

State of Bahrain
Ministry of Health
Directorate of Public Health
Nutrition Unit

**STUDIES ON
NUTRITION
IN BAHRAIN**

Edited by
Abdulrahman O. Musaiger

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STUDIES ON NUTRITION IN BAHRAIN

Summaries of the main studies carried out
by the Nutrition Unit during the period 1981-1983

Edited by
Abdulrahman O. Musaiger
Head, Nutrition Unit

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BACKGROUND ABOUT BAHRAIN

PREFACE

Problems cannot be defined and programme formulated in the absence of information. The purpose of most nutrition investigations is the collection of information which provide basis of immediate or long term action. Information available in recording files in the statistical section, health centers and hospitals are also valuable, if collected and carefully interpreted. Therefore, one of the functions of the Nutrition Unit is to collect the available social, economical and health information related to nutritional situation in Bahrain. Such a task is not easy, since the lack of qualified personnel, scattering of data in various departments and incompleteness of such data are common obstacles.

This publication includes summaries of investigations carried out by the Nutrition Unit during the period 1981-1983. More details are given for unpublished reports, whereas a brief summary is presented for published data.

BACKGROUND ABOUT BAHRAIN

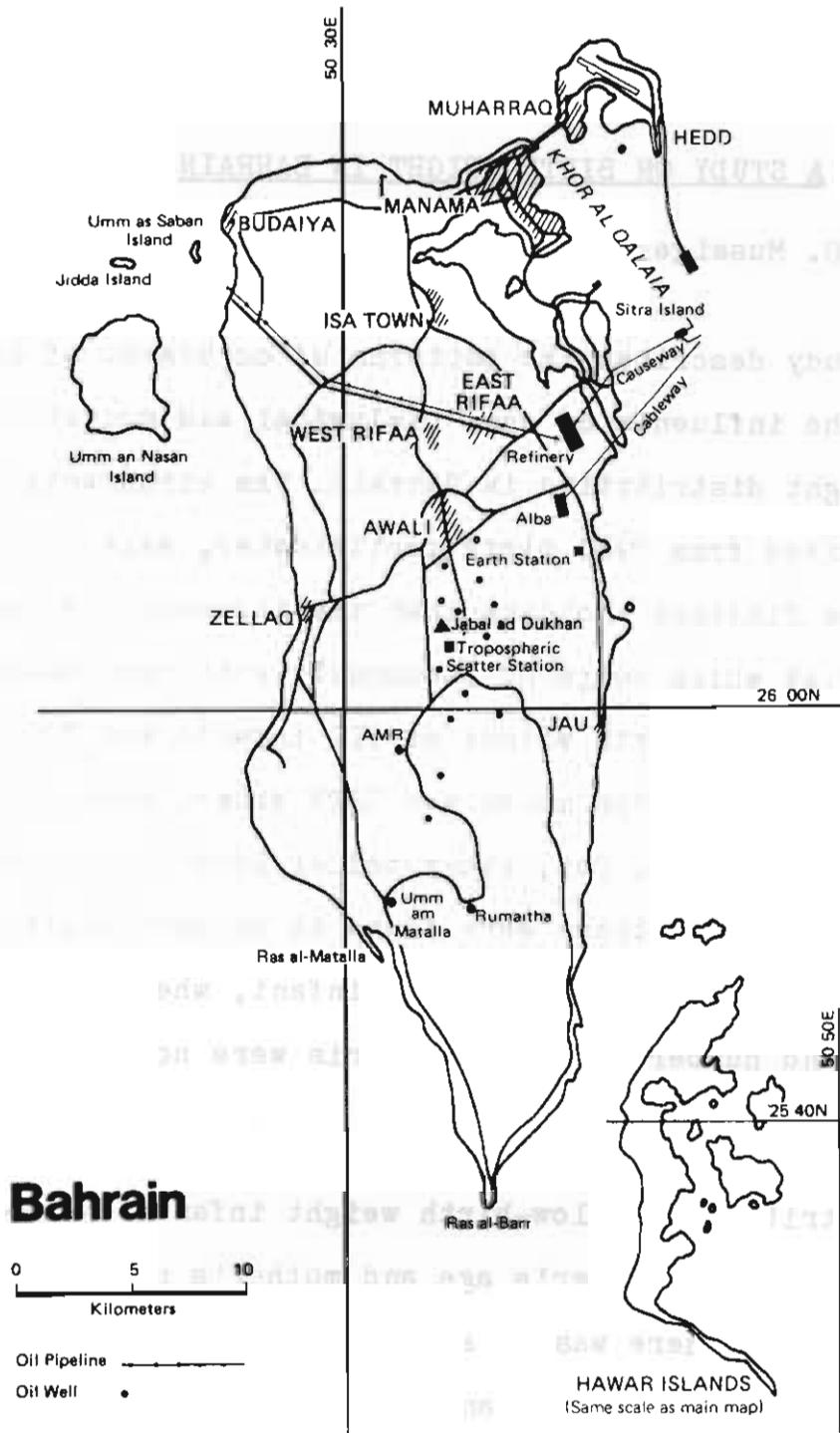
PREFACE

The State of Bahrain consists of an archipelago of 30 low lying islands situated off the coast of the Arabian Gulf. The total area of the State is 669.26 sq.km. of which Bahrain Island itself is 517.79 sq.km.

