

TRADITIONAL FOODS IN THE ARABIAN GULF COUNTRIES

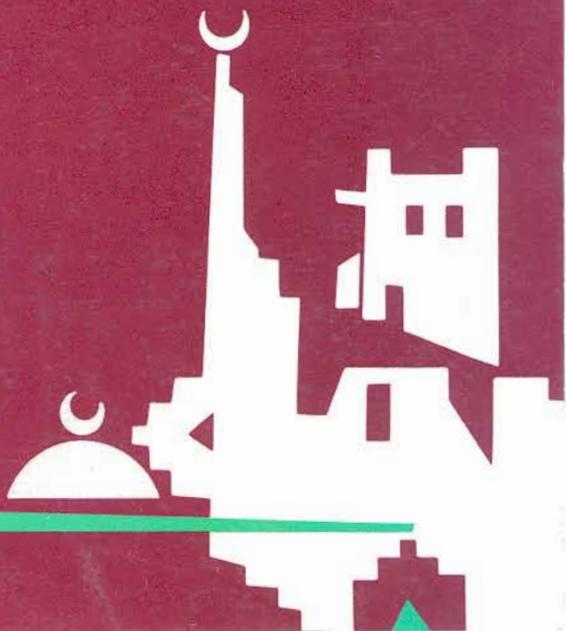
ABDULRAHMAN O. MUSAIGER



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Traditional Foods in the Arabian Gulf Countries

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FOREWORD

Traditional foods constitute an essential aspect of people's cultural heritage, historical background and their environmental conditions. In addition, traditional foods represent an important component of people's diet and are very much related to their food habits and nutrition. During the last two decades, the high rate of urbanization, labour migration and the increase in income have affected the life-styles of the population of the Arab Gulf countries and resulted in an extensive increase in food import. This led to a high reduction in the consumption of traditional foods.

The governing bodies of FAO have recommended that FAO give due consideration in its programme to the promotion of the production and consumption of traditional foods worldwide. Accordingly, several studies and projects have initiated by FAO in different parts of the world, to survey existing traditional foods and food crops, study their nutritional values and identify ways and means of promoting their production and consumption. With the assistance of selected consultants from the Near East Region, FAO has conducted four sub-regional studies on traditional foods. These studies were reviewed by a panel of experts at a technical consultation and were combined in one single document which was published by FAO under the title of "Traditional Foods in the Near East".

Since the consumption of traditional foods in the Arab Gulf countries is decreasing at a very fast rate, it was found necessary to publish a separate document on traditional foods in this part of the Region. It is hoped that this publication will encourage nutritionists, food technologists and social scientists to give this subject more attention.

Comments on the contents of the document and proposals for inclusion in subsequent revisions, if any, can be addressed to the author and /or to FAO Regional Office for the Near East.

A.Y. Bukhari
ADG/Regional Representative
for the Near East



FOREWORD

The rapid change in food habits in the Arabian Gulf countries has adversely affected the consumption of many traditional foods. Consequently these foods have gradually disappearing from the food tables.

A great emphasis has been recently made by FAO on the role of traditional foods in improving nutrition status of the people. Many of these foods are nutritionally important in the diet and can make a significant contribution in meeting the nutritional requirements of a population.

Nowadays, the Arabian Gulf countries have been making substantial efforts to increase their food production and promote health and nutritional well being of the community. Nevertheless, the traditional foods received little attention in nutrition programmes, which is mainly due to the lack of information on the nutritive value of these foods.

This publication highlights the method of preparation and nutritive value of the most common traditional foods in the Arabian Gulf countries. It is hoped that this publication will be a useful document for those interested in the field of nutrition and health .

Dr. A. Al-Refai
President, AGU



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INTRODUCTION

Background on food situation in the Gulf

The Arabian Gulf countries which include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates, have similar social and economic characteristics with common food habits. In 1981, these countries signed an agreement to establish the so-called Gulf Council for Cooperation (GCC). Two years later, they initiated between them a unified economic agreement. This allowed the Gulf countries to coordinate their plans in food security.

Recently, the GCC countries have been making great efforts to increase their self-sufficiency in some food items, mainly vegetables, eggs, poultry, fish and milk. However, food production is subject to many constraints. Low quality of cultivated land, an unfavourable environment for growing crops and raising animals, salinity and soil deterioration, decrease in available agriculture land due to urbanization, shortage of water resources, and lack of quality and quantity of agricultural manpower are the main constraints to food production in the GCC countries. For these reasons food importation has increased sharply, especially with the rapid growth in population and the increase in income.

Some of the Gulf countries, such as Saudi Arabia and Oman, have a good potential for agricultural production. Saudi Arabia has sharply increased its local production of cereals (mostly wheat), vegetables, milk and dairy products, and fish. Land in some parts of Oman is very suitable for growing vegetables and tropical fruits. All the GCC countries have good resources for fish and fish products. Food industry and mainly dairy industry have dramatically developed in these countries, particularly in Saudi Arabia and Kuwait.

Nevertheless, due to the low quality and limited cultivated land, as well as to the low production of local animals, all the countries still depend on the importation of dried milk for the preparation of dairy products. In general, the food industries in the Gulf are confined to milling, baking, soft drinks, dairying, mineral water bottling, water desalination and slaughtering of livestock.

Food consumption patterns in the Gulf

The rapid economic growth of the GCC countries has led to a drastic change in the life-style of the people including their food consumption patterns. Traditional foods - dates, milk, rice, high fiber bread and fish have been replaced by a more diversified diet. Red and poultry meat are consumed more frequently than fish and mutton, and lamb are preferred rather than beef. Rice is still the most staple cereal, and is eaten almost daily with other complements. Wheat is mainly consumed as bread and macaroni. Milk and dairy products, particularly laban, cheese, butter, yoghurt and liquid milk have become essential meal items. Nuts, seeds, carbonated beverages, potato-chips, corn-puffs, chocolates and candies are the main foods consumed as snacks between meals. These foods have replaced the traditional foods such as *rahash*, *halwah*, and dates. Tea is the most popular drink and is consumed sweetened with or without milk. The traditional herb tea is still drunk but on a small scale, mainly in social occasions. Fast foods like hamburgers, fried chicken, sausages and pizza are very popular, especially among the younger generation.

These changes in food consumption patterns have been reflected in the health and nutrition status of the community. A paradoxical situation of both undernutrition and overnutrition now exists. Undernutrition such as mild growth retardation, and iron-deficiency anaemia are still prevalent, and at the same time diseases often associated with affluence such as obesity, heart disease, hypertension and diabetes have increased sharply and become the main public health problems in the Gulf.

Traditional foods and their role in improving the nutritional status

It is hard to put a clear cut division between traditional and non-traditional foods, especially with the great change in the food situation in the Gulf. In general traditional foods are those foods which are commonly consumed in the country through custom and tradition. They are highly accepted by the community or a sector of it. People are familiar with their cultivation or the raising the relevant animals. Additionally, people know how to prepare traditional foods, and they are included in local dishes.

For the purpose of this report traditional foods are defined as those which are locally available, and widely consumed in the Arabian Gulf countries, or, in one of them, or in a sector of a country. These foods are closely linked to the culture and food habits of the inhabitants of the Gulf region. They could be of a single or in a composite form. They can be subjected to processing and storage, and have a good potential for commercial production.

Some traditional foods have a high nutritive value, and therefore can play an important role in providing essential nutrients. They can also supplement the main dishes and improve the nutritional composition of a meal.

Objectives

The main objectives of this publication are to:

- (1) Provide as much information as possible on the the most common traditional foods in the GCC countries.
- (2) Determine the nutritional value of traditional foods, with special emphasis on their proximate and mineral composition.
- (3) Assess the possibility of the production of some traditional foods on a commercial basis.
- (4) Asses the health potential of traditional foods, in order to promote and encourage their consumption in the region.

Methods of collecting the data

Data were collected from published and unpublished scientific reports written about the local foods in the Gulf region. Information was also taken from some recipe books available in the region, as these books provide a useful background on the origin and the method of preparation of some traditional foods. The author has also made his own investigations by visiting some local markets in the region, and interviewing resource people.

The nutritive value of the traditional foods was extracted from published articles, and from food composition tables used in the region. In order to clarify the information, the local name is given along with the common name. The local name is written in *italic* and used in this report, rather than the common name.

It is possible that this report does not include all the traditional foods in the Gulf. There are many foods available in the region for which no information is at present available. The best example, is the wild plants which are grown in the Gulf. Many of these are known to be good sources of nutrients, particularly minerals and vitamins. They are also widely used in folk medicine.

CEREALS, PULSES AND THEIR PRODUCTS

Rice (*Ayash, Ruz* in S. Arabia)

عیش، رز

Rice is the staple food in the Arabian Gulf countries. It is the main food consumed at lunch, and sometimes at supper. Rice is not grown in the Gulf, but is imported mainly from India, Pakistan and Thailand.

The rice used in the Gulf is milled and has a lower proportion of nutrients than unmilled grain. In addition to milling the rice grains are subject to another severe loss of vitamins and possibly some minerals. The custom of repeatedly washing the rice grains, boiling and straining the water before cooking, leads to the removal of several water soluble nutrients. The B vitamins are all very soluble in water and heavy losses of such vitamins may take place.

In order to decrease the losses of nutrients, a minimum amount of water should be used for cooking. The strained water can be used in the preparation of other dishes or soups. However, it is important to mention that rice is never eaten alone, it is always consumed with high protein foods such as meat, chicken and fish. This of course supplements the nutritional value of rice.

Rice is cooked in various ways, but in all cases it is boiled either alone, or mixed with meat or fish. When rice is boiled alone it is called "*Aysh shilani*" or "*Aysh abyed*". A small amount of melted butter or fat (*samin*) is usually poured over the rice before eating.

Nutritive Value (boiled rice)

a. Proximate composition (g/100g edible portion)

Energy (Kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
172	60.5	3.1	3.8	0.8	0.5	31.3

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
20.8	42.6	627.5	0.2	0.5

Parathas (*Chapatis*)

جباني

Unlike the *chapatis* of the Indian-subcontinent, the *chapatis* in the Gulf are mostly refers to unleavend bread made with oil (*parathas*). *Chapatis* are generally produced and consumed fresh in homes and restaurants. There are no bakeries preparing such bread. This bread is mainly prepared by Indian-subcontinent immigrants, and commonly eaten with Indian dishes, which are popular in the Gulf.

Preparation

Chapatis are prepared by mixing 100g of wheat flour with 55g water and 0.7g salt until a dough of firm consistency is formed. The dough is then cut into small pieces, rounded, flattened and grilled on a greased griddle over a stove at 183-205°C. The bread is turned over, after one side has been baked. The baking time is about 5 minutes. The final product is a circular, one layered loaf, with an average weight of 82g. *Chapatis* are best eaten warm.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
285	31.8	8.2	3.6	1.2	0.2	55.0

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
34.4	72.4	227	1.2	0.7

Date Bread (*Khoubez al-tamer*)

خبز التمر

Khoubez al-tamer is commonly consumed in the Arabian Gulf countries. The date bread is baked in a special clay oven built in the ground and is often consumed with a traditional sweet (*halwah*), and Arabic coffee, during weddings, religious ceremonies, and other social occasions. Consumption of this kind of bread is on the decrease and few local bakeries still produce it.

