

## Food Consumption Patterns and Nutrition Situation in the Arab Countries

Samir S. Miladi, PhD\*  
Abdulrahman O. MUSAIGER, DrPH\*\*

Since ancient time the traditional diet of the region was basically a mixture of wheat and legumes. Fruit and vegetables were also commonly consumed. However, the rapid changes in lifestyle during the past three decades have led to great changes in food and nutrition status in the Arab countries. The average per caput energy intake increased by 30% and fat intake by 45%. The largest increases in food consumption were seen in sugar, fat and oil, red meat and poultry. Consequently the trend of diet-related diseases has changed. The prevalence of diabetes, heart disease, hypertension, cancer and obesity has increased dramatically, especially in the Arab Gulf countries, Jordan, Tunisia, Egypt and Lebanon. At the same time micronutrient deficiencies such as iron-deficiency anaemia, iodine deficiency disorders and vitamin D deficiency are common in most Arab countries. A plan of action for prevention and control of nutritional problems in these countries is highly recommended.

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### Food Consumption Patterns

Studies on food consumption, particularly on dietary intake in the Arab countries are lacking. Reviewing the food availability and food consumption patterns in the Region is a difficult task due to the large socio-economic, geographical and cultural differences among countries, as well as due to insufficient and nonrelevant statistical data. The current review on trends in food consumption depends on FAO Food Balance sheets which show total availability per commodity. It is well known that Food Balance sheets do not show the differences that may exist in the diets consumed by different socio-economic groups, ecological zones and geographical areas within a country, neither do they provide information on seasonal variation in food availability.

Using two relevant indicators, per caput GNP and Daily Energy Supply (DES), derived from FAO Food Balance Sheets, the Arab Region can be divided into three major groups of countries as follows<sup>1</sup>:

1. High-income countries with GNP/caput above US \$6000 and DES above 3000 kcal/caput/day. This group included petroleum exporting countries: Libya, Saudi Arabia, Kuwait, the United Arab Emirates (UAE), Qatar, Bahrain and Oman.
2. Middle income countries with GNP/caput between US \$600 and US \$3000 and DES between 2700 and 3300 kcal/caput. This group includes Algeria, Egypt, Iraq, Iran, Jordan, Lebanon, Morocco, Syria and Tunisia.
3. Low-income countries with GNP/caput below US \$600 and DES between 2000 and 2300 kcal/caput. This group includes Djibouti, Mauritania, Somalia, Sudan and Yemen.

The petroleum-exporting countries which are comparatively sparsely populated have an average daily energy supply (DES) exceeding 3000kcal/caput. Cereal consumption seems to have reached a ceiling, with a contribution to the calorie supply of 35% to 40%. Sugar consumption is rising despite its already very high level (30 to 40 kg per caput per annum) and its contribution to the calorie supply of about 10% to 15%. The same trend may be seen for oils and fats, with consumption around 30 kg per caput per annum and contribution to calorie supply of 30%. Consumption levels of animal products are high, comparable to those in industrialized countries: 60 to 70 kg of meat, 150 to 180 kg of milk and 8 to 12 kg of eggs per person per annum.

The average per caput calorie supply in the middle-income countries as a whole is between 2700 and 3300 kcal. Cereals contribute more than half the calorie supply and are at present around 200 kg per caput per annum. Wheat is by far the most popular cereal in these countries where, in many circumstances, it is largely imported and heavily subsidized.

Wheat is being supplemented by rice in Jordan, Iraq and Egypt and by barley in Morocco despite its rapid rise in consumption. Only in Egypt is there still substantial direct consumption of maize (58 kg/caput/year). Sugar consumption has also risen considerably to reach an average level of 30 to 40 kg per person per year. Similarly, vegetable oil consumption (12 to 15 kg) has increased two-fold or more between 1972-74 and 1984-86 in several countries (Algeria, Lebanon and Egypt). Sugar, oils and fats contribute 20% to 30% of calorie intake. Consumption of animal products is also rising and is reaching the level of 20 kg for meat and 60 to 100 kg for milk per person per year. Their contribution

\* Food and Agriculture Organization  
Regional Office for Near East  
Cairo, Egypt

\*\* Director  
Environmental and Biological Programme  
Bahrain Centre for Studies and Research  
State of Bahrain

to calorie intake is around 10% and they supply 20% to 30% of the total protein in the diet. Fruit and vegetable consumption has also risen appreciably in almost all countries of this group. In the major consumer countries such as Syria, Lebanon, Iraq, Tunisia and Egypt, the per capita consumption is 200 to 300 kg of fruit and vegetables per year while in other countries such as Algeria and Morocco consumption is far more modest (less than 199 kg/caput/year).

