0	0	3
causes overweight / too many calories	0	0	3	3	0	0
OTHER	1	1	3	0	1	1

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
high cholesterol content	17	33	11	10	32	13
allergy/diarrhoea/stomach upset	11	8	7	11	15	16
bad for blood pressure/heart/arteries	9	3	0	8	0	1
poisonous / bacteria / parasites	7	2	4	6	6	4
fat content	4	0	2	3	0	3
causes overweight / too many calories	0	1	2	0	1	1
should not eat too much/bad for you	0	1	2	0	0	0
not tasty	0	0	2	0	0	0
causes cancer	0	1	2	0	0	3
OTHER	0	1	5	0	1	1

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
high cholesterol content	34	16	15	15	18	22
allergy/diarrhoea/stomach upset	13	4	10	17	15	10
poisonous / bacteria / parasites	6	4	3	7	8	2
bad for blood pressure/heart/arteries	5	1	7	7	3	1
fat content	3	1	1	4	1	1
should not eat too much/bad for you	3	0	0	0	0	0
OTHER	3	3	0	0	1	1

Benefits

The major benefits of eggs were seen to be protein and that they were a source of energy and strength (Table 36, 37, 38).

- **supplies protein:** This was given by almost half of all respondents, somewhat higher amongst men, the youngest age group and the Chinese. Those women who were in the highest intake group (consumption of eggs more than six times per week) mentioned this the most often.

- **source of energy/ strength/ power/ stamina:** This was named slightly more often by those aged between 31-45 and the least often by the Chinese.

Problems

High cholesterol content was the main problem mentioned by all respondents (Table 39, 40, 41).

- **high cholesterol** was mentioned by 1almost half of all respondents. Younger males were the least likely to mention cholesterol, while it was a common response among the Chinese. Women with the highest intake mentioned this the least often. This trend was not seen amongst the males

Table 36. Benefits of eating eggs (responses included in each category and numbers of people giving those responses).

220 protein
    138 contains protein
    75 High protein
    4 good protein
 	
68 source of energy/
    strength/power/stamina
    40 energy
    11 strong body
    10 strength
    3 high in energy
    2 feel energetic
    1 good for energy
    1 hard working
 	
43 healthy/good for body
    18 good for health
    14 healthy
    6 healthy body
    3 good for body
    2 keep fit
 	
37 vitamins
    19 contains vitamin
    10 high in vitamins
    8 vitamins (type
        specified)
 	
17 nutritious / basic food/
    staple
    10 nutritious
    7 nutrients
 	
OTHER
    2 fat
    2 side dishes
    1 body feels more fresh
    2 to increase blood
    1 blood
    1 healthy for blood
    3 good for children
    3 enhances growth
	1 body building
	1 favourite
	1 got the good
	    cholesterol
	1 increases the heart's
	    activity
	2 satisfaction
	1 it gives a good diet
	1 full meal
	1 good mouthfeel
	4 add the appetite
	3 carbohydrate
	1 high carbohydrate
	1 increases metabolism
	1 metabolism
	3 builds antibodies
	3 strong antibodies
	4 low in protein
	1 good food for people
	    who sweat
	1 has water
	4 high calcium
	1 calcium
	1 high iron
	1 iron
	1 mineral
	3 tasty
	1 delicious
	1 high fibre
	3 convenient
	2 easy to cook
	1 easy to prepare
	1 strong gums
	1 cheap
	1 save expenditure
	1 value for money
	1 easy to get
	1 calories for health
	1 calories high
	1 clean skin
	1 good for skin

Table 37. Benefits of eggs for all respondents and men and women (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
protein	47	48	47
source of energy/strength/power/stamina	14	18	11
healthy/good for body	9	9	10
vitamins	8	7	8
nutritious / basic food /staple	3	4	3
builds body/muscle/growth/children	2	2	1
easy to cook/prepare/store/convenient	1	2	1
builds antibodies	1	1	2

Table 38. Benefits of eggs for men and women across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
protein	53	44	48	51	45	45
source of energy/strength/power/stamina	18	21	16	11	12	8
healthy/good for body	11	10	5	6	13	9
vitamins	5	14	1	14	5	7
nutritious / basic food /staple	5	5	3	3	2	3
calcium	3	0	0	4	0	0
builds body/muscle/growth/children	3	1	1	0	2	1
improves appetite	3	0	0	0	1	1
good for metabolism	3	0	0	0	0	0
easy to cook/prepare/store/convenient	1	1	3	1	1	0
supplies calories	0	0	0	3	0	0
builds antibodies	0	3	0	3	1	1
tasty	0	0	3	1	0	1
cheap	0	0	1	0	2	0
OTHER	0	0	0	0	2	0

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
protein	40	61	39	47	59	32
source of energy/strength/power/stamina	27	8	21	15	4	13
healthy/good for body	9	4	16	15	5	9
vitamins	9	8	4	10	7	7
nutritious / basic food /staple	5	4	4	6	1	0
improves appetite	2	0	0	2	0	0
makes / enriches blood	1	1	0	2	0	0
easy to cook/prepare/store/convenient	1	0	5	1	1	0
calcium	1	1	0	0	4	0
tasty	1	1	0	0	2	0
builds body/muscle/growth/children	1	1	4	0	2	1
good for metabolism	1	0	2	0	0	0
low protein	1	0	2	0	2	0
cheap	0	1	0	2	0	0
supplies carbohydrate, sugar	0	1	2	1	0	1
supplies calories	0	0	0	0	2	0
light/fresh/refreshing/cooling	0	0	2	0	0	0
popular/children like it /family like it	0	0	2	0	0	0
satiety	0	0	4	0	0	0
builds antibodies	0	1	2	0	4	1

Table 38. continued.........

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
protein	43	52	48	38	44	62
source of energy/strength/power/stamina	12	22	18	14	12	3
healthy/good for body	5	7	14	7	13	8
vitamins	0	10	9	4	8	16
nutritious / basic food /staple	7	2	5	1	6	0
builds antibodies	0	0	3	0	3	2
easy to cook/prepare/store/convenient	2	1	3	1	1	0
builds body/muscle/growth/children	0	2	3	2	1	0
calcium	0	1	1	0	1	3
makes / enriches blood	0	1	1	0	0	3
supplies carbohydrate, sugar	0	1	1	0	0	3
tasty	0	1	1	0	1	2
iron	2	0	1	0	0	0
supplies calories	0	0	0	0	1	2
good for skin/beauty/eyes	0	2	0	0	0	0
satiety	2	1	0	0	0	0
good for metabolism	3	0	0	0	0	0
low protein	2	1	0	1	1	0

Table 39. Problems with eating eggs (responses included in each category and numbers of people giving those responses).

218 high cholesterol content 127 high in cholesterol 76 cholesterol 14 cholesterol in the yolk **28 fat content** 15 fat 13 high fat **24 causes overweight/ too many calories** 21 fattening 2 over weight 1 many calories **22 bad for blood pressure/heart/arteries** 13 high blood pressure 8 bad for heart 1 egg yolk causes heart disease **9 allergy/diarrhoea/stomach upset** 8 allergy 1 don't feel well when eat too many	**8 should not eat too much/bad for you** 4 can only eat a few 2 egg yolk no good 1 men should not eat a lot 1 not suitable for adults **OTHER** 1 smelly 1 hormones 1 chemical content 2 difficult for digestion 2 wind 1 not fresh 1 have to cook . 4 not tasty 2 not suitable for the old people 1 old man can't eat a lot 1 high carbohydrate 1 not suitable for diabetics 1 diabetes 2 causes illness 1 low protein

Table 40. Problems with eggs for all respondents and for males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
high cholesterol content	47	49	45
fat content	6	5	7
causes overweight / too many calories	5	5	5
bad for blood pressure/heart/arteries	5	3	6
allergy/diarrhoea/stomach upset	2	1	3
should not eat too much/bad for you	2	1	2

Table 41. Problems with eggs for men and women across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
high cholesterol content	38	55	53	48	43	43
causes overweight / too many calories	8	6	1	8	2	5
fat content	4	3	9	9	5	7
bad for blood pressure/heart/arteries	3	0	7	4	6	8
not tasty	1	3	0	0	0	1
allergy/diarrhoea/stomach upset	0	3	1	3	2	3
hard to digest / overfilling / flatulence	0	0	1	1	2	0
should not eat too much/bad for you	0	4	0	1	2	3

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
high cholesterol content	43	57	45	37	59	39
causes overweight / too many calories	9	2	5	6	1	9
fat content	7	0	11	11	0	9
bad for blood pressure/heart/arteries	5	1	4	7	7	3
allergy/diarrhoea/stomach upset	2	0	2	6	0	1
should not eat too much/bad for you	2	0	2	1	1	4
too much sugar/CHO; not for diabetics	2	0	0	0	1	0
hard to digest / overfilling / flatulence	0	0	2	0	0	4
not tasty	0	2	2	0	1	0
bad for the elderly	0	0	0	0	4	0

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
high cholesterol content	49	49	49	49	47	37
fat content	5	8	3	7	7	6
bad for blood pressure/heart/arteries	5	3	1	5	8	5
causes overweight / too many calories	5	4	6	4	6	6
not tasty	3	0	1	1	0	0
too much sugar/CHO; not for diabetics	2	1	0	0	0	2
should not eat too much/bad for you	0	3	0	5	1	0
hard to digest / overfilling / flatulence	0	1	0	4	0	0
allergy/diarrhoea/stomach upset	0	3	0	4	1	3
chemicals/pesticides/hormones/antibiotic	0	1	0	0	0	2
bad for the elderly	0	0	0	0	2	2
OTHER	2	0	0	0	1	2

Benefits

The main benefits of soy products were considered to be protein and the supply of vitamins (Tables 42, 43, 44).

- **supplies protein:** This was mentioned more often by older men and younger women. Protein was the most popular benefit in women who had a higher intake of soy.

- **vitamins:** was named most frequently by Chinese men.

Problems

Few problems were seen for soy products although overweight/ calorie problems were mentioned. Meaningful comparison among the groups cannot be made (Tables 45, 46, 47).

Table 42. Benefits of eating soybean products (responses included in each category and numbers of people giving those responses).

<table>
<tr><td>

158 protein
    92 protein
    64 high in protein
    3 protein rich
    1 contains different type of
        protein

91 vitamins
    39 vitamins
    31 high in vitamins
    21 vitamin (type specified)

38 healthy/good for body
    18 good for health
    9 healthy
    7 healthy body
    3 good for body
    1 keep fit

36 source of energy/
    strength/power/stamina
    26 energy
    8 strengthens the body
    2 active

25 nutritious / basic food/
    staple
    7 nutritious
    6 high in nutrients
    6 very nutritious
    4 nutrients
    2 good food

21 good for skin/beauty/eyes
    20 good for skin
    1 good for eyes

21 light/ fresh/
    refreshing/cooling
    17 cooling
    1 feel fresh
    1 fresh breath
    1 fresh looking
    1 freshness

</td><td>

18 fibre
    14 fibre
    4 high fibre

15 calcium
    8 high calcium
    7 calcium

OTHER
    3 aids digestion
    1 cleans your stomach
    1 takes care of blood
    1 avoids cancer
    2 low cholesterol
    3 enhances intellect
    3 good drink
    2 substitute for meat
    1 lifts appetite
    2 carbohydrate
    2 sugar
    1 starch
    1 metabolism
    4 strong antibodies
    3 low protein
    1 not gassy
    1 iron
    1 iron supplement
    6 contains minerals
    7 tasty
    1 delicious
    1 digest easily
    3 strong bones
    2 strong teeth
    1 cheap
    1 balances weight of our
        body
    1 gets rid of body fat
    1 balanced diet
    2 contains fat
    1 low fat

</td></tr>
</table>

Table 43. Benefits of soybean products for all respondents and men and women (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
protein	34	33	35
vitamins	19	20	18
healthy/good for body	8	7	9
source of energy/strength/power/stamina	8	9	7
nutritious / basic food /staple	5	5	5
fibre	4	6	2
good for skin/beauty/eyes	4	4	5
light/fresh/refreshing/cooling	4	2	7
calcium	3	3	3
tasty	2	2	1
minerals	1	2	1
supplies carbohydrate, sugar	1	2	0