Preparation

Wheat flour, dates and/or dates syrup (*dibs*), sugar, yeast (active dry) and water are the main ingredients used in the preparation of *khoubez al-tamer*. Sometimes sesame seeds are spread over the bread. For preparation, the sugar is dissolved in water, and then flour, dates and yeast are added. The ingredients are mixed well until a dough of good consistency has formed. The dough is then cut into pieces, flattened and baked at 400°C in an earth clay oven until brown.

Nutritive value

This kind of bread is high in energy and minerals compared with other breads, due to the use of dates and dates syrup.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
307	22.4	8.8	1.9	1.2	0.5	65.2

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
5.8	75	116	1.8	8.4

Thin Pan Bread (*Khoubez Al-Rigag*)

خبز الرقاق

Al-rigag is a traditional bread usually prepared at home by some families. People purchase it directly from homes or from the local market (which in turn depends on home preparation). Recently some modern bakeries began producing *al-rigag* but on a small scale, because its consumption remains limited to a few social occasions. *Al-rigag* is especially eaten at the Muslim fasting month, Ramadan.

Preparation

A high extraction wheat flour is generally used in the preparation of *al-rigag*. The flour is mixed with salt and water until a loose consistency elastic dough is formed. A handful of dough is then spread (in very thin layer) by hand on the top of an iron pan (*Tawah*). When the edges of the dough start drying, and lifting from the pan surface, the bread is removed by a knife and folded in half or in quarters. Sometimes an egg, some sugar and cardamom are added to the dough when it is on the pan. This sweet bread is commonly eaten with tea or at *Sahoor* (the meal before sunrise in Ramadan).

Traditionally, dried date palm leaves (*khouse*) are burnt to heat the pan. More recently, families are using modern gas burners.

Nutritive value

This bread can be of good nutritive value when supplemented with eggs. It has been reported to have the following composition.

a. Proximate Composition (g/100g edible portion)

Energy kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
372	6.5	12.5	0.4	0.8	—	79.8

b. Mineral Composition (mg/100 g edible portion)

Ca	P	Na	Fe	Zn
17	231	359	1.8	1.7

Millet Bread (*Khoubez Al-Dokhn*)

خبز الدخن

Millet is a traditional cereal for a large sector of the inhabitants in the Northern and Southern regions of Saudi Arabia. Millet is used to prepare a special bread (*khoubez al-dokhn*). This bread is only prepared in the home.

Preparation

The millet grains are ground in a stone mill. The flour is mixed with salt and water, and kneaded by hand for 15-20 minutes. The prepared dough is set for one hour for fermentation. Pieces of about 300g each are separated, rounded and flattened with the palm of the hand. The loaves are baked in an earthen oven at about 300°C for 15 minutes.

Nutritive value

a. Proximate Composition (not available)

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
23	250	102	3.1	1.0

Sorghum Bread (*Khoubez Al-Thorah*)

خبز الذرة

Sorghum is a basic ingredient in the preparation of several traditional foods that are commonly consumed in the southern part of the Arabian peninsula. It is usually used for the preparation of a flat thick bread (*khoubez al-thorah*). This bread is prepared from two sorghum cultivars that are commonly grown in S.Arabia: white and reddish-white. This bread is only baked at home in an earthenware oven.

Preparation

Sorghum grains are ground in a stone mill and the flour obtained is passed through a 0.5 mm sieve. The flour is then mixed with salt and water. The mixture is kneaded by hand for 20 minutes until a uniform dough is formed. Pieces (300g each) of dough are scaled off, rounded and flattened with the palm of the hand into circular sheets (2-3 cm thick). The loaves are then baked in an earthenware oven at about 300°C for 15 minutes.

Nutritive Value

a. Proximate Composition (g/100g edible portion, expressed on a dry basis) (fermented)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
-	-	16.4	4.9	2.2	2.9	73.6

b. Mineral Composition (mg/100g edible portion, expressed on dry basis)

Ca	P	Na	Fe	Zn
27	187	174	4.2	2.5

Wheat Bread (*Khoubez Samouli*)

خبز صامويلي

Samouli bread is commonly consumed in Saudi Arabia. It is oblong in shape with varying sizes. It is usually consumed at breakfast or used for the preparation of sandwiches.

Preparation

Samouli bread is prepared from a proportion of 1:2 of wheat flours of extraction rates 75% and 85% respectively. The flour is mixed with water, yeast (active dry) and salt for 15 minutes. The dough is allowed a bulk fermentation for 30 minutes. The dough is then moulded and fermented in trays on which oil is spread. It is baked at 200-225°C for 20 minutes. The final product has a brown crust and a white crumb. The average weight of the small size loaf is 107g.

Nutritive Value

The process of spreading vegetable oil on the trays increases the level of fat in the product due to the absorption of the oil from the bottom of the trays. Using enriched flour leads to an increase in the amount of thiamine. Lysine and threonine are the first and second limiting amino acids in *samouli* bread.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
257	36.9	9.2	2.2	1.1	0.6	50.0

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
38	108	357	2.5	0.9

Flat bread (*Khoubez Tanoor, Khoubez Irani*)

خبز التنور

Tanoor, or so called Iranian bread, is one of the most popular breads in many Arabian Gulf countries. It is commonly consumed in Bahrain, Qatar, Kuwait and the UAE.

Tanoor bread is very similar to the Iranian bread known as *taftoon*. Actually this bread (*tanoor*) was introduced by Iranians long ago, and has become one of the common breads consumed at breakfast and dinner in the Gulf.

Preparation

Wheat flour is used in the preparation of *tanoor* bread. The extraction rate of the flour varies from country to country. For example in Kuwait a high extraction rate flour (90%) is used, while in Bahrain the extraction rate is lower (80%).

Tanoor bread is prepared by dissolving yeast (0.12g), salt (1.3g) and sodium bicarbonate(0.3g) in 55g water. The flour (100g) is then added and mixed for 15 minutes. The dough obtained is cut into pieces, rounded, flattened and baked at 400-500°C in earthen ovens for 30 to 60 seconds. The final product is described as a circular bread composed of one layer, with an average loaf weight of 100g (in Bahrain), and of 150g (in Kuwait).

The short fermentation period of *tanoor* bread affects the utilization of iron and possibly other minerals. Fermentation increases the destruction of phytic acid which adversely affects the bioavailability of iron, zinc and calcium. If sodium bicarbonate is used in bread preparation it inhibits phytic acid destruction. Sodium bicarbonate should not therefore be used but the fermentation time increased in order to improve the nutritive quality of the bread.

Lysine and threonine are the first and second limiting amino acids in this bread. However, *tanoor* breads are never consumed

alone, they are usually eaten with other foods such as meat and fish. This of course supplements the nutritional value of the bread.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
278	29.5	8.4	1.2	1.9	0.5	58.5

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
24.9	103.4	533.6	1.2	0.9

Wheat Bread (*Khoubez Yemeni*)

خبز يمني

Yemeni bread is consumed in Saudi Arabia, particularly in the central area. It is a circular single layered bread and is made from wheat flour.

Preparation

This bread is prepared from wheat flour, salt, yeast and water. A proportion of 1:2 of flours of extraction rates 75% and 85% respectively are used. For preparation, the flour is first mixed with water. Other ingredients are then added, and mixed well for 15 minutes. The dough is then allowed to undergo bulk fermentation for 45 to 60 minutes. The dough is then cut into small pieces, rounded, flattened and baked at 450-550°C for 15 seconds. The average weight of the final loaf is about 190g.

Nutritive Value

Yemeni bread has a relatively lower niacin level when compared to other Saudi breads, probably due to smaller amount of yeast added. Lysine and threonine are the first and second limiting amino acids in *Yemeni* bread.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
270	31.6	10.1	0.3	0.8	0.4	56.8

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
24	112	112	2.5	1.2

Broad beans, Chickpeas and Black-eye beans: (*Bajeleh*, *Nakhee* and *Loobah*)

الباجلة، النخي، اللوبه

These three legumes are commonly consumed in the Gulf. They are not cultivated in the region, and are imported from different countries and are prepared in the same way. They are washed thoroughly, soaked overnight in cold water and then boiled in water and salt. Baking soda is sometimes added to the boiling water to tenderize them. Boiled legumes are also available in local bakeries. They constitute the main food items at breakfast and supper. Recently canned legumes became available on the market. These canned products are gradually replacing the traditional boiled legumes.

Nakhee (chickpeas) and *loobah* (black-eye beans) are used in many traditional dishes. They supplement the nutritional composition of these dishes, as they contain a relatively good amount of protein and some minerals. *Bajeleh* (broad beans) and *Nakhee* are sometimes dried, roasted and salted. They are eaten as a snack in the same way as nuts. The dried legumes can be stored for several months.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

	Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
<i>Bajeleh</i> , boiled	99	75.0	6.2	1.0	0.7	0.8	16.3
<i>Nakhee</i> , boiled	92	76.4	5.9	0.9	0.8	0.9	15.1
<i>Loobah</i> , boiled	98	75.0	5.0	2.0	1.6	1.4	15.0

b. Mineral Composition (mg/100g edible portion)

	Ca	P	Na	Fe	Zn
<i>Bajeleh</i> , boiled	65.9	21.8	133.8	0.7	0.0
<i>Nakhee</i> , boiled	70.5	80.6	464.5	1.7	0.0
<i>Loobah</i> , boiled	69.4	21.9	134.5	1.1	0.0

MILK AND MILK PRODUCTS

Camel Milk (*Haleeb Al-Jamal*)

حليب الجمل

The camel was and is still the vehicle of transport for the bedouin community in the Gulf. It plays an important role in supplying the desert dwellers with milk, as well as meat, especially under the unfavourable conditions prevailing in the desert.

Camel milk is usually drunk fresh as raw milk by desert dwellers. This practice can cause a hazard to their health. However, recently in Saudi Arabia the camel milk was produced commercially as a pasteurized milk. This milk is still a favourite for the bedouins, even for those who have shifted to urban areas.

Since camel milk is the main source of protein and minerals for some desert dwellers, more attention should be paid to camel breeding and selection. This is particularly true when we know that the camel has a good potential to accustom itself to the harsh environment of the desert as compared to goats and cows.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
62	87.5	2.7	3.3	0.8	-	5.3

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
114.8	83.8	58.8	0.2	0.4

Goat Milk (*Haleeb Ghanam, Haleeb Ma'az*)

حليب الغنم

Goat milk is often consumed in the pastoral community, mainly in Saudi Arabia, Oman and the UAE. In general, goats play a vital role in the ceremonies, traditions and nutritional status of the rural population in the Gulf. Goat's milk may be consumed fresh (such as in the mountainous region of Oman), or added to tea. It is also used for the preparation of some traditional foods like *madeer and samin*. Goats's milk is rarely available on the market as it is usually produced for local consumption.

The protein and fat content of milk produced by two breeds of goat in Saudi Arabia are lower than those of goat milk produced in other parts of world. This is because of the harsh conditions under which these animals live. But no significant variation between the vitamins content of milk from Saudi goats and that from other goats is reported in the literature.

Goat's milk contains a higher amount of unsaturated fatty acids (particularly 18:2) as compared to cow's milk. The amino acid profile of goat's milk shown a higher level of lysine, comparable concentration of the sulphur amino acids, and less tryptophan compared to cow's milk.

Goat's milk is a good substitute to cow's milk, especially for young children and those allergic to cow's milk. Also, it has been reported that goat's milk can be used for the treatment of peptic ulcers because of its buffering capacity. Encouragement to use goat's milk is therefore highly recommended, particularly in pastoral communities.

Nutritive Value**a. Proximate Composition (g/100g edible portion)**

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
77	84.8	3.4	4.0	0.7	-	7.1

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
128.0	95.0	-	0.1	-

Sheep Milk (*Haleeb Kharouf*)

حليب الخروف

In some parts of Arabian Gulf, ewe's milk is the main food for the pastoral population. This milk is traditionally drunk fresh as raw milk. Any seasonal surplus is used for the preparation of ghee and *madeer*. Sheep's milk is home produced and no commercial production is available.

Sheep's milk has a higher protein content than the milk of the goat, cow and camel. Sulphur amino acids are also found in higher concentration in sheep's milk compared to cow's milk.

With regards to vitamins, sheep's milk has a higher concentration of thiamine and niacin, lower amount of vitamins B₆, B₁₂ and ascorbic acid, and similar level of riboflavin and folacin, compared to cow's milk.

Nutritive Value**a. Proximate Composition (g/100g edible portion)**

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
94	83.1	5.9	6.0	0.9	-	4.1

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
201.0	138.0	-	0.3	-

Soft White Cheese (*Jibneh Beyadh*)

جبنة بيضاء

Jibneh beydah is a soft white cheese made from goat's and/or sheep's raw milk. It is particularly prepared by desert dwellers. The cheese is consumed with honey, ghee and bread.

Preparation

The traditional method of preparing this cheese relies on a crude mixture of enzymes produced in the stomach of suckling lambs. After birth, the lamb is nursed for one day, and then sacrificed. The coagulated milk (natural curd) is then removed from the lamb's stomach, wrapped tightly in a cloth and sundried for 3-4 days. The tightened cloth, containing the coagulated milk is then immersed 3 to 4 times in raw milk. When the curd is formed, it is mixed by pressing with hands on the surface and the sides of the tightened cloth, until the curd is broken into small pieces. These pieces are then put into a metallic container and is ready for consumption.

Recently some desert dwellers shifted to the use of rennet tablets because they are easier to use, cheaper and can produce a larger yield when compared to the traditional method.

Soft white cheese prepared by desert dwellers is available on the local markets. However, this and other kinds of cheese are produced commercially by dairy factories, especially in Saudi Arabia. The difference between traditional soft cheese and the commercially produced cheese, is that the first is prepared from raw goat's or sheep's milk, while the second is prepared from pasteurized cow's milk.

Nutritive Value

a. Proximate Composition (g/100g edible portion, dry basis)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
-	-	21.1	23.4	2.6	-	-

b. Mineral Composition (not available)

Butterfat Milk (*Laban*)

لبين

Laban is traditionally prepared from cow's, sheep's or goat's milk. *Laban* is an accompanying drink at lunch, and also at other meals. It is usually consumed with dates, but sometimes it is added to rice.

Preparation

There are two methods of preparing *laban*. The first one is by mixing goat's and/or sheep's milk in a pot, and then covering it with a piece of cloth, and leaving it for natural fermentation. An old *laban* yoghurt drink (as starter) is sometimes added, and the mixture kept in a warm place for 6 to 24 hours. If old *laban* is not available *madeer* is added as a starter. In the second method the milk is allowed to ferment overnight (without the addition of starter). The fermented milk is then churned in a local churner (made from an animal stomach) for 1-2 hrs, until the fat is separated from the milk. The *laban* is then consumed. The product prepared by the second method has a lower fat content than that prepared by first method.

Recently, *laban* production in a pasteurized form has common to many dairy plants operating in all Arabian Gulf countries.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
60	88.1	3.4	3.1	0.8	-	4.6

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
128	100.5	81	0.2	0.5

Ghee (*Samin, Dehin*)

سمن، دهن

Samin is a frequently consumed food in various parts of the Arabian Gulf. It is prepared mainly from sheep's or goat's milk, especially when the milk season is successful. *Samin* is spread on the surface of rice dishes and also used in the preparation of some dishes and sweets. Nowadays, *samin* is mostly produced by pastoral sectors of the population. In urban areas, it is replaced by butter, canned ghee or vegetable oils.

Preparation

The traditional method for the preparation of *samin* is carried out by covering milk with a cheese cloth, and keeping it under the sun for about four hours, for initiating a natural fermentation. The milk is then taken out of the sunlight and kept in a warm place (30°C) for a few hours until it becomes sour. The sour milk is churned in a homemade churner to obtain *buttermilk*. The *Samin* is then obtained by heating the *buttermilk* for a 15-20 minutes. A small amount of wheat flour is added and mixed with the *samin* to absorb any water left. Salt is also added for flavouring, and sometimes a slice of onion is added to absorb any odd odours. Finally, the *samin* is filtered through multi layers of cheese cloth and the filtrate collected.

There are no major differences in the chemical composition between *samin* prepared from goat "or sheep" milk, and that of butter prepared from the same milk. However, the level of free fatty acids in *samin* is about twice that in *butterfat*.

Nutritive Value (samin made from sheep's milk)

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
813	9.4	0.3	90.2	0.1	-	-

b. Mineral composition (not available)

Hard Cheese (*Uggot*, *Madeer* in S.Arabia, *Jamid* in Oman)

يقط، مَدِير

Uggot is a dried fermented milk product made from goat "or sheep" milk. It has different shapes and sizes. *Uggot* has a colour of cream to pale yellow, and a goaty, rancid flavour. This product is commonly consumed by desert dwellers, and plays an important role in providing them with essential nutrients. It is usually prepared when there is a surplus of milk production. However, when there is a shortage of milk, *Uggot* is dissolved in water and drunk or eaten with dates.

Preparation

Uggot is prepared by allowing goat's or sheep's milk to undergo natural fermentation overnight. The fermented milk is then manually churned in a homemade churner (made from sheep's or goat's skin) for 1/2 - 2 hours to cause separation of the fat. The remaining buttermilk, called *laban*, is boiled until most of the water is evaporated. The semi-solid mass is then allowed to cool to the ambient temperature. The mass (or paste) is then shaped by hand into small pieces (20-50g). The pieces are covered with a cloth and allowed to dry under direct sunlight for 2-4 days.

Nutritive Value

The low moisture content as well as the low pH of *uggot*, allow the product to be stored for a long time (about one year) at room temperature without any detrimental changes. *Uggot* is a rich source of protein. The essential amino acids in *uggot* were found to be higher than the FAO/WHO reference protein.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
427	3.9	35.5	15.3	7.9	0.5	36.9

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
982	957	477	2.5	1.4

MEAT, FISH AND THEIR PRODUCTS

Goat Meat (*Laham Ghanam* or *Ma'az*)

لحم الغنم

Goats are widely raised in the Gulf region. In some areas such as in the mountains of Oman, goats are raised for their milk, meat and wool. Goat meat is preferable to beef in all Arabian Gulf countries, for their special taste and flavour. Goat meat is often consumed with rice at lunch.

The goat meat available in the local markets is either produced locally or imported from other Middle East countries. The composition of such meat therefore varies depending on the breed and country of origin. Goat meat imported from Turkey and Syria is preferable to that imported from other countries.

Nutritive Value

a. Proximate Composition (g./100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
157	71.5	18.4	9.2	0.9	-	-

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
11	154	-	2.2	-

Camel Meat (*Laham Jamal*)

لحم الجمل

Camels are the main animals living in the desert. They can tolerate the difficult environmental factors of the desert. Camels are raised for several purposes, as vehicles, for their milk and meat. Camel meat has tough muscle fibers and a characteristic flavour. The fat is mostly concentrated in the hump (*sanam*). The breed of camels living in the Arabian Gulf region has one hump, but other camel breeds in Asian regions have two humps.

Camel meat is rarely available on the market. It is mostly consumed in the desert, by the bedouins and is remain their favourite meat even when they move into urban areas.

In comparison with medium fat beef, camel meat has high levels of thiamine, riboflavin and iron, but low levels of fat and phosphorous.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
101	77.2	19.3	2.6	0.9	-	-

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
21.6	-	210	8.5	14.1

Fermented Fish Sauce (*Mehiawah*)

المهيأوه

Mehiawah was introduced by Iranian immigrants long ago, and has become one of the traditional foods in various parts of the Gulf, mainly in Bahrain, Qatar, Kuwait and the UAE. *Mehiawah* is usually prepared at home, but is now available at some local bakeries that produce *tanoor* breads. The quantities prepared for marketing are small, and depend mainly on home-preparation.

Preparation

Mehiawah is prepared from a mixture of tiny pickled fish (Indian oil sardine), water, spices and salt. The fish is cleaned and washed thoroughly. Salt is dissolved in water and mixed with the fish. The mixture is then put in a glass bottle, tightly covered and exposed to sunlight for 7 to 15 days for fermentation. The fermented fish product is then mashed and strained. The mixture of spices is roasted, ground, and cooled. The final product is prepared

by mixing the spices with the fermented fish. The mixture is preserved in glass bottles for further fermentation for 5 to 10 days.

Mehiawah is generally spread over *tanoor* bread, then folded or rolled, and served with spring onions. It is a preferred food for breakfast.

Nutritive Value

The composition of *mehiawah* varies considerably depending on the amount of fish used and water added. Since *mehiawah* is usually too salty, it is consumed in small quantities. Generally, one to two tablespoons of *mehiawah* are spread over one *tanoor* bread.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
106	67.4	7.9	3.2	7.7	2.4	11.4

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
174.9	176	1572	3.9	48.3

Fish (*Samak*)

السمك

Fish is one of the traditional foods more frequently consumed in the coastal areas of the Gulf. Prior to the discovery of oil, fish was the main source of animal protein. At that time fish with rice and dates constituted the main meal. Nowadays the consumption of fish has decreased as it has been replaced gradually by meat and poultry.

The Arabian Gulf has a coastline of approximately 3000 km. The Gulf countries are rich in fishing resources with many potentially productive sites on the inhabited coasts. It is estimated that more than 100 types of fish are available in the region.

Preparation of fish for consumption

Fish is consumed in various ways, grilling (*Samak mashwey*) is one of the traditional methods used to prepare fish. Usually, the fish is grilled without gutting or removing the fins or scales. It is rubbed with salt inside gills and on the surface and grilled over an iron pan (*Tawah*). Palm leaves (*Khouse*) are traditionally used for the fire, but recently, they have been replaced by gas burners. Only a few kinds of fish are used for grilling; the most common one is *Maid* (*Liza macrolapis*).

Fried fish (*Samak magli*) is also consumed in the Gulf, mainly with rice or bread. Before frying, fish is cleaned and fins, tail and scales are removed. The fish is then rubbed inside and out by a mixture of spices and salt before frying in vegetable oil in a shallow frying pan, until it is brown on both sides.

Drying is one of the traditional methods for the preservation of fish in the Gulf region. The fish is salted and exposed to sunlight for 3 to 7 days depending on the kind of fish. Shrimps, small sardines and sharks are commonly preserved in this way. Salted, dried fish is used for the preparation of some traditional foods such as *mehiawah*, *tareeh*, and stews.

Crabs (*Gubgub*) are another sea food commonly consumed in the Gulf. Crabs are boiled in salted water until well done. The flesh is then eaten along with salads.

Nutritive Value

In general, fish are rich in protein and dried fish are very high in protein due to their low moisture content. Some fish have a high fat content such as *Maid* (12.1%), *Mochwah* (7.8%) and *Zobaidy* (6.7%). Dried fish contain high concentration of iron and phosphorous which makes this food nutritious. However, dried fish have a high sodium content which makes it unsuitable for people with hypertension.

It is well documented that the consumption of fish has a beneficial effect in the prevention of coronary heart disease, a principal cause of death in the Gulf. The following table shows the proximate and mineral composition of some fish commonly consumed in the Gulf.

a. Proximate Composition (g/100 g edible portion)

	Energy (kcal)	Moisture	Protein	Fat	Ash	Carbo- hydrate
Crab (<i>Gubgub</i>)	57	85.8	11.4	0.7	2.0	0.5
Grouper (<i>Hamour</i>)	108	76.8	18.9	3.6	1.1	—
Mullet (<i>Maid</i>)	184	67.6	18.6	12.1	1.9	—
Sea bream (<i>Muchawah</i>)	149	70.6	19.2	8.0	2.5	—
Shrimp, dried (<i>Rubian</i>)	331	8.1	76.4	1.2	10.5	3.9
Shrimp, raw (<i>Rubian</i>)	86	78.5	17.9	0.9	1.6	1.5

b. Mineral Composition (mg/100g edible portion)

	Ca	P	Na	Fe	Zn
Crab (<i>Gubgub</i>)	—	—	—	—	—
Grouper (<i>Hamour</i>)	18	210	54	0.6	0.8
Mullet (<i>Maid</i>)	39	367	108	1.7	2.1
Sea bream (<i>Muchawah</i>)	112	433	97	0.7	2.2
Shrimp, dried (<i>Rubian</i>)	1158	969	—	6.2	—
Shrimp, raw (<i>Rubian</i>)	164	276	—	2.6	—

Fermented Fish Sauce (*Tareeh*)

الطريخ

Tareeh is, like *mehiawah*, prepared from fermented fish, but it is more concentrated. It is limited to home preparation by some families of Iranian origin. Unlike *mehiawah*, *tareeh* is rarely available on the market.

Preparation

Tareeh consists of fish, salt, cumin, and red chillies. The fish (Indian oil sardine) are washed, drained and mixed with salt, cumin and red chillies. The mixture is then put into a big container, and

exposed to sunlight for one week, or until the fish are soft. Just before consumption, the *tareeh* is diluted with water as required, and eaten with bread, spring onions, and radish leaves.

Nutritive value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
80	58.5	14.9	1.8	23.2	0.5	1.1

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
525	473	4204	3.0	162

FRUITS AND VEGETABLES

Leek (*Bagel, Kurrat*)

بقل، كرات

Bagel is cultivated in all countries of the Arabian Gulf. In general, the green leaves are the main part eaten. The flavour of leeks is rather like onion, though much milder and sweeter. *Bagel* leaves are particularly consumed as salad with *tikkah* (grilled meat). They are also widely eaten as salad with lunch and supper.

Nutritive Value (leek leaves)

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
22	90.8	1.6	0.5	2.1	-	2.9

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
24	44	2	1.1	0.2

Spineless Prickly Pear, Indian Fig (*Barshomi, Teen shwaki*)

برشومي، تين شوکي

Barshomi is an ablong or pear-shaped fruit, containing soft, whitish juicy pulp and many seeds. It is grown mainly in Saudi Arabia on dry sands or rocky soils. The ripe fresh fruits are normally skinned before eating. The fruit is very popular and available in local markets.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (crude)	Moisture	Protein	Fat	Ash	Fiber	Carbo- hydrate
49	85.2	0.7	0.3	-	-	11.5

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
53	27	4	0.4	0.6

Purslane (*Berber*)

بربير

Berber is cultivated in the Arabian Gulf. It is a sprawling plant with rosettes of thick leaves. The leaves are usually eaten raw as salad, especially at lunch and supper. They have a sourish taste. *Berber* leaves are usually eaten fresh, they are not stored, but can be pickled or dried.

Berber contains a high concentration of oxalic acid which interferes with calcium absorption. The leaves are rich in carotene and some minerals. The vitamin C level is higher in young leaves after flowering.

Nutritive Value

a. Proximate Composition(g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
32	91.5	2.0	0.4	1.4	0.9	3.8

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
79	32	46	2.5	-

Pumpkin (*Bober, Gara'a*)

بوبر، قرع

This fruit is cultivated successfully in all the Gulf regions. The main parts consumed are the flesh and the seeds. The flesh is white to yellow, somewhat coarse, strongly flavoured and not usually served as a table vegetable. The mature fruits are peeled, cut into small pieces and used in many dishes, especially stews. The seeds are washed, roasted and consumed as snacks.

The fruits can be stored for one to three months, depending on the stage of maturity and the variety. For long storage, fruits should be kept on slatted shelves with good ventilation. The seeds can be stored for several months.

The yellow flesh has a good amount of carotene, but traces of vitamins B and C. Pumpkin's leaves contain more nutrients than the fruits, however, they are not eaten in the Gulf region. It is important to encourage consumption or utilization of the leaves as they are abundantly available. The fruits can be used in pies and making jam, as well as for weaning foods.

Nutritive Value (mature fruit)

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
39	90.0	1.0	0.2	0.6	0.7	7.5

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
21	24	-	0.6	-

Sapota (*Chiko*)

جيكو

Chiko is an earthy brown skinned fruit, with black stones. It is mostly eaten raw, or used in pies and sweets. *Chiko* is cultivated on a small scale mainly in Oman. The local production is generally of low quality and for this reason most of it imported from India and

Pakistan. *Chiko* is very popular, but relatively costly. For these reasons it is highly recommended that the local production should be increased.

Nutritive Value (fresh fruit)

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
98	73.7	0.7	1.1	0.5	2.6	21.4

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
28	27	-	2.0	-

Coriander (*Hasheesh, Kizbarah*)

حشيش، كزبرة

Hasheesh is grown throughout the Gulf region. It is one of the most ancient vegetables and is used both in cooking and as a medicine. The main parts used are the green leaves and the ripe seeds. The taste of these two parts is completely different. The leaves are used in the preparation of many dishes, especially stews and salads while the seeds are used in the preparation of mixed spices (*ibzar*). Bunches of green *hasheesh* are available on the local market, but their shelf life is short. The leaves are sometimes sun-dried and stored for later use.

Hasheesh has pealier seeds which can be easily split in two: and the colour varies when ripe from pale green to cream or brown. They are available in the market either whole or ground. If they are stale, after grinding, they rapidly lose their flavour. The taste is sweet, aromatic and vaguely like orange peel.

Nutritive value

The seeds contain about 1% of their weight as volatile oil. The seeds also contain malic acid, tannin and some fatty matter. If used

too freely the seeds have a narcotic effect. The leaves are rich in minerals, particularly iron and their consumption should be encouraged in the preparation of local dishes.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
25	92.1	1.6	0.3	2.0	-	4.1

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
154	40	99	5.3	-

Tamarind (*Isbar or Sebar*)

صابار

Isbar has rust coloured pods, straight or slightly curved with constrictions in the spaces between seeds. It is grown widely in Oman, and other parts of the Gulf.

Preparation

The fruits are consumed in a variety of ways. They are eaten raw, and in this stage are particularly liked by women, especially those who are pregnant. They are also used to prepare a drink (*sharbat al-sebar*). This is done by soaking the tamarind pulp in water and mashing the mixture thoroughly by hand. The seeds are then removed and the solution heated with frequent stirring, until the tamarind is disintegrated. The suspension is then strained through a clean muslin cloth. The solution is diluted with water and sweetened with sugar to prepare the drink. It is commonly believed that the tamarind drink is good for the treatment of constipation and indigestion.

In Saudi Arabia, the fruit pulp is kneaded into flattened round cakes, 10-20 cm diameter and 2-5 cm thick which are sun-dried for storage. Tamarind paste is now commercially available. It is widely used to flavour many dishes, especially stews.

Nutritive Value

The fruits are considered a rich source of sugars, and an excellent source of B-vitamins. They are also have a useful amount of calcium, phosphorus, and iron compared to other fruits.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
305	22.6	3.1	0.4	2.1	3.0	68.8

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
54	108	-	1.0	-

Jujube [(*Kinar, nabk* (in Oman and S.Arabia)] كِنَار، نَبِق

Kinar is grown throughout all Arabian Gulf countries. The fruits, which are commonly consumed fresh, are ovoid, 2-3 cm long, with fleshy acid pulp and a hard stone. The tree is known as *cidar* or *cidrah* and its leaves are widely used in folk medicine. In general the jujube tree can survive under very unfavourable conditions of soil, water and weather conditions.

Commercially, the fruits can be utilized in different ways. They can be used to prepare a refreshing drink or sun-dried and stored for a long period of time. It was found that after drying for a few weeks, the fruits acquire a soft and appealing texture similar to that of dates. The dried *kinars* can be used as raisins in cooked rice or utilized in the making of chutney and pickles. *Kinars* are very popular fruits and are sold in local markets when in season.

Nutritive Value

The fruit in general, is rich in vitamin C and some minerals, compared with many other fruits. Data on the amino acid content of *Kinar* at the ripe stage shows a very high level of threonine and a complete absence of methionine.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
90	77.2	1.6	0.3	0.6	-	20.4

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
43	28	6.0	0.9	-

Lemons (*Loomi*)

لومي

Loomi is grown in some parts of the Arabian Gulf, particularly in Oman. Traditionally when lemons are in season, lemon drink (*Sherbat-al-loomi*) is commonly consumed. It is believed that lemon drink helps to care nausea and vomiting. Lemon drink is prepared by squeezing the lemon in water, and adding sugar as required.

When large quantities of lemons are available they are sundried and stored for future use. Dried lemons, called *loomi aswad* (black lemon), are used in most of the Gulf dishes to perfume and flavour them. Dried lemons are sometimes ground to a powder. This product has a long shelf life because of its low moisture content and high acidity.

Preparation

The dried lemons are prepared by boiling the fruits with water and salt, for 3 to 5 minutes. The water is then drained, and the lemons are placed on a mesh metal cake rack, and kept under direct sunlight for one week to dry. The lemons are ready for use when they become dark, and the flesh completely dehydrated. The dried lemons can be stored in an airtight container for months.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

	Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
Fresh lemon	43	89.8	0.7	0.6	0.4	0.7	7.8
Dried Lemon	327	16.3	7.8	2.7	5.3	-	67.6

b. Mineral Composition (mg/100g edible portion)

	Ca	P	Na	Fe	Zn
Fresh lemon	41	15	-	0.7	-
Dried Lemon	199	216	119	16.0	-

Ornamental Almond (*Looze*, *Betham* in Oman) لوز، بيزام

Looze is widely grown in most Arabian Gulf countries. The fruits have green, yellow and red colours. The kernel is about three quarters of an inch long (the size varies from species to species) with a delicate flavour of almond. Between the green (or red) skin and the kernel is a thick layer of fibrous yellow or red flesh. This is the main part of the fruit for human consumption, and is highly consumed in its season (summer). The kernel is dried and then broken to obtain the nuts inside it. The whole kernel is used for animal feeding.

Nutritive Value

No information on nutritive value is available, probably the fruit has a high fiber content.

Coconut (*Narjeel*)

النارجيل

Narjeel is only grown in South Oman (Salalah). The majority of the coconuts produced are used to supply coconut water. This is obtained by deftly slicing the top of the fruit with a machete, and inserting a straw. After drinking the water, the soft flesh may be scooped out and eaten.

Preparation

Coconut fruits produced for drinking purposes, are usually harvested while still green, that is about six months after flowering. Those fruits destined for eating are usually harvested after nine months. Two methods are used to obtain the grated flesh. The outer husk of the whole coconut is stripped, and the shell broken open and the inside pressed against a set of rotating serrated blades. The second method is to allow the unopened coconut to dry. Eventually the white flesh comes away from the shell, contracting until it is the size of a cricket ball. It is then separated from the cover and grated. This dried coconut can be stored for a long period.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

	Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
Coconut water	24	93.8	1.4	0.1	0.3	-	4.4
Coconut flesh	41	90.8	0.9	1.4	0.6	-	6.3

b. Mineral Composition (mg/100g edible portion)

	Ca	P	Na	Fe	Zn
Coconut water	24	10	-	0.1	-
Coconut flesh	10	30	-	0.9	-

Papaya (*Papay, Fefy* - in Oman)

باباي، فيفای

Papay is another tropical fruit which is grown successfully in many parts of the Arabian Gulf and particularly in the Southern region of Oman. The fruit is eaten raw along with other dishes. In Oman the fruit is popular at breakfast.

Papay is usually eaten fresh. The fruit can be commercially processed into soft drink, pure and nectar bases. The fruits once picked can be stored for about 6-10 days at room temperature. Cool storage life is about 2-4 weeks.

The fruit is very rich in carotene and vitamin C. Red-fleshed fruits have approximately one half the carotene of yellow-fleshed fruits. Papain the protein-splitting enzyme is present in the fruit, and helps in the digestion of meat. *Papaya* is a poor source of calcium, phosphorus and iron.

Nutritive Value (ripe fruit)

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
42	89.3	0.7	0.1	0.4	-	9.5

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
29	18	4	0.8	0.3

Sugarcane (*Qalam Shaiker, Khasab Alsokar*)

قلم شکر، قصب السكر

Qalam Shaiker is a tall grass-like plant which is grown only in Southern Oman. This plant is produced only for its juice. When the cane is fully grown it is cut, trimmed and crushed by passing it through rollers to extract the juices. It is believed that sugar cane juice is good for patients with jaundice.

Sugar cane is also peeled and cut into small pieces (2 inches of each), and sold in plastic packs in local markets. These pieces are chewed, especially by children and women to extract their juices.

Nutritive Value (sugar cane juices)

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
39	90.2	0.1	0.2	0.4	-	9.1

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
10	10	-	1.1	-

Radish (*Rowaid, Fejel*)

روييد، فجل

Rowaid is widely grown in all Arabian Gulf countries. It is preferable vegetable at lunch. Usually the leaves and the roots are the main parts eaten. There are two groups of radish red and white skins. The white skins (oriental radishes) are the most commonly available in the region. The roots are eaten while still young, crisp and tender. Both roots and leaves are eaten raw in salads or a lone. Radish has a very short market life, therefore, should be kept of the sun, preferably covered with damp cloths.

Nutritive value

a. Proximate composition (g/100 edible portion)

	Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
Radish, leaves	20	93.7	1.3	0.2	1.6	-	3.2
Radish, roots	17	94.6	0.7	0.1	1.4	-	3.2

b. Mineral Composition (mg/100g edible portion)

	Ca	P	Na	Fe	Zn
Radish, leaves	178	27	212	4.2	-
Radish, roots	84	22	158	4.5	-

Pomegranate (*Rumman*)

الرمان

Rumman is cultivated in some parts of the Arabian Gulf, mainly in Saudi Arabia. The fruits are eaten as a table or salad fruit. Juice from the pulp is processed into drinks or mixed with other fruit juices. The fruit pulp is rich in sugars, mainly glucose and fructose. The dry part (root and stem) are ground and used in folk medicine for treatment of tonsillitis.

The fruits can be stored for 5 to 6 months, if harvested at certain stage of ripeness. During storage the fruit ripens and improves in quality. The seed pulp becomes softer, and the skin thinner and harder. Also the flesh loses its acidity.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
72	82.5	1.4	0.8	0.5	-	14.8

b. Mineral Composition (g/100g edible portion)

Ca	P	Na	Fe	Zn
9	30	3	0.3	0.43

Dates (*Rutab, Tamer*)

الرطب، التمر

Date palms are the most extensively cultivated fruit trees in the Arabian Gulf countries. For desert dwellers, dates are the main foods that can be carried for a long period in a hostile climate where little grows. Even in the coastal areas, dates are considered important, and many sailors used to live on dates and fish during long and difficult voyages. Most of the dates that are grown in the region, are consumed fresh or dried. Dates are sometimes boiled and sundried before eating.

There are about 400 different date cultivars in Saudi Arabia alone, but only 50-60 cultivars are of commercial importance. Saudi Arabia is considered to be one of the major producers of dates in the world. In general, dates are eaten with *laban* or milk and Arabic coffee. However, there is no rule for date consumption as they are eaten at any time and with any meal. Dates are also used in the preparation of many traditional desserts.

Preparation

There are about 5 stages of date production, but those of *khalal*, *rutub* and *tamer* are the most important. *Khalal* refers to the early stage at which dates begin to change colour to yellow or red depending on the cultivar. *Rutub* refers to the stage when the fruit softens and loses its astringency. *Tamer* is the final stage of maturity when the fruit acquires a dark-brown colour and a firm consistency.

Large quantities of surplus dates are dried and eaten later. Date syrup "*dibs*" is also extracted from dates. The traditional method for extracting date syrup is by putting the dates in a small room of 1-2 meters high. The room has a slanting floor covered by a mat made from date palm leaves. The dates are spread on the mat in layers until they almost reach the roof of the room. The upper layer of dates is then covered by other mats. This method of stacking the dates, causes a rise in their temperature due to slow fermentative activity. These conditions cause the date syrup to flow on the ground and run through a small hole to a container. Commercially this method is not practical as only 15% of the syrup can be extracted. Nowadays, there is a mechanical method for the extraction of date syrup. An hydraulic press can efficiently extract a greater proportion of the date sugars and other soluble solids. Date syrup is used in the preparation of many traditional foods and dishes, such as date bread, *legaimat* (doughnut cake), and *mahmer* (sweet rice).

Dates are now commercially produced in different ways. At the *tamer* stage dates are available in metal or plastic containers. Nuts

are sometimes mixed with these dates. Dates frozen at *rutab* stage are available on the market. Dates are mixed with tehineh and sold as a confectionery. Commercially, dates can also be well utilized in the processing of jam. The stones are removed and sold as animal feeds.

Nutritive Value

In general, the levels of moisture, protein, fat, fiber, ash, tannins, vitamins A and C are at their maximal values in the early stages of fruit maturity, while the minimum amounts of these nutrients are present in the *tamer* stage. Only, the sugar content increases in the *tamer* stage.

a. Proximate Composition (g/100g edible portion)

	Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
<i>Khalal</i>	102	67.1	3.3	0.4	2.4	5.6	21.2
<i>Tamer</i>	313	17.0	2.4	0.2	1.9	3.1	75.4

b. Mineral Composition (mg/100g edible portion)

	Ca	P	Na	Fe	Zn
<i>Khalal</i>	72	76	26.0	1.7	0.6
<i>Tamer</i>	35	57	26.0	1.5	0.4



CONFECTIONERIES AND SWEETS

Corn Flour Sweet (*Halwah*)

حلوى

Halwah is one of the most frequently consumed traditional sweets in the Gulf region. It is usually eaten before drinking coffee and it is the main sweet served to visitors. *Halwah* is prepared from cornflour, water, fat, sugar, nuts, cardamom, and saffron.

Preparation

Cornflour is mixed with water, and heated over a low fire. Sugar, nuts, cardamom and saffron are then added, and the mixture is stirred continuously. Fat (butter or *samin*) is gradually added, and the mixture continuously stirred, until a thick paste is formed. The paste (*halwah*) is put in small containers and kept at room temperature for further use.

Nutritive Value

From the nutritional point of view the high content of animal fat in *halwah*, makes this sweet high in saturated fatty acids. *Halwah* is low in protein and minerals, it is preferable, therefore, not to encourage the consumption of this kind of sweet, and to replace it by other more nutritious snacks.

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
393	15.3	1.0	11.4	0.2	0.6	71.5

b. Mineral composition (not available)

Nashab (*Darabeel in Kuwait*)

نشاب، درابيل

Nashab is a traditional food which is widely consumed at weddings and on other social occasions. It is mostly served with Arabic coffee. *Nashab* is produced commercially in Bahrain and Kuwait. This food can be stored for a long time, mainly because of its very low moisture content.

Preparation

The major ingredients used in the preparation of *nashab* are; wheat flour, sugar, ground almond, cardamom powder, rose water and oil. The pastries are made from flour. These are cut into 10 cm x 25 cm rectangles, and brushed with oil. As in *sambosa helwah*, sugar, cardamon and rose water are mixed until a crumbly mixture is formed. The mixture is then stuffed in the rectangles and rolled. The rolled stuffed pastries are fried in oil until brown, and then strained.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
423	4.2	8.5	9.6	1.0	1.1	75.7

b. Mineral composition (not available)

Sesame Sweet [(*Rahash*, *Halawah* (in S.Arabia))]

رهش، حلاوة

Rahash is prepared from a paste of dehulled roasted sesame seeds (tehinah), sugar, citric acid, and egg white. In Saudi Arabia, the egg white is replaced by *saponaria officinalis* root extract. *Rahash* is consumed both as a main food item or as a dessert. It is commonly eaten with bread, and sometimes it is served before Arabic coffee.

In all Arabian Gulf countries, *Rahash* is produced commercially and is very similar to *halwah tehenih* in other Middle East countries.

Preparation

For the preparation of *rahash*, the mixture of sugar, citric acid and egg white are first boiled for 5 to 10 minutes. Egg white or *saponaria officinalis* is used for its emulsifying-stabilizing properties. The mixture is then cooled and added to tehineh and mixed well. The final paste is put into suitable containers.

Nutritive Value

Tehineh and egg white are good sources of high quality protein. Inorganic elements are also found in a considerable concentration in *rahash*. The fatty acid profile of *rahash* indicates a high percentage of unsaturation (83%), with oleic, and linoleic acids being the major unsaturated fatty acids.

The amino acid content of *rahash* shows that lysine is the first limiting amino acid. In general *rahash* is a nutritious food when compared with other Gulf desserts. It can be used as a substitute to many sweets such as pastries and candies.

a. Proximate Composition (g/100g edible portion)

	Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
<i>Rahash</i> (S.Arabia)	548	3.0	14.0	31.6	1.7	1.7	52.0
<i>Rahash</i> (Kuwait)	525	2.7	12.4	29.0	1.3	-	53.5

b. Mineral Composition (mg/100g edible portion)

	Ca	P	Na	Fe	Zn
<i>Rahash</i> (S.Arabia)	41	381	196	5.8	4.8
<i>Rahash</i> (Kuwait)	43	340	810	6.5	4.9

Sweet Samosa (*Sambosa helwah*)

سمبوسة حلوة

Sambosa helwah is one of the traditional sweets widely consumed in the Gulf area. It is mostly prepared in Bahrain, Kuwait and Qatar. This sweet is served for visitors at weddings and feasts. Traditionally *sambosa helwah* is prepared in the home. Recently, many local bakeries developed commercial methods for preparing it, and sweet sambosa is now on the market in plastic bags of 1/2 or 1 Kg weight.

Preparation

Wheat flour, sugar, ground almonds, cardamom powder, rose water, salt and saffron constitute the main ingredients of *sambosa helwah*. For preparation, the almonds, sugar, cardamom, saffron and rose water are mixed well until a crumbly mixture is formed. The flour, oil, salt and water are kneaded until a tender dough is obtained. The dough is then formed into sheets which are cut into approximately 2 cm x 11 cm strips. The mixture is then placed on the sheets and shaped into a triangle. The edges are closed by a wet flour. The *sambosa* is fried in corn oil until brown. The final products can be kept for a long time without deterioration in quality, however, *sambosa* is always preferred when it is warm.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
413	10.5	5.4	12.0	0.6	0.7	70.8

b. Mineral composition (not available)



OTHER PRODUCTS

Hot Tomato Sauce (*Dakkous*)

دقوس

Dakkous is a flavouring food which is usually served with rice. It is prepared from tomatoes, garlic, chili, salt and oil. *Dakkous* is prepared in the home, or produced commercially as a pasteurized product. The pasteurized *dakkous* can be stored at room temperature with a shelf life of 6 months.

Preparation

For preparation, tomatoes are sliced and mixed with oil, ground garlic and salt. The mixture is then simmered over fairly low heat until well cooked. Chilies are added at the end of the cooking stage and mixed well. *Dakkous* is eaten in small quantities as chutney. Therefore, its contribution to the daily nutrient intake is insignificant.

Nutritive Value

a. Proximate Composition (g/100g edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
81	80.5	2.2	4.8	5.2	-	7.3

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
58	63	-	0.94	0.49

Truffles (*Faqa*)

فقع

Faqa is a desert wild plant that grows mostly during autumn. It grows underground but a small part of it cracks the surface of the ground. The *faqa* tubers are washed to remove the adhering soil, but sometimes are peeled due to the difficulty in removing the dirt between the crevices.

Preparation

The tubers are boiled and mixed with rice or stews. Flaying the tubers with tomatoes and onions is another method for its preparation.

Peeling the faqa's tubers lead to a considerable decrease in the amount of protein, fat, ash and vitamin C. Furthermore , crude fiber is higher in the peeled tubers as compared to the unpeeled ones. Peeling the tubers reduced the concentration of mineral elements, particularly calcium and iron. However, peeling has no significant effect on the amino acid composition.

Nutrition Value

The amino acids profile of Faqa tubers shows that it contains a high quality protein. All the essential amino acids are present in fairly good amounts.

a. Proximate Composition(g/100g edible portion)

Energy (kcal)	Moisure	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
82	79.6	3.6	0.5	0.84	-	15.7

b. Mineral Composition (mg/100g edible portion)

Ca	P	Na	Fe	Zn
29	86	18	1.6	-

Seeds (*Hab, Bether*)

حب، بذر

Various kinds of seeds are consumed in the Gulf countries. The most popular ones are that of pumpkin (*hab fasad*), water-melon (*hab ragi*) and sunflower (*hab shamsy*). These seeds are commonly eaten as a snack between meals with tea or carbonated beverages . The seeds are obtained from their plants, washed, sundried, and salted. Sometimes, the seeds are roasted in their husks and salted before consumption.

These seeds are rich in protein, oil and vitamin E. They are usually consumed in relatively large amounts and because of this, they may be played an important role in the prevalence of obesity. The salted seeds may have a high sodium concentration due to salting, and therefore should be consumed with caution.

Nutritive Value

a. Proximate Composition (g/100g edible composition)

	Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
<i>Hab ragi</i>	593	6.1	32.3	45.7	3.8	2.7	9.4
<i>Hab fasad</i>	602	4.5	30.3	47.0	4.6	2.2	11.4
<i>Hab shamsy</i>	589	6.0	25.0	45.0	4.0	5.5	14.5

b. Mineral Composition (mg/100g edible portion)

	Ca	P	Na	Fe	Zn
<i>Hab ragi</i>	50	1000	-	8.5	-
<i>Hab fasad</i>	40	1064	-	9.2	-
<i>Hab shamsy</i>	100	868	-	7.5	-

Mixed Spices (*Ibzar, Baharat*)

بزار، بهارات

Ibzar is a mixture of various kinds of spices. It is highly used in all regions of the Arabian Gulf and any recipe will be incomplete without the use of this mixture.

The contents of *ibzar* vary from home to home, depending on the kind and proportions of spices used. In general a mixture of black peppercorns, cumin seeds, dry coriander, cinnamon stick, cloves, dried ginger, cardamom, dried red pepper and turmeric roots is used in preparation of *ibzar*.

The spices are thoroughly washed, and allowed to dry in the air. The principal ingredients are ground into a coarse mixture with a hand mill. All the ingredients are then mixed, and ground. The final mixture is kept in a tightly covered container, and may be

stored for months. Previously, there were traditional places called (*Matahen*) which specialized in grinding the spices. But with modern technology, more and more women start using the electric grinders for the preparation of *ibzar*.

Nutritive Value

It is difficult to obtain the nutritive value of *ibzar*, because the ingredients and their proportion vary considerably from home to home. Many spices are rich in protein, ash and fiber, but their contribution to the daily intake is very small due to the small amounts used in any one dish. However, some spices contain large amounts of sodium. These include cumin, coriander and cloves which are commonly used in Arabian Gulf dishes. Consequently, more attention should be paid to the spice content of sodium-restricted diets in hospitals.

Chickpea Snack (*Mattay*)

متای

Mattay is one of the most popular snacks available in various parts of the Gulf. *Mattay* originated from the Indian-subcontinent, and is very similar to the so-called "mixture" in these countries. It is usually eaten as a snack between meals, but it is also served to visitors in the home. This food is composed of a mixture of different shapes of crunchy snacks prepared mainly from chickpea flour. Nuts such as peanuts, and legumes, such as moungea, are usually added to the mixture.

Preparation

Chickpea flour is mixed with water, spices and salt, until a semi-liquid paste is formed. The dough is then pressed through a sieve or special container into hot vegetable oil so as to come out as thick noodles with a smooth or corrugated surface. The size and shape of the holes in the sieve are changed to produce various shapes of this product. Roasted peanuts, chickpeas and moungeas are added and the product packed into plastic bags.

Mattay is available in local markets, and is commercially prepared through automatic processing and packing machines.

Nutritional Value

From the nutritional point of view, *mattay* is a good source of protein and calories. It is superior to other snacks commonly provided for children in schools, such as corn-puffs, and potato-chips. Reducing the amount of salt in this snack is recommended before encouraging its consumption.

a. Proximate Composition (g/100gm edible portion)

Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbo- hydrate
491	3.4	19.3	28.3	0.9	4.4	39.7

b. Mineral composition (not available)

Arabic Coffee or Gulf Coffee (*Qahwah*) القهوة الخليجية

Qahwah is light coffee. It can be prepared in various ways, but always without sugar. It is a traditional welcoming drink served at all social occasions. It is served from a traditional pot (*dallah*) into a very small cup without handles *finjan*, in small quantities of about half a *finjan* (25ml).

Preparation

Qahwah is prepared from water, coffee, cardamom, saffron and rose water. The coffee beans are roasted in a large shallow frying pan over medium heat until they turn golden brown. The coffee beans are then slightly cooled and ground coarsely in a coffee grinder, *hawan* (nowadays an electric grinder is used). The ground coffee is added to water and brought to the boil. Cardamom, rose water and saffron are then added to the boiling water. After boiling for a few minutes, the solution is poured into a *dallah*, retaining the ground coffee in the saucepan.

Nutritive Value

Qahwah has no significant nutritional value because it is a very light coffee and contains no sugar. The coffee is sometimes recommended for obese people to be taken before a meal to decrease their appetite for food.



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Table A: Proximate and mineral composition of traditional foods consumed in the Arabian Gulf Countries.

Local name	Common name	Proximate composition (g/100g)							Mineral composition (mg/100g)					
		Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbohydrate	Ca	P	Na	Fe	Zn	
Cereals, pulses and their products														
<i>Ayach</i>	Rice, boiled	172	60.5	3.1	3.8	0.8	0.5	31.3	20.8	42.6	627.5	0.2	0.5	
<i>Chapati</i>	Parathas	285	31.8	8.2	3.6	1.2	0.2	55.0	34.4	72.4	227.0	1.2	0.7	
<i>Khoubez al-tamer</i>	Date bread	307	22.4	8.8	1.9	1.2	0.5	65.2	5.8	75.0	116.0	1.8	8.4	
<i>Khoubez al-rigag</i>	Thin Pan bread	372	6.5	12.5	0.4	0.8	-	79.8	17.0	231.0	359.0	1.8	1.7	
<i>Khoubez al-dokhn</i>	Millet bread	*	-	-	-	-	-	-	23.0	250.0	102.0	3.1	1.0	
<i>Khoubez al-thorah</i>	Sorghum bread	-	-	16.4	4.9	2.2	2.9	73.6	27.0	187.0	174.0	4.2	2.5	
<i>Khoubez Samoudi</i>	Wheat bread	257	36.9	9.2	2.2	1.1	0.6	50.0	38.0	108.0	357.0	1.2	0.9	
<i>Khoubez tanoor</i>	Flat bread	278	29.5	8.4	1.2	1.9	0.5	58.5	24.9	103.4	533.6	2.5	0.9	
<i>Khoubez Yemni</i>	Wheat bread	270	31.6	10.1	0.3	0.8	0.4	56.8	24.0	112.0	112.0	0.7	1.2	
<i>Bajeleh</i>	Broad beans, boiled	99	75.0	6.2	1.0	0.7	0.8	16.3	65.9	21.8	133.8	1.7	0.0	
<i>Nakhee</i>	Chickpeas, boiled	92	76.4	5.9	0.9	0.8	0.9	15.1	70.5	80.6	464.5	1.1	0.0	
<i>Lookiah</i>	Black-eye beans, boiled	98	75.0	5.0	2.0	1.6	1.4	15.0	69.4	21.9	134.5	-	0.0	
Milk and milk products														
<i>Haleeb al-jamal</i>	Camel milk	62	87.5	2.7	3.3	0.8	-	5.3	114.8	83.8	58.8	0.1	0.4	
<i>Haleeb ghanam</i>	Goat milk	77	84.8	3.4	4.0	0.7	-	7.1	128.0	95.0	-	0.3	-	
<i>Haleeb Kharouf</i>	Sheep milk	94	83.1	5.9	6.0	0.9	-	4.1	201.0	138.0	-	-	-	
<i>Imneh beydah</i>	Soft white cheese	-	-	21.1	23.4	2.6	-	-	-	-	-	-	0.2	
<i>Laban</i>	Butterfat milk	60	88.1	3.4	3.1	0.8	-	4.6	128.0	100.5	81.0	-	0.5	
<i>Samim</i>	Ghee	813	9.4	0.3	90.2	0.1	-	-	-	-	-	-	2.5	
<i>Uggot</i>	Hard cheese	427	3.9	35.5	15.3	7.9	0.5	36.9	982.0	957.0	477.0	-	1.4	

* - data not available

Local name	Common name	Proximate composition (g/100g)							Mineral composition (mg/100g)					
		Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbohydrate	Ca	P	Na	Fe	Zn	
Meat, fish and their products														
<i>Laham Ghannam</i>	Goat meat	157	71.5	18.4	9.2	0.9	-	-	11.0	154.0	-	2.20	-	
<i>Laham Jamal</i>	Camel meat	101	77.2	19.3	2.6	0.9	-	-	21.6	-	210	8.50	14.1	
<i>Mehiawah</i>	Fermented fish sauce	106	67.4	7.9	3.2	7.7	2.4	11.4	174.9	176	1572	3.90	48.3	
Samak														
<i>Gubgub</i>	Crab	57	85.8	11.4	0.7	2.0	-	0.5	-	-	-	-	-	
<i>Hamour</i>	Grouper	108	76.8	18.9	3.6	1.1	-	-	18.0	210.0	54	0.6	0.8	
<i>Maid</i>	Mullet	184	67.6	18.6	12.1	1.9	-	-	39.0	367.0	108	1.7	2.1	
<i>Muchawah</i>	Sea bream	149	70.6	19.2	8.0	2.5	-	-	112.0	433.0	97	0.7	2.2	
<i>Rubian (dried)</i>	Shrimp	331	8.1	76.4	1.2	10.5	-	3.9	1158.0	969.0	-	6.2	-	
<i>Rubian (raw)</i>	Shrimp	86	78.5	17.9	0.9	1.6	-	1.5	164.0	276.0	-	2.6	-	
<i>Tareeh</i>	Fermented Fish	80	58.5	14.9	1.8	23.2	0.5	1.1	525.0	473.0	4204	3.0	162.0	
Fruits and vegetables														
<i>Bagel</i>	Leek	22	90.8	1.6	0.5	2.1	-	2.9	24.0	44.0	2.0	1.10	0.2	
<i>Berber</i>	Purslane	32	91.5	2.0	0.4	1.4	0.9	3.8	79.0	32.0	46.0	2.50	-	
<i>Bober</i>	Pumpkin	39	90.0	1.0	0.2	0.6	0.7	7.5	21.0	24.0	-	0.60	-	
<i>Chiko</i>	Sapota	98	73.7	0.7	1.1	0.5	2.6	21.4	28.0	27.0	-	2.00	-	
<i>Hashesh</i>	Coriander	25	92.1	1.6	0.3	2.0	-	4.1	154.0	40.0	99.0	5.30	-	
<i>Isbar</i>	Tamarind	305	22.6	3.1	0.4	2.1	3.0	68.8	54.0	108.0	-	1.00	-	
<i>Kinar</i>	Jujube	90	77.2	1.6	0.3	0.6	-	20.4	43.0	28.0	6.0	0.90	-	

Continued Table A

Local name	Common name	Proximate composition (g/100g)							Mineral composition (mg/100g)				
		Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbohydrate	Ca	P	Na	Fe	Zn
<i>Loomi</i>	Lemon - fresh	43	89.8	0.7	0.6	0.4	0.7	7.8	41.0	15.0	-	0.7	-
	- dried	327	16.3	7.8	2.7	5.3	-	67.6	199.0	216.0	119.0	16.0	-
<i>Narijeel</i>	Coconut - water	24	93.8	1.4	0.1	0.3	-	4.4	24.0	10.0	-	0.1	-
	- flesh	41	90.8	0.9	1.4	0.6	-	6.3	10.0	30.0	-	0.9	-
<i>Papaya</i>	Papaya	42	89.3	0.7	0.1	0.4	-	9.5	29.0	18.0	4.0	0.8	0.3
<i>Qalam Shaiker</i>	Sugar cane	39	90.2	0.1	0.2	0.4	-	9.1	10.0	10.0	-	1.1	-
<i>Rouaid</i>	Radish - leaves	20	93.7	1.3	0.2	1.6	-	3.2	178.0	27.0	212.0	4.2	-
	- roots	17	94.6	0.7	0.1	1.4	-	3.2	84.0	22.0	158.0	4.5	-
<i>Rumman</i>	Pomegranate	72	82.5	1.4	0.8	0.5	-	14.8	9.0	30.0	3.0	0.3	0.43
<i>Rutab</i> ...	Dates	102	67.1	3.3	0.4	2.4	5.6	21.2	72.0	76.0	26.0	1.7	0.6
	<i>Tamer</i>	313	17.0	2.4	0.2	1.9	3.1	75.4	35.0	57.0	26.0	1.5	0.4
<i>Teen Shuwaki</i>	Prickly pear	49	85.2	0.7	0.3	-	-	11.5	53.0	27.0	4.0	0.4	0.6
Confectioneries and sweets													
<i>Habwah</i>	Corn flour sweet	393	15.3	1.0	11.4	0.2	0.6	71.5	-	-	-	-	-
<i>Nashab</i>	Cylindrical pastries	423	4.2	8.5	9.6	1.0	1.1	75.7	-	-	-	-	-

Continued Table A

Local name	Common name	Proximate composition (g/100g)							Mineral composition (mg/100g)				
		Energy (kcal)	Moisture	Protein	Fat	Ash	Fiber (crude)	Carbohydrate	Ca	P	Na	Fe	Zn
<i>Rahash - S. Arabia</i>	Sesame sweet	548	3.0	14.0	31.6	1.7	1.7	52.0	41.0	381.0	196.0	5.8	4.8
<i>Kauzait</i>		525	2.7	12.4	29.0	1.3	-	53.5	43.0	340.0	810.0	6.5	4.9
<i>Sambusa helwah</i>	Sweet sarrusa	413	10.5	5.4	12.0	0.6	0.7	70.8	-	-	-	-	-
Other Products													
<i>Dalkous</i>	Hot tomato sauce	81	80.5	2.2	4.8	5.2	-	7.3	58.0	63.0	-	0.94	0.49
<i>Faqa</i>	Truffles	82	79.6	3.6	0.5	0.8	-	15.7	29.0	86.0	18.0	1.6	-
<i>Hab.</i>	Seeds												
<i>Hab ragi</i>	Watermelon seeds	593	6.1	32.3	45.7	3.8	2.7	9.4	50.0	1000.0	-	8.5	-
<i>Hab lasad</i>	Pumpkin seeds	602	4.5	30.3	47.0	4.6	2.2	11.4	40.0	1064.0	-	9.2	-
<i>Hab shamsy</i>	Sunflower seeds	589	6.0	25.0	45.0	4.0	5.5	14.5	100.0	868.0	-	7.5	-
<i>Maitay</i>	Chickpea snack	491	3.4	19.3a	28.3	0.9	4.4	39.7	-	-	-	-	-



APPENDIX (B)

Methods of preparation and nutritive value of some traditional recipes commonly consumed in the Arabian Gulf countries*

*Source: Musaiger A.O. 1988 *Traditional Dishes of Bahrain* Al-Yamani Commercial and Management Services Bureau, Bahrain.

MACHBOUS DAJAJ (Rice with chicken)

140g chicken, boneless
 1 cup rice (175g)
 1 medium tomato, chopped (118g)
 1 medium onion, chopped (88g)
 2 tablespoons corn oil (17g)
 3 cloves garlic, crushed (2.5g)
 1 tablespoon fresh coriander, ground (4g)
 1 tablespoon butter, melted (9g)
 1 teaspoon salt (4g)
 1 teaspoon mixed spices (2g)
 ½ teaspoon black pepper, ground (1.5g)
 ¾ teaspoon dried lemon, ground (1.5g)
 2½ cups water

- Brown onion and garlic with little water.
- Add oil and chicken; fry until half done.
- Add the rest of ingredients (except rice and butter), and mix well.
- Add rice; cook until rice is tender.
- Pour melted butter on top.
- Serve hot.

1 Serving**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	62.4	g
Protein	5.0	g
Fat	6.0	g
Fiber	0.28	g
Carbohydrate	25.2	g
Energy	175	kcal
Calcium	35.0	mg
Iron	0.92	mg
Vitamin C	0.36	mg

MASLEY LAHAM (Rice with meat)

- 200g beef
- 1 cup rice (160g)
- 1 medium potato, chopped (90g)
- 1 large onion, chopped (140g)
- $\frac{1}{4}$ cup chickpeas (42g)
- 3 cloves garlic, crushed (3g)
- 1 tablespoon raisin (10g)
- 3 pieces of cardamoms (0.5g)
- 7 pieces of cloves (1.0g)
- 2 tablespoons corn oil (17g)
- 1 tablespoon butter, melted (9g)
- 2 teaspoons salt (8g)
- 1 teaspoon mixed spices (3g)
- $\frac{1}{2}$ teaspoon black pepper, ground (1.5g)
- $\frac{3}{4}$ teaspoon dried lemon, ground (1.5g)
- 4 cups water

- Cook rice with water and salt until rice is tender; set aside.
- Cook meat with the rest of ingredients (except butter), until almost done.
- Add rice; cook over low heat for one hour.
- Pour melted butter on top.
- Serve hot.

1-2 Servings**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	60.3	g
Protein	6.6	g
Fat	4.2	g
Fiber	0.22	g
Carbohydrate	26.8	g
Energy	171	kcal
Calcium	18.0	mg
Iron	0.23	mg
Vitamin C	2.7	mg

MOMOWASH REBIAN (Rice with shrimps)

- 3/4 cup rice (135g)
- 1/4 cup mungbeans, soaked in water for 2 hours, drained (40g)
- 30g dried shrimps
- 1 medium onion, chopped (100g)
- 1 medium tomato, chopped (115g)
- 3 cloves garlic, crushed (2.5g)
- 2 tablespoons corn oil (17g)
- 1 tablespoon butter melted (9g)
- 2 teaspoons fresh coriander, ground (2g)
- 2 teaspoons salt (8g)
- 1 teaspoon black pepper, ground (3g)
- 2 teaspoons mixed spices (5g)
- 1 1/2 teaspoon dried lemon, ground (3g)
- 4 cups water

- Brown onion and garlic with water.
- Add the rest of ingredients (except rice and butter) and cook for one hour.
- Add rice; cook until rice is tender and water absorbed.
- Pour melted butter on top.
- Serve hot.

1 Serving**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	66.2	g
Protein	4.6	g
Fat	4.0	g
Fiber	0.58	g
Carbohydrate	22.0	g
Energy	142	kcal
Calcium	53.0	mg
Iron	0.11	mg
Vitamin C	0.53	mg

MADROUBAH REBIAN (Rice with shrimp)

110g shrimps
 2/3 cup rice (131g)
 1 medium tomato, chopped (116g)
 1 medium onion, chopped (105g)
 2 tablespoons corn oil (20g)
 1 tablespoon green coriander, ground (3g)
 5 cloves garlic, crushed (2.5g)
 1 tablespoon butter, melted (8g)
 1½ teaspoon salt (5g)
 1 teaspoon mixed spices (2g)
 ½ teaspoon dried lemon, ground (1g)
 4 cups water

- Brown onion, garlic and shrimps with little water.
- Add the rest of ingredients (except butter) and cook over low heat for one hour.
- Beat the mixture until smoothly blended.
- Pour melted butter on top.
- Serve hot.

1 Serving**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	79.1	g
Protein	3.3	g
Fat	3.3	g
Fiber	0.3	g
Carbohydrate	13.2	g
Energy	96	kcal
Calcium	45.5	mg
Iron	0.8	mg
Vitamin C	6.2	mg

JEREESH REBIAN (Crushed wheat with shrimps)

67g fresh shrimps, cleaned
 1 cup crushed wheat (jereesh)(118g)
 2 tablespoons corn oil (17g)
 1 tablespoon butter, melted (9g)
 1 medium tomato, chopped (100g)
 1 medium onion, chopped (100g)
 1 tablespoon fresh coriander, chopped (3g)
 3 cloves garlic, crushed (4g)
 1 teaspoon salt (4g)
 1½ teaspoon mixed spices (4g)
 ¾ teaspoon dried lemon, ground (1.5g)
 4 cups water

- Brown onion and garlic with little water.
- Add the rest of ingredients (except jereesh and butter); cook until well done.
- Roast wheat in dry pan until brown and add to mixture.
- Cook over low heat until well done.
- Pour melted butter on top.
- Serve hot.

1 Serving**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	74.1	g
Protein	3.3	g
Fat	4.8	g
Fiber	0.47	g
Carbohydrate	15.8	g
Energy	120	kcal
Calcium	33.0	mg
Iron	1.0	mg
Vitamin C	0.93	mg

SALOONAT DAJAJ (Chicken stew)

- 167g chicken
- 1 medium onion, chopped (93g)
- 1 medium tomato, chopped (118g)
- 1 medium potato, chopped (130g)
- 5 cloves garlic, crushed (3g)
- 1 tablespoon corn oil (10g)
- 2 teaspoons tomato paste(8g)
- 1 tablespoon green coriander, chopped (3g)
- 1 teaspoon salt (4g)
- 1 teaspoon mixed spices (1.5g)
- $\frac{1}{2}$ teaspoon dried lemon, ground (1g)
- 2 cups water

- Brown onion and garlic with little water.
- Add the rest of ingredients and mix well.
- Cook until well done.
- Serve hot with rice or bread.

1-2 Servings

NUTRITIONAL VALUE (per 100g edible portion)

Moisture	82.3	g
Protein	7.3	g
Fat	4.4	g
Fiber	0.8	g
Carbohydrate	3.6	g
Energy	83	kcal
Calcium	34.6	mg
Iron	0.8	mg
Vitamin C	13.9	mg

MARKOUKAH DAJAJ (Bread with chicken stew)

140g chicken
 1 medium tomato, chopped (100g)
 1 medium onion, chopped (70g)
 1½ cup wheat flour (145g)
 4½ tablespoons green beans (60g)
 4 cloves garlic, crushed (3g)
 2 tablespoons tomato paste (30g)
 2 tablespoons corn oil (17g)
 1 teaspoon salt (4g)
 1 teaspoon mixed spices (2g)
 ½ teaspoon black pepper, ground (1.5g)
 ¾ teaspoon dried lemon, ground (1.5g)
 4 cups water

- For making bread, add water to flour; knead until a soft dough is formed.
- Roll out the dough to thin layer; bake in oven until dry.
- Mix the rest of ingredients and cook until well done.
- Cut bread into small pieces; add to mixture.
- Stir until bread absorbed with sauce.
- Serve hot.

1 Serving**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	65.6	g
Protein	5.6	g
Fat	4.1	g
Fiber	0.59	g
Carbohydrate	22.7	g
Energy	150	kcal
Calcium	26.0	mg
Iron	3.5	mg
Vitamin C	1.81	mg

THAREED (Bread with beef stew)

- 150g beef
- 1 medium onion, chopped (93g)
- 1 medium tomato, chopped (80g)
- 1 medium potato, chopped (99g)
- 1 small piece of pumpkin (68g)
- 5 cloves garlic, crushed (2.5g)
- 1 piece of bread (flat or Arabic bread)
- 1 tablespoon tomato paste (15g)
- 4 teaspoons green coriander, chopped (4g)
- 5 teaspoons corn oil (15g)
- 1½ teaspoon salt (6g)
- 1½ teaspoon mixed spices (2g)
- ½ teaspoon dried lemon, ground (1g)
- 4 cups water

- Cook onion, garlic and meat until water is absorbed.
- Add the rest of ingredients, (except bread)and cook until well done.
- Cut bread into small cubes and arrange into a serving dish.
- Pour the mixture over the bread cubes.
- Serve hot.

1 Serving**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	75.0	g
Protein	6.8	g
Fat	3.5	g
Fiber	0.6	g
Carbohydrate	12.1	g
Energy	107	kcal
Calcium	48.9	mg
Iron	1.2	mg
Vitamin C	8.6	mg

HAREESE (Beaten wheat with beef)

120g beef

1 cup blanched wheat (180g)

2 teaspoons salt (8g)

1 tablespoon butter, melted (8g)

6 cups water

- Put meat and wheat into heavy pot; add water; cook for 3-4 hours until very tender. Add water whenever need.
- Add salt and mix well.
- Beat the mixture until smoothly blended.
- Pour into plate and pour melted butter on top.
- Serve hot

1-2 Servings**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	81.0	g
Protein	5.1	g
Fat	1.5	g
Fiber	0.5	g
Carbohydrate	10.5	g
Energy	76	kcal
Calcium	31.0	mg
Iron	1.2	mg
Vitamin C	0	

KHABESSAH (Semolina sweet)

- 1 cup semolina (150g)
- 1/3 cup sugar (80g)
- 1/4 cup butter (50g)
- 1/4 teaspoon cardamom, ground (1g)
- 1/4 cup raisin (39g)
- 1/2 cup water

- Dissolve sugar in water, cook until boil.
- Roast semolina in dry pan.
- Add butter, sugar syrup and the rest of ingredients, combine.
- Cook over low heat until well done.
- Serve hot or cold.

2 Servings**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	29.7	g
Protein	3.5	g
Fat	6.3	g
Fiber	1.6	g
Carbohydrate	58.6	g
Energy	305	kcal
Calcium	82.0	mg
Iron	2.3	mg
Vitamin C	0	

MAHAMER (Sweet rice)

- 1½ cup rice (200g)
- 1 cup sugar (216g)
- 1 tablespoon corn oil (10g)
- 1 tablespoon butter, melted (8g)
- ½ teaspoon fennel seed (1g)
- 5 cups water

- Soak rice in 1½ cup water for ½ hour, strain.
- Brown sugar in a pot; add water; cook until boil.
- Add rice and fennel seed; cook until nearly tender.
- Place rice in another oiled pot; cook over low heat until well done.
- Pour melted butter on top.
- Serve hot.

1-2 Servings**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	42.9	g
Protein	2.9	g
Fat	4.0	g
Fiber	0.4	g
Carbohydrate	49.0	g
Energy	244	kcal
Calcium	31.1	mg
Iron	0.2	mg
Vitamin C	0	

KHANFAROOSH (Semolina with eggs)

- 1 cup semolina (150g)
- 2 eggs (118g)
- 1/3 cup sugar (80g)
- 1/3 cup corn oil (70g)
- ¼ teaspoon baking soda (1g)
- ½ teaspoon cardamom, ground (1g)
- ¼ cup water

- Beat eggs with sugar.
- Add the rest of ingredients (except oil) and knead to tender paste.
- Shape the paste into round thick cakes and fry them in hot oil until brown.
- Serve hot or cold.

3 Servings**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	32.3	g
Protein	6.3	g
Fat	10.1	g
Fiber	0.9	g
Carbohydrate	50.1	g
Energy	316	kcal
Calcium	184.5	mg
Iron	3.4	mg
Vitamin C	0	

AALOO (Fried potato with onion)

3 medium potatoes (330g)
 1 small onion, chopped (54g)
 1/3 cup corn oil (63g)
 3 cloves garlic, crushed (3g)
 ¼ teaspoon chili powder (0.5)
 ½ teaspoon salt (2g)
 3½ cups water

- Brown onion and garlic with oil.
- Add little water, chilli and salt; cook until well done.
- Boil potatoes until soft; drain and mash them; add salt and mix well.
- Shape portion of potatoes into balls.
- Make a hole into each ball and fill with mixture.
- Close opening and shape into round thick cakes.
- Fry in hot oil until brown.
- Serve hot.

2 Serving**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	57.8	g
Protein	2.1	g
Fat	19.7	g
Fiber	2.2	g
Carbohydrate	16.5	g
Energy	252	kcal
Calcium	61.3	mg
Iron	0.8	mg
Vitamin C	20.9	mg

KABAB (Chickpea flour with egg)

- 1 cup chickpea flour (93g)
- 1 small onion, chopped (30g)
- 6 cloves garlic, crushed (6g)
- 1 egg (59g)
- 3 small green peppers, chopped (3g)
- 3/4 teaspoon mixed spices (2g)
- 1/2 teaspoon salt (2g)
- 1/4 teaspoon baking soda (1g)
- 1/3 cup corn oil (70g)
- 1/2 cup water

- Beat egg with onion, garlic, pepper and salt.
- Add flour and water; knead to paste.
- Shape paste into round thick cakes.
- Fry in hot oil until brown on each side, drain.
- Serve hot.

3 Servings**NUTRITIONAL VALUE (per 100g edible portion)**

Moisture	42.9	g
Protein	8.1	g
Fat	12.6	g
Fiber	1.2	g
Carbohydrate	33.7	g
Energy	281	kcal
Calcium	358.5	mg
Iron	10.5	mg
Vitamin C	9.7	mg

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