NUTRITION COUNTRY PROFILE
STATE OF KUWAIT

Acknowledgments

This profile was prepared by Dr. Nawal Al-Hamad, Food and Nutrition Department, Ministry of Health, Kuwait, in collaboration with Amélie Solal-Céligny, Chiara Deligia and Giulia Palma, Consultants, and Marie Claude Dop, Nutrition Officer in the Nutrition Planning, Assessment and Evaluation Service of the Nutrition and Consumer Protection Division, Food and Agriculture Organization of the United Nations.

The Administration of Food and Nutrition, Ministry of Health, Kuwait, would like to address its special thanks to Mrs. Prasanna Prakash, for her precious collaboration in reviewing the data, and in discussing and preparing this document; to Mr. Abdul Rahman Al Mansouri, Assistant Undersecretary for Statistics and Census sector, to Dr. Khalid Affan, Economic Consultant, and to Mrs. Al Kharaz, Head of Foreign Trade Sector, from the Ministry of Planning, for the data provided; to the Statistics Department of the Ministry of Health, for the data provided; to Mr. Ahmed Hussein, for his assistance in secretarial work.

Summary

Kuwait is a small urban state located on the coast of the Persian Gulf. The country's economy is dominated by the oil industry. Petroleum is the main source of national income. Agriculture is limited by the lack of water and arable land and by harsh climate conditions. Most of the food commodities for human consumption are imported, with the exception of aquatic resources which are plentiful. However, most of the captured fish and seafood is not consumed but is exported.

The population of the country is composed of approximately one third of Kuwaiti nationals and two thirds of immigrants. The population of Kuwaiti nationality is young, with around 41 % below 15 years of age.

Per capita income is high. Access to social services is very good and the Human Development Index is high. Education is free and compulsory for all citizens until the age of 15 years. Health care, including immunization, is free for all Kuwaitis.

The socio-economic development which followed the discovery of oil resources brought considerable changes to the food patterns and lifestyles of the Kuwaiti population. Traditional foods have been replaced by energy-dense high-fat foods. Excessive dietary intake and unbalanced diets along with sedentary lifestyles have contributed to the increase in the prevalence of overnutrition and the incidence of diet related non-communicable diseases such as diabetes, hypertension, cardiovascular diseases and cancer. Currently approximately 80% of adult women are overweight or obese. Overnutrition is also highly prevalent among school children and adolescents.

Stunting and wasting do not constitute health problems in Kuwait. While overnutrition is progressing at an alarming rate among both men and women, iron deficiency anemia persists, affecting children, adolescents and women.

Since 1985, the government is actively promoting breastfeeding. However, early initiation of breastfeeding is still rare and duration is short. Breastmilk substitutes are subsidized and bottle-feeding is widespread. More efforts are needed for the promotion of breastfeeding and adequate infant feeding practices. Better infant feeding practices could play a role in preventing overnutrition.

The government of Kuwait is actively implementing policies to curb the obesity and non-communicable disease epidemic. Nevertheless measures are needed to more effectively promote healthy eating and to increase the population's, and particularly women's, level of physical activity.

While the health and nutrition situation of the Kuwaiti population is well documented, that of the non-Kuwaiti population, which represents two thirds of the total population, urgently needs to be evaluated.

Summary Table

Basic Indicators					Year
Population	**MDG**[1]	Kuwaitis	Non-Kuwaitis		
Total population		2.645		million	2004
Rural population		4		%	2004
Population under 15 years of age		41	13	%	2004
Annual population growth rate		3	10	%	2004
Life expectancy at birth		78	n.a.	years	2003
Human development and poverty					
Human development index		0.844		[0-1]	2003
Proportion of population living with <1$/day (PPP)	***MDG1***	n.a.			
Education					
Net primary enrolment ratio	***MDG2***	96		%	2004
Youth literacy (15-24 years)	***MDG2***	100	n.a.	%	2004
Ratio of girls to boys in primary education	***MDG3***	1.03		girl per 1 boy	2004
Health					
Infant mortality rate	***MDG4***	8	12	‰	2003
Under-five mortality rate	***MDG4***	10	14	‰	2003
Maternal mortality ratio	***MDG5***	4	20	per 100 000 live births	2003

Nutrition indicators					Year
Energy requirements					
Population energy requirements		2 185		kcal per capita/day	2002
Food supply					
Dietary Energy Supply (DES)		3 010		kcal per capita/day	2002
Prevalence of undernourishment	***MDG1***	5		%	2000-02
Share of protein in DES		11		%	2002
Share of lipids in DES		31		%	2002
Food diversification index		57		%	2001
Food consumption					
Average energy intake (per capita)		n.a.		kcal/day	
Percent of energy from protein		n.a.			
Percent of energy from lipids		n.a.			
Infant and young child feeding	**Age** (months)				
Exclusive breastfeeding rate	<4	12		%	1996
Timely complementary feeding rate	4-6	26		%	1996
Bottle-feeding rate	0-11	86		%	1996
Continued breastfeeding rate at 2 years	12-15	21		%	1996
Continued breastfeeding rate at 2 years	20-23	9		%	1996
Nutritional anthropometry					
Underweight in children under 5 years	***MDG1***	3	n.a.	%	2004
Overweight in children under 5 years		6	n.a.	%	2004
Women with BMI<18.5 kg/m²		1	n.a.	%	2004
Women with BMI≥25 kg/m²		81	n.a.	%	2004
Micronutrient deficiencies					
Prevalence of anemia in women		28		%	2004
Prevalence of iron supplementation in mothers		n.a.			

n.a.: not available.
[1] Millennium Development Goal indicator.

TABLE OF CONTENTS

List of tables and figures

List of tables

List of figures

Acronyms

BMI	Body Mass Index
CHD	Coronary heart diseases
DPT3	Diphtheria, Pertussis (whooping cough) and Tetanus vaccine – three doses
EMRO	Eastern Mediterranean Regional Office (WHO)
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistical Databases
FIVIMS	Food Insecurity and Vulnerability Information and Mapping Systems
GCC	Gulf Cooperation Council
GDP	Gross domestic product
GNP	Gross national product
ITU	International Telecommunication Union
KFHS	Kuwait Family Health Survey
KNSS	Kuwait Nutrition Surveillance System
MICS	Multiple Indicator Cluster Survey
MOE	Ministry of Education
MOH	Ministry of Health
MOP	Ministry of Planning
NCD	Non-communicable diseases
PPP	Purchase Power Parity
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNPD	United Nations Population Division
UNSTAT	United Nations Statistics Division
WB	World Bank
WHO	World Health Organization

Part I: Overview and basic indicators

I.1 Context

The State of Kuwait is located at the north-western tip of the Persian Gulf. It is bordered on the North and West by Iraq, on the South and West by Saudi Arabia and on the East by the Persian Gulf. Its territory of 17 818 km^2 consists mainly of arid desert and includes several islands, the largest of which is Bubiyan, near the Iraqi border.

The climate is extremely hot from April to September, with temperatures over 49°C. Humidity is generally low except in August and September. The average temperature in January, the coldest month, is 13.5°C. Annual rainfall is usually less than 150 mm per year, mostly falling in the winter season (FAO, Forestry Division).

Kuwait is a constitutional monarchy, governed by the Sabah family. Over 90 % of the country's population lives within the 500 km^2 area surrounding Kuwait City and its harbour.

Kuwait's economy is dominated by the oil industry. It has limited natural fresh water resources, and desalination facilities provide most of the water for human consumption. Agriculture is limited by the lack of water and arable land. Aquatic resources, fish and crustaceans are plentiful in the Gulf.

I.2 Population

Population indicators

The mid-year population of the country in 2004 was 2.645 million of which 36 % were Kuwaiti nationals and 64 % were non-Kuwaitis. Among the non-Kuwaiti population, 34% are Arabs, 61% are non-Arabs (mainly Asians) and 5% are stateless (nomads). The ratio of males to females among the total population was 1.6:1 (1:1 among Kuwaitis and 2.2:1 among non-Kuwaitis) due to the large proportion of single men among the immigrant work force present in the country (Table 1).

The Kuwaiti population is young with approximately 41 % below 15 years of age. Among the immigrant population, on the contrary, the majority are adults. The crude birth rate of the Kuwaiti population is high.

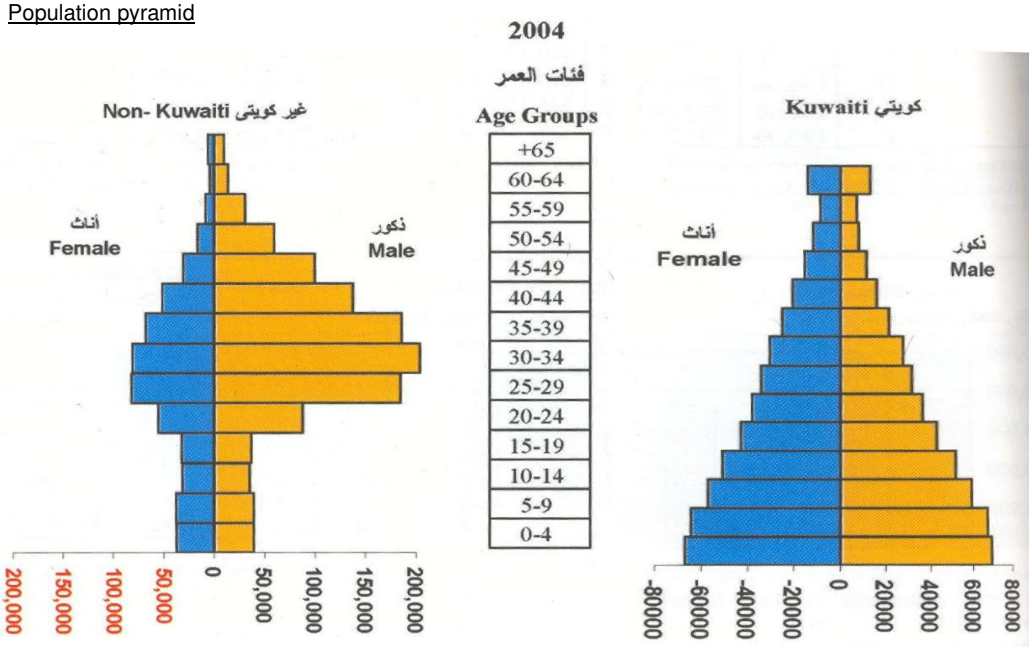
Kuwait is an urban country with about 90 % of the population living in urban areas (MOP, 2004a).