Table 44. Benefits of soybean products for males and females across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
protein	27	31	41	39	36	29
vitamins	18	22	21	20	13	22
source of energy/strength/power/stamina	11	10	5	8	8	4
healthy/good for body	9	8	5	6	12	8
nutritious / basic food /staple	5	5	4	5	7	4
calcium	5	1	3	4	4	3
fibre	5	5	7	3	2	1
tasty	3	0	4	1	0	1
good for skin/beauty/eyes	1	4	7	5	6	3
good for bones / teeth / osteoporosis	1	1	0	3	0	0
minerals	1	1	3	1	0	1
supplies carbohydrate, sugar	1	3	1	0	1	0
light/fresh/refreshing/cooling	0	5	0	9	5	7
good for brain / contains DHA	0	0	0	4	0	0
assists constipation / digestion / bowel	0	1	0	0	2	0
good meal/breakfast/subs .for other food	0	4	0	0	1	1
low protein	0	0	3	0	1	0

Table 44 continued……

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
protein	28	34	38	37	35	32
vitamins	21	24	13	21	21	13
source of energy/strength/power/stamina	11	7	9	9	2	9
healthy/good for body	6	3	16	9	7	10
nutritious / basic food /staple	6	3	5	8	5	3
calcium	4	4	0	2	6	1
good for skin/beauty/eyes	2	7	2	6	5	3
light/fresh/refreshing/cooling	2	0	4	6	2	13
good for bones / teeth / osteoporosis	2	0	0	2	0	0
low protein	2	0	0	1	0	0
tasty	2	0	5	0	1	1
good meal/breakfast/subs. for other foods	1	2	0	1	0	1
minerals	1	2	2	0	2	0
builds antibodies	0	1	0	1	2	0
easy to digest / absorb	0	0	2	0	0	0
fibre	0	14	0	0	6	0
assists constipation / digestion / bowel	0	0	2	0	2	0
supplies carbohydrate, sugar	0	2	4	0	1	0
OTHER	0	0	2	0	0	0

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
protein	28	40	32	26	36	42
vitamins	24	12	25	22	20	14
fibre	1	1	15	1	3	2
healthy/good for body	8	5	10	11	11	6
source of energy/strength/power/stamina	4	13	10	7	8	6
nutritious / basic food /staple	5	4	6	1	9	6
calcium	1	4	4	3	4	3
good for skin/beauty/eyes	6	3	3	5	3	6
minerals	0	3	3	1	0	1
makes / enriches blood	0	0	2	0	0	0
supplies carbohydrate, sugar	2	1	2	1	0	0
light/fresh/refreshing/cooling	0	4	1	5	5	9
builds antibodies	0	0	1	0	1	2
assists constipation / digestion / bowel	0	0	1	0	0	2
tasty	1	4	1	0	3	0
good for brain / contains DHA	0	0	0	1	0	2
good meal/breakfast/subs. for other food	1	3	0	0	3	0
low protein	3	0	0	1	0	0

Table 45. Problems with eating soybean products (responses included in each category and numbers of people giving those responses).

10 causes overweight / too many calories 10 fattening 5 fat content 5 fat 4 not tasty 4 quite dislike 3 hard to digest / overfilling / flatulence 1 causes wind 1 filling 1 stomach 3 makes tired, lazy 3 body tires easily	OTHER 1 vomit 1 cholesterol increase 1 bad for rheumatism 1 cooking 1 affect heart function 1 artery 1 bad for elderly 1 not every likes it 2 because it is sweet 1 heat level becoming high 1 too cold for the elderly 1 could cool the body 1 finish fast

Table 46. Problems with soybean products for all respondents and men and women (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
causes overweight / too many calories	2	3	1

Table 47. Problems with soybean products for men and women across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
causes overweight / too many calories	3	4	3	1	1	1

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
causes overweight / too many calories	4	2	4	0	0	4
fat content	2	1	0	1	1	0
hard to digest / overfilling / flatulence	1	0	0	2	0	0
not tasty	1	1	0	2	0	0
cools body	0	0	2	1	0	0
makes tired, lazy	0	0	2	1	1	0
bad for the elderly	0	0	2	0	0	0

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
causes overweight / too many calories	4	4	1	1	0	2
fat content	3	1	0	0	3	0
not tasty	0	3	0	3	0	0

DAIRY PRODUCTS

Benefits

Calcium was seen as the major advantage of dairy products. Their supply of protein, vitamins as a source of energy/ power were also popular benefits (Tables 48, 49, 50).

- **supplies calcium:** around one quarter of the respondents gave this answer. Response rates were slightly higher in the youngest women. The Chinese, particularly the men, named this the most frequently. Calcium was mentioned the least often by those with an intake equivalent to 2-5 times per week (medium).

- **supplies protein:** This was named the most often by the younger respondents. The Chinese were twice as likely to mention this response and those with the highest intakes gave this response the most often.

- **supplies vitamins:** was cited the most often by younger men and women.

Problems

Few problems were cited for dairy products and the main ones were seen to relate to their fat content and overweight/ calories (Tables 51, 52, 53).

- **fat content:** This was cited most frequently by older men.

Table 48. Benefits of eating dairy products (responses included in each category and numbers of people giving those responses).

105 calcium
    58 calcium
    47 high calcium

86 protein
    63 protein
    23 high protein

56 vitamins
    34 vitamins
    13 high in vitamins
    6 vitamins (type specified)
    3 good in vitamins

50 source of energy/
    strength/power/stamina
    35 energy
    12 strengthens the body
    2 high in energy
    1 energy for children

36 good for bones / teeth/
    osteoporosis
    19 strong bones
    11 good for bones
    4 strong teeth
    2 builds bones
32 healthy/good for body
    14 good for health
    9 healthy
    7 healthy body
    1 healthy for children
    1 keep fit

16 nutritious / basic food/
    staple
    10 nutritious
    3 high in nutrient
    2 very nutritious
    1 part of food we need

15 iron
    13 iron
    2 high iron

13 supplies fat
    12 fat
    1 some fats

12 builds body/ muscle/
    growth/children
    8 for strong child
    4 growth
OTHER
    1 high in minerals
    2 contains minerals
    1 delicious
    1 high fibre
    3 convenient
    1 it provides a simple diet
    1 good for children's
      eyesight
    2 easy to consume
    1 balance diet
    2 blends well
    1 cleans your hormones
    1 feel fresh
    1 freshness
    1 good for stomach
    2 strong blood
    1 satisfaction
    4 good for mentality
    1 makes you diligent
    1 replaces meal
    1 heat the body
    4 carbohydrate
    2 sugar
    6 good for metabolism
    1 don't get sick easily

Table 49. Benefits of dairy products for all respondents and males and females (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
calcium	23	26	20
protein	19	18	20
vitamins	12	12	12
source of energy/strength/power/stamina	10	8	12
good for bones / teeth / osteoporosis	8	7	8
healthy/good for body	7	9	5
iron	3	4	3
nutritious / basic food /staple	3	4	3
supplies fat	3	2	3
builds body/muscle/growth/children	3	3	3
good for brain / contains DHA	1	0	2
supplies carbohydrate, sugar	1	1	2
good for metabolism	1	0	2

Table 50. Benefits of dairy products for men and women across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
protein	26	8	20	24	17	18
calcium	23	27	27	28	18	13
good for bones / teeth / osteoporosis	14	5	3	6	14	4
healthy/good for body	12	6	8	8	5	3
vitamins	8	13	15	16	11	9
source of energy/strength/power/stamina	7	10	8	11	13	12
nutritious / basic food /staple	5	4	3	1	4	4
supplies fat	4	3	0	3	5	3
builds body/muscle/growth/children	3	4	1	1	2	4
iron	1	3	8	4	2	1
good for brain / contains DHA	1	0	0	1	2	1
good for metabolism	0	0	1	4	1	1
supplies carbohydrate, sugar	0	1	1	0	4	1

Table 50. continued.......

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
calcium	15	41	16	14	28	17
good for bones / teeth / osteoporosis	12	3	5	14	2	9
source of energy/strength/power/stamina	12	4	9	14	2	22
healthy/good for body	10	4	14	7	1	7
protein	7	29	14	14	29	16
vitamins	7	17	11	6	21	10
supplies fat	4	1	2	7	0	3
nutritious / basic food /staple	4	1	9	3	5	0
builds body/muscle/growth/children	2	1	5	3	2	1
iron	2	6	4	0	6	1
good for metabolism	1	0	0	6	0	0
good for brain / contains DHA	1	0	0	0	1	4
minerals	0	0	2	0	2	0
easy to cook/prepare/store/convenient	0	1	4	0	0	1
easy to eat	0	0	4	0	0	0
versatile / variety of foods	0	0	4	0	0	0
light/fresh/refreshing/cooling	0	0	2	0	1	0
good meal/breakfast/subs for other foods	0	0	2	0	0	0
supplies carbohydrate, sugar	0	0	4	0	2	3

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
calcium	31	18	29	22	13	25
protein	16	15	23	14	15	30
vitamins	9	7	20	12	12	13
source of energy/strength/power/stamina	3	11	12	9	14	13
good for bones / teeth / osteoporosis	9	5	7	9	9	6
healthy/good for body	8	11	7	1	8	5
iron	3	4	6	3	0	5
nutritious / basic food /staple	1	5	6	3	5	1
easy to cook/prepare/store/convenient	0	0	4	0	1	0
easy to eat	0	0	3	0	0	0
builds body/muscle/growth/children	4	2	1	1	1	5
supplies fat	3	2	1	0	5	5
good for brain / contains DHA	0	0	1	1	0	4
supplies carbohydrate, sugar	0	1	1	1	2	1
minerals	0	0	1	0	2	0
good for metabolism	0	1	0	0	5	1

Table 51. Problems with eating dairy products (responses included in each category and numbers giving those responses).

65 fat content 48 fat 17 high fat **50 causes overweight/ too many calories** 45 put on weight 3 Calories 2 high calories **22 high cholesterol content** 11 High cholesterol 11 cholesterol **8 too much sugar/CHO; not for diabetics** 4 sugar 2 sweetness 1 diabetes	**OTHER** 1 colouring 1 flavourings 1 difficult to find 1 body feels heavy 1 not good for stomach 2 allergy 1 contains lactose 1 can't overeat 1 difficult to get fresh 4 dislike 2 not tasty 2 get high blood pressure 1 not many ways to cook 1 pick up the heat 1 easy to get bored eating a lot

Table 52. Problems with dairy products for all respondents and men and women (responses given by at least 2% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
fat content	14	13	15
causes overweight / too many calories	11	8	13
high cholesterol content	5	4	5
too much sugar/CHO; not for diabetics	2	3	1

Table 53. Problems with dairy products for men and women across age, ethnic and intake categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
fat content	9	12	19	16	14	13
causes overweight / too many calories	5	12	8	10	13	16
high cholesterol content	5	4	3	4	4	9
too much sugar/CHO; not for diabetics	1	3	4	3	0	0
not tasty	0	3	1	0	1	3

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
fat content	11	18	9	20	11	13
causes overweight / too many calories	6	13	4	11	17	10
too much sugar/CHO; not for diabetics	2	4	0	0	2	0
high cholesterol content	1	4	7	5	5	7
not tasty	1	1	2	2	1	0
hard to purchase	0	0	2	0	0	0
allergy/diarrhoea/stomach upset	0	0	2	0	1	1
should not eat too much/bad for you	0	0	2	0	0	0
bad for blood pressure/heart/arteries	0	0	2	0	0	1

	INTAKE OF MEN (%)			INTAKE OF WOMEN (%)		
	Low	Med.	High	Low	Med.	High
fat content	20	7	13	18	13	13
causes overweight / too many calories	5	7	13	13	16	9
not tasty	4	0	0	4	0	0
high cholesterol content	3	6	3	3	6	8
too much sugar/CHO; not for diabetics	3	2	3	0	0	3

FRUIT AND VEGETABLES

Benefits

The major benefits of fruits and vegetables were seen as their vitamin content, their fibre content, their role in giving good skin and beauty. Intake categories were not generated as all respondents had a high intake each week (Tables 54, 55, 56).