In summary, the diet in the intermediate countries is being diversified, with a sufficient calorie intake to cover the energy requirement of most of the population but it is actually undergoing structural changes towards higher consumption of sugar, fats and animal products<sup>1,2</sup>.

The main feature of the diet in low-income countries is the insufficient supply of calories 2000 to 2300 kcal/person/day with cereals and roots and tubers contributing 60% to 80% of total calorie supply. Wheat in Yemen, sorghum in the Sudan, and a mixture of several cereals in Mauritania (wheat, rice and millet) and in Somalia (wheat, rice and sorghum) constitute the main staple foods. In quantitative terms, cereals supplies are a little more than 100kg per person per year in Somalia and the Sudan whereas in other countries it is higher and ranges from 160 to 180 kg. Per caput sugar supply is also rising and attain 20 to 25 kg per year and vegetable oils are levelling at 8 to 10 kg with the two combined contributing 15% to 25% of total calorie intake, a figure significantly different from the intermediate countries (20% to 30%) and the high-income countries (40% to 50%).

Protein supply is 60 to 70 g per person per day with the exception of Mauritania, a traditional consumer of fish, milk and meat and where per caput protein supply is 96 g per day. About 60% to 80% of proteins in the other countries are of plant origin, contributed mainly by cereals. In summary, the diet in low-income countries is insufficient in calories. It is little diversified, traditionally cereal-based with insufficient fruit and vegetable intake, and with cereals contributing 60% to 80% of total calorie and protein intake<sup>1</sup>.

## NUTRITION SITUATION

### Protein-Energy Malnutrition (PEM)

Comprehensive nutritional surveys have been carried out in some countries of the Region. However, adhoc surveys have been conducted in most of countries. Findings of these surveys revealed that PEM is a problem of concern in infants and young children in the Arab countries. Nevertheless, the magnitude of the problem varies from country to another. In general, the prevalence of undernutrition among infant and young children is very low in Kuwait, low in most Gulf states, relatively high in middle-income countries and very high in Sudan, Yemen and Djibouti.

Moderate and severe underweight (weight-for-age) is highly prevalent in Sudan and Yemen (20%-40%). Weight for age is more sensitive to any deterioration or improvement in the health of the child. Change in weight is also a very rapid indicator since it can take place in a matter of a few days. Excluding the low income countries, the prevalence of wasting is low in most Arab countries (2%-3%). Wasting (weight-for-height) is more specific to the child's degree of thinness than the measurement of weight for age, which does not distinguish between a tall thin child and a short fat one. Stunting (height-for-age) is more prevalent compared

to underweight and wasting, 12%-50%. Stunting is a stable measure that reflects the total increase in size of the child up to the moment that it is determined, and therefore the child's total previous health history<sup>3</sup>.

### Micronutrient Deficiencies

Micronutrient deficiencies are amongst the most common nutritional problems worldwide. The common micronutrient deficiencies of public health significance are iron deficiency anaemia, iodine deficiency disorders and vitamin A deficiency. According to WHO about 149 millions are at risk and affected by iron deficiency anaemia in the Eastern Mediterranean region. The corresponding figures for iodine disorders and vitamin A deficiency are 45 and 14 millions, respectively<sup>4</sup>.

Iron deficiency anaemia is the main nutritional problem in all Arab countries. It is estimated that about 30%-70% of pregnant women in the Region suffered from iron deficiency anaemia. The prevalence ranged from 10% to 50% among pre-school children, and from 20% to 70% among school children. Main causes of this problem are poor dietary intake of iron, low iron absorption, parasitic infection, malaria, vitamin A deficiency, multiparity and early age of marriage<sup>5</sup>.

In many of the Arab countries endemic goiter has been a familiar condition for decades with the result that alarming prevalence rates in certain regions have continued unchecked.

Results of surveys indicate that the Near East Region which include all Arab countries have about 15 countries in which iodine deficiency disorders (IDD) might pose a public health problems<sup>6</sup>.

The prevalence of IDD ranged from 6% to 80%. The main countries reporting these disorders are Egypt, Iraq, Jordan, Lebanon, Sudan, Syria, Algeria and Tunisia. Iodine deficiency disorders were also reported in some mountain areas in Saudi Arabia and the United Arab Emirates, but these disorders are not common health problems<sup>7,8</sup>. Low iodine in soil and in most foods commonly consumed are the main causes of IDD in this Region.

Despite abundant sunlight in this part of the world, vitamin D deficiency was found to be a public health problem in some countries. Rickets is a major public health problem in Yemen. A study in the North part of Yemen showed that 27% of children under five years of age had rickets. The condition was most common at the end of the first year and had disappeared by the fifth year<sup>9</sup>.

Vitamin D deficiency among infants and children has been confirmed in Jordan. This may be due to use of non-fortified milk and cereals, in addition to lack of exposure to sunlight during the period of children's rapid growth. A higher prevalence of vitamin D deficiency was reported among children in poor slums and remote villages<sup>10</sup>. Several studies in Saudi Arabia suggest low levels of vitamin D in mothers' plasma and in their infants. This indicates the role of the pathogenesis of rickets in infants born to mothers with inadequate vitamin D status, and the disease has its origin in the perinatal period. Even among Saudi adults, vitamin D deficiency is frequently seen<sup>11</sup>. Factors responsible for prevalence of vitamin D deficiency are: low exposure to sunlight, wrapping of infants for a long time, low dietary

intake of vitamin D and unavailability of other nutrients, especially calcium.

Few studies were carried out on vitamin A deficiency in this Region. Studies in Djibouti, Egypt, Iraq, Jordan, Lebanon, Oman, Somalia, Sudan and Yemen indicate that vitamin A deficiency is a public health problem, though the prevalence varied from country to country.

The national survey (1991) in Oman showed that 20.8% of those surveyed had serum retinal levels less than 0.70 mol/l, indicating a moderate to severe subclinical problem.

Children aged 19 months were mostly affected (22.8%) having serum retinal levels less than < 0.70 mol/l. Results of a biochemical study in Riyadh, Saudi Arabia, revealed that 10% of the population surveyed had serum retinal levels less than 0.70 mol/l, and that 1.1 had serum values less than 0.33 mol/l, indicating that VAD is not a severe problem. In Yemen it was found that 62.4% of children aged 1-5 years had serum retinal levels less than 0.70 mol/l<sup>12</sup>.

### **DIET-RELATED CHRONIC DISEASES**

Diet-related chronic diseases such as cardiovascular diseases, hypertension, diabetes, cancer and obesity have become the major health problem in high income countries, and in some urban areas in other countries in the Region.

#### **Cardiovascular disease (CVD)**

Cardiovascular diseases in general are emerging as a major health problem in most of the Arab countries. Although reliable mortality data are hard to obtain, and some countries do not report death by cause, data provided from Arab countries of the Gulf, Iraq, Jordan and Syria revealed that CVD were the leading cause of death, representing 18% to 40% of total deaths<sup>13</sup>.

Studies on risk factors associated with CVD in the Arab countries are limited. However, studies conducted in some countries on the risk factors profile and related lifestyle patterns reveal levels generally similar to those in industrialized communities. High fat and cholesterol diet, lack of physical activity, obesity, diabetes, hypertension and tobacco smoking were the main factors responsible for the high incidence of CVD in the Arab countries<sup>13</sup>.

Available data indicate a considerable and progressive increase in tobacco consumption over the last three decades.

Imports and manufacture of cigarettes are progressively increasing. Data also demonstrate high rates of smoking in populations of the Arab countries, especially among men<sup>13</sup>.

#### **Hypertension**

Several studies have examined blood pressure levels in the Arab population. Using the WHO criteria of 160/95, the prevalence rates of hypertension ranged from 10% to 17% of adult population. Some epidemiological surveys on hypertension (>140/90) reported prevalence rates among adults of up to 30% in some urban areas. The prevalence of hypertension appears to be lower in rural than urban areas<sup>13</sup>.

Detection rate and the level of awareness among hypertensive persons are generally low. In the report from Iraq, only 19% of hypertensives were aware of their high blood pressure

prior to the survey. Similarly, in Pakistan, for every known case of hypertension, there are three undetected cases. Hypertension, like diabetes, may remain asymptomatic for years and is only detected when one of its devastating consequences occurs<sup>13</sup>.

#### **Diabetes mellitus**

Diabetes and impaired glucose tolerance, are increasingly encountered. During the last decade, data on the epidemiology and clinical characteristics of the two types of diabetes have been reported from several countries. On the basis of various diagnostic criteria, diabetes has been detected in 4.3%, 4.8% and 5% of Egyptian, Iraqi, and Saudi Arabian samples, respectively. Based on the results of epidemiological surveys using the WHO standardized criteria, it is estimated that 10% of Tunisians and 14% of Omanis in the age range 30-64 years have diabetes. A survey in Oman, using WHO diagnostic criteria, revealed a prevalence of 9.8% in a sample of people aged 20 years and over. The intermediate category of impaired glucose tolerance, which may be associated with increased susceptibility to macrovascular complications, affects an additional proportion of people. In the Omani survey, this condition occurred in 10.9% of the sample, and so the overall prevalence of glucose tolerance abnormalities exceeded 20%<sup>14</sup>.

The proportion of non-insulin dependent diabetics who suffer from obesity ranges between 75% in Iraq to 46% in Sudan. A substantial proportion of insulin dependent diabetes presents with ketoacidosis. This serious and potentially fatal condition has been reported to be present in 82% and 67% of diabetic children at the time of diagnosis in Sudan and Saudi Arabia respectively, and is the presenting manifestation in about 30% of Iraqi diabetics<sup>15</sup>.

While these data demonstrate the high susceptibility of the Arab populations to diabetes, reports have also shown that diabetics develop long term complications such as coronary heart disease at a rate similar to that seen in Western countries. This means that up to 20% of non-insulin dependent diabetics have been found to have retinal complications at the time of first diagnosis and that most would develop them over subsequent decades. A substantial proportion of people with IDDM eventually develop end stage renal failure and the majority of the diabetic population will eventually develop a potentially lethal cardiovascular complication<sup>15</sup>.

#### **Cancer**

Cancer has become the third cause of death in many countries of the Region, behind diseases of the circulatory system and accidents and injuries. Published reports on the magnitude of the cancer problem are scarce and population based cancer registries are established in only a few countries. However, hospital-based data are available from the major cancer treatment centers in most countries in the Region. Generally, the common cancers among males include lung, lymphoma, bladder, stomach and mouth/pharynx. Among females, breast, urinary bladder, lymphoma and cervix are common cancer sites. However, regional variations exist, as can be observed from the country profiles; for example, high frequencies of nasopharyngeal carcinoma in males and uterine cervical cancer in females are reported from Morocco and Sudan<sup>16</sup>.

**Obesity**

Obesity, which is considered a risk factor for several chronic diseases, has reached alarming levels in many countries in the Region, especially among women. Using the cut-off of more than 25 Body Mass Index (BMI), the prevalence of overweight and obesity ranging from 50% to 70% in women in the Arab countries of the Gulf, Jordan, Lebanon, Egypt and Tunisia. The corresponding percentages for men are 15% to 55%<sup>17</sup>.

Factors associated with obesity have not been well investigated. Some studies showed that lack of physical activity, high intake of energy rich foods, sedentary life-style, multiple pregnancies, ethnic background, family history of obesity and socio-cultural factors are linked with obesity among adults in the Region.

**CONCLUSION**

**The Arab countries face several nutritional problems; growth retardation in infants and young children, micronutrient deficiencies and diet-related chronic diseases. The prevalence of these problems vary from country to country, due to difference in socio-economic status, health facilities and food availability. Although some of the Arab countries have formulated a National Nutrition Plan of Action to overcome the nutritional problems, none of these countries have put this plan in implementaiton. The need for practical and effective programmes to prevent and control of nutritional problems in the Arab countries are highly recommended. These programmes should be carried out in cooperation and coordination with several governmental, private and industrial sectors.**

**REFERENCES**

1. FAO. A Balanced Diet-A way to Good Nutrition. Report submitted to the Twentieth FAO Regional Conference for the Near East, Tunis, Tunisia, 12-6 March, 1990. Italy, Rome: FAO, 1996.
2. Miladi S. Changes in Food Consumption Patterns in the Arab Middle East Countries. FAO/RNEA, Cairo, Egypt, 1994.
3. WHO/EMRO. Strengthening Maternal and Child Health Programmes through Primary Health Care. WHO Regional Office for the Eastern Mediterranean Region, Alexandria. Egypt: 1991.
4. WHO. National Strategies for Overcoming Micronutrient Malnutrition. Geneva, 1992.
5. MUSAIGER AO, MILADI S. Proceedings of Workshop on Establishing Food Composition Data for the Arab Countries of the Gulf. FAO/RNEA, Cairo, Egypt: 1996.
6. WHO/EMRO. Iodine Deficiency Disorders, A Strategy for Control in the Eastern Mediterranean Region. WHO Regional Office of the Eastern Mediterranean, Alexandria, Egypt:1990.
7. Miladi S. Micronutrient Deficiencies in the Arab Middle East Countries. FAO/RNEA, Cairo, Egypt:1995.
8. MUSAIGER AO, MILADI S. Micronutrient Deficiencies in the Arab Middle East Countries. FAO Regional Office for the Near East, Cairo, Egypt: 1996.
9. FAO/RNEA. Nutrition Country Profiles for Selected Countries of the Near East Region. FAO Regional Office for the Near East, Cairo, Egypt: 1995.
10. Hijazi SS, et al. Vitamin D deficiency rickets in Jordanian children. Jordan Med J 1986;19:18-29.
11. Madani K, Kashoggi R. Micronutrient status in Saudi Arabia. In: MUSAIGER AO MILADI S, eds. Micronutrient Deficiencies in

- the Arab Middle East Countries, FAO/RNEA, Cairo, Egypt:1996.
12. WHO. Global Prevalence of Vitamin A Deficiency, Geneva, 1995.
13. WHO/EMRO. Prevention and Control of Cardiovascular Diseases. WHO Regional Office for the Eastern Mediterranean, Alexandria, Egypt:1995.
14. WHO/EMRO. Diabetes, Prevention and Control. WHO Regional Office for the Eastern Mediterranean, Alexandria, Egypt, 1993.15.
15. Alwan A. Chronic diseases in Eastern Mediterranean Region: An Overview. In: MUSAIGER AO, MILADI S, eds. Diet-Related Non-Communicable Diseases in the Arab Countries of the Gulf. FAO/RNEA, Cairo, Egypt:1996.
16. WHO/EMRO. Cancer Control in the Eastern Mediterranean Region. WHO Regional Office for the Eastern Mediterranean Region, Alexandria, Egypt:1995.
17. MUSAIGER AO. Diet-related non-communicable diseases in the Arab States. In: SHETTY P, MCPHERSON K, eds. Diet, Nutrition and Chronic Diseases. UK, John Wiley & Sons:1996.

**Appendix. Summary of Nutritional Problems in the Arab Countries**

Problems	Countries most affected	Major underlying causes
Undernutrition in general and PEM in infants and young children	Sudan, Somalia and Yemen	Food Scarcity Poverty High infection Lack of nutrition awareness Poor sanitation
Maternal malnutrition	Somalia, Sudan and Yemen	Dietary inadequacy Early age at marriage Frequent pregnancies at short intervals High energy cost due to work during pregnancy Lack of maternal care
Anaemia (especially iron deficiency anaemia)	All the countries	Unsound food habits Low iron intake Low iron absorption Parasitic infestation Malaria Multiparity
Iodine deficiency Disorders (IDD)	Egypt, Iraq, Lebanon, Libya, Sudan and Tunisia	Low iodine in soil and food commonly consumed
Vitamin A deficiency	Sudan and Yemen	Unsound food habits Low vitamin A intake Infection
Vitamin D deficiency	S. Arabia, Yemen, Jordan (and may be in most countries especially among infants)	Use of unfortified food Lack of vitamin D in foods Lack of exposure to sunlight
Diet-related chronic diseases: cardiovascular disease, hypertension, diabetes, obesity, dental caries and some types of cancer	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE, Tunisia, Jordan and Egypt Sizeable proportion of population in urban areas is affected too, in other countries	Excess intake of certain nutrients Sedentary lifestyle Smoking Lack of physical activity High intake food rich in fat and sugar