The climate of Bahrain is characterised by high summer temperatures, scanty and irregular rainfall, high relative humidity, and persistent prevailing winds from the north-west. For the year 1982 maximum temperature of 44.5⁰C was recorded in the month of July. Relative humidity varies between minimum of 40% and maximum of 89%. Total rainfall in the year 1982 was 97.3 mm as against 28.9 mm in 1981 and 93.5 mm in 1980.

According to the latest Census (1981) the population of Bahrain was 350798 of whom 68% were Bahrainis and 32% were non-Bahraini, mainly from Asia, Middle East and Europe, respectively. The percentage of Bahraini population under 15 years of age was 41.2%, which indicates of a young population.

Bahrain's economy, in common with those of other Gulf States, is oil-based. However, oil production is relatively small and the resources finite, so the government is implementing a policy of industrial diversification. The average daily oil production for 1981 was 44000 barrels, as against 61120 barrels in 1975.



A STUDY ON BIRTH WEIGHT IN BAHRAIN

Abdulrahman O. Musaiger

This study describes the patterns of occurrence of low-birth weight and the influence of some biological and social factors on birth weight distribution in Bahrain. The birth weight of 6793 infants, derived from 1980 birth certificates, were collected and analysed. The findings indicate that the incidence of low-birth weight was 7.4% which compared favourably with many developing countries. The mean birth weight of all infants was 3170 grams; the mean birth-weight for males was 3223 grams, while that for females was 3140 grams. Sex, geographical location, mother's age and interval between births were found to be contributing significantly to the birth weight of the infant, whereas mother's nationality and number of past deliveries were not significant contributing factors.

The distribution of low-birth weight infants by sex of infant, geographical region, mother's age and mother's nationality is shown in Table 1. There was no significant differences between low-birth-weight distribution and these factors. It was found that the majority of low-birth-infants (78.6%) were in the weight group 2000-2499 grams.

Table (1): The distribution of low-birth-infants by sex of infant, geographical region, mother's age and mother's nationality.

Factors	Low-birth-weight(g)						Total	
	< 1500		1500-1999		2000-2499		No.	%
	No.	%	No.	%	No.	%		
<u>Sex</u>								
Male	13	5.4	41	17.1	186	77.5	240	100.0
Female	13	5.0	40	15.3	208	79.7	261	100.0
<u>Geographical Region</u>								
Urban	12	4.8	32	12.8	206	82.4	250	100.0
Rural	14	5.6	49	19.5	188	74.9	251	100.0
<u>Mother's Age(years)</u>								
15-19	3	4.3	14	20.3	52	75.4	69	100.0
20-39	22	5.4	59	14.5	326	80.1	407	100.0
40-	1	4.0	8	32.0	16	64.0	25	100.0
<u>Mother's Nationality</u>								
Bahraini	21	5.5	68	17.8	294	76.8	383	100.0
Non-Bahraini	5	4.2	13	11.0	100	84.8	118	100.0
Total	26	5.2	81	16.2	394	78.6	501	100.0

INFANT FEEDING PRACTICES IN BAHRAIN (A PILOT STUDY)

Abdulrahman O. Musaiger and Kabila H. Alshehabi

A cross-sectional study of infant feeding practices amongst 262 mothers was carried out in all health centers in Bahrain. Mothers were interviewed in the health centers by students of the College of Health Sciences as a part of their training programme at the Public Health Directorate. The questionnaire was designed to provide information on the social background of mothers, duration of breast-feeding, methods of feeding and weaning practices.

The results showed that 35% of mothers had given their children additional feeding during the first day of their life. About 54% of mothers stated that they started breast-feeding in the first day of the infant's life. A high percentage (54.2%) of children had breast-fed during the first six months. Only 15% of mothers had breast-fed their infants for less than three months, whereas the majority continued breast-feeding for more than six months.

Regarding methods of bottle feeding preparation, 18.3% of mothers indicated correct technique for preparing daily formula of artificial milk. About 9% of mothers stated that they boiled the bottle after each use. Boiling the bottle daily was indicated by 20% of the mothers. Tables 2 and 3 summarize the main findings.

Table (2): Infant feeding pattern in Bahrain.

Pattern	No.	%
<u>Timing of breast-feeding</u>		
First day	143	54.6
Second day	40	15.3
Third day	52	19.8
Fourth day	3	1.1
More than four days	12	4.6
Not applicable	12	4.6
<u>Type of infant feeding</u>		
Breast-feeding only	142	54.2
Artificial feeding only	24	9.2
Mixed feeding	96	36.6
<u>Schedule for infant feeding</u>		
On demand	212	80.9
Schedule	39	14.9
Not applicable	11	4.2
<u>Duration of breast-feeding(months)</u>		
< 3	41	15.7
3 - 6	49	18.7
7 - 10	18	6.9
11 - 14	27	10.3
15 - 18	11	4.2
19 - 22	6	2.3
23 - 26	69	26.3
Not applicable	41	15.6
Total	262	100.0

Table (3): Technique for preparing daily formula of powdered milk in Bahrain.