- **supplies vitamins:** was named by two-thirds of respondents, but less often by the Malays.

- **supplies fibre:** this answer was given by 10% of all respondents.

- **good for skin/ beauty:** was named the most often by the youngest women, and by one quarter of all Malays.

Problems

There were very few responses given by the Malaysian although the presence of chemical residues was the most popular answer given (Tables 57, 58, 59).

Table 54. Benefits of eating fruit and vegetables (responses included in each category and numbers of people giving those responses).

308 vitamins
89 vitamins
88 high in vitamins
82 vitamin C
30 high in vitamin C
17 vitamins (other type specified)
2 good vitamins
 	
67 good for skin/beauty/eyes
57 good for skin
6 eyes
2 skin and eyes
2 good for beauty
 	
45 fibre
27 fibre
13 high in fibre
5 roughage
 	
27 healthy/good for body
11 good for health
8 healthy
6 healthy body
1 for chest
1 for throat
 	
21 nutritious / basic food /staple
9 nutrition
7 high in nutrition
3 high in nutrients
1 helps to stabilise our diet
1 very good food
 	
19 protein
16 protein
3 high protein
 	
19 assists constipation / digestion /
  bowels
8 digestion
8 good for digestion
3 good for bowels
	14 source of energy/
	  strength/power/stamina
	11 energy
	2 strong body
	1 strength
	
	14 light/fresh/refreshing/cooling
	7 feel fresh
	4 refreshes the body
	3 cooling
	
	OTHER
	5 calcium
	1 high calcium
	5 iron
	2 high iron
	6 minerals
	1 delicious
	1 easy to enjoy yourself
	7 easily digested
	1 can eat fresh
	1 strong teeth
	1 save money
	2 easy to get
	1 easy to find
	1 avoid fatness
	1 balance diet
	1 neutral
	2 low fat
	1 no oil
	4 cleans the blood
	1 good for body growth
	1 good for child
	3 low in cholesterol
	1 help blood circulation
	1 reduces high blood pressure
	1 vegetarian
	1 creates appetite
	6 carbohydrates
	2 sugar
	1 high carbohydrates
	1 build antibodies
	2 more juice
	1 can eat a lot
	1 no illness
	1 salt

Table 55. Benefits of fruit and vegetables for all respondents and in men and women (responses given by at least 2% of those surveyed).

	TOTAL %	MALE %	FEMALE %
vitamins	63	63	63
good for skin/ beauty	13	14	13
fibre	10	10	9
healthy/ good for body	6	7	4
nutritious/ basic food/ staple	4	6	3
assists constipation/ digestion/ bowel	4	5	3
protein	4	4	5
source of energy/strength/power/stamina	3	4	2
light/ fresh/ cooling/ refreshing	3	2	4
iron	2	3	0
supplies carbohydrate, sugar	2	3	1
easy to digest/ absorb	2	1	2
calcium	1	2	1
minerals	1	1	2

Table 56. Benefits of fruit and vegetables for men and women across age and ethnic categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
vitamins	66	65	57	65	61	62
good for skin/ beauty	12	15	13	16	14	8
fibre	9	12	9	9	12	7
healthy/ good for body	7	5	9	3	5	5
nutritious/ basic food/ staple	4	10	3	3	4	3
protein	3	3	5	6	4	4
assists constipation/ digestion	3	5	8	4	2	3
supplies carbohydrate, sugar	3	4	1	3	0	1
iron	3	1	4	1	0	0
source of energy/power/stamina	3	3	7	1	4	0
easy to digest/ absorb	1	0	3	5	0	0
purifies body/ blood	1	0	0	4	0	0
minerals	1	0	1	1	2	1
calcium	1	3	1	0	1	1
light/fresh/refreshing/cooling	0	3	3	5	2	5
available	0	0	0	4	0	0
builds body/muscle/growth/children	0	0	0	3	0	0
OTHER	0	1	3	0	1	1

Table 56. continued..........

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
vitamins	54	67	70	45	74	71
good for skin/ beauty	26	9	4	26	7	3
fibre	6	11	14	2	17	9
healthy/ good for body	12	4	4	7	1	4
source of energy/power/stamina	6	1	5	2	0	3
protein	5	1	5	7	2	4
assists constipation/ digestion	5	4	7	2	5	1
nutritious/ basic food/ staple	4	3	13	5	0	4
calcium	2	1	2	1	0	1
light/fresh/refreshing/cooling	2	0	4	1	4	9
supplies carbohydrate, sugar	2	2	4	1	0	3
iron	1	4	2	1	0	0
easy to digest / absorb	1	2	0	1	4	0
low cholesterol / fights cholesterol	1	0	2	0	1	0
OTHER	1	2	0	0	0	3
minerals	0	0	4	2	1	1
builds body/muscle/growth/children	0	0	0	2	0	0
available	0	0	0	0	0	4
low calorie/non-fattening/good for diet	0	0	2	0	0	0
balanced food/nutrients	0	0	2	0	0	1
low in fat	0	2	0	0	1	0
purifies blood / body	0	0	2	0	2	1

Table 57. Problems with eating fruit and vegetables (responses included in each category and numbers of people giving those responses).

12 chemicals/ pesticides/ hormones/ antibiotics 7 a lot of chemicals 3 pesticide **OTHER** 1 a lot of cholesterol 1 cholesterol 1 expensive 1 insecticide usage may be high 1 wind 1 discomfort	1 upset tummy 1 quite dislike vegetables 1 tasteless 1 high blood pressure 2 contains toxin 1 used more poison 1 pollution 1 too sweet 1 energy problem 1 increases the level of acid in the stomach

Table 58. Problems with fruit and vegetables for all respondents and males and females (responses given by at least 2% of those surveyed).

	TOTAL %	MALE %	FEMALE %
chemicals/pesticides/hormones/antibiotics	2	2	3

Table 59. Problems with fruit and vegetables for men and women across age categories (responses given by at least 2% of those surveyed).

	MEN (%)			WOMEN (%)		
	18-30	31-45	46-60	18-30	31-45	46-60
chemical residues/ pesticides	0	4	1	3	4	1

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
chemicals/pesticides/hormones/antibiotic	2	2	0	2	4	1
not tasty	0	0	2	1	0	0
poisonous / bacteria / parasites	0	0	2	1	1	0
high cholesterol content	0	1	2	0	0	0
expensive	0	0	2	0	0	0
pollution	0	0	2	0	0	0

Benefits

Of those who answered the rice question (instead of the pork question) the major benefit was the supply of energy (Table 60). Rice is such a staple food in Malaysia that further demographic analyses were not conducted.

Problems

There were very few responses given by the Malaysians although problems with overweight and calories were the most common (Table 61).

Table 60. Benefits of eating rice (responses included in each category and numbers of people giving those responses).

151 source of energy/ strength/power/stamina	OTHER
137 energy	3 calcium
11 strength	2 iron
3 strong body	4 minerals
1 supplies fat	5 vitamins
1 fat	3 vitamins (type specified)
	1 very tasty
57 supplies carbohydrate, sugar	2 fibre
45 carbohydrates	3 easy to get
8 high carbohydrate	4 good for health
2 lot of sugar	4 healthy
2 starch	1 makes the body healthy
	1 growing
49 protein	6 very filling
36 protein	1 don't get hungry easily
13 high in protein	1 is very filling in a short while
	2 very 'feeling' (good mouthfeel)
18 nutritious / basic food /staple	1 metabolism
13 staple food in Malaysia	1 low protein
3 nutritious	1 low in sugar
2 high in nutrients	1 water for body

Table 61. Problems with eating rice (responses included in each category and numbers of people giving those responses).

50 causes overweight / too many calories	4 sugar
46 fattening	2 high carbohydrate
3 high calories	
1 overweight	OTHER
1 hard to control weight	4 high cholesterol
	1 cholesterol
22 fat content	1 body feels heavy
19 fat	1 cause unease to stomach
3 high fat	3 you might feel sick if eat a lot
	1 hypertension
19 too much sugar/ CHO; not for diabetics	1 hard to avoid sickness
7 too much starch	1 causes the body to be tired
6 unsuitable for diabetes	1 feel sleepy

Whilst food intake or preferences are often analysed in terms of demographic factors such as gender, age, place of residence, income and education there is evidence that personal characteristics and value systems can sometimes be more powerful predictors of food choice and preferences than demographics. In this survey a number of questions were asked relating to cultural background and value systems which have been analysed in terms of their influence on food selection.

The values assessed, their meaning, their distribution across the sample survey and links to food selection are summarised below.

Traditionality

This has been defined as the symbols, ideas and behaviours that define a particular cultural group or society. Those who score high on items from this value show a respect and commitment towards the maintenance of these ideas and behaviours. The items which form part of the values scale used in this questionnaire were respect for tradition and being devout and humble.

Conformity

This value is defined as a restraint of individual impulses that may impede the functioning of the group or society. People who score high on this value are more likely to show self-restraint in their own wishes and behaviours in preference to those of the collective. The items used in this questionnaire were: self-discipline, honouring of parents and elders, and obedience.

Security

This has been defined as a sense of harmony and safety. It has been thought that it may contain two elements - security for the individual (like health) and security for the collective (like national security). Two items relating to each element were included in this scale: health and cleanliness, and family security and social order. Those who score high on security believe in the importance of a stable society and individual.

Universalism

This value is defined as a respect for and tolerance of all people and for nature. There appears to be some difference between collective and individualistically focussed societies on universalism where collectively focussed groups are less concerned with the welfare of outsiders but show more concern for their own groups. People who score high on this value tend to be more tolerant of others and are more concerned with broader environmental and social justice issues. The items related to universalism in this scale were: equality, wisdom and inner harmony.

Power

This has been defined as the strata used in interpersonal relations between people within and across societies and appears to be part of any social life. People who score high on this dimension view social status, prestige and dominance as important. The items used for this value in the questionnaire were authority and wealth. The scores were grouped into two categories: low and high power.

Self-direction

This value has been defined as the importance of having independent thought and action with an emphasis on autonomy, creativity and exploration. A person who scores high on this dimension believes in the importance of freedom to choose their own destiny. The items used in this scale were freedom, independence and curiosity. The scores were divided into three groups: low, moderate and high self-direction.

Achievement

This value has been defined as the relative personal success of individuals according to those symbols that are highly regarded by the society which may lead to higher social approval. People who score highly on this achievement dimension usually value personal competence and success. The items used in this questionnaire were intelligence and success.

Stimulation

Stimulation has been defined as a need for differing social experiences, variety and excitement. People who score high on this value tend to be thrill-seekers who believe it is important to have excitement and variety in social experiences. The items in this questionnaire that were used to form the stimulation scale were having a varied life, an exciting life and being daring. Three groups of stimulation scores were generated - low, moderate and high.

Hedonism

Hedonism is associated with the satisfaction of needs. For example, the pleasure associated with eating sweet foods reinforces the place of sweet foods in the diet. Those who are higher in hedonism and derive pleasure from sweet foods will want to satisfy their craving for sweet foods more quickly than people who are lower in hedonism but also like sweet foods. There are notions of speed of satisfaction within the hedonism value. The items used in this questionnaire were enjoying life and pleasure.

Health Locus of Control.

This has been defined as the degree to which an individual believes that they are in control of their own health or whether factors outside of their control like fate/ chance or heredity are controlling their health. A higher score on this scale indicates that the person is more external and looks to factors

outside of their control as explanations for health status. The items which made up this scale included "if it is meant to be I will stay healthy", "no matter what I do, if I am going to get sick, I will get sick" and "I am in control of my health".

Cultural values, beef and lamb consumption and liking

Overall, Malaysians who ate beef more frequently scored higher on a number of cultural values including self-direction, stimulation and hedonism. Males who consumed beef more often tended to score more highly on power and stimulation. Linkage with power reflected the males' view of beef as a source of energy /stamina/ power. In women, there was a tendency for higher consumers to score higher on security, power, self-direction and stimulation. Security contained notions of family health and beef may provide strength for the family.

