

Original

The Food Dome; dietary guidelines for Arab countries

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Abstract

Dietary guidelines are important tool for selection a healthy diet. There is no special dietary guidelines for Arab people. Health Institutes are mainly using the Western dietary guidelines, such as American Food Pyramid. The objective of this paper therefore, was to summarize the steps taken by Arab Centers for Nutrition to establish 'Food Dome', the dietary guidelines for the Arab countries. The development of Food Dome was done in eight steps as: 1) Identification of the current nutrition problems, 2) Identification of current food consumption patterns, 3) Identification of food groups used in the region, 4) Identification of specific foods within each group, 5) Estimation of nutritional profile for each group, 6) Identification the serving sizes for each group, 7) Incorporating physical activity into the food guidelines, 8) Identification of the pictorial illustration for the food guidelines. This Food Dome provides dietary guidelines for the Arab people to prevent the risk of diet-related diseases. It is also a useful tool for nutrition education. However, more testing in the target population is needed to evaluate the understanding of messages delivered by this Food Dome.

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Introduction

The need for the establishment of dietary guidelines for Arab countries has been emphasized at several conferences and meetings organized in the Arab region.¹⁻³ In

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LA CÚPULA ALIMENTARIA; GUÍAS DIETÉTICAS PARA LOS PAÍSES ÁRABES

Resumen

Las guías dietéticas son una herramienta importante para la selección de una dieta saludable. No existen guías dietéticas específicas para las personas de origen árabe. Los Institutos de Salud utilizan principalmente las guías dietéticas occidentales, como la Pirámide americana de la alimentación. Por lo tanto, el objetivo de este artículo es el de resumir los pasos dados por los Centros Árabes para la Nutrición para establecer la "Cúpula alimentaria", las guías dietéticas para los países árabes. El desarrollo de la Cúpula alimentaria se realizó en ocho pasos: 1) Identificación de los problemas nutricionales actuales; 2) Identificación de los patrones actuales de consumo de alimentos; 3) Identificación de los grupos de alimentos usados en la región; 4) Identificación de alimentos concretos dentro de cada grupo; 5) Estimación del perfil nutricional para cada grupo; 6) Identificación las raciones servidas para cada grupo; 7) Incorporación de la actividad física dentro de las guías alimentarias; 8) Identificación de la ilustración pictórica para las guías alimentarias. Esta Cúpula alimentaria proporciona unas guías dietéticas para la gente árabe para prevenir el riesgo de las enfermedades relacionadas con la dieta. También es una herramienta útil para la educación nutricional. Sin embargo, se necesitan pruebas adicionales en la población diana para evaluar la comprensión de los mensajes suministrados por esta Cúpula alimentaria.

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Palabras clave: *Guías dietéticas. Tamaño de las porciones. Dieta saludable. Árabe.*

general, the guidelines used in this region differ from country to another. However, the American Food Pyramid is widely used in most health and educational institutes in the region. Since this Food Pyramid was designed for the American people, an attempt was made to develop food guidelines for the Arab countries. This paper summarizes the steps taken to develop such food guidelines, provides a pictorial presentation of these guidelines, and the specific recommendations for the use of the guidelines for vulnerable groups. It is worth mentioning that these dietary guidelines can be modified by any Arab country to suit its nutritional status.

It was suggested that the dietary guidelines for Arab countries should consider the following criteria:

1. The pictorial presentation used for the guidelines should reflect the culture of the region and should be common to and acceptable to all Arab countries.
2. The foods illustrated in each food group should be common and widely consumed by Arab people.
3. The food groups should focus on food that can contribute to the prevention of most diet-related diseases that are prevalent in the Arab region.
4. Daily servings for each group should be provided, taking into consideration the current serving sizes used in the region.
5. Due to the high prevalence of obesity and other chronic diseases, physical activity recommendations should be clearly considered in these guidelines.
6. Specific nutrition recommendations for vulnerable groups should be provided.

Development of the dietary guidelines

Step 1: Review the current nutrition problems

Two types of nutritional problems are apparent in the Arab countries: those associated with deficient in nutrients intake such as underweight, anemia and goiter. And those associated with change in lifestyle and dietary habits such as heart disease, obesity, diabetes, osteoporosis and some types of cancer.

Low birth weight (less than 2.5 kg) is common in the Arab region. It ranged from 6% in Lebanon to 32% in Yemen.⁴ Under nutrition among preschool children is highly prevalent. Stunting (low height for age) and underweight (low weight for age) are widely prevalent. The proportion of stunting among this age group ranges from 8% in Qatar to 53% in Yemen, while that for underweight ranges from 4% in Algeria to 46% in Yemen. Underweight has been also reported among school children (6-11 years) and adolescents (12-18 years) in many Arab countries. Studies in Egypt, Lebanon, Tunisia, Jordan, Yemen and Arab Gulf countries showed that the prevalence of underweight ranged from 10% to 35% among school children and 5% to 25% among adolescents.^{4,6}

Anemia, particularly iron deficiency anemia, is dominant. The prevalence among preschoolers to be 17-70% with it being lower in adolescents (14-42%), and around 11-40% in pregnant women.⁷ In general, vitamin A deficiency in the Region prevails at mild to moderate levels. National surveys conducted from 1990-2000 estimated that the prevalence of vitamin A deficiency among children 0-72 months, decreases from 32.6% in 1990 to 28% in 2000.⁶

There is a relatively high prevalence of hypovitaminosis D in Arab countries, despite the sunny environment. Studies showed that the prevalence of low bone mass in the Arab world is higher than in Western countries.^{8,9} In Qatar, which is one of the highest per capita income in the world, it was found that the prevalence of vitamin D deficiency among adolescents aged 11-16 years was 68%, with low exposure to sunlight

and inadequate intake of vitamin D were the main factors responsible for this high prevalence.¹⁰

The prevalence of total goiter in the Arab countries ranged from 5% to 70%. The countries most affected by total goiter were Iraq, Jordan, Lebanon, Morocco, Sudan, Syria and Yemen. The iodine deficiency status (IDD) in the Region ranged from mild to moderate, with exception of Iraq, where the IDD status is severe most likely due to inadequate intake of dietary iodine, ingestion of goitrogens (food contain chemicals inhibit iodine absorption) and habitation in Region where the soil lacks iodine.⁶

The nutrition and lifestyle transitions during the past three decades in the Arab countries have played a great role in the high proportion of the diet-related chronic non-communicable diseases such as obesity, cardiovascular disease, diabetes, osteoporosis and cancer. These diseases are represent more than 60% of total death in these countries.¹¹

Obesity is a major public health problems. The incidence of obesity in children and adults in this region exceeded that in many Western countries. Using body mass index (BMI) the prevalence of obesity among preschool children ranged from 2% to 8%, while those among school children (6-10 years) ranged from 10% to 25%. The prevalence among adolescents (11-18 years) reached 15-45%. Overweight and obesity have been reported as ranging from 30% to 60% among adult men, and 35% to 75% among women.¹²

Cardiovascular disease (CVD) is rapidly growing problem in the Region, accounting for 25-31% of total deaths (13). Hypertension, diabetes mellitus, hyperlipidemia and obesity were the commonest risk factors for CVD.¹³ Type 2- diabetes has reached alarming level in most Arab countries. It was estimated that 10-25% of adults had diabetes. However, pre-diabetes and underdiagnosed are also high; making this disease is the most challengeable health problem in the Region. This is especially true with the fact that diabetes is significantly related to obesity and CVD.¹⁴

Osteoporosis is considered a growing health problem in Arab countries, especially with the steady growth of the aging population. Studies in Lebanon¹⁵, Saudi Arabia¹⁶ and Qatar¹⁰ showed a lower bone mass density (BMD) among adult population of those countries compared to the standard established for Caucasian population. Female sex, age, menopause, high parity, inadequate intake of vitamin D and lack of exposure to sunlight are the main risk factors for osteoporosis in these countries.^{10,17}

Statistics in the Region indicated that cancer is the third cause of death after CVD and accidents and injuries, representing 8% to 12% of total deaths. The main diet-related cancer prevalent in this Region are breast, stomach, colon and liver cancers.¹¹

Step 2: Review the current food consumption patterns

During the period 1970-2005, there has been on increase in per capita energy and fat supplies in most

Arab countries. The increase in calorie supplies during this period ranged from 10% in Sudan to 40% in Egypt. Data from food balance sheets prepared by FAO⁵ showed that a high percentage of these calories came from animal foods. This is particularly true in high-income countries. Daily per capita fat supplies showed impressive increases compared to the supply of calories during 1990-2005. The percent of increase during this period ranged from 13.6% to 50%. Although some low and intermediate countries showed a marked increase in per capita fat supplies, most of the fat comes from plant origin, exception are Sudan and Somalia, where the intake of animal food is very high, and consequently the intake of fat coming from animal origin. The increase in per capita fat supplies in the Arab Gulf countries is also of animal origin.^{5,18-19}

Additionally, foods in the region are becoming increasingly processed with the result that grain products tend to be refined and thus lose their fiber content. A further decrease in fiber intake takes place with a decrease in the consumption of whole grain. For example, sorghum and millet which are usually unrefined (and therefore keep much of their fiber) are becoming less important in the diets of poor Arabic countries, and are being replaced by refined wheat flour.

There is good evidence that intake of fruit and vegetables participate in the prevention of certain chronic diseases such as hypertension, CVD and some types of cancer²⁰. Based on WHO Stepwise survey in six Arab countries (Egypt, Jordan, Iraq, Kuwait, Saudi Arabia and Syria), it was found that the low intake of fresh fruit and vegetables (below 5 servings/day) ranged from 79% in Egypt to 95.7% in Syria.¹¹

Inadequate intake of some micronutrients in the region is important factor responsible for undernutrition, especially among children and adolescents. Indicators show that the daily intake of iron, calcium and vitamins D and C in the region are below the recommended daily allowances (RDA).²¹

Step 3: Identification of food groups used in the region

At this stage, emphasis was placed on reviewing the food groups commonly used in the Arab countries. It was found that there is no single standard reference used for grouping food. Some countries used four groups and others used five and/or six food groups. This was mainly due to the educational background of the people advocating the food groups. For the purpose of this project five food group guidelines were selected. These are: cereals and their products; vegetables; fruit; milk and dairy products; and meat, chicken, fish, eggs, legumes and nuts.

Step 4: Identification of specific foods within each group

In general, most Arab countries have copied the food groups from other countries, without considering

whether or not the foods were common in their communities. For example, many foods mentioned in the American Food Pyramid (which is widely used) are not commonly consumed by many Arab people. Therefore, it was decided to list foods that are commonly consumed by Arab people in each of the five food groups. Information on these foods was obtained from several food consumption surveys carried out in the region.¹⁹ Then a careful selection was made to obtain the foods which could be illustrated in each food group.

Step 5: Estimation of nutritional profile for each group

It is important that each group should provide some essential nutrients, and therefore, eating certain foods mentioned from each group (based on the suggested serving size) can help to provide most of essential nutrients needed for the body. Data on the composition of the foods mentioned in each group was obtained from the main food composition tables used in the region.²²⁻²⁵

Step 6: Identifying the serving sizes for each group

All the dietary guidelines are built on the suggested serving sizes for each group of foods. These are used as an estimated guide to provide adequate nutrients and energy for the whole day. A review of serving sizes applied in Arab countries showed that these countries used similar serving sizes to those existing in most developed and developing countries. This finding is in agreement with previous report²⁶ as a remarkable similarity in basic food grouping and serving sizes in several developed and developing countries studied were found. Therefore, very few changes were made to the serving sizes for each food group (table I). This is mainly in the meat group, as it includes a wide range of foods.

Step 7: Incorporating physical activity into the food guidelines

Changes in lifestyle and socio economic status in the Arab region have had a significant negative effect on physical activity. Life has become more sedentary and the practice of exercise has diminished steeply among children, adolescents and adults, especially in high and middle income countries, as well as in urban areas in low income countries. Using a WHO Stepwise survey in seven Arab countries (Egypt, Iraq, Jordan, Kuwait, Saudi Arabia Sudan and Syria), it was found that low physical activity among adults ranged from 32.9% in Syria to 86% in Sudan¹¹. The marked decrease in physical activity has become one of the main risk factors for the high prevalence of diet-related non-communicable diseases.²⁷⁻²⁸ Therefore, physical activity should be promoted and included in the Arab Food Guidelines. Incorporating

Table I
Food groups and suggested daily servings

<i>Food group</i>	<i>Serving</i>	<i>Serving sizes</i>
Cereals and their products	6-11	1 slice, ¼ Arabic flat bread, 30g cornflakes, ½ cup cooked cereals (rice, wheat oats, macaroni), 6 small crackers (use whole meal cereals)
Vegetables	3-5	1 cup raw leafy vegetables or cooked vegetables, ¾ cup vegetable juice
Fruit	2-4	1 medium piece of fruit (banana, apple, mango, pear), ½ cup fresh, frozen or canned fruit, ¾ cup fruit juice.
Milk and dairy products	2-3	1 cup of milk, laban or yoghurt, 43g of cheese, 1 tablespoon cream cheese (use low fat dairy product).
Meat, chicken, fish, eggs, legumes and nuts	2-4	50-80 g of meat, chicken or fish, one egg, 2 tablespoons of peanut butter, ½ cup legumes, 1/3 cup nuts, 2 tablespoons of seeds.
Physical activity	Daily	Medium activity like walking (30 minutes for adults and 60 minutes for children) most days.

porating physical activity into the dietary guidelines has also been emphasized by both the Food and Agricultural Organization and the World Health Organization.³ It was suggested that adults should undertake at least 30 minutes of physical activity on most days, while children and adolescents should undertake at least 60 minutes of moderate physical activity on most days.²⁹

Step 8: Identification of the pictorial illustration for the food guidelines

It is preferable that the illustration used for the food guidelines should reflect the culture of the targeted people. In addition it should be simple and easy to understand so that they can be used as an educational tool for all age groups and genders. Many countries in the world have used specific pictorial illustrations, while some have used those designed by other countries. For example, the illustration of the American Food Pyramid is widely used in several developing countries.²⁶

After designing and testing several pictorial illustrations, it was found that the Dome illustration was more suitable and acceptable design, as it reflects the culture and religious background of all Arab people. The Dome can be seen in most mosques and churches in the region. It is also widely used in the home and other cultural institutes and buildings. The food groups were presented as vertical columns and not in a horizontal way, to explain that all foods are equal from their nutritional point of view, and the only difference is in the amount of food that should be eaten from each group (fig. 1).

Specific recommendations for the intake of food from each food group³⁰

Several recommendations related to the intake of the different food groups were suggested for those using the Food Dome and are summarized as follows:

Milk and dairy products:

1. Consume low fat milk and dairy products.
2. Consume milk and dairy products fortified with vitamin D.

Fruit:

1. Eat a variety of fruit.
2. Choose fruit when it is in season.
3. Drink fresh fruit juice.

Vegetables:

Eat more dark green vegetables like spinach and more orange vegetables like carrots.

Cereals and their products:

1. Eat at least half the cereals as whole grains.
2. Eat more fortified cereals and their products.

Meat, eggs, legumes and nuts:

1. Choose low fat or lean meat.
2. Consume legumes at least 3 times a week.
3. Consume fish on most days if possible.
4. Consume chicken and other poultry without the skin as and when possible.

Specific recommendations for the use of the food dome for vulnerable groups

In addition to the development of the Food Dome as a food guideline for healthy eating for the public in Arab Countries, specific recommendations for vulnerable groups were suggested to detail the significant issues related to healthy eating for these groups.

A. Women at reproductive age, pregnant and lactating women should:

1. Consume a sufficient quantity of food rich in iron.
2. Consume a sufficient quantity of food which promotes the absorption of iron such as foods rich in vitamin C (orange, guava, mango, etc).

FOOD DOME

DIETARY GUIDELINES FOR ARAB COUNTRIES



Practice medium activity like walking 30 minutes most days

Meat, eggs and legumes	Vegetables	Cereals and their products	Fruit	Milk and dairy products
<ul style="list-style-type: none"> Choose low fat or lean meat Consume legumes at least 3 times a week Consume more fish as possible 	<ul style="list-style-type: none"> Eat more dark green vegetables like spinach and orange vegetables like carrots 	<ul style="list-style-type: none"> Eat at least half of cereals of whole grain Eat more of fortified cereals and their products 	<ul style="list-style-type: none"> Eat variety of fruit Choose fruit during their seasons Drink fresh fruit juice 	<ul style="list-style-type: none"> Consume low fat milk and their products Consume milk fortified with vitamin D
Suggested daily servings				
2-4 servings/ day	3-5 servings/ day	6-11 servings/ day	2-4 servings/ day	2-3 servings/ day
One serving =	One serving =	One serving =	One serving =	One serving =
50-80g meat, chicken or fish, ½ cup cooked legumes, one egg	1 cup raw vegetables, ¾ cup vegetables juice	1 slice, ¼ Arabic bread, 30g cornflakes, ½ cup cooked cereals	1 medium piece of fruit, ¾ cup fruit juice	1 cup milk, 45g cheese, 1 tbs cream cheese

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Fig. 1.—Food Dome: dietary guidelines for the Arab countries.

- Pregnant women should consume a sufficient quantity of food rich in folic acid or take folic acid tablets.
- Consume a sufficient quantity of food fortified with vitamin D.
- Pregnant women should consume foods that are properly cooked.
- Pregnant women should monitor their weight and not undertake any kind of dieting.
- Pregnant women can participate in physical activity for 30 minutes on most days, but

should avoid activities related to falling or those affecting the abdomen.

- Lactating women should consume appropriate quantities of food to provide for sufficient breast milk. Reducing weight may be safe at this stage but a restrictive diet should not be followed.

B. Infants and preschool children (below 6 years):

- It is preferable that mothers continue breast feeding until the second year of their infant's life as far as possible.

2. For breast fed infants, supplementary foods should be introduced at the age of 6 months.
3. Children between 2 to 8 years should drink two cups of low fat milk or the equivalent of other dairy products per day and preferably milk fortified with vitamin D.
4. Breakfast should be eaten daily with an emphasis on a variety of different foods.
5. Children should consume daily sufficient servings of fruit and vegetables.
6. Routine measurement of weight and height, to prevent overweight and obesity should be undertaken.
7. Energy from fat should not exceed 35% of total daily food intake.
8. The intake of food and drink rich in sugar, especially between meals should be minimized as far as possible.
9. Food should be thoroughly cooked before being given to children.

C. School children and adolescents should:

1. Eat sufficient quantities of fruit and vegetables daily.
2. Reduce the intake of food and drink rich in sugar, especially between meals.
3. Consume a sufficient quantity of whole cereals daily and of those fortified with micronutrients.
4. Reduce intake of food rich in fat such as some western and local fast foods, some local sweets and dishes.
5. Brush and clean teeth daily using appropriate brush and toothpaste containing fluoride.
6. Drink a sufficient quantity of water and other liquids daily.
7. Consume 3 cups of low fat milk or dairy products daily.
8. Energy from fat should not exceed 30% of total daily calories.
9. Maintain proper weight for height.
10. Participate in moderate physical activity for 60 minutes on most days.

People aged 50 years and above should:

1. Take vitamin B₁₂ and vitamin D tablets and foods fortified with these vitamins daily as possible and affordable.
2. Drink a sufficient quantity of water and other liquids daily.
3. Consume foods low in fat and low in salt. Most traditional foods and dishes contain high amounts of salt, therefore, reducing the salt used in cooking should be considered.
4. Consume an adequate amount of fruit and vegetables daily.
5. Practice physical activity daily as and when possible.
6. Consume food and dishes that are properly cooked.

Conclusion

Studies in Arab countries indicate that food habits and changes in lifestyle are the most important risk factors responsible for the high occurrence of diet-related diseases. Therefore, the selection of a healthy diet and the undertaking of physical activity are essential in the prevention of these diseases. In order to achieve and maintain a good state of health, individuals should consume sufficient quantities of a variety of different foods daily. The Food Dome provides dietary guidelines for Arab people so as to reduce the risk of diet-related diseases, especially those related to non-communicable diseases such as heart disease, type 2 diabetes, hypertension, osteoporosis, obesity and some types of cancer. The Food Dome is also a useful tool in the prevention of undernutrition and micronutrient deficiencies, especially iron-deficiency anemia. It is essential that the application of the Food Dome be reviewed periodically to find out if there are any deficiencies in its application and to look at new scientific evidence related to the role of food with regard to health and disease.

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