Methods of preparation	No.	%
<u>Correction of the technique</u>		
Correct technique	100	38.2
Not correct technique	48	18.3
Not applicable	114	43.5
<u>Sterilization method of baby foods utensils</u>		
Boiling the bottle after each use	24	9.2
Boiling the bottle daily	53	20.2
Boiling the bottle twice a day	54	20.6
Not boiled the bottle	15	5.7
Others method	22	8.4
Not applicable	94	35.9
Total	262	100.0

FACTORS AFFECTING BREAST-FEEDING IN BAHRAIN

Abdulrahman O. Musaiger

Data for this study were obtained from pre-natal files available in 12 health centers in Bahrain. Information on breast-feeding was collected from these files and correlated with mother's age, mother's nationality, geographical region and mother's employment. The sample studied was 1482 mothers from different areas of Bahrain.

The results showed that as the age of the mother increased, the practice of breast-feeding decreased. Rural mothers (82.6%) were more likely to practice breast-feeding than urban ones (69.4%). About 75% of Bahraini mothers breast-fed their infants compared to 66.4% of non-Bahraini mothers. Employed mothers (68.7%) were less likely to breast-feed their infants compared with unemployed mothers (73.8%) - Table 4.

It was concluded that most of the mothers started to breast-feed their infants from the first day of the infant's life, however they introduced supplementary foods at an early time. This may lead to early stopping breast-feeding.

Table (4): Factors affecting breast-feeding in Bahrain.

Factor	Chi square	Significancy
Mother's age	7.35 p 0.002	+
Mother's nationality	34.5 p 0.001	+
Geographical region	43.6 p 0.001	+
Mother's employment	1.4 p 0.50	-

INFANT FEEDING PRACTICES OF HOSPITALIZED
MALNOURISHED CHILDREN IN BAHRAIN

Saidah Lankarani, Abdulrahman O. Musaiger and Kabila H. Alshehabi

Thirty four cases of malnutrition among children admitted to Salmaniya Medical Center were studied during the period (June, 1982 - June, 1983). The aim of this study was to find the relationship between infant feeding practices and malnutrition.

The results indicated that 26% of the children studied were bottle-fed, while the rest received mixed-feeding. Marasmus was the common undernutrition status of all the children. The main reasons for early bottle feeding were; illness of the child (48.6%), inadequacy of breast-milk (17.1%), and illness of the mother (11.4%). Supplementary feeding was introduced early at less than 4 months by high percentage of the mothers (47%). Most of the children were admitted to the Center because of gastroenteritis (44.4%), followed by respiratory infection (16.7%). Tables 5, 6 and 7 illustrate the main findings.

Table (5): The distribution of malnourished children according to type of feeding and age of the child.

Age (months)	Type of feeding				Total	
	No.	%	No.	%	No.	%
1 - 4	4	44.5	12	48.0	16	47.0
5 - 8	3	33.3	7	28.0	10	29.4
9 - 12	-	-	4	16.0	4	11.8
> 12	2	22.2	2	8.0	4	11.8
Total	9	100.0	25	100.0	34	100.0

Table (6): The distribution of malnourished children according to type of feeding and age when supplementary food was given.

Age (months)	Type of feeding					
	Bottle		Mixed		Total	
	No.	%	No.	%	No.	%
1 - 4	4	44.5	12	48.0	16	47.1
5 -	1	11.1	5	20.0	6	17.6
Undetermined	4	44.4	8	32.0	12	35.3
Total	9	100.0	25	100.0	34	100.0

Table (7): The distribution of malnourished children according to type of feeding and type of infection.*

Type of infection	Type of feeding					
	Bottle		Mixed		Total	
	No.	%	No.	%	No.	%
No infection	4	40.0	3	11.5	7	19.4
Gastroenteritis	2	20.0	14	53.9	16	44.4
Respiratory	1	10.0	5	19.2	6	16.7
Others	2	20.0	1	3.9	3	8.4
Unknown	1	10.0	3	11.5	4	11.1
Total	10	100.0	26	100.0	36	100.0

* The total is not the same, because some children had more than one infection.

SOME DEMOGRAPHIC AND HEALTH INFORMATION ABOUT
PREGNANT MOTHERS IN BAHRAIN (1981)

Zohair S. Aldalal

Data for this report were based on information available in ante-natal files in health centers for the year 1981. Demographic, as well as health information were collected from 1428 files of pregnant women at various health centers in Bahrain.