Overall, Malaysians who ate lamb the most often tended to have a higher conformity score. Men who ate lamb the most frequently had higher security, power, self-direction and hedonism scores. Many of these were contrary to the case for women as those who ate lamb the most often tended to score lower on power, self-direction, stimulation and hedonism.

Further multivariate analyses will determine the relative effects of each of these variables, or combinations of these variables, on beef, lamb and other food intake and beliefs. This analysis is presented in the final section.

A series of questions concerning health were asked. The first related to the importance they placed on their own health. The question asked was: "**Please tell me how important good health is to you**" The average responses are shown in Table 62.

The table shows the average score for different age and gender groups. The average scores were found to range between health as quite and very important to them. Few differences were noted across age, gender and ethnic categories.

A second question specifically asked about concerns with weight control - "**Please indicate how important weight control is to you**".

The average are shown overleaf in Table 63. Ratings for concern with weight control were found to be between "somewhat" and "very" important.

The issue was of somewhat greater concern in the Malay group and of least concern to the Chinese. The Chinese women appeared to be least concerned about weight control issues.

Two further questions were asked relating food to health and weight control. The first asked "**Please tell me how much you agree or disagree with the following statement: - 'The food I eat affects my health'**". The second question was similar but asked about the importance of food in weight control (Tables 64, 65).

Again the Malay group scored the highest and the Chinese the lowest. The young Chinese males showed the least agreement about the relationship between food and health.

The perceived link between food consumption and weight control was not quite as strong as might be expected from perceptions of the food/ weight linkage in western cultures but this may reflect the generally lower levels of obesity in Malaysia. In general, a stronger link was perceived by Malays, and the Chinese women did not perceive such a strong link as other groups.

Table 62. How important is health to you? (on a scale of 1 to 5 where 1, is "not at all important" ; 2,"a little important"; 3, "somewhat important"; 4, "quite important", and 5 "very important").

	Total	Malay	Chinese	Indian
Total	4.8	4.9	4.8	4.8
Males	4.8	4.9	4.8	4.7
18-30	4.8	4.9	4.9	4.4
31-45	4.8	4.9	4.7	4.7
46-60	4.9	4.9	4.8	4.9
Females	4.9	5.0	4.8	4.8
18-30	4.8	5.0	4.7	4.9
31-45	4.9	4.9	4.9	4.8
46-60	4.8	4.9	4.7	4.9

Table 63. How important is weight control to you? (on a scale where 1, means "not at all important"; 2, "a little important"; 3, "somewhat important"; 4, "quite important", and 5, "very important").

	Total	Malay	Chinese	Indian
Total	4.3	4.5	4.0	4.4
Males	4.3	4.5	4.1	4.3
18-30	4.1	4.4	3.9	4.1
31-45	4.3	4.4	4.2	4.5
46-60	4.3	4.6	4.2	4.3
Females	4.3	4.6	3.9	4.4
18-30	4.2	4.6	3.8	4.4
31-45	4.4	4.6	4.2	4.5
46-60	4.3	4.6	3.8	4.5

Table 64. The food I eat affects my health (on a scale ranging from 1, "strongly disagree"; 2, "disagree"; 3, "unsure"; 4, "agree" and 5 "strongly agree".)

	Total	Malay	Chinese	Indian
Total	4.2	4.4	4.0	4.1
Males	4.2	4.5	4.1	4.0
18-30	4.1	4.4	3.7	4.2
31-45	4.2	4.4	4.2	3.9
46-60	4.3	4.5	4.3	4.1
Females	4.2	4.4	3.9	4.1
18-30	4.2	4.4	3.9	4.3
31-45	4.2	4.4	3.8	4.2
46-60	4.1	4.5	3.9	3.9

Table 65. The food I eat affects my weight (on a scale ranging from 1, "strongly disagree"; 2, "disagree"; 3, "unsure"; 4, "agree" and 5 "strongly agree".)

	Total	Malay	Chinese	Indian
Total	4.1	4.3	3.9	4.0
Males	4.1	4.3	4.0	4.0
18-30	4.0	4.2	3.7	4.1
31-45	4.1	4.3	4.2	3.8
46-60	4.2	4.4	4.0	4.1
Females	4.0	4.3	3.7	4.1
18-30	4.0	4.3	3.7	4.1
31-45	4.1	4.2	3.7	4.3
46-60	4.1	4.4	3.8	3.9

CONCERN ABOUT, AND RISK FACTORS FOR, MAJOR HEALTH CONDITIONS

As part of the health-related aspects of the questionnaire, respondents were asked how concerned they were about each of four major health conditions and what they thought the major risk factors were. Respondents could freely mention up to three responses.

If respondents mentioned diet as part of their open ended response, they were asked to specify what part of the diet. If they did not mention diet they were specifically asked how diet could play a role in the disease. The percentage of responses for each risk factor for each disease are shown in Table 67 overleaf.

HEART DISEASE

The risk factors most often cited for heart disease in order of times chosen were lack of exercise, high cholesterol, overweight and diet (30%). Diet was seen to be less important by the Indian-Malays (see Table 67 overleaf).

Dietary risk factors for heart disease
(see Table 66)

Too much fat in the diet was specified as a risk factor by over one third of all respondents, with more women than men mentioning this. This response was the most common one mentioned by Malay men and women and by Indian women. Too much cholesterol was named by 20% of people. Too much meat was the third most popular response cited and this was mentioned most often by Indian men and women.

Table 66. Dietary risk factors for heart disease for all respondents, males and females and across ethnic groups (responses given by at least 4%).

	TOTAL (%)	MALE (%)	FEMALE (%)
too much fat (meat not mentioned)	35	30	41
too much cholesterol	20	19	21
too much meat (fat not mentioned)	18	19	17
too much food/calories	14	16	12
too much egg	7	7	6
too much meat fat	6	6	7
too much fish / seafood	4	4	4
coconut products	4	3	5

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
too much fat (meat not mentioned)	38	26	25	52	29	41
too much food/calories	21	10	18	23	7	4
too much cholesterol	20	23	13	14	24	25
too much meat (fat not mentioned)	16	17	25	11	17	23
too much egg	6	12	2	2	11	6
unbalanced diet/too choosy	5	0	5	2	1	3
coconut products	4	0	5	5	7	4
lack of food / nutrition /dieting	2	1	5	1	1	1
too much meat fat	1	7	13	5	9	7
too much sugar/ sweet foods	1	8	2	2	4	3
irregular eating habits	1	0	4	2	0	0
too much fish / seafood	1	6	4	1	9	1
too much dairy / ice cream	1	2	4	0	0	1
not enough veg /fruit (type not spec.)	0	1	4	2	0	0
too much pork / chicken	0	0	2	2	5	1
not enough vitamins	0	1	2	0	0	4

Table 67. The most important risk factors for selected health conditions for all respondents and across ethnicity (percentage) *.

	TOTAL	Malay	Chinese	Indian
HEART DISEASE				
Lack of exercise	63.7	71.4	63.8	53.2
Age	17.3	19.6	16.1	15.9
Smoking	47.2	48.2	43.7	50.8
Overweight	27.6	27.4	23.6	33.3
Gender	1.3	1.2	1.1	1.6
High cholesterol	56.4	59.5	52.9	57.1
Family history	14.5	10.7	14.9	19
Not relaxed	7.3	7.1	6.9	7.9
Alcohol	16.5	9.5	16.7	25.4
Pollution	3.2	3	4	2.4
Diet	29.9	33.3	33.3	20.6
OBESITY				
Lack of exercise	87.6	91.1	85.1	86.5
Age	17.3	18.5	17.2	15.9
Smoking	6.8	6.5	4	11.1
Overweight	24.8	32.7	17.2	24.6
Gender	1.3	0.6	0.6	3.2
High cholesterol	41.9	43.5	37.9	45.2
Family history	22.6	14.3	25.9	29.4
Not relaxed	4.9	7.1	0.6	7.9
Alcohol	10.3	4.8	13.8	12.7
Pollution	0.2	0.6	0	0
Diet	51.7	57.7	52.9	42.1
IRON DEFICIENCY				
Lack of exercise	33.3	36.3	27	38.1
Age	20.9	26.8	16.7	19
Smoking	11.8	13.7	8	14.3
Overweight	13	14.3	4.6	23
Gender	4.3	1.2	5.7	6.3
High cholesterol	17.9	20.8	6.3	30.2
Family history	19.4	19	20.7	18.3
Not relaxed	17.7	17.3	19	16.7
Alcohol	10.9	7.1	12.1	14.3
Pollution	15.6	22	10.9	13.5
Diet	32.7	37.5	32.2	27
BOWEL CANCER				
Lack of exercise	24.6	28	22.4	23
Age	13	16.7	8.6	14.3
Smoking	36.8	38.7	25.9	49.2
Overweight	9.4	6.5	5.2	19
Gender	3.2	1.8	2.9	5.6
High cholesterol	22.2	23.2	15.5	30.2
Family history	23.3	16.1	21.3	35.7
Not relaxed	5.3	4.2	8	3.2
Alcohol	34.8	35.7	33.9	34.9
Pollution	17.1	18.5	13.8	19.8
Diet	26.3	33.3	25.9	17.5

*numbers do not add to 100 because respondents could choose more than one answer.

The most frequently cited risk factor for overweight was lack of exercise (88%) followed by diet (52%) and high cholesterol (42%). Diet was cited least often by Indian-Malays (Table 67).

Dietary risk factors for overweight

(see Table 68)

Too much food/ calories was considered the main dietary risk factor for overweight, and was named by almost half of the respondents. This response was given by a significant proportion of the Malay men and women. Too much fat in the diet was mentioned by one third of people, most often by Indian men and all women regardless of ethnic group. Too much sugar and meat were other responses (only 10-13%) and these were mentioned most often by Chinese men and women.

Too much fat from meat was only mentioned by 5% of all respondents, and most often by Indian men.

Table 68. Dietary risk factors for overweight for all respondents, males and females and across ethnic groups (responses given by at least 4% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
too much food/calories	44	44	44
too much fat (meat not mentioned)	33	30	35
too much sugar/ sweet foods	13	11	15
too much meat (fat not mentioned)	11	10	11
too much cholesterol	11	11	10
too much rice	8	8	7
too much carbohydrate/starch/rice	6	7	4
too much meat fat	5	6	4
irregular eating habits	4	5	4
unbalanced diet/too choosy	3	2	4
coconut products	3	2	4

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
too much food/calories	56	40	32	67	24	39
too much fat (meat not mentioned)	23	32	38	32	38	35
too much cholesterol	9	12	14	9	10	10
too much rice	9	4	13	6	6	10
irregular eating habits	7	1	7	7	1	3
too much carbohydrate/starch/rice	7	2	14	5	5	3
too much meat (fat not mentioned)	4	16	11	9	16	9
too much meat fat	4	4	13	1	7	4
too much sugar/ sweet foods	2	20	11	8	23	14
unbalanced diet/too choosy	2	0	5	7	1	3
late night eating	2	3	4	3	1	1
too much takeaway food	1	0	4	3	0	6
coconut products	1	2	2	3	1	7
too much dairy / ice cream	1	3	2	1	5	4
too much pork / chicken	1	3	2	0	1	6
lack of food / nutrition /dieting	0	1	5	1	1	1
too much instant food, fried noodles	0	0	4	0	0	3
OTHER	0	0	0	1	1	4

Lack of exercise (33.3%) followed by diet (32.7%) and having a high cholesterol level were the most common responses. Chinese-Malays were the least likely to cite cholesterol as a risk factor for anaemia. Interestingly diet was chosen by only 33% of people overall which at a rate similar to exercise (Table 67).

Dietary factors in iron deficiency (anaemia)

(see Table 69)

There appeared to be some confusion about the dietary correlates of iron deficiency such that only a few responses were mentioned overall. Not enough fruit and vegetables was the most popular response followed by a generic lack of iron-rich foods. Not enough

seafood (9%) was also mentioned by significant numbers and this response was more common than lack of meat (4%). Indeed, there appeared to be a common perception that seafood was a good source of iron (see page 46). There appeared to be few differences among men and women overall perhaps indicating a general lack of information and understanding about iron deficiency. Indian men and women were the most likely to mention not enough fruit and vegetables as a risk for iron deficiency. Malay men and women and Indian women were the most likely to cite lack of seafood. Not enough meat was mentioned slightly more often by Chinese men and women.

Table 69. Dietary risk factors for iron deficiency for all respondents, males and females and across ethnic categories (responses given by at least 4% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
not enough veg/fruit (type not spec.)	18	20	16
not enough iron/iron foods	15	13	16
lack of food / nutrition /dieting	11	10	13
not enough fish / seafood	9	7	11
not enough vitamins	5	5	5
not enough meat	4	5	4
OTHER	3	4	3

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
not enough iron/iron foods	16	8	18	20	9	20
not enough veg/fruit (type not spec.)	15	17	32	15	12	20
not enough fish / seafood	14	2	5	13	6	16
lack of food / nutrition /dieting	14	9	7	6	17	16
not enough milk / dairy products	4	4	0	7	1	0
not enough vitamins	4	3	9	3	6	7
unbalanced diet/too choosy	4	4	0	1	1	1
not enough meat	2	7	5	3	5	3
too much salt / salty foods	0	1	0	0	4	0
acid/sour/pickled food	0	1	0	0	4	1
OTHER	4	2	5	1	1	6

The major risk was thought to be smoking (37%) followed by alcohol (23%) and diet (26%). Indian respondents were the least likely to mention diet as a risk factor for this disease. Pollution was also a prominent answer here (17%), much more common than in the other three disease questions (see Table 67).

Dietary risk factors for bowel cancer

(see Table 70)

Very few responses were given overall indicating a lack of knowledge about bowel cancer. Too much spicy food followed by too many preservatives were the most frequently named responses. Too many spicy foods was mentioned the most often by Malay men and women. Sixteen percent of Malay women cited too many preservatives as a dietary risk factor. Five percent of Indian men mentioned that too much meat was a risk factor for bowel cancer, and the other groups had even lower rates of response.

Table 70. Dietary risk factors for bowel cancer for all respondents, males and females and across ethnic groups (responses given by at least 4% of those surveyed).

	TOTAL (%)	MALE (%)	FEMALE (%)
too much spicy foods	9	8	9
too much preserv./chemicals/MSG	8	6	10
too much fish / seafood	5	6	5
dirty /polluted / contaminated food	5	6	4
not enough veg/fruit (type not spec.)	4	4	4
acid/sour/pickled food	4	4	5
too much fat (meat not mentioned)	3	3	3
too much food/calories	3	4	3
lack of food / nutrition /dieting	3	4	2

	MEN (%)			WOMEN (%)		
	Malay	Chinese	Indian	Malay	Chinese	Indian
too much spicy foods	14	6	5	15	4	9
dirty /polluted / contaminated food	7	6	5	6	4	3
acid/sour/pickled food	6	2	4	10	1	1
too much preserv./chemicals/MSG	5	8	5	16	6	6
unbalanced diet/too choosy	5	0	2	0	1	0
too much fish / seafood	5	4	9	0	9	6
irregular eating habits	4	1	5	5	1	3
too much food/calories	4	2	5	3	2	1
hard-to-digest food	4	0	0	2	0	3
not enough veg/fruit (type not spec.)	1	6	7	5	1	6
lack of food / nutrition /dieting	1	6	5	2	1	3
too much fat (meat not mentioned)	1	4	4	1	4	4
too much salt / salty foods	1	4	0	1	2	0
too much meat (fat not mentioned)	0	2	5	1	2	1
too much instant food, fried noodles	0	0	4	1	1	1
overcooked / burnt / smoked food	0	4	2	1	6	3
not enough fibre	0	7	2	1	5	3
too much takeaway food	0	0	2	0	0	4
OTHER	4	1	5	5	2	3

In this section, a number of questions were asked relating to the perceived importance of nutrition information; information sources and their trustworthiness; where respondents would go to seek information; what messages they have seen in the last year and whether they had changed anything about their eating habits as a consequence.

When asked "How important is knowing about nutrition to you?" the

average response received was as shown below in Table 71.

The average response was halfway between quite and very important on average. There were no apparent differences between men and women overall. Older Chinese women and younger Indian men gave the lowest ratings for importance of nutrition than all other groups.

Table 71. "How important is knowing about nutrition to you?" (using the scale where 1 was "not at all"; 2, "a little": 3, "somewhat"; 4, "quite" and 5, "very important")

	Total	Malay	Chinese	Indian
Total	4.3	4.6	4.0	4.3
Males	4.3	4.6	4.1	4.2
18-30	4.1	4.4	4.0	3.9
31-45	4.4	4.7	4.3	4.2
46-60	4.4	4.7	4.2	4.4
Females	4.3	4.5	4.0	4.4
18-30	4.3	4.5	4.1	4.3
31-45	4.3	4.6	4.0	4.4
46-60	4.3	4.5	3.8	4.6

When asked "Do you think generally that there is sufficient available nutrition information that you can access if you need to?" respondents replied as shown in Figure 11 overleaf. The figure shows the percentages of people by gender and age who responded "yes".

Just over half of most respondent groups were satisfied overall about the availability of nutrition information with responses ranging from 50-70% satisfaction depending on gender, ethnicity and age. Indian men overall and Chinese women were the least satisfied.

Thus in Malaysia overall approximately 50% wanted more information.

Sources of accurate nutrition information

Respondents were asked where they would go if they wanted to get accurate nutrition information. They could list up to six sources. The interviewer had a list for their own use which they could circle

when the respondent mentioned each particular item. This list was not shown to the respondents.

Figure 12 overleaf shows the distribution according to how many sources respondents cited. Most Malaysians listed five or six sources each. Slightly more men than women listed the most number of sources of accurate nutrition information.

Figure 13 shows the distribution of information sources. The media, friends and family and health professionals were the most popular types of sources of accurate nutrition information listed.

Figure 11. Percentage of respondents by age and gender categories who responded "Yes" to the availability of sufficient nutrition information.
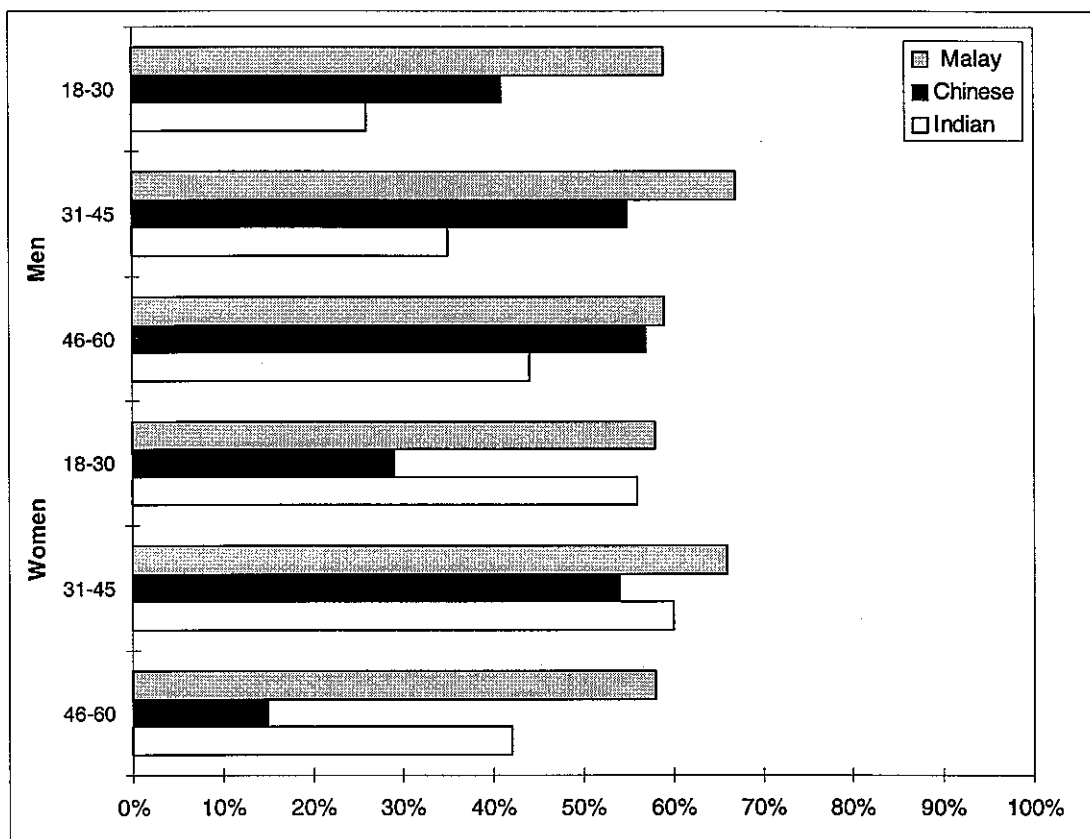

Figure 12. Percentage of respondents listing numbers of sources of accurate nutrition information.
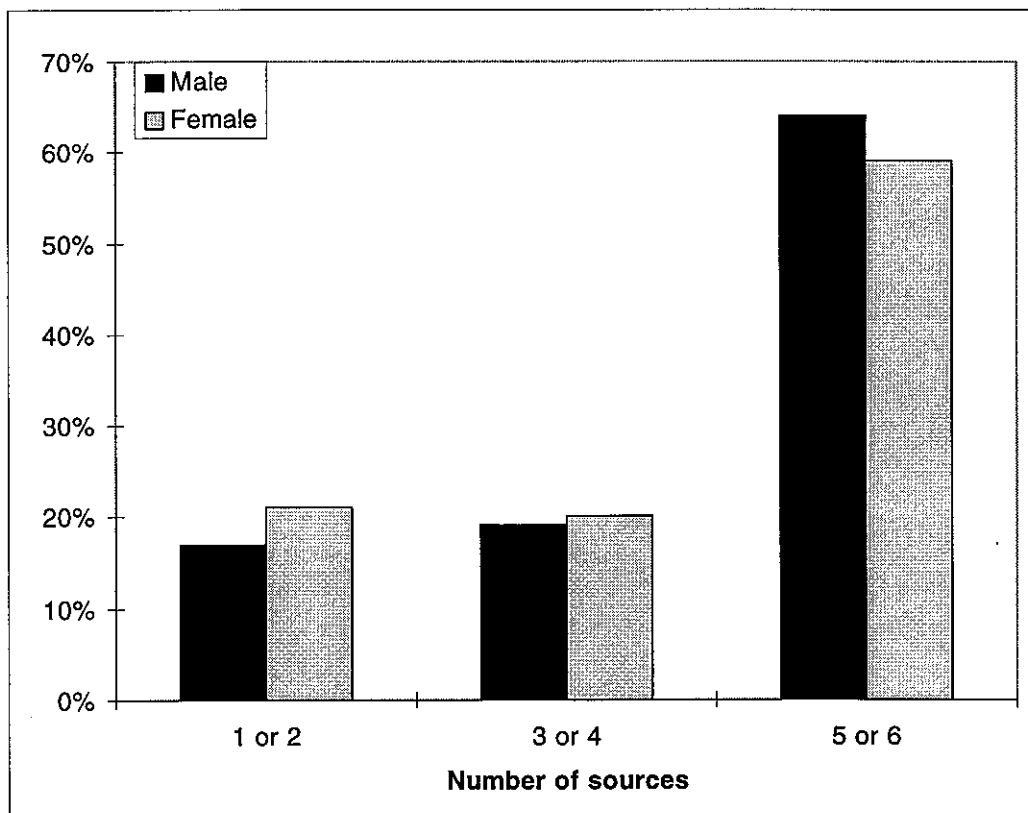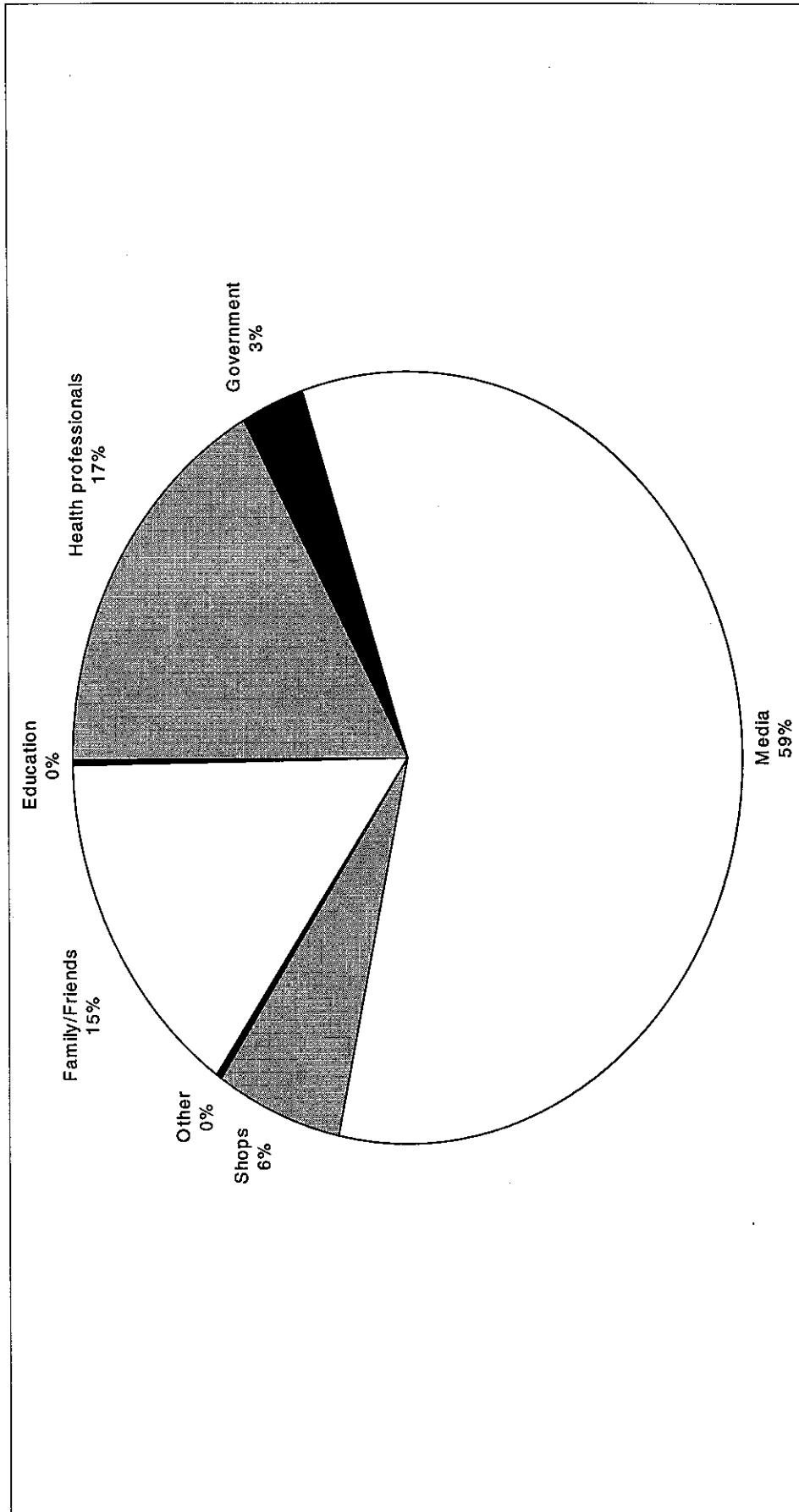
Figure 13. Relative percentages of total sources of information listed.

Messages about nutrition

Respondents were asked whether they had seen, heard or read about any nutrition-related information or messages from six sources over the last year. The responses are shown in Figure 14.

Nutrition messages were seen or heard most often from the media. Friends and family were also sources of nutrition messages. Nutrition messages from a health professional, from a shop selling food or a food label were also remembered. Over 20% of respondents could not remember having heard or seen any nutrition message in the previous twelve months.

If the respondents remembered hearing or seeing a message in the media, from health professionals, government sources and shops/labels, they were asked whether they remembered any specific messages and if so what changes, if any, they had made to their diet as a result.

Figure 14. Percentages of respondents who saw, heard or read about any nutrition-related information from different sources over the last 12 months.
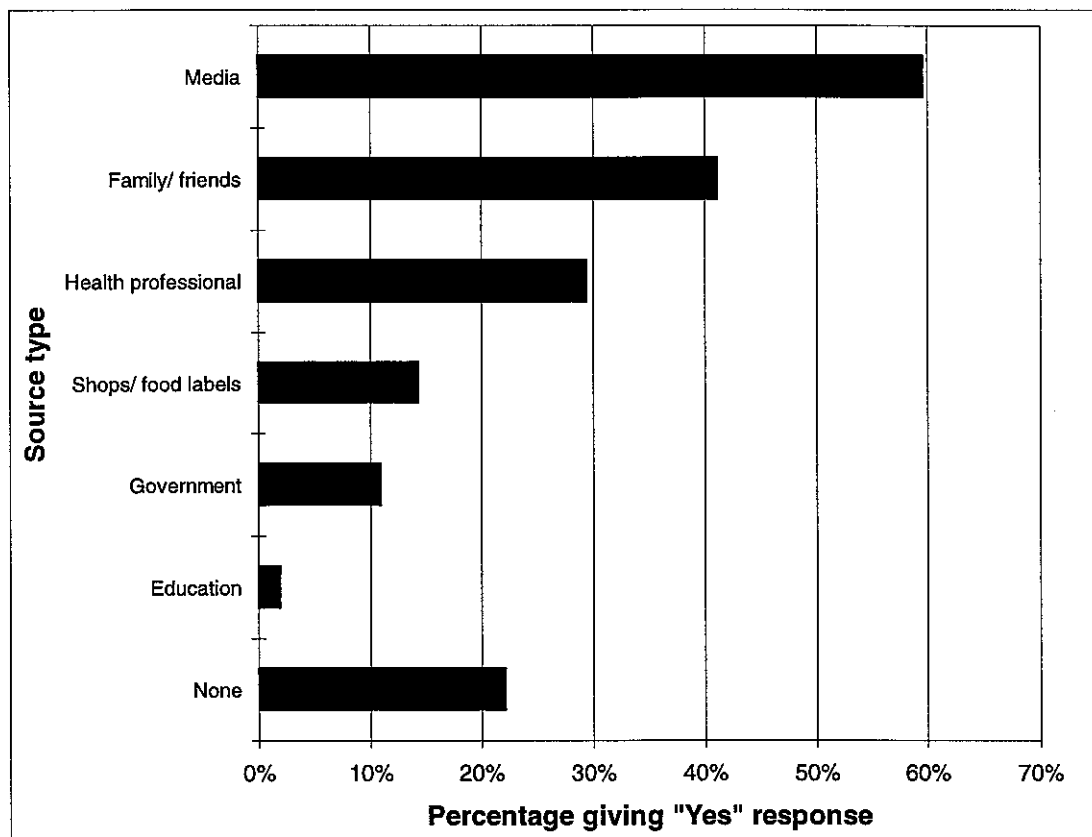
Health professionals as sources of information

An almost equal number of men and women said they had received information from a health professional (28% men; 31% women). Of these 138 respondents, about one half nominated a doctor/ hospital as the source. For men, nominating health professionals, eleven also identified the doctor at work. The other major health professional sources were dietitians in hospital, or doctors in the workplace or in community health centres. Nurses in any setting were hardly used by either men or women (all settings: 6 men; 7 women).

Figures 15 and 16 show the messages seen by men or women from health professional sources and the number who claimed to have made dietary changes as a result.

Over eighty percent of the men and women who had seen or received information from health professionals claimed to remember the message with more than two-thirds of these taking some action. Thus, 94 of the Malaysian people in the survey reported taking some action over the past year in

response to advice or information from health professionals.

The major messages or information from health professionals remembered by male respondents related to eating more fruit and vegetables (over 60% of these respondents), iron and calcium (about 40%). Many of the males mentioned the message was to eat less fat, cholesterol, salt and sugar (over 70%). Eating less meat was mentioned by about 60% of those who could remember a message.

For the women, the main messages remembered related to eating more fruit and vegetables (over 80%), calcium and protein (over 50%), and iron and fibre (about 40%). Many also mentioned that the messages concerned eating less meat, fat, cholesterol, salt and sugar. Eat less meat was cited by more that 75% of these women.

In terms of actions taken, about half of the men hearing a message of any sort claimed to have eaten more fruit and vegetables, and cut back on fat, cholesterol, salt, sugar and meat. For the women who remembered the message, more than half reported eating more fruit and vegetables, while 30% reported having more iron. Over half claimed to have reduced their intake of fat, cholesterol, salt and sugar. About 40% said that they had lowered their meat intake.

Figure 15. Dietary changes made by men who remembered a message from a health professional.
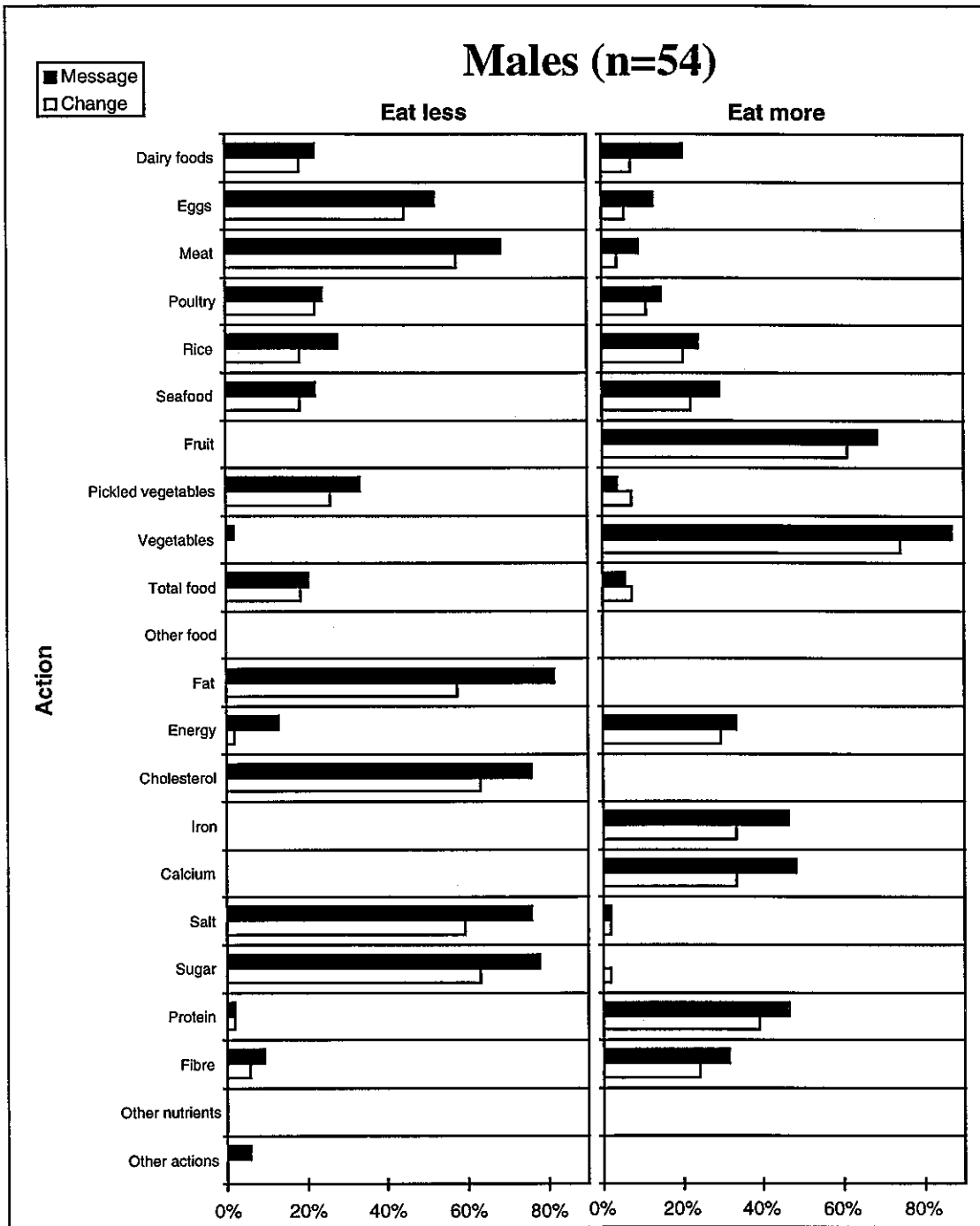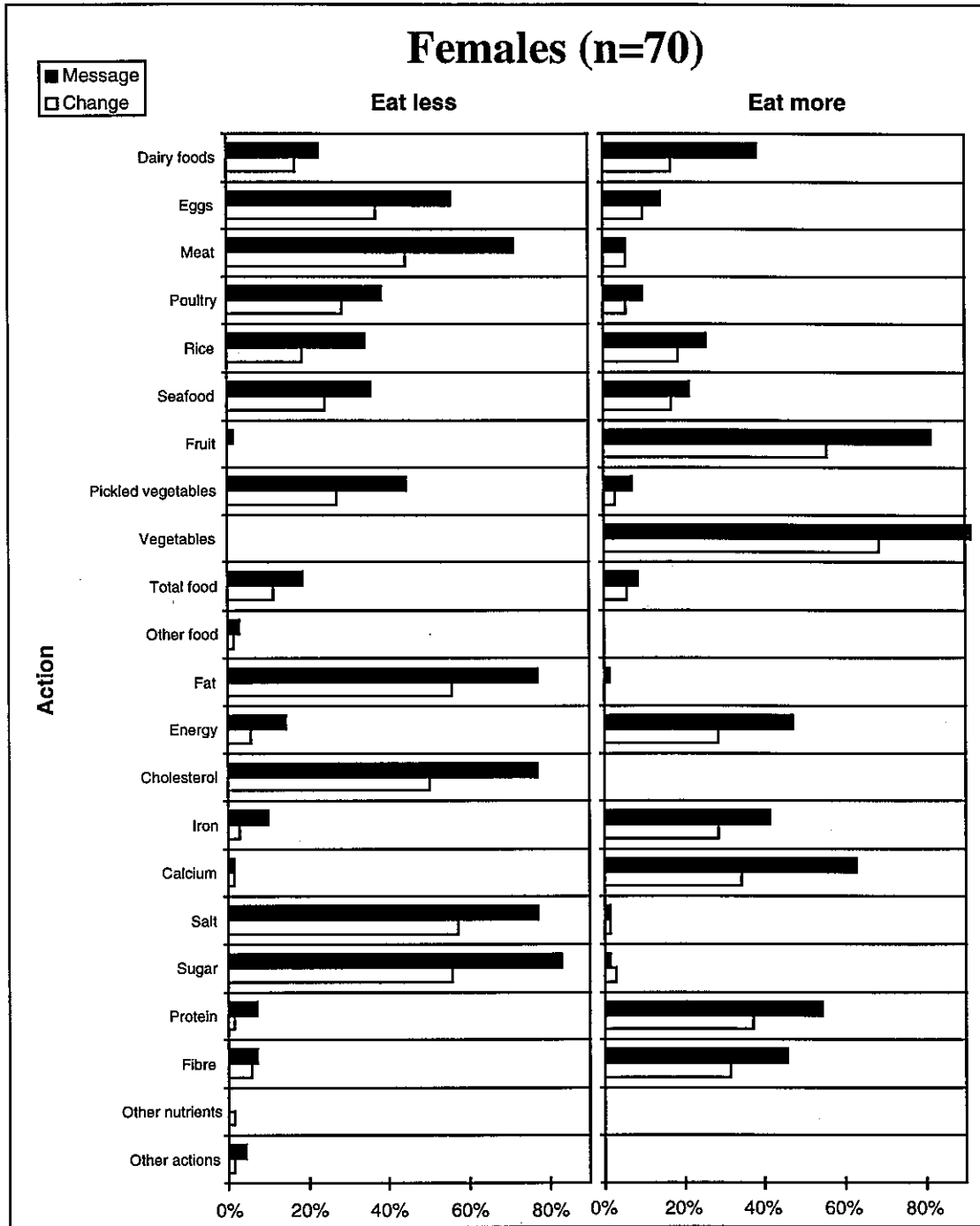
Figure 16. Dietary changes made by women who remembered a message from a health professional.

Females (n=70)

Message
Change

Eat less · Eat more

Action: Dairy foods, Eggs, Meat, Poultry, Rice, Seafood, Fruit, Pickled vegetables, Vegetables, Total food, Other food, Fat, Energy, Cholesterol, Iron, Calcium, Salt, Sugar, Protein, Fibre, Other nutrients, Other actions

0% 20% 40% 60% 80%   0% 20% 40% 60% 80%

Government and health authorities as sources of information

Government and health authorities were not commonly used as sources of nutrition messages during the previous twelve months. Only 27 men and 25 women remembered hearing or seeing a message from this health authority group and the Ministry of Health and Welfare was the most popular.

Of those who could remember the nutrition message from the health authorities (n=44), the types of messages conveyed included -
Males:
- eating less eggs and meat
- reducing fat, cholesterol, salt and sugar
- increasing fruit, vegetable and seafood intake
- increasing calcium and iron intake
Females:
- eating less dairy foods, eggs and meat
- decreasing intake of fat, cholesterol, salt and sugar
- eating more fruit and vegetables
- increasing calcium and iron, protein and fibre

Most of these respondents indicated that they had changed their eating habits because of these messages including:
- eating less meat and eggs
- eating less fat, cholesterol, salt and sugar
- eating more fruit and vegetables
- eating more calcium and protein (women only).

Media sources for nutrition information

The media was the major source of information with about 60% of men and 59% of women receiving information about nutrition from the media in the past year.

The major sources for men and women from within the media were local television, newspapers and radio. Magazines of all types were less well remembered sources of nutrition messages (Figure 17).

Of the 92 men who could remember specific messages, the main areas related to eating more fruit, vegetables, protein, fibre, calcium, iron and energy, and less eggs, meat, fat, cholesterol, salt, and sugar. The main changes made related to consuming more fruit and vegetables followed by a reduction of meat, eggs, fat, cholesterol, salt and sugar intake (Figure 18).

For the 98 women recalling messages, eating more fruit, vegetables, calcium, protein, fibre, and iron (30%), and less meat, fat, cholesterol, salt and sugar were the major themes. More than half claimed to have responded (Figure 19).

Food shops and labels as sources of information.

Food shops and labels were a minor source of nutrition information for respondents with 67 reporting seeing some information from this source. Food labels were the main source for both men and women followed by the supermarket in general (Figure 20).

For men (n=15), the main messages relating to major food and nutrient categories concerned eating more fruit, vegetables and calcium and less fat, salt and sugar. For women (n=15), eating more fruit, vegetables, calcium, iron and protein and less fat, cholesterol, salt and sugar were the main messages.

Figure 17. Percentages of source types listed by those males and females who indicated that they had seen a nutrition message in the media.
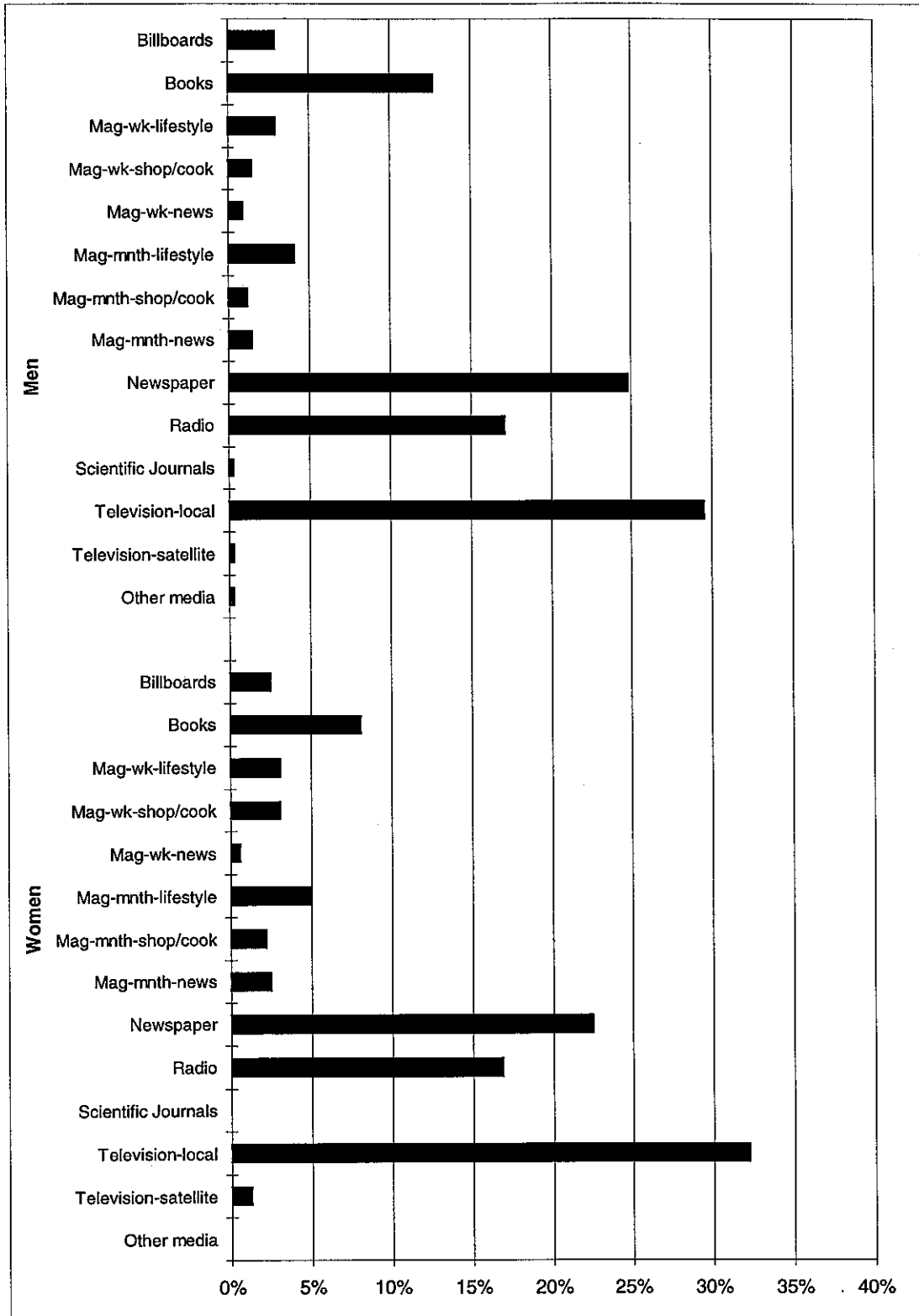
Figure 18. Dietary changes made by men who remembered a message in the media.
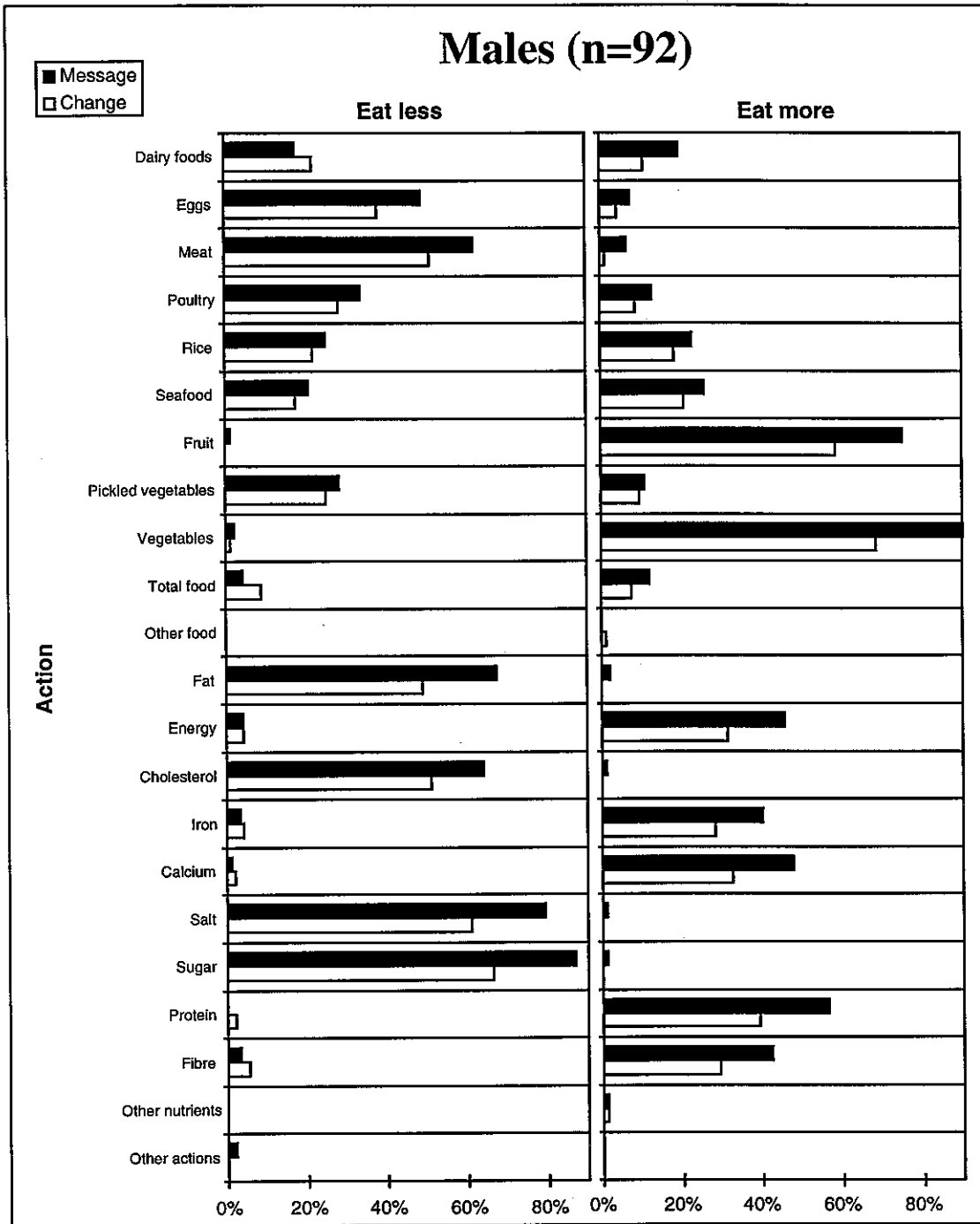
Figure 19. Dietary changes made by men who remembered a message in the media.
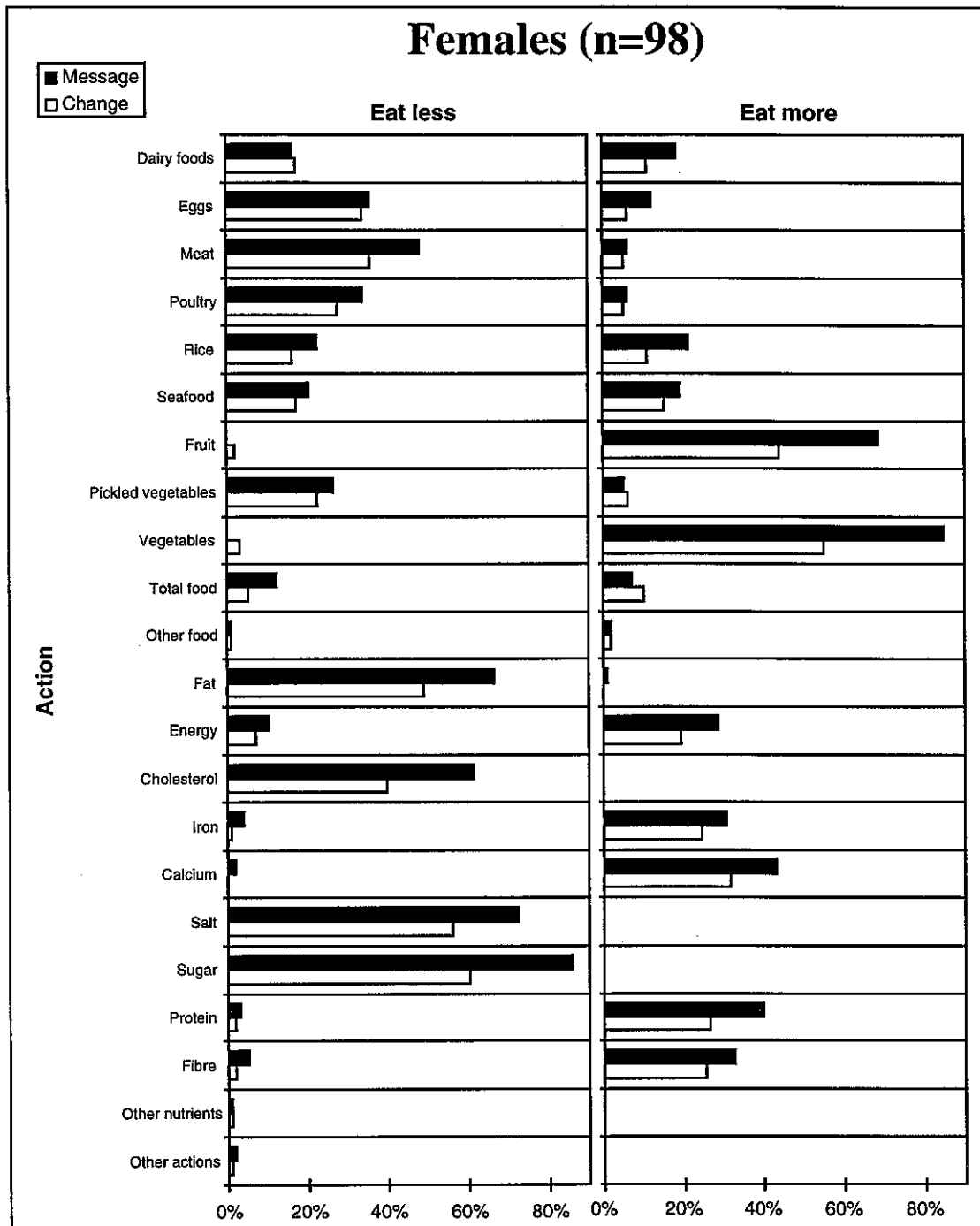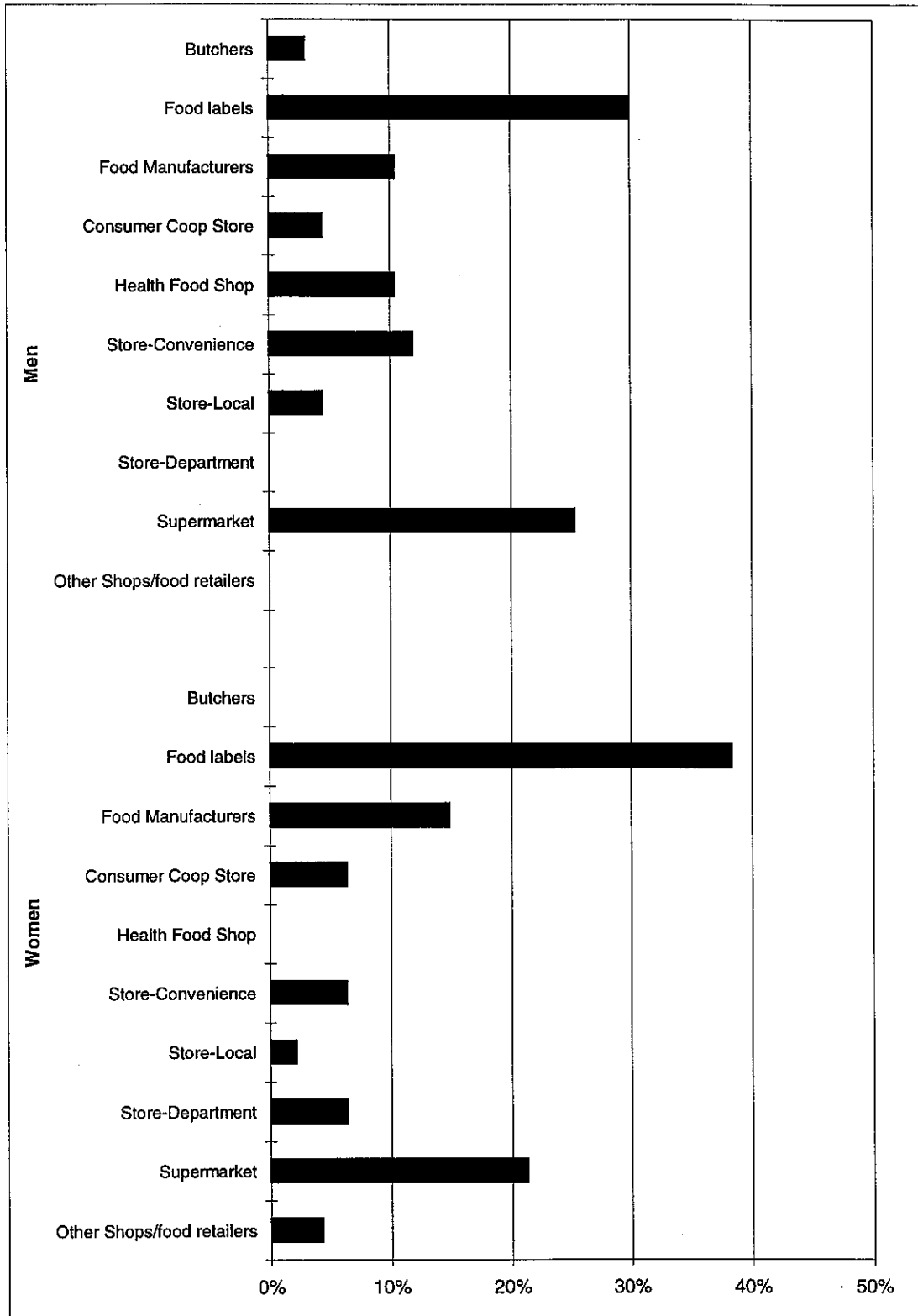

Females (n=98)

Figure 20. Percentages of source types listed by those males and females who indicated that they had seen a nutrition message at food shops.

MULTIPLE REGRESSION ANALYSIS OF KEY DETERMINANTS OF BEEF AND LAMB CONSUMPTION

A large number of demographic, attitudinal and psychosocial factors were correlated with beef and lamb intake. A multiple regression analysis was undertaken to determine which of these factors were the key correlates with higher frequency of beef and lamb consumption. Because of the smaller numbers of those consuming these foods at all, separate analyses for each ethnic group were not conducted. Ethnicity, however, was one of the variables entered into the analysis in its own right.

More than demographic, attitudinal and psychosocial variables that correlated with beef or lamb consumption in a one-to-one fashion were entered into the model.

Predictors of beef consumption

This analysis was based on the 226 Malaysians who answered all questions about beef. The model accounted for 34% of the variation (from low intakes to high intakes) in beef consumption frequency. The factors that predicted a higher beef consumption frequency were liking for beef, younger ages, particularly those aged less than 29 years, not being Indian, having a higher income and perceiving beef to be a good source of protein. Not surprisingly, ethnicity was important in predicting beef consumption, as most Indians are Hindu which precludes eating beef. City of residence was not a significant individual predictor of beef consumption although the tendency for higher consumption by George Town people was noted on page 17.

Predictors of lamb consumption

All respondents who answered all of the lamb questions were included in this multiple regression analysis (n=204). The model accounted for 45% of the variation in the frequency of lamb consumption. The factors which best predicted a higher lamb consumption frequency were a liking for lamb, a university education, a belief that lamb contained cholesterol, less value placed on nutrition overall, and those who were in a management position. The cholesterol perception predictor is counter-intuitive but perhaps those who did not specify cholesterol as a problem listed others instead. The perception of cholesterol does not appear to deter their subsequent consumption.

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