Table 1: Population indicators

Indicator	Estimate		Unit	Reference Period	Source
	Kuwaitis	Non-Kuwaitis			
Total population	0.9	1.7	million	2004	MOP
Annual population growth rate	2.9	9.5	%	2004	MOH
Crude birth rate	31.3	9.8	‰	2003	MOH
Population distribution by age				2004	MOP
0-4 years	15	5	%		
5-14 years	26	8	%		
15-24 years	20	13	%		
25-59 years	35	71	%		
60+ years	5	2	%		
Rural population	4		%	2004	FAO
Agricultural population	1		%	2004	FAO
Population density	130.5		per km^2	2003	MOP
Median age	30		years	2005	UNPD
Life expectancy at birth	78	n.a.	years	2003	MOH
Population sex ratio	100	220	males per 100 females	2004	MOP
Net migration rate	20		‰	2000-2005	UNPD
Total dependency rate	35		%	2005	UNPD

n.a.: not available

Population pyramid



Source: MOP, 2004a

I.3 Agriculture

Due to soil infertility, water scarcity, unfavourable climate and lack of trained labour force, the agricultural sector plays a minor role in the Kuwaiti economy. Out of 17 818 km² of national territory, only 1 538 km² are used for pasture, trees and crops. With the exception of fishery products, Kuwait is totally dependant on imports for its food supply (MOP, 2004a).

The government has been carefully managing farms and experimenting hydroponic systems. However, most of the soil which was suitable for farming in south central Kuwait was heavily polluted during the 1991 Gulf war, when the destruction of oil wells in the area created vast "oil lakes".

Land use and irrigation statistics

Table 2: Land use and irrigation

Type of area	Estimate	Unit	Reference period	Source
Total Land Area	1 782	1000 Ha	2002	FAO
Agricultural Area	9	%	2002	FAO
Arable lands & Permanent Crops	<1	%	2002	FAO
Permanent Crops	<1	%	2002	FAO
Permanent Pasture	8	%	2002	FAO
Forested land areas	<1	%	2000	FAO
Irrigated agricultural land	<1	%	2002	FAO

N.B. Percents are calculated on the total land area.

Main crops, agricultural calendar, seasonal food shortage

The main food and agricultural commodities produced in Kuwait in 2002 were fresh vegetables, cow milk and poultry meat (FAO, Statistics Division). All these commodities were destined to local human consumption (FAO, FAOSTAT).

Winter, summer and semi-perennial crops include fruits, leafy vegetables, tubers and pulses. Vegetables such as tomatoes, cucumbers, lettuce, bell peppers, etc. and fruit such as strawberries are grown in green houses and in some cases exported to neighbouring countries. The food processing industry is well developed but the domestic production remains small in comparison with the volume of food imports (MOP, 2004a).

Livestock production and fishery

The Persian Gulf is a rich fishing area. Kuwait uses the latest technologies for the development of this important resource. Fish and crustaceans are plentiful in territorial waters, and large-scale commercial fishing is undertaken locally and in the Indian Ocean (MOP, 2004a).

Table 3: Livestock and fishery statistics

Livestock production and fishery	Estimate	Unit	Reference period	Source
Cattle	24 970	number of heads	2002	FAO
Sheep and Goats	946 590	number of heads	2002	FAO
Poultry Birds	30 000	thousands	2002	FAO
Fish catch and aquaculture	6 095	tons	2002	FAO

I.4 Economy

The Kuwaiti economy depends heavily on the oil sector. Approximately 90 % of the export revenue of the country is derived from petroleum products while the main imported items are food products, construction materials, vehicles, spare parts and clothing (MOP, 2004b).

In 2003, although government expenditures increased by about 8 %, Kuwait's fiscal surplus was about 18 % of GDP.

Industry in Kuwait consists of several large export-oriented petrochemical units, oil refineries and a range of small manufactures. Also ammonia, fertilizers and cement are produced in the country. Industries include various sectors such as ship building and repair, desalination, food processing and construction plants.

The labour force in Kuwait is of about 1.42 million people, of which 80 % are non-Kuwaitis.

Communications and transport facilities, as well as infrastructure are excellent. Telephone, mobile, radio, television and internet networks are well developed. The road network was estimated in 1999 at 4 450 km (3 587 km paved and 863 km unpaved). There are neither railways nor waterways. There are six harbours and six airports, one in each region (MOP, 2004b).

Table 4: Basic economic indicators

Indicator	Estimate	Unit	Reference Period	Source
Gross Domestic Product per capita	15 799	PPP US $	2000	UNDP
GDP annual growth	19.3	%	2004	MOP
Gross National Income per capita	17 970	$	2003	WB
Industry as % of GDP	59	%	2003	WB
Agriculture as % of GDP	<1	%	2003	WB
Services as % of GDP	41	%	2003	WB
Paved roads as % of total roads	81	%	1999	MOP
Internet users	2 280	per 10 000 people	2003	ITU
Total debt service as % of GDP	n.a.	-	-	-
Military Public expenditure	10.4	% of GDP	2002	UNDP

n.a.: not available

I.5 Social indicators

Health indicators

Infant and maternal mortality have been decreasing in the decades and are currently low: infant mortality rate of the total population (Kuwaitis and non-Kuwaitis) decreased from 12 ‰ in 1996 to 9 ‰ in 2003 and maternal mortality also decreased, especially for Kuwaitis. However, there are differences between Kuwaiti and non-Kuwaiti rates, the latter having higher mortality rates. (Table 5).

Heart diseases, cancer, and injury (particularly transport accidents) are the three major causes of death among both Kuwaitis and non Kuwaitis. Gender wise, higher mortality rates are observed among men from heart diseases and transport accidents. However, higher death rates due to cancer are reported among women.

Cardiovascular disease

Coronary heart disease (CHD) is the first cause of mortality in Kuwait. The prevalence of CHD increased over the years and CHD is appearing at a younger age. In 1995, CHD was responsible for 15 % of all deaths among Kuwaitis and 24 % among non-Kuwaitis (MOH, 1996). The mortality rate from CHD in the Kuwaiti population increased by approximately one third between 1983 and 1993. There is growing evidence that obesity is a contributing cause of chronic diseases (Abdella et al., 1995; Al-Mousa, 1996; Emara et al., 1989; Malaviya et al., 1998). Moreover, studies show that obesity in Kuwait is increasing (Abdella et al., 1999) and may contribute to the high mortality rates due to CHD (Al-Mousa, 1996) and diabetes mellitus (Emara et al., 1989; Alwan and King, 1992; Abdella et al., 1995).

Diabetes
Non-insulin-dependent (Type 2) diabetes is emerging as a major chronic non-communicable disease among the adult Kuwaiti population (data on diabetes in non-Kuwaitis are not available). Though genetic factors contribute to the high prevalence of glucose intolerance in the Kuwaiti population, environmental factors such as diet, lack of physical activity and obesity appear to be most immediately amenable to prevention. A study on diabetic dyslipidemia in Kuwaitis reported a high prevalence of type 2 diabetes and hyperlipidemia in the adult Kuwaiti population (Akanji, 2002).

The incidence of Type 1 diabetes (20 per 100 000 children) in Kuwait is high compared with the neighbouring Arab countries, and it appears to be increasing (Shaltout et al., 2002).

Cancer
Cancer is the second major cause of death in Kuwait (MOH, 2002).

In 2002, the Primary Health Central Office established "well-being" clinics in some of the Primary Health Center clinics to raise health awareness and reduce the incidence of non-communicable diseases. In these clinics children and adults are examined to check their weight, blood pressure, diabetes risk and receive advice on healthy lifestyles and measures for the prevention of NCDs.There are still few such clinics at present but the aim is to establish them in all health areas, with staff including dietitians and health educators as well as nurses and doctors.

In 2003 the three major communicable diseases were diarrhea, chicken pox and salmonella carrier state. Non-Kuwaitis were more affected by communicable diseases than Kuwaitis (MOH, 2003).

Table 5: Health indicators

Indicator	Estimate	Unit	Reference Period	Source
Mortality				
Infant mortality *Kuwaitis* *Non-Kuwaitis*	 8 12	‰	2003	MOH
Under-five mortality *Kuwaitis* *Non-Kuwaitis*	 10 14	‰	2003	MOH
Maternal mortality ratio :				
reported *Kuwaitis* *Non-Kuwaitis*	 4 20	per 100 000 live births	2003	MOH
adjusted *Kuwaitis*	 5	per 100 000 live births	2000	UNICEF
Morbidity				
Prevalence of diarrhea in the last 2 weeks in under-fives	10	%	1996	KFHS
Oral rehydration rate among under-fives	33	%	1996	KFHS
Percentage of under-fives with acute respiratory infections in the last 2 weeks	45	%	1996	KFHS
Tuberculosis prevalence	n.a.			
Immunization				
Percent of infants with immunization against tuberculosis at 1 year of age	n.a.			
Percent of infants with DTP3 immunization at 1 year of age	99	%	2003	UNICEF /WHO
Percent of infants with immunization against measles at 1 year of age	97	%	2003	UNICEF
Percent of pregnant women immunized against tetanus	n.a.			

n.a.: not available

Water and sanitation

Kuwait has limited natural fresh water resources. Large sophisticated desalination facilities provide most of the water needed in the country. Proper sanitation facilities are accessible to both Kuwaitis and non Kuwaitis.