The findings suggest that most of the pregnant mothers were un-employed (92.7%). Out of 1428 mothers, 296 were below 20 years of age (20.7%). A high percentage of the mothers were breast-fed their last infants (66.7%). The incidences of diabetes and anaemia were relatively high (12.7% for diabetes and 50% for anaemia), and about 14% of pregnant mothers had a history of hypertension (Table 8).

Table (8): Demographic and health information related to pregnant mothers attended health centers in Bahrain.

Information	No.	%
A. <u>Demographic information</u>		
<u>Age (years)</u>		
15 - 20	296	20.7
21 - 30	914	64.0
31 - 40	207	14.5
41 - 50	11	0.8
<u>Nationality</u>		
Bahraini	1102	77.2
Non-Bahraini	326	22.8
<u>Employment</u>		
Employed	104	7.3
Un-employed	1324	92.7
B. <u>Health information</u>		
<u>Infant feeding pattern of last child</u>		
Breast only	953	66.7
Bottle only	176	12.3
Mixed feeding	299	21.0
<u>Cases of diabetes</u>		
Diabetic	182	12.7
No-diabetes	1246	87.3
<u>Cases of hypertension</u>		
Hypertension	205	14.4
No-hypertension	1223	85.6
<u>Hb level (g/100ml)</u>		
< 9	66	4.6
9 - 10	658	46.1
11 - 12	545	38.2
> 12	159	11.1
Total	1428	100.0

AVERAGE BODY WEIGHT OF VARIOUS AGE AND
SEX GROUPS IN BAHRAIN

Abdulrahman O. Musaiger

The aim of this study was to get rough figures about the average body weight of Bahraini persons at various ages and for both sexes. Data were collected at health centers in Bahrain, by weighing visitors to these centers during one day period. Extreme over and under-nourished persons were excluded, in order to obtain the average body weight of normal persons. In all cases, body weight was made while the subject was barefooted and wearing minimum clothing as possible. The total sample studied was 1693 persons, of whom 892 (52.7%) were males and 801 (47.3%) were females. Table 9 illustrates the average body weight of Bahraini persons at various age and sex groups.

Comparison between average body weight of Bahraini persons with that in other countries is shown in Table 10. It was concluded that the body weight of Bahraini infants at the first six months of life is optimum, when compared to other countries. However, the body weight declined gradually with increasing age when compared with weight for age recommended by FAO/WHO and USA. At adulthood the average body weight of Bahraini persons became almost similar to that recommended by FAO/WHO for males and females, whereas it was lower than USA recommendation for males only.

Table (9): Average body weight of Bahraini persons at various age and sex groups.

Age (years)	Sex	No. of subject	Average body weight (kg)	±S.D.
0 - 6 (months)	M	115	6.2	1.4
0 - 6 (months)	F	82	5.9	1.4
7 - 12 (months)	M	46	8.6	1.5
7 - 12 (months)	F	52	7.6	1.1
1 - 3 (years)	M	74	11.8	1.8
1 - 3 (years)	F	68	11.4	2.2
4 - 6	M	71	15.9	2.6
4 - 6	F	57	16.7	2.7
7 - 9	M	42	21.0	3.6
7 - 9	F	19	21.4	2.9
10 - 12	M	49	29.5	7.0
10 - 12	F	29	31.5	7.5
13 - 15	M	69	44.0	9.9
13 - 15	F	35	43.6	6.6
16 - 19	M	111	57.8	9.2
16 - 19	F	88	51.8	8.1
Adult	M	315	62.8	8.1
Adult	F	383	56.0	7.6

Table (10): Body weight of various age and sex groups in selected countries.

Age and sex group	Average body weight (kg)			
	Bahrain	Thailand	FAO/WHO	USA
<u>Children</u>				
0 - 6 months	6	6	9.0	6
7 - 12 months	8	8	9	9
1 - 3 years	11.6	10	13.4	13
4 - 6	16.6	16	20.2	20
7 - 9	21.5	20	28.1	28
<u>Male</u>				
10 - 12	29.5	25	36.9	(11-14)45
13 - 15	44.0	36	51.3	(15-18)55
16 - 19	57.8	50	62.9	(19-)70
Adult	62.8	54	65.0	
<u>Female</u>				
10 - 12	31.5	25	38.0	(11-14)46
13 - 15	43.6	38	49.9	(15-18)55
16 - 19	51.8	46	54.4	(19-)55
Adult	56.0	47	55.0	

NUTRITIONAL DEFICIENCIES OF PATIENTS DISCHARGED

FROM SALMANIYA MEDICAL CENTER

Abdulrahman O. Musaiger

This report includes all the patients suffering from nutritional deficiencies who were discharged from Salmaniya Medical Center during 1978 and 1979. The data were abstracted from the Salmaniya Medical Information System. The objective of this report was to show the available relevant information on nutritional deficiencies in Bahrain, since such information often provides useful criteria for the assessment of nutritional status.

The results showed that anaemia occurred among 50.5% and 73.9% of males during 1978 and 1979, respectively. Manama area showed the highest percentage of anaemic patients both during 1978 and 1979 (40.7% and 43.4% respectively). The incidence of iron deficiency anaemia was high in Bahraini patients (79.1% and 73.9% during 1978 and 1979 respectively), followed by Indian and Pakistani patients. The occurrence of iron deficiency anaemia was high among patients with no occupation (58.2% in 1978, compared to 73.9% in 1979). This may be due to the fact that majority of anaemic patients were less than four years of age. Considering all age group the incidence of iron deficiency anaemia was highest in the age group 1-3 years. The percentage was 34.1% in 1978 compared to 39.1% in 1979 (Table 11).

It was noticed that the incidence of other nutritional deficiencies was very low (Table 12). The numbers under consideration however were too small. This may not reflect the real situation, because of many factors: (1) A high percentage of the medical records had no final diagnosis on the admission and discharge summary sheet at the time of coding the data. (2) In Bahrain, actual clinical signs of nutritional deficiencies may be uncommon especially in certain nutritional deficiencies such as infantile beriberi and vitamin A deficiency. (3) Lack of specificity of clinical signs of nutritional disorders, in addition to the interrelationship between non-nutritional and nutritional factors, makes it difficult to diagnose nutritional disorders.

Table (11): The distribution of the anaemia cases according to age of patient (1978-1979).

Age group (years)	1978		1979	
	No.	%	No.	%
< 1	2	2.2	2	8.7
1 - 3	31	34.0	9	39.1
4 - 6	11	12.1	4	17.4
7 - 9	8	8.8	1	4.4
10 - 20	8	8.8	-	-
21 - 30	17	18.7	4	17.4
31 - 40	7	7.7	-	-
> 40	7	7.7	3	13.0
Total	91	100.0	23	100.0

Table (12): Number of cases of other nutritional deficiencies (1978-1979).

Other nutritional deficiencies	1978 (No.)	1979 (No.)
Marasmus	7	14
Kwashiorkor	2	5
Ascorbic acid deficiency	1	1
Vit. D. deficiency	-	3
Other nutritional deficiencies	1	2
Other deficiency anaemias	1	2
Simple goiter	3	1
Total	15	28

ASSESSMENT OF DIETARY SERVICES IN HOSPITAL
IN BAHRAIN

Abdulrahman O. Musaiger

The aim of this study was to assess the dietary services in Bahraini hospitals. Three questionnaires were designed to determine the patient's reactions and attitudes towards dietary services; the type of diet offered to patients; and the current food services. The weight of foods given to patient during 24 hours was also taken. A systematic random sample of about 30% of the total population in each hospital was chosen. The size of the sample was 165 patients (104 from Salmaniya Medical Center, 41 from Maternity Hospital and 20 from Chest Hospital).

The findings show that 41% of patients in Salmaniya Medical Center did not require special diet. The main causes of patients illness were; accident and poisoning (14.6%), circulatory system diseases (12.4%), and nervous and sensory system diseases (10.9%).

The assessment of the nutritive value of meals offered to patients over a 24 hour period showed a higher amount of protein and calcium than the Recommended Daily Allowances (RDA). The amount of iron was deficient for adult females but adequate for adult males.

The unemployed represented the highest percentage of patients in all hospitals (78%, 45.2% and 40% in Maternity, Salmaniya and Chest Hospitals, respectively). Most of the patients were Bahraini (75%).

About 76% of the patients agreed that the meals offered were good. The main reasons given for preference of hospital meals were; cooking is good (27.9%), food is clean (11.5%), and diet is appropriate for patient (11.5%).

All the patients felt satisfied with behaviour of the person presenting the meals. Most of them (66.7%) did not express a preference for Bahraini or non-Bahraini nurses. However, 28% of the patients preferred Bahraini nurses because of ease of communication.

Almost 64% of patients stated that their relatives and friends brought foods from home for them. Fruits (54.5%) and canned juices (26.7%) were the main foods brought (Table 13). A high percentage (43.6%) preferred foods brought from home to that offered in hospitals. They attributed their preferences to tastiness and cleanliness of food from the home (29%).

Table (13): Types of food brought by relatives and friends to the hospitalized patients in Bahrain.

Foods brought	Hospitals							
	Salmaniya		Maternity		Chest		Total	
	No.	%	No.	%	No.	%	No.	%
Fruit	56	53.8	26	63.4	8	40.0	90	54.5
Canned juices	31	29.8	9	22.0	4	20.0	44	26.7
Milk	13	12.5	7	17.1	3	15.0	23	13.9
Rice with meat	18	17.3	5	12.2	-	-	23	13.9
Coffee	11	10.6	7	17.1	2	10.0	20	12.1
Biscuits	18	17.3	1	2.4	-	-	19	11.5
Sweets	9	8.7	3	7.3	2	10.0	14	8.5
Tea	5	4.8	6	14.6	-	-	11	6.7
Chicken	7	6.7	3	7.3	-	-	10	6.1
Rice with fish	5	4.8	4	9.8	-	-	9	5.5
Others	15	14.4	6	14.6	5	25.0	26	15.8

SOCIAL AND ECONOMIC FACTORS AFFECTING
FOOD CONSUMPTION IN BAHRAIN

Abdulrahman O. Musaiger

Factors influencing food consumption in Bahrain have been inadequately researched. This paper is based on the available researches and references on food and nutrition in Bahrain.