Access to health services

Kuwait has a well developed health care system. It provides primary, secondary and tertiary health care[i] and emergency medical services free-of-charge to Kuwaiti citizens. Foreigners living in Kuwait can obtain free or low cost medical care at all government-run clinics and hospitals. Before the Gulf war, comprehensive services were provided to Kuwaitis and non-Kuwaitis relatively equally. However, since 1994, expatriates are charged for certain non-emergency procedures. Foreigners still receive free emergency care. For other health care services, a nominal fee (US$ 3.34) is charged.

Immunization is compulsory and free for all, Kuwaitis and non-Kuwaitis, and immunization rates are consequently high (MOH, 2003).

Table 6: Access to Health Services

Indicator	Estimate	Unit	Reference Period	Source
Health personnel: number of physicians	160	per 100 000 people	1990-2003	WHO
Sustainable access to affordable essential drugs	very good*	-	1999	UNDP
Percent of births attended by skilled health personnel	100	%	2004	MOP
Public expenditure on Health	3.5	% of GDP	2001	UNESCO

* estimated between 95-100% of total population

Education

Education is free and compulsory for all Kuwaitis until the age of 15 years. Progress has been made both for child and adult education (Table 7). The illiteracy rate decreased and the number of people achieving higher education has increased in the last decade (MOP, 2004a).

There are no data on school enrolment of the immigrant children under 15 years of age residing in Kuwait.

The level of equipment in schools is good. School canteens are present in all the government and private schools and are controlled by high committees and subcommittees in all governorates. The high committees include representatives from the Ministry of Education, of Health and from Municipalities: these stipulate and monitor standards for the quality and type of foods sold and distribute a yearly circular on foods allowed or forbidden in the canteens.

Table 7: Education

Indicator	Estimate	Unit	Reference Period	Source
Adult literacy	82	%	2000	UNESCO
Adult literacy rate : females as % of males	93	%	2000	UNESCO
Youth literacy (15-24 years)	100	%	2004	MOP
Net primary enrolment ratio (Kuwaiti only)	96	%	2004	MOE
Grade 5 completion rate	98	%	2004	MOE
Ratio of girls to boys in primary education	1.03	number of girls per 1 boy	2004	MOE
Public expenditure on education	5.0	% of GDP	1995-1997	UNESCO

[1] The health system is based on three levels of health care delivery: primary health care is delivered through a series of health centres, with general or family health clinics, maternal and child care clinics, diabetic clinics, dental clinics, preventive care clinics and school health services. Secondary health care is provided through six general hospitals. Tertiary health care is provided through a number of national specialised hospitals and clinics.

Level of development, poverty

The State of Kuwait has established a comprehensive social welfare programme. The government provides free housing for all Kuwaiti citizens, financial support to vulnerable groups, virtually guaranteed employment, free medical services, and education at all levels. Child allowances are given to all families of Kuwaiti nationality (MOH, 1996).

Non-Kuwaiti residents do not have access to these welfare services, except for subsidized electricity, water and petrol. The right to have a majority share in a business is restricted to Kuwaiti citizens, but in some cases is also granted to citizens of the Gulf Cooperation Council.

Table 8: Human development and poverty

Indicator	Estimate	Unit	Reference period	Source
Human development index (HDI)	0.844	value between 0-1	2003	UNDP
Proportion of population living with less than 1$ a day (PPP)	n.a.	-	-	-
Population living below the national poverty line	n.a.	-	-	-
Human poverty index (HPI-1)	n.a.	-	-	-

n.a.: not available

Other social indicators

Kuwaiti women have access to education and hold jobs in government and in the private sector. They are not involved in agriculture.

In 2004 the total work force in Kuwait was of about 1.147 million individuals. Kuwaitis represented about 19 % of the work force. Among both the Kuwaiti and non-Kuwaiti labour force, about two-thirds were men and one third was women (MOP, 2004a and 2004b).

Table 9: Other social indicators

Indicator	Estimate	Unit	Reference period	Source
Gender related development index (GDI)	0.843	value between 0-1	2003	UNDP
Women's wage employment in non-agricultural sector as % of total non agricultural employees	39	%	2004	MOP
Ratification of ILO Convention 182 on The Worst Forms of Child Labour	ratified	-	2000	ILO

Part II: Food and nutrition situation

II.1 Qualitative aspects of the diet and food security

Food consumption patterns

Before the discovery of oil resources, Kuwait's food supply depended on a limited variety of foods: mainly rice, dates, fish and seafood, camel milk, sheep and goat meat and their by-products. Meat was eaten once a week, or once a month by the less wealthy. Beverages were mainly Arabic coffee and milk. Sweetened tea was served only on special occasions.

As in most societies, food plays an important social and ceremonial role in Kuwait. Traditional food used to be served in a big plate around which family members gathered. Modernization has modified the traditional eating patterns, especially among the more educated. Kuwaiti families no longer share food from one big common plate; nowadays, they eat separately.

The economic and social development that followed the discovery of oil and gas resources brought life-style changes in the Kuwaiti population, particularly in their food habits and dietary intake patterns. Processed foods are now imported from all over the world. Sweets, chocolates, pastries, and snacks are available in abundance. Fast foods such as hamburgers, pizza, and fried chicken are widely consumed by the younger generation. All kinds of ethnic foods are available and employment of foreign domestic helpers also introduced new food habits in the Kuwaiti society.

Excessive food intake and unbalanced diets, sedentary life-styles and smoking contribute to the increased incidence of diet related non-communicable diseases such as diabetes, hypertension, cardiovascular diseases and cancer together with increased prevalence of obesity.

The main staple foods are rice and wheat. Normally three meals are eaten per day (breakfast, lunch and dinner). Lunch is eaten mostly at home, and consists mainly of rice with meat, chicken or fish, with vegetable stew, salad and yogurt or buttermilk. Chicken and lamb are the most common sources of animal protein; beef and pulses are less frequently consumed. Dairy products are frequently consumed. Fruits are available throughout the year and are financially accessible to all. Dinner is mostly eaten outside or ordered from restaurants and is often composed of fast foods such as pizza, fried chicken hamburgers, *kabab* (traditional dish based on meat – usually sheep meat), sandwiches etc. Traditional sweets are replaced by jams, honey and chocolates. Tea and Arabic coffee are the most common hot drinks and fresh juice and carbonated beverages are the most common cold drinks. A variety of nuts is consumed in Kuwait mostly after supper or while watching television.

There are no differences in eating patterns by region or by gender, although food habits vary for different ethnic groups. Food consumption changes during the fasting month of Ramadan as meals, consumed at night, include more sugary and energy-dense foods.

Infant formula and basic food items such as rice, sugar, milk powder, oil, lentils and tomato paste are subsidized by the Government.

Food security situation

Food security is defined as "A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FIVIMS).

Both Kuwaitis and non-Kuwaitis have adequate access to foods. Cooperative stores supplying food are situated in all areas of Kuwait. The population of Kuwait is not affected by food insecurity.

II.2 National food supply data

Supply of major food groups for human consumption

Table 10: Trends in per capita supply of major food groups (in g/day)

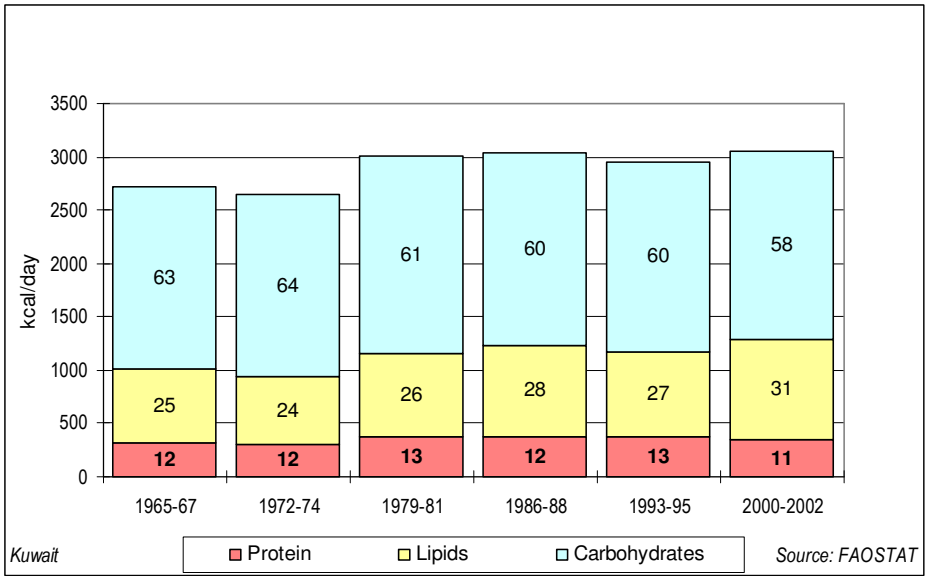
Major food groups	Supply for human consumption in g/day					
	1965-67	1972-74	1979-81	1986-88	1993-95	2000-2002
Cereals (excl. beer)	378	346	349	356	341	388
Starchy roots	39	42	53	54	77	63
Sweeteners	90	115	126	108	103	95
Pulses, nuts, oilcrops	39	33	35	36	42	32
Fruits and vegetables	691	626	733	820	771	580
Vegetable oils	33	27	27	37	31	58
Animal fats	8	8	13	12	10	9
Meat and offals	128	125	180	185	194	189
Fish, seafood	26	21	35	34	35	22
Milk and eggs	373	400	554	512	504	291
Other	20	20	29	21	24	18

Source: FAOSTAT

Data on food availability in Kuwait from 1965-1967 to 2000-2002 show a high level of supply for most food groups, especially fruits and vegetables, with some minor fluctuations over the period, except for meat and offals, where the supply has increased over time. The supply of fish and seafood is low for a country with abundant fishing resources. Because Kuwait imports a large of amount of processed foods, the accuracy of the food supply data is uncertain for certain food groups such as oils and fats, dairy products and fruit and vegetables. The slight decline in the availability of fruit and vegetables as well as of dairy products which is noted since the 90's is probably an artefact.

Dietary energy supply, distribution by macronutrient and diversity of the food supply

Figure 1: Dietary energy supply (DES), trends and distribution by macronutrient

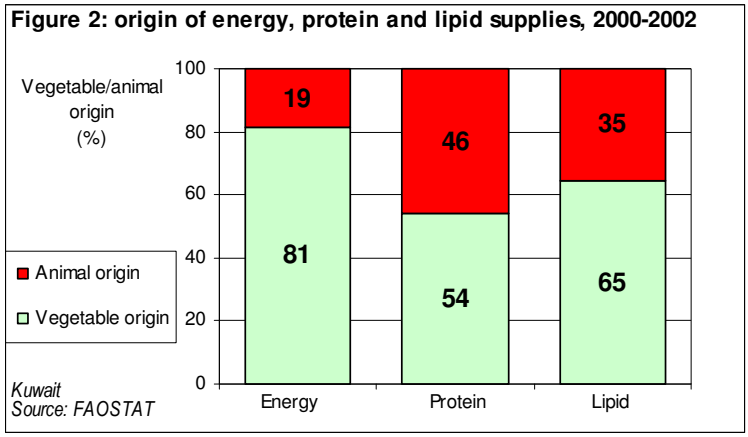


In 2002, the DES of 3 010 kcal per capita/day was well above population energy requirements of 2 185 kcal per capita/day[2]. This high energy availability in a population with a sedentary lifestyle explains the widespread increase of overnutrition in the country. Moreover the percentage of energy from lipids is at the upper limit of recommendations (WHO/FAO, 2003).

According to SOFI (FAO, 2005), the prevalence of undernourishment was 5 % in Kuwait in 2000-2002.

Vegetable/animal origin of macronutrients

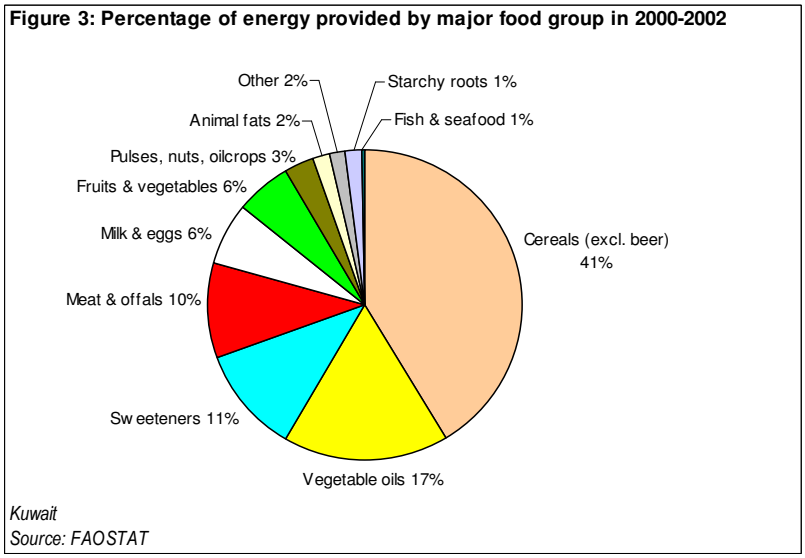
Figure 2: Vegetable/animal origin of energy, protein and lipid supplies, 2000-2002



While foods of vegetable origin still predominate in the Kuwaiti diet, the share of animal foods in the protein supply is high.

Dietary energy supply by food group

Figure 3: Dietary energy supply by food group



Three foods groups, cereals, vegetable oils and sweeteners, provide more than two thirds of the energy supply.

[2] Energy requirements are for a healthy and active lifestyle calculated using the FAO software (FAO, 2004). Software default values attribute to 90 % of the urban adult population a light physical activity level (PAL=1.55) and greater than light activity to the remaining 10% (PAL=1.85), and to 50% of the rural adult population a light activity (PAL=1.65) and greater than light physical activity (PAL=1.95) to the other 50%.

Table 11: Share of the main food groups in the Dietary Energy Supply (DES), trends

Food groups	% of DES					
	1965-67	1972-74	1979-81	1986-88	1993-95	2000-2002
Cereals (excl. beer)	43	41	37	38	37	41
Starchy roots	1	1	1	1	2	1
Sweeteners	12	16	15	13	13	11
Pulses, nuts, oilcrops	4	4	3	3	4	3
Fruits and vegetables	9	8	8	8	8	6
Vegetable oils	11	9	8	11	9	17
Animal fats	2	2	3	3	3	2
Meat and offals	9	9	11	11	11	10
Milk and eggs	7	8	10	9	10	6
Others	1	2	3	2	3	2
Fish, seafood	<1	<1	<1	<1	<1	<1

The contribution of the major food groups to the energy supply is adequate for most of them, with the exception of the supply of pulses and fish which are low and need to be increased. Supply of meat and offals is more than adequate. Iron deficiency and iron deficiency anemia (in specific population groups) might be more related to a low bioavailability of dietary iron rather than to low iron intake.

The diversification index (DES from non-starchy foods) is adequate (58%), indicating a varied diet.

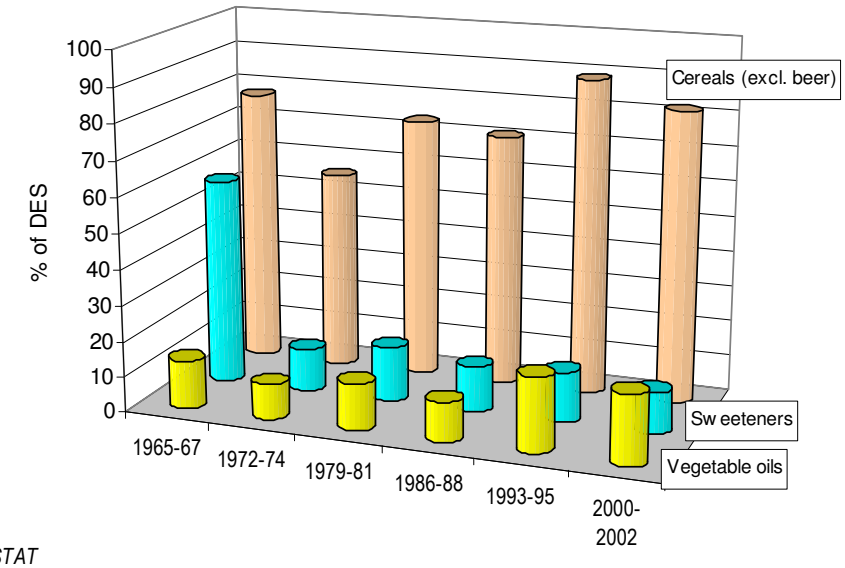
The level of supply of sweeteners is high. This group provides more than 10% of energy which is the upper limit of recommendations (WHO/FAO, 2003). The trend towards increasing consumption of sweeteners, nevertheless, seems to be underestimated.

Food imports and exports expressed as percentage of DES

Kuwait depends almost entirely on imports for all food groups except fish - and to a certain extent, milk and dairy products - to meet the national demand. Foods are imported from both industrialized and developing countries. Exports of foods are limited (data not shown).

Figure 4: Major food imports as percentage of Dietary Energy Supply (DES), trends
Note that only the 3 most important food groups are shown in the graph below.

Figure 4: Food imports expressed as percentage of DES. Trends from 1965-67 to 2000-2002.



Kuwait
Source: FAOSTAT

Food aid
Kuwait does not receive food aid. On the contrary, Kuwait is a food aid donor (WFP, 2005).

II.3 Food consumption

Community based surveys on dietary intake are urgently needed to provide valid estimates of energy and nutrient intake of the Kuwaiti population.

Due to the discovery of oil and gas resources, Kuwait showed rapid changes in the lifestyle and standard of living within the span of one generation. The changes in food patterns were due to increased family income, availability of various foods in local markets, food advertisements and lack of proper nutrition education and knowledge. Increase in the local production and imports of various foods from all over the world made available a great abundance and variety of foods in local markets at reasonable prices.

According to a survey investigating food consumption patterns and dietary habits in Kuwait (Al-Awadi et al., 1997), illiterate mothers cook food themselves while graduate mothers depend on their parents and maids to cook for them. Fast foods - such as hamburgers, fried chicken and onion rings - are frequently consumed by educated families.

National level surveys
A Kuwait Nutrition survey has been approved by the Kuwait Institute for Advancement of Sciences and initiated in August 2006. It consists in a cross sectional survey including 1 600 households (10 000 Kuwaiti subjects). Food consumption data are collected using the 24 hour recall and a food frequency questionnaire. The objectives are to assess prevalence of micronutrient deficiencies (of iron, folate, iodine, vitamin A and vitamin D), to identify contributing factors to specific nutrition related health problems and to enable the government to develop policies and implement intervention programmes. Results have not yet been published.

Other surveys
A study based on a semi quantitative food frequency questionnaire was conducted in 2003-2004. It included 152 food items and the participants, aged between 18 and 65 years, reported their frequency of food intake over the past year. The reported average intake was 2.8 servings per day for fruits and 3.2 servings per day for vegetables. Participants reported eating cereals 5.3 times per day (Dehghan et al., 2005). Intake of fruit and vegetables are insufficient and need to be increased substantially to comply with recommendations (WHO/FAO, 2003).

II.4 Infant and young child feeding practices

A Kuwait Family Health Survey was conducted in November-December 1996 on a nationally representative sample of households (MOH, 1996). The survey included a household health status survey, a reproductive health interview for ever-married women under 50 years of age, and a child health survey for children under 5 years of age. The sample was based on current civil registration records with a one-stage, stratified, systematic random selection, prepared in cooperation with the United Nations Statistics Division. A total of 3 500 households were selected from five governorates. The sample was comprised of 3 514 children under five years of age.

Deleted: (out of 6)

The results of the survey concerning initiation and duration of breastfeeding, conducted on 2 132 children under three years of age, are shown in table 12. Although breastfeeding was common, with more than three-quarters of infants everbreastfed, early initiation was rare (MOH, 1996).

Breastmilk substitutes are introduced as early as the first month of life and mixed feeding is very common. Milk insufficiency, child refusal, and maternal disease were the most frequently reported reasons for cessation of breastfeeding (Afifi et al., 1996).

Table 12: Initiation and duration of breastfeeding

Survey name/date (Reference)	Background characteristics	Sample size (children under three years)	Percentage of children under three years everbreastfed	Number of children under three years ever breastfed	Among children everbreastfed, percentage breastfed within one hour of birth	Among children everbreastfed, percentage breastfed within 24 hours of birth[1]
Kuwait Family Health Survey-1996 Ministry of Health, Kuwait. (MOH, 1996)	**Total**	2 132	76.6	1 632	4.5	51.2
	Sex					
	M	1 125	77.2	869	5.0	51.1
	F	1 007	75.8	763	3.9	51.4
	Residence					
	urban	n.a.	n.a.	n.a.	n.a.	n.a.
	rural	n.a.	n.a.	n.a.	n.a.	n.a.
	Region					
	Capital	280	75.0	210	3.9	53.6
	Hawalli (incl. Mubarak Al Kabeer)	561	71.1	399	5.3	45.0
	Farwania	531	76.5	406	3.0	48.2
	Al-Ahmadi	380	83.2	316	6.8	55.9
	Al-Jahra	380	79.2	301	3.1	58.5

[1] Includes children who started breastfeeding within one hour of birth
n.a.: not available

Table 13: Type of infant and young child feeding

Survey name/date (Reference)	Type of feeding in the 24 hours preceding the survey		
	Indicator by age	Sample size	Percentage of children
Kuwait Family Health Survey-1996 Ministry of Health, Kuwait. (MOH, 1996)	**Exclusive breastfeeding rate**		
	<4 months	n.a.	12
	Timely complementary feeding rate		
	4-6 months	n.a.	26
	Bottle-feeding rate		
	0-11 months	1 834	86
	Continued breastfeeding rate		
	12-15 months (1 year)	456	21
	20-23 months (2 years)	198	9

n.a. : not available

Duration of breastfeeding is short, as shown by a low rate of continued breastfeeding at one and two years of age, while the practice of bottle feeding is very common (MOH, 1996).

Breastmilk substitutes are subsidized in Kuwait, which indirectly encourages mothers to use these products thus leading to cessation of breastfeeding and early weaning. Since 1985, Kuwait implements an active policy for promotion of breastfeeding, which is described in more detail in Section II.7. More recent data on infant feeding practices are urgently needed to allow assessment of the impact of the breastfeeding promotion programme.

II.5 Nutritional anthropometry

Low birth weight

In 2003, 3 369 neonates were weighed, i.e. 2 269 Kuwaitis and 1 100 non-Kuwaitis. While these figures represent more than three-quarters of births of Kuwaiti nationals, they account for less than 10% of non-Kuwaiti births. The prevalence of low birth weight (% less than 2 500 g at birth among live births) was 8% for Kuwaitis and 7% for non-Kuwaitis (MOH, 2003). However, the prevalence of low birth weight obtained for non-Kuwaitis is not representative of non-Kuwaiti births.

Kuwait Nutrition Surveillance System

The Kuwait Nutrition Surveillance (KNS) system was developed in 1995 in collaboration with WHO. It uses anthropometric cut-off points of WHO. It is based on sentinel health clinics. The data on height, weight, age and sex are collected from all 6 governorates and are used to calculate prevalence of stunting, wasting and obesity for the Kuwaiti population. The KNS reports include recent surveillance data including obesity trends for the past five years. The system is described in more detail in section II.7. Nutritional studies are conducted mainly among Kuwaiti nationals. There are no data available for non-Kuwaitis.

Anthropometry of preschool children

Table 14: Anthropometry of preschool children

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition			
					Percentage of children with			
					Stunting Height-for-age	Wasting Weight-for-height	Underweight Weight-for-age	Overweight Weight-for-height
					< -2 Z-scores*	< -2 Z-scores*	< -2 Z-scores*	> +2 Z-scores
Kuwait Nutrition Surveillance System, Jan-Dec. 2004 (MOH, 2004)	**Total**	0.2-4.99	M/F	4 381	2.7	2.6	2.7	5.7
	Sex							
		0.2-4.99	M	2 246	2.4	2.8	2.3	5.6
		0.2-4.99	F	2 135	3.0	2.4	3.1	5.8
	Age							
		0.2-0.49	M/F	776	3.7	1.9	0.9	6.6
		0.5-0.99	M/F	506	2.6	2.6	1.8	5.3
		1-1.99	M/F	709	3.4	4.2	3.1	8.2
		2-2.99	M/F	697	2.4	1.7	3.2	4.2
		3-3.99	M/F	900	2.0	1.3	3.7	4.3
		4-4.99	M/F	793	2.0	4.2	3.3	5.7
	Region							
	Capital	0.2-4.99	M/F	740	2.6	4.3	2.3	4.3
	Hawalli	0.2-4.99	M/F	824	3.6	2.9	4.1	6.7
	Farwania	0.2-4.99	M/F	599	2.3	1.2	1.5	9.2
	Al-Ahmadi	0.2-4.99	M/F	852	2.1	2.9	2.6	4.2
	Al-Jahra	0.2-4.99	M/F	661	2.6	1.2	2.0	5.9
	Mubarak Al-Kabeer	0.2-4.99	M/F	705	2.7	2.7	3.4	4.5

* Category <-2 Z-scores includes <-3 Z-scores. NCHS reference (WHO, 1983).

Table 14: Anthropometry of preschool children (continued)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition			
					Percentage of children with			
					Stunting Height-for-age	Wasting Weight-for-height	Underweight Weight-for-age	Overweight Weight-for-height
					< -2 Z-scores*	< -2 Z-scores*	< -2 Z-scores*	> +2 Z-scores
Kuwait Nutrition Surveillance System, Jan-Dec. 1996-97 (MOH, 1998)	**Total**	0-4.99	M/F	12 376	3.2	1.2	1.7	5.7
	Sex							
		0-4.99	M	6 163	3.7	1.3	1.8	4.7
		0-4.99	F	6 213	2.7	1.1	1.6	6.7
	Age							
		0-0.49	M/F	2 291	2.9	0.4	0.5	6.3
		0.5-0.99	M/F	1 390	5.2	0.7	1.4	8.9
		1-1.99	M/F	1 961	7.3	1.1	2.1	9.8
		2-2.99	M/F	2 406	1.4	2.2	2.3	3.3
		3-3.99	M/F	1 697	2.1	1.2	1.9	3.4
		4-4.99	M/F	2 631	1.8	1.4	2.0	4.1
	Region							
	Capital	0-4.99	M/F	2 865	2.2	1.1	1.6	5.0
	Hawalli **	0-4.99	M/F	3 343	2.4	1.5	1.9	5.1
	Farwania	0-4.99	M/F	1 862	2.0	1.2	1.6	4.9
	Al-Ahmadi	0-4.99	M/F	2 624	5.7	1.4	2.5	5.8
	Al-Jahra	0-4.99	M/F	1 682	4.0	0.6	0.6	8.9

* Category <-2 Z-scores includes <-3 Z-scores. NCHS reference (WHO, 1983). ** incl. Mubarak Al-Kabeer

Data from the KNS for 1996-97 and for 2004 show that there is virtually no wasting, nor underweight, among Kuwaiti pre-school children (MOH, 1998; MOH, 2004). Because the definition of prevalence of undernutrition based on anthropometry is statistical, it implies that a percentage of 2.5% of children with an index less than -2 Z-scores of the reference indicates that there is no undernutrition at population level, thus the prevalence of stunting (which was already very low (3%) in 1996-97), became negligible in 2004. On the other hand, prevalence of obesity remained high (6%), and peaked between 6 and 23 months. Although the age range of the sample is not exactly the same in the two surveys, it appears that prevalence of overweight in the underfives remained stable between 1996-97 and 2004.

A study done on obesity among Kuwaiti children aged 3-5 years showed that the following factors were significantly associated with overweight and obesity: gender, age, parents' education, birth order, meal frequency and socio economic status. The study concluded that ecological factors play an important role in the development of overweight and obesity (Al-Isa and Moussa, 1999).

Anthropometry of school-age children

Table 15: Anthropometry of school-age children

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition			
					Percentage of children with			
					Stunting Height-for-age	Wasting Weight-for-height	Underweight Weight-for-age	Overweight Weight-for-height
					< -2 Z-scores[1]	< -2 Z-scores[1]	< -2 Z-scores[1]	> +2 Z-scores
Kuwait Nutrition Surveillance System, Jan-Dec. 2004 (MOH, 2004)	**Total**	5-9.99	M/F	5 047	2.4	2.0	2.3	13.1
	Sex							
		5-9.99	M	2 522	3.2	2.1	3.1	12.3
		5-9.99	F	2 525	1.7	2.0	1.5	14.0
	Age							
		5-5.99	M/F	578	3.5	4.0	1.9	8.7
		6-6.99	M/F	1 053	2.8	1.2	2.9	10.4
		7-7.99	M/F	1 148	1.8	2.1	2.5	11.2
		8-8.99	M/F	1 177	2.1	1.5	2.4	17.8
		9-9.99	M/F	1 091	2.5	1.4	1.7	15.5
	Region							
	Capital	5-9.99	M/F	814	1.4	4.1	1.7	17.6
	Hawalli	5-9.99	M/F	874	2.6	1.8	1.7	14.3
	Farwania	5-9.99	M/F	835	2.2	2.0	2.8	11.1
	Al-Ahmadi	5-9.99	M/F	860	3.1	1.5	3.1	10.5
	Al-Jahra	5-9.99	M/F	842	3.1	1.5	2.5	13.9
	Mubarak Al-Kabeer	5-9.99	M/F	822	2.2	1.3	2.2	11.6

[1] Category <-2 Z-scores includes <-3 Z-scores

As with preschool children, data from the KNS for 2004 indicate that there is no undernutrition among school-age children in Kuwait. However, the prevalence of overweight is very high (13 %). It increases with age and is slightly higher among girls (14 %) than among boys (12 %).

Anthropometry of adolescents

Table 16: Anthropometry of adolescents

Name/date of survey (month and year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	**Anthropometry of adolescents**	
					Percentage of adolescents with	
					Body Mass Index (kg/m^2) BMI-for-age	
					Overweight *	Obese *
Kuwait Nutrition Surveillance System, Jan-Dec. 2004 (MOH, 2004)	**Total**	10-13.99	M/F	2 000	22.6	17.3
		14-19.99	M/F	2 953	22.0	21.3
	Sex					
		10-13.99	M	991	22.7	16.8
		10-13.99	F	1 009	22.5	17.7
		14-19.99	M	1 563	20.2	23.7
		14-19.99	F	1 390	24.0	18.6
	Age					
		10-10.99	M/F	631	18.4	12.4
		11-11.99	M/F	459	20.5	16.8
		12-12.99	M/F	454	30.6	16.7
		13-13.99	M/F	456	22.6	25.0
		14-14.99	M/F	493	23.7	17.8
		15-15.99	M/F	671	23.0	19.2
		16-16.99	M/F	643	19.9	22.2
		17-17.99	M/F	621	21.3	25.0
		18-18.99	M/F	362	23.5	22.9
		19-19.99	M/F	163	20.2	19.0
	Region					
	Capital	10-13.99	M/F	302	22.5	16.6
		14-19.99	M/F	694	21.5	20.6
	Hawalli	10-13.99	M/F	321	27.4	19.3
		14-19.99	M/F	528	20.3	28.8
	Farwania	10-13.99	M/F	344	25.6	23.0
		14-19.99	M/F	416	21.4	21.2
	Al-Ahmadi	10-13.99	M/F	385	17.7	15.9
		14-19.99	M/F	447	24.2	18.8
	Al-Jahra	10-13.99	M/F	318	19.8	13.5
		14-19.99	M/F	409	23.2	17.6
	Mubarak Al-Kabeer	10-13.99	M/F	330	23.3	15.2
		14-19.99	M/F	459	22.0	19.6

* as defined in "Establishing a standard definition for child overweight and obesity worldwide" (Cole et al., 2000)

The KNS presents the prevalence of overweight and obesity based on a reference that is slightly different from that of WHO (WHO, 1995; Cole et al, 2000); nevertheless prevalence estimates are roughly comparable to those estimated with WHO cut-off points.

The prevalence of overweight and obesity is very high among adolescents. In the age group 10-13 years, 23 % of boys and girls are overweight and 17% are obese. In the age group 14-19 years, 20 % of boys are overweight and 24 % are obese, whereas 24% of girls are overweight and 19 % are obese. Prevalence of overweight and obesity are very high in both the age group 10-13 years and 14-20 years. Approximately 40% of adolescents are either overweight or obese.

The prevalence of obesity among adolescents in Kuwait increases with age. Overall there are no differences by gender. Data on physical activity among adolescents are not available. The comparison of BMI-for-age data for adolescent girls in three Middle Eastern countries (Egypt, Kuwait, and Lebanon) showed that the highest rates of overweight and obesity were found among the Kuwaiti girls (Jackson and Pellet, 2004).

Undernutrition does not constitute a public health problem in Kuwait. However, nutrition problems associated with affluence such as obesity, diabetes, hypertension, heart disease are highly prevalent.

The combination of high income, abundant food supply, easy access to energy-dense foods, and declining physical activity are probably responsible for the high prevalence of overweight and obesity in Kuwaiti school children and adolescents. It would be highly recommendable to establish an obesity prevention programme among all segments of the Kuwaiti population.

The results of studies conducted between the 80's and the mid-90's showed that the prevalence of overweight and obesity have increased among Kuwaitis (adults aged > or = 18 years), probably due to the effects of modernization, affluence, increased food consumption and sedentary lifestyles (Al-Isa, 1997). More recently it was shown that BMI and obesity rates are increasing rapidly in Kuwait (Al-Isa, 2004; Al-Isa, 2003).

Data on obesity for non-Kuwaitis are not available.

Anthropometry of adult women

Table 17: Anthropometry of adult women

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	**Anthropometry of adult women**								
			Height			Body Mass Index[1] (kg/m²) (BMI)					
								Percentage of women with BMI			
			Sample size	Mean (cm)	Percent of women with height < 145cm	Sample size	Mean (kg/m²)	<18.5 (chronic energy deficiency)	18.5-24.9 (normal)	25.0-29.9 (overweight)	≥30.0 (obesity)
Kuwait Nutrition Surveillance System, Jan-Dec. 2004 (MOH, 2004)	**Total**	20-60+	1 778	157.1	1.5	1 778	30.4	1.2	18.2	32.6	48.0
	Age										
		20-29.99	534	158.2	0.7	534	27.4	2.8	35.8	35.8	25.6
		30-39.99	526	158.0	0.2	526	30.4	0.4	16.0	38.0	45.7
		40-49.99	394	156.9	2.0	394	32.0	0.8	9.6	26.1	63.2
		50-59.99	234	154.9	3.4	234	33.3	0.4	3.0	24.8	71.8
		60+	90	152.3	6.7	90	33.4	0.0	4.4	30.0	65.5
Prevalence of coronary risk factors in healthy adult Kuwaitis 1998-2000 (Jackson et al., 2001)	**Total**	13-72	n.a.	n.a.	n.a.	5 052	27.7	2.3	35.0	32.8	29.9

The KNS monitors the prevalence of coronary risk factors among healthy adult Kuwaitis who attend the Kuwait Medical Council (MC) for medical checkups before beginning government service, and among elderly people who attend the Public Authority for Social Security (PASS) to obtain pension money. In 2004, the results of this surveillance system revealed that almost half of Kuwaiti women were obese (BMI≥30 kg/m²) and that 5 % were severely obese (BMI>40 kg/m²).

Altogether approximately 80% of Kuwaiti women are affected by overnutrition (overweight and obesity). The prevalence of obesity increases sharply from the age of 30 years. Although the sample is not representative of the entire population, the results are alarming. Moreover, the comparison of these results with those of a study of 1998-2000 points to a significant increase in the prevalence of obesity, indicating that actions are urgently needed to reduce obesity and associated pathology (MOH, 2004; Jackson et al., 2001).

Anthropometry of adult men

Table 18: Anthropometry of adult men

Name and date of survey (month/year) (References)	Background characteristics	Age (years)	Sample size	Anthropometry of adult men				
				Body Mass Index (kg/m²) (BMI)				
				Mean	Percentage of men with BMI			
					<18.5 (chronic energy deficiency)	18.5-24.9 (normal)	25.0-29.9 (overweight)	≥30.0 (obesity)
Kuwait Nutrition Surveillance System, Jan-Dec. 2004 (MOH, 2004)	**Total**	20-60+	1 226	28.6	2.3	22.4	39.9	35.4
	Age							
		20-29.99	332	n.a.	5.4	31.3	37.7	25.6
		30-39.99	392	n.a.	0.8	22.7	41.3	35.2
		40-49.99	246	n.a.	1.6	15.4	39.0	43.9
		50-59.99	148	n.a.	1.4	15.5	35.8	47.3
		60+	108	n.a.	0.9	19.4	49.1	30.6
Prevalence of coronary risk factors in healthy adult Kuwaitis 1998-2000 (Jackson et al., 2001)	**Total**	13-80	4 679	27.5	2.7	31.5	38.3	27.6

n.a.: data not available

As for women, overweight and obesity are highly prevalent among Kuwaiti men. However, the prevalence of overweight is higher among men than among women, while the prevalence of obesity is somewhat lower among men. The prevalence of obesity increases slightly with age, but this increase is less significant among men than it is among women.

Although data are lacking to assess trends in the prevalence of overweight and obesity, it is clear that a major obesity epidemic is affecting Kuwait. Prevalence among women is one of the highest in the world. High rates of overnutrition in school-age children and adolescents also indicate that the epidemic will affect future generations as well.

II.6 Micronutrient deficiencies

Kuwait is one of the richest countries in the world yet micronutrient malnutrition persists alongside overnutrition.

Iodine deficiency disorders (IDD)

Prevalence of goitre and urinary iodine level
Very few studies have investigated the prevalence of goitre and the level of urinary iodine. According to WHO, iodine nutrition is optimal in Kuwait (WHO, 2004).

Iodization of salt at household level
Kuwait implements the WHO recommendations for salt iodization since 1996: all table salt (imported or local) should be iodized with a concentration of 80 ppm.

In practice, table salt is fortified but non-iodized salt is also available in the market. There are no routine checks to identify the iodine content of table salt available in local markets.

Vitamin A deficiency (VAD)

Prevalence of sub-clinical and clinical vitamin A deficiency
Very little is known about vitamin A status of the Kuwaiti population. However, the high intake of animal foods makes vitamin A deficiency unlikely. The absence of reports by physicians of clinical signs of vitamin A deficiency suggests that the deficiency is either at sub-clinical level or does not exist at all. The KNS surveys initiated in August 2006 should provide new data to investigate this problem.

Iron deficiency anemia (IDA)

Nutritional anemia has been documented in various segments of the population over the last 20 years. Environmental factors (aridity, paucity of vegetation and of water bodies) and public health measures instituted by the government have contributed to the elimination of the most common parasites that usually cause anemia. Surveys suggest that iron deficiency is the most likely cause of anemia in Kuwait (Jackson and Al-Mousa, 2000; Jackson et al., 1999 and Jackson, 1999).

Prevalence of IDA

Iron deficiency anemia is a public health problem. Women of child-bearing age (particularly pregnant women), young children, school-age children and adolescents are the most affected.

In the 90's, studies showed that iron deficiency anemia was prevalent among Kuwaiti children (Jackson et al., 2003; Eid et al., 1986; Mostafa and Nuyayahed, 1979), adolescent girls (Jackson and Al-Mousa, 2000) and women of childbearing age (Al-Awadi et al., 1976; Dawood et al., 1990; Al-Awadi et al., 1997). As shown in Tables 19 and 20, more recent data indicate that anemia persists in these groups.

Table 19: Prevalence of anemia in preschool children

Survey name/date (Reference)	Background characteristics	Age (months)	Sex	Sample size	Percentage of children with	
					Any anemia (Hb<11.0 g/dL)	Severe anemia (Hb<7.0 g/dL)
Kuwait Nutrition Surveillance System, Jan-Dec. 2004 (MOH, 2004)	**Total**	6-59	M/F	3 605	25.3	0.1
	Sex					
		6-59	M	1 837	24.8	0.1
		6-59	F	1 768	25.8	0.0
	Age					
		6-11	M/F	506	34.6	n.a.
		12-23	M/F	709	31.7	n.a.
		24-35	M/F	697	24.1	n.a.
		36-47	M/F	900	23.8	n.a.
		48-59	M/F	793	16.4	n.a.

Hb: Hemoglobin.
n.a.: data not available

Data from the KNS for the year 2004 showed that 25 % of preschool children were anemic (MOH, 2004). Prevalence was especially high in children under 24 months.

Table 20: Prevalence of anemia in school children and adolescents

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Sample size	Percentage of children with	
					Any anemia*	Severe anemia (Hb<7.0 g/dL)
Kuwait Nutrition Surveillance System, Jan-Dec. 2004 (MOH, 2004)	**Total**	5-9.99	M/F	5 047	19.0	0.0
		10-13.99	M/F	2 000	14.3	0.1
		14-19.99	M/F	2 953	18.8	0.1
	Sex					
		5-9.99	M	2 522	17.7	0.0
		5-9.99	F	2 525	20.3	0.0
		10-13.99	M	991	15.7	0.0
		10-13.99	F	1 009	12.8	0.1
		14-19.99	M	1 563	18.0	0.1
		14-19.99	F	1 390	19.6	0.1

Hb: Hemoglobin. * Cut points are: Hb<11.5g/dl for children 5-11 years, Hb<12g/dl for children 12-14 years and adolescent females, Hb<13g/dl for adolescent males

Prevalence is high both in school-age children and adolescents (MOH, 2004). There is no difference in prevalence by gender even after the usual age of menarche. Prevalence is unusually high among adolescent boys, a group that is usually not at high risk of iron deficiency. In the absence of information on sampling of subjects in these studies, it is difficult to evaluate the true extent of the problem of anemia and the causes of anemia need to be further investigated.

Table 21: Prevalence of anemia in women of childbearing age

Survey name/date (Reference)	Background characteristics	Age (years)	Sample size	Percentage of women with	
				Any anemia (pregnant women Hb<11.0 g/dL; nonpregnant women Hb<12.0 g/dL)	Severe anemia (all women Hb<7.0 g/dL)
Kuwait Nutrition Surveillance System, Jan-Dec. 2004 (MOH, 2004)	**Total**	20-60+	1 778	28.3	0.1
	Age				
		20-29	534	26.8	0.0
		30-39	526	26.8	0.0
		40-49	394	32.5	0.0
		50-59	234	20.1	0.4
		60+	90	8.9	0.0

Hb: Hemoglobin.

The 2004 KNS survey among 1778 Kuwaiti women and 1226 Kuwaiti men between 20 and 60 years revealed a prevalence of anemia of 28 % among women and 4% among men (Hb<13.0 g/dL) (MOH, 2004). Among women, prevalence was high during the child-bearing age while it was much lower after the age of menopause. Data are not available for non-Kuwaitis.

Interventions to combat IDA

The Ministry of Health is already giving iron and folic acid supplements to all pregnant women during their antenatal visits. A pilot project was implemented with preventive weekly iron and folic acid supplementation for adolescent girls and the results were very promising (Jackson et al., 2003).

Wheat flour is fortified with iron, folic acid, thiamin, riboflavin and niacin since 2001 in order to reduce the prevalence of anemia among the population. An impact assessment has not yet been carried out.

Other micronutrient deficiencies

Vitamin D deficiency may be a problem in Kuwait. A study was conducted among 103 children with rickets and 102 control children matched for age and socio-ethnic characteristics recruited over a 2 year period (Jan. 1995-1997) in Al-Adan Hospital in Kuwait. It showed that nutritional rickets have multiple causes, in particular lack of exposure to sunlight and inadequate infant feeding practices. Maternal education could help prevent vitamin D deficiency in children (Majid Molla et al., 2000).

II.7 Policies and programmes aiming to improve nutrition and food security

Rice, flour, pita bread, sugar, milk powder, oil, lentils, tomato paste, breastmilk substitutes and baby foods are subsidized by the Kuwaiti government. Given the overwhelming obesity epidemic that is affecting the country, the rationale for subsidizing foods such as breastmilk substitutes, oil and sugar should be questioned.

Fortification and supplementation interventions
Flour used for production of bread, biscuits, pasta etc. is fortified with iron and vitamin B, whereas table salt is regularly iodized since 1996. Iron and folic acid supplementation are provided to all pregnant women in antenatal clinics.

Nutrition Surveillance System
Kuwait has established a nation-wide Nutrition Surveillance system running since 1995. It was established by the Nutrition Unit of the Ministry of Health, following consultation provided through WHO/EMRO. It is now run by the Community Nutrition Supervisory of the Food and Nutrition Administration of the Ministry of Health.

The purpose of the Kuwait Nutrition Surveillance System is to provide information on the nutritional status of the Kuwaiti population and in particular to assess trends of nutrition-related disorders such as anemia and obesity. These data are useful to both health professionals who manage public health programmes and for policy makers.

Initially, the sample consisted mainly of preschool children but within two years the sample was extended to all age groups from two months to more than 65 years. The system is designed as a sentinel surveillance system. Data on selected nutritional status indicators are collected annually by the Community Nutrition Supervisory staff available at selected health clinics serving all Kuwait governorates. Data are analyzed, recorded and compiled annually and reports are sent to the Ministry of Health[1].

Nutrition Education
The Nutrition Education Department is responsible for promoting and advocating for healthy diets and lifestyles. The department organizes campaigns, lectures and workshops providing basic nutrition education, and publishes brochures, booklets, posters and flyers on topics related to nutrition taking into account local habits of children and adults.

Breastfeeding Promotion
In 1985, breastfeeding promotion and adoption of the International Code of Marketing of Breastmilk Substitutes were implemented. In 1995, the Nutrition Unit was assigned as supervisor for the implementation of the Code. In 1997, a circular to ban direct donation of Breastmilk Substitutes to mothers or maternity services' staff was introduced. In 1998, the National Policy on Breastfeeding & the Ten Steps to Successful Breastfeeding started to be implemented.

Promotion of breastfeeding activities in Kuwait comprise:
- Various education and training courses on breastfeeding for hospital administration and medical staff, mothers, pregnant women, school children etc.
- Breastfeeding promotion through the media.

Food Safety
Kuwait recognizes the need for effective and efficient food control for the protection of public health. Food laws, regulations and standards are monitored by the Ministries of Commerce, Industry and Health, by Kuwait Municipalities, by the Public Authority for Agriculture and Fish Resources and by the Kuwait Institute for Scientific Research.

[3] Data on pre-school children and school children are collected from selected schools and kindergartens from all 6 governorates. For the age group under five years, data are collected on socio-demographic variables, anthropometric indices, iron status (hemoglobin) and infant feeding practices. For the school age children and adolescents from 6 to 18 years, data are collected on anthropometry and hemoglobin. Data on working young adults are collected through the Medical Council (where persons undergo medical screening for employment). Information includes hemoglobin, blood glucose, and cholesterol levels. Data on elderly retired persons are collected through the Public Authority for Social Security

The government of Kuwait implements several policies and programmes to combat the current nutrition problems. Nevertheless, the magnitude of the obesity epidemic calls for more vigorous measures, including innovative ways of promoting or encouraging healthy diets and measures to increase children and women's physical activity.

Reference list

Abdella, N.A., Khogali, M.M., Salman, A.D., Ghuneime, S.A. & Bajaj, J.S. 1995. Patterns of non-insulin dependent diabetes mellitus in Kuwait. *Diabetes Res. Clin. Pract.*, 29(2):129-136.

Abdella, N., Al Nakhi, A., Al Arouj, M., Al Assoussi, A. & Moussa M. 1999. Impact of the 1997 American Dietetic Association criteria on classification of glucose intolerance among Kuwaitis below 50 years of age. *Acta Diabetol.,* 36(3):133-140.

Afifi, Z., Al-Moussa, Z. & Al-Jeeran, L. 1996. Feeding practices of infants in Kuwait: Methods and interrelationships. *J. Kuwait Med. Assoc.,* 28(3):268-273.

Akanji, A.O. 2002. Diabetic dyslipidaemia in Kuwait. *Med. Princ. Pract.,* 11(Suppl. 2):47-55.

Alwan, A. & King, H. 1992. Diabetes in Eastern Mediterranean region. *World Health Stat.Q.*, 45(4):355-359.

Al-Awadi, F.A. & Amine, E.K. 1997. Recent trends in infant feeding patterns and weaning practices in Kuwait. *Eastern Mediterranean Health Journal,* 3(3):501–510. (Available at http://www.emro.who.int/Publications/emhj/0303/13.htm)

Al-Awadi, F., Amine, E. & Gaulan, Z.. 1997. *Food consumption and dietary habits in Kuwait*. Food and Nutrition Administration, Ministry of Health, Kuwait.

Al-Awadi, F., Nowaid, H., Kholi, K., & Hassan, S. 1976. *Nutritional status of Kuwaiti pregnant women*. Food and Nutrition Administration, Ministry of Health, Kuwait.

Al-Isa, **A.N.** 2004. Body mass index, overweight and obesity among Kuwaiti intermediate school adolescents aged 10-14 years. *Eur. J. Clin. Nutr.,* 58(9):1273-1277.

Al-Isa, A.N. 2003. Are Kuwaitis getting fatter? *Nutr. Health*., 17(3):185-197.

Al-Isa, A.N. 1997. Changes in Body Mass Index and Prevalence of Obesity among Kuwaitis 1980-1994. *Int. J. Obes. Relat. Metab. Disord*., 21(12):1093-1099.

Al-Isa, A.N. & Moussa, M.A.A. 1999. Factors associated with overweight and obesity among Kuwaiti kindergarten children aged 3-5 years. *Nutr. Health*., 13(3):125-139.

Al-Mousa, Z. 1996. Nutrition related chronic diseases in Kuwait. *In* Musaiger A.O., Miladi S., eds. *Diet-related non-communicable disease in the Arab countries of the Gulf*. United Arab Emirates, United Arab Emirates University and the Food and Agriculture Organization.

Cole, T.J., Bellizzi, M.C., Flegal, K.M. & Dietz, W.H. 2000. Establishing a standard definition for child overweight and obesity worldwide: international survey. *Br. Med. J.,* 320(7244):1240-1243. (available at: http://bmj.bmjjournals.com/cgi/content/abridged/320/7244/1240)

Dawood, J. S., Prakash, P. & Shubber, K. M. 1990. Iron deficiency anemia among pregnant Arab women. *J. Kuwait Med. Assoc.*, 24:167-172.

Dehghan, M., Al Hamad, N., Yusufali, A.H., Nusrath, F., Yusuf, S. & Merchant, A.T. 2005. Development of a semi-quantitative food frequency questionnaire for use in United Arab Emirates and Kuwait based on local foods. *Nutrition Journal*, 4:18. (available at: http://www.nutritionj.com/content/4/1/18)

Eid, N., Al-Hooti, S., Bourisly, N. & Khalafawi, M. 1986. Anemia in school children: a preliminary study. *J. Kuwait Med. Assoc.,* 20:39-43.

Emara, M.K., Saadah, A., Hassan, M., Moussa, M. & Hourani, H. 1989. Pattern of obesity and insulin, glucagon, sex hormone binding globulin and lipids in obese Arab women. *Diabetes Res.,* 10(4):175-181.

FAO. 2005. *The State of Food Insecurity in the World (SOFI), 2005*. Food and Agriculture Organization of the United Nations. Rome.
(available at http://www.fao.org/sof/sofi/index_en.htm).

FAO. 2004. *Human energy requirements*. Report of a Joint FAO/WHO/UNU Expert Consultation, Rome, 17-24 October 2001. FAO Food and Nutrition Technical Report Series No. 1. Rome.

FAO. *FAOSTAT Database*. Food and Agriculture Organization of the United Nations. Rome.
(available at http://faostat.external.fao.org/faostat).
Accessed in 2006.

FAO. *Forestry Division*. Country Profiles. Food and Agriculture Organization of the United Nations. Rome. (available at
http://www.fao.org/forestry/foris/webview/forestry2/index.jsp?sitetreeId=18927&langId=1&geoId=0).
Accessed in 2006.

FAO. *Statistics Division. Database on Major Food and Agricultural Commodities and Producers: commodities by country*. Food and Agriculture Organization of the United Nations. Rome.
(available at http://www.fao.org/es/ess/top/country.jsp).
Accessed in 2006.

ITU. *World Telecommunication Indicators Database*. (available at http://www.itu.int/ITU-D/ict/statistics/).
Accessed in 2006.

Jackson, R.T. 1999. Short term consultancy for Community Nutrition Unit, Ministry of Health, Kuwait. November 12th-26th, 1999.

Jackson, R.T. & Al-Mousa, Z. 2000. Iron deficiency is a more important cause of anemia than hemoglobinopathies in Kuwaiti adolescent girls. *J.Nutr.*, 130(5):1212-1216.
(available at: http://jn.nutrition.org/cgi/content/abstract/130/5/1212)

Jackson, R.T., Al-Mousa, Z., Adekile, A.D., Mughal, H.A. & Nkansa-Dwamena, D.K. 1999. The prevalence and etiology of anemia in Kuwaiti preschoolers and adolescents. *J. Kuwait Med. Assoc.,* 31(1):33-39.

Jackson, R.T., Al-Mousa, Z., Al-Raqua, M. & Prakash, P. 2003. Effect of Short-Term Weekly Iron and Folic Acid Supplementation on Anemia and Symptoms in Adolescent Kuwaiti girls. *J. Kuwait Med. Assoc.,* 35(4):275-280.
(available at: www.kma.org.kw/KMJ/Issues/dec2003/Original%20articles/Effect%20of%20Short-Term.pdf)

Jackson, R.T., Al-Mousa, Z., Al-Raqua, M., Prakash, P & Muhanna A. 2001. Prevalence of coronary risk factors in healthy adult Kuwaitis. *Int. J. Food Sci. Nutr.,* 52(4):301-311.

Jackson, R.. & Pellet, P. 2004. Introductory observations: the region, nutrition and health. *Ecology of Food and Nutrition*, 43(1-2):3-16.

Majid Molla, A., **Badawi, M.H.**, **Al-Yaish, S.**, **Sharma, P.**, **El-Salam, R.S. & Molla, A.M**. 2000. Risk factors for nutritional rickets among children in Kuwait. *Pediatr. Int.*, 42(3):280-284. (available at:
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10881586&dopt=Citation)

MOH. 2004. *Kuwait Nutrition Surveillance (2001-2004)*, Food and Nutrition Administration, Ministry of Health, Kuwait.

MOH. 2003. *Health Kuwait, 2003, Edition 40*. Health and Vital Statistic Division, Ministry of Health, State of Kuwait.

MOH. 2002. *Kuwait Cancer Registry. Annual Report, 2002*. Ministry of Health, State of Kuwait.

MOH. 1998. Kuwait national nutritional surveillance system, 1996-1997. Nutrition unit, Ministry of Health. Al Shaab, Kuwait (and additional analysis).

MOH. 1996. *Kuwait Family Health Survey, 1996*. Ministry of Health, State of Kuwait.

MOP. 2004a. *Annual Statistical Abstract, 2004, Edition 41*. Ministry of Planning, Statistical and Information Sector, State of Kuwait. March 2004.

MOP. 2004b. *Annual Statistical Abstract, 2004. Edition 37*, Ministry of Planning, State of Kuwait

Mostafa, S.A. & Nuyayahed, H.Y. 1979. *Nutritional Status assessment among pre-school children*. Nutrition Unit, Ministry of Health, Kuwait.

Shaltout, A.A., Moussa, M.A.A., Qabazard, M., Abdella, N., Karvonen, M., Al-Khawari, M., Al-Arouj, M., Al-Nakhi, A., Tuomilehto, J., El-Gammal, A. & Kuwait Diabetes Study Group. 2002. Further evidence for the rising incidence of childhood Type 1 diabetes in Kuwait. *Diabet. Med.,* 19(6):522-525. (available at: http://www.blackwell-synergy.com/doi/abs/10.1046/j.1464-5491.2002.00703.x?journalCode=dme)

UNDP. 2004. *Human Development Report 2004*. New York. (available at http://hdr.undp.org/reports/global/2004/).

UNESCO. 2004. *Global Education Digest 2004*. Unesco Institute for Statistics, Montreal, 2004. (available at http://www.uis.unesco.org)

UNICEF. 2005. *The State of the World's Children 2005.* New York. (available at http://www.unicef.org/publications/index_24432.html).

UNICEF. Statistics databases. (available at http://www.unicef.org/statistics). Accessed in 2006.

UNSTAT. *Millennium Indicators Database*. (available at http://unstats.un.org/unsd/mi/mi_goals.asp). Accessed in 2006.

WFP. 2005. *The 2004 Food Aid Flows. The Food Aid Monitor - May 2005*. International Food Aid Information System of the World Food Programme. World Food Programme of the United Nations. Rome. (available at http://www.wfp.org/interfais/index2.htm#)

World Bank. *World Development Indicators Database*. (available at http://devdata.worldbank.org/data-query). Accessed in 2006.

WHO. 2004. *Iodine status worldwide*: *WHO Global Database on Iodine Deficiency.* Department of Nutrition for Health and Development, World Health Organization of the United Nations, Geneva. (available at http://www3.who.int/whosis/menu.cfm?path=whosis,mn&language=english)

WHO. 1995. *Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee*. Technical Report Series No. 854. World Health Organization of the United Nations, Geneva. (available at http://www.who.int/childgrowth/publications/physical_status/en/index.html)

WHO/FAO. 2003. *Diet, Nutrition and the Prevention of Chronic Diseases*. WHO Technical Report Series 916. Report of a Joint WHO/FAO Expert Consultation, Food and Agriculture Organization and World Health Organization of the United Nations, Geneva. (available at http://www.fao.org/docrep/005/AC911E/AC911E00.HTM)