The food consumption pattern of Bahraini households is affected by many factors. Industrialization led to a decline in the agricultural and fishing products with the result of more dependence on imported foods. Income and prices of food limited the purchasing power of the households, particularly low social classes. The high population growth and family size affect the quantity of food consumed by different household members. Educational level of housewife and husband has also a potent effect on the food consumption pattern. Immigrants have their influence too; they introduced many dishes which have become popular in the Bahraini community. Television advertising of food products and utensils also plays an important role in modifying the food consumption of Bahraini households.

DIETARY HABITS OF PREGNANT MOTHERS VISITING THE
HEALTH CENTERS IN BAHRAIN (A PILOT STUDY)

Kabilla H. Alshehabi

This study reports the food habits of Bahraini mothers visiting the health centers. A random sample of 80 mothers was chosen from different health centers.

The results revealed that women prefer the eating of meat (56%) and fish (60%) to other foods during their months of pregnancy. Most of these mothers (87.5%) could not give a specific reason for this preference. On the other hand, meat (22.5%), fish (23.7%) and chicken (21.3%) were quoted as the foods most avoided and disliked. Reasons given were mainly the taste (28.7%) and the smell (20%) of these foods.

Most pregnant women made it a point to eat breakfast specifically eggs, cheese and milk (92.5%). It was also found that 30% of pregnant women ate fruit in the period between breakfast and lunch. Such a practice is encouraged since it provides a good source of vitamins and minerals.

Questions on the type of food eaten for lunch revealed little variations from the traditional Bahraini lunch (i.e. rice with fish or meat or chicken). However it was found that only 17.5% of pregnant mothers ate fruits after the main course. Emphasis should therefore be placed on encouraging this practice amongst pregnant mothers. Unfortunately 55% of the mothers ate no supper at all, which should be discouraged since this depletes the mothers Recommended Daily Allowances for certain nutrients.

FOOD HABITS IN BAHRAIN, DIETARY PRACTICES
AND SOCIAL OCCASIONS

Abdulrahman O. Musaiger

This study aimed to survey dietary practices and food habits of Bahraini families during social occasions. A random sample of 310 households was taken from the 8 geographical regions of Bahrain, representing 1% of the national number of household. Housewives were interviewed in their homes. The questionnaire was planned to obtain information on the socio-economic background of the housewives, meal patterns, foods eaten during social occasions, some food beliefs, and methods of serving the meal.

The findings indicate that the difference in food habits between urban and rural areas is not great. There was no difference in the type of breakfast consumed in the urban and rural areas of Bahrain, but at lunch fruit was more consumed by urban housewives. Meat or chicken stew, bread and tea (with milk) constituted the main supper in urban area (41.1%), while tea with milk, bread, cheese, and/or eggs were the main foods eaten in rural area (27%).

Al-harees⁽¹⁾ and Al-threed⁽²⁾ were the main dishes consumed during the fasting month (Ramadan), while the Gadoo⁽³⁾ (35%) and

-
- (1) Al-harees: A dish composed of boiled wheat mixed with meat, spices and fat.
- (2) Al-threed: A dish composed of pieces of meat and mixed with cooked vegetables served on pieces of bread soaked in tomato sauce.
- (3) Gadoo: Consists of nuts, fruit, biscuit and sweets.

rice with meat (35%) were the main dishes presented to the visitors, during wedding and after pilgrimage, respectively. Tea or coffee with sweet were the main foods (63%) given to the visitors during griefs. Most of the families (61%) did not give their male children any food after circumcission. Others gave milk (10.6%), eggs (9%) and sweets (5.8%) - Table 14. About 25% of the housewives believed that nuts increase the sexual ability of the male. Relatives and friends (32%) were the main source of this belief, followed by the grandmother (23%) - Table 15.

Most of the families (71.6%) ate together from the same dish, while 13.2% segregate the sexes. The majority of the housewives (95%) used canned foods in their diets. Almost 36% of the housewives agreed that the price of food affects the quality and quantity consumed.

Table (14): Special foods given to the child after circumcission in Bahrain.

Food	Geographical region					
	Urban		Rural		Total	
	No.	%	No.	%	No.	%
No specific foods	159	61.6	30	57.7	189	61.0
Milk	24	9.3	9	17.3	33	10.6
Eggs	20	7.8	8	15.3	28	9.0
Sweets	16	6.2	2	3.9	18	5.8
Hot water	10	3.9	1	1.9	11	3.6
Others*	29	11.2	2	3.9	31	10.0
Total	258	100.0	52	100.0	310	100.0

* Others include: nuts, rice with meat, and fruits.

Table (15): Foods given to men in order to increase their sexual abilities and source of knowledge about such foods in Bahrain.

Foods	Geographical region					
	Urban		Rural		Total	
	No.	%	No.	%	No.	%
<u>Food given</u>						
No specific foods	155	60.1	28	53.9	183	59.0
Nuts	56	21.7	22	42.3	78	25.2
High protein foods*	39	15.1	2	3.8	41	13.2
Fruits	8	3.1	-	-	8	2.6
<u>Source of knowledge</u>						
No specific foods	155	60.1	28	53.8	183	59.0
Relatives and friends	33	12.8	8	15.4	41	13.2
Mother	22	8.5	7	13.5	29	9.4
Previous experience	22	8.5	2	3.8	24	7.7
Other sources**	26	10.1	7	13.5	33	10.7
Total	258	100.0	52	100.0	310	100.0

* High protein foods: fish, meat, eggs and milk.

** Other sources: husbands and local druggist.

FOOD PRACTICES AND PREFERENCES OF
COLLEGE STUDENTS IN BAHRAIN

Zohair S. Aldalal and Kabila H. Alshehabi

This study was designed to determine actual food practices and preferences of students in three colleges in Bahrain; the College of Health Sciences, Gulf Polytechnic College and the University College.

A questionnaire was designed to obtain information on the background of the study population, their meal pattern, their food preferences and their dietary practices. Two hundred and thirty-eight students (95 men and 143 women) completed the questionnaire.

The population was 40% men and 60% women. Therefore, the result reported in this study may represent a bias favour of response by women students. It was found that 46.2% of the students were in the age group 16-18 years, compared to 41.2% and 12.6% in the age group 19-21 and above 21 years, respectively. Only 6.7% of the students were married, while the rest were single. Almost 15% of the students came from rural areas.

Approximately 21% of the students skipped their breakfast. The main reasons for skipping breakfast were; no appetite for eating breakfast (71.8%), and arose late in the morning (23.4%).

The breakfast mainly constituted of cheese (58.4%), eggs (51.7%), milk (53.7%), tea (26.5%), and butter (22.0%) - Table 16. Most of the foods eaten between breakfast and lunch were found consistently to provide energy to a greater extent than essential nutrients especially protein; carbonated beverages (86.0%), coffee (31.1%), tea with milk (23.5%), and canned juices (23.1%).

Rice with meat (72.3%) was the main lunch consumed by the students, followed by rice with fish (62.2%), and rice with chicken (45.5%) - Table 17. It was also found that 42% of the students ate fruits at lunch. The majority of the students (68.2%) ate their lunch at home, compared to 12.6% ate at the college's canteen. Tea (38.2%) and carbonated beverages (29.4%) were the main beverages drunk immediately after lunch. Regarding supper, cheese and bread (47.5%), eggs and bread (44.5%), meat with potatoes (30.7%), and maccaroni (19.8%) were the essential supper consumed by the students (Table 18).

The mother was the main person (65.2%) who determined the type of meal in student's home, followed by relatives (21.3%) and sons (12.2%). As for food preferences, chicken (45%), rice (45%), meat (43.3%) and fish (39.9%) were the main food preferred by the students. whereas, 23.9% of them declared disliking fish.

Table (16): Frequency of foods consumed at breakfast
by college students in Bahrain.

Foods	Frequency	
	No.	%
Chesse and bread	139	58.4
Eggs and bread	123	51.7
Milk	85	35.7
Tea	63	26.5
Butter and bread	52	21.9
Jam, honey and olives	45	18.9
Tea with milk	30	12.6
Carbonated beverages	27	11.3
Fruit juices	15	6.3
Falafel	9	3.8
Others*	34	14.2

* Others: Sweets, nescafe, cakes, corn-flaks,
fruits, Pacha and potatoes.

Table (17): Frequency of foods consumed at lunch
by college students in Bahrain.

Foods	Frequency	
	No.	%
Rice with meat	172	72.3
Rice with fish	148	62.2
Rice with chicken	113	47.5
Fruits	100	42.0
Vegetables (salad)	66	27.7
Bread	44	18.5
Prawns	41	17.2
Maccaroni	28	11.8
Soup	21	8.8
Dates	15	6.3
Others*	83	34.8

* Others: liver, sweets, sandwiches, carbonated beverages, laban and lebanese foods.

Table (17): Frequency of foods consumed at lunch
by college students in Bahrain.

Foods	Frequency	
	No.	%
Rice with meat	172	72.3
Rice with fish	148	62.2
Rice with chicken	113	47.5
Fruits	100	42.0
Vegetables (salad)	66	27.7
Bread	44	18.5
Prawns	41	17.2
Maccaroni	28	11.8
Soup	21	8.8
Dates	15	6.3
Others*	83	34.8

* Others: liver, sweets, sandwiches, carbonated beverages, laban and lebanese foods.

Table (18): Frequency of foods consumed at supper by college students in Bahrain.

Foods	Frequency	
	No.	%
Cheese and bread	113	47.5
Eggs and bread	106	44.5
Meat and potatoes	73	30.7
Fruits and vegetables	60	25.2
Maccaroni	47	19.8
Soup	42	17.6
Canned foods (bean, vegetables, meats, etc)	39	16.4
Falafel	35	14.7
Butter, honey and bread	33	13.9
Tea with milk	26	10.9
Milk	23	9.7
Fried chicken	22	9.2
Tea	19	8.0
Others*	101	42.5

* Others: Same as lunch, mehiawa, Balallet, corn flakes and eating out-side home.

FOOD PURCHASING HABITS OF CONSUMERSIN BAHRAIN (A PILOT STUDY)

Zohair S. Aldalal

The aim of this report is to identifying food purchasing trends and habits of consumers in Bahrain. One hundred and twenty five persons were chosen randomly in the various market places in Bahrain, and were interviewed on the spot.

The study showed that a large number of respondents (59%) claimed that prices had increased relative to the previous year. The price of meat and fish was quoted as having increased most (52.8%), followed by that of vegetables (41.6%) and fruits (38.4%). However when the price of these products were actually compared for the two years it was found that the cost of meat had not increased and only some kinds of fish, fruit and vegetables had become more expensive.

Questions were asked as to the type of foods that required the expenditure of a large portion of the family budget. Meat and fish were quoted as first (62%), followed by grains of which rice was the most frequently stated (55%).

A number of respondents blamed the rise in prices of foods on merchants who controlled the market for these products (24%). An additional number (19%) blamed it on the fact that most foods

FOOD PURCHASING HABITS OF CONSUMERS

are imported. Government control of prices was stated as a measure to combat the increase in prices by 32% of the respondents. A further 17% called for encouraging and developing local production. However, 41.6% could give no solution to the increase in prices.

Most of the respondents (96.8%) were directly affected by the rise in prices of food. The response to this increase, was in many cases (37.6%) to decrease the amount of food bought. Others (20.8%) preferred to spend less on clothes, recreation, etc, rather than on food.

The period of storage of food was also asked; most foods were stored for a period of 2-4 weeks; rice (69.6%), sugar (42.4%), other grains(44%), canned foods (48.8%), and oil and fat (70.4%) - Table 19.

Table (19): Storage period of food materials available in the market of Bahrain.

Foods	Storage period (weeks)										Total	
	- 2	2 - 4	5 - 7	7 -	Not consumed	Total	%	No.	%	No.	%	
Rice	4	87	10	23	1	125	3.2	69.6	18.4	0.8	100.0	
Suger	4	53	9	55	4	125	3.2	42.4	44.0	3.2	100.0	
Tea	19	91	3	7	5	125	15.2	72.8	5.6	4.0	100.0	
Other cereals	55	34	2	3	31	125	44.0	27.2	2.4	24.8	100.0	
Canned foods	36	61	1	3	24	125	28.8	48.8	2.4	19.2	100.0	
Oils & fats	25	88	-	7	5	125	20.0	70.4	5.6	4.0	100.0	
Meat & poultry	123	2	-	-	-	125	98.4	1.6	-	-	100.0	
Fresh Vegetables	125	-	-	-	-	125	100.0	-	-	-	100.0	
Fresh fruits	125	-	-	-	-	125	100.0	-	-	-	100.0	

FOOD AND NUTRITION INDICATORS FOR BAHRAIN

Abdulrahman O. Musaiger

In many developing countries, the absence of useful health information is one of the principal public health problems. Many diseases such as malnutrition could be brought under control if adequate and useful information were available. This publication was an attempt at providing all available information related to food and nutrition in Bahrain to all persons engaged in nutrition, public health, agriculture and commerce activities. The book is divided into ten chapters, Background about Bahrain, Vital and Health Statistics, Demographic Statistics, Food Imports, Food Production and Food Consumption, Food Prices, Household Food Expenditure, Meal Pattern, Infant and Children Feeding Practices, and Malnutrition.

SOME FACTORS INFLUENCING CAUSES
OF DEATH IN BAHRAIN (1976 - 1980)

Abdulrahman O. Musaiger and Zohair S. Aldalal

Mortality data were collected from the death registers for the five years period, 1976-1980. The relationship between age, sex, nationality and geographical region to causes of mortality was investigated, using the information gathered by the Statistical Section in the Directorate of Public Health.

Main towns like Manama, Esa-Town, Riffa, Muharraq and Hidd had a higher mortality from the circulatory system diseases, while Sitra and the Central Region had the lowest mortality from such diseases. The contribution of infective and parasitic diseases was higher in rural areas (9.1%), compared with urban areas (4.6%). In contrast, the contribution of circulatory system diseases was higher in urban (28.6%) than rural (20.3%) areas - Table 20.

The contribution of diseases of the circulatory system started with 3.2% in less than one year, increased gradually to 43.8% in the age group 50-69 years, and decreased slightly to 33.5% in over 69 years of age - Table 21.

About 28% of the deaths among males and 24.5% among females were of diseases of the circulatory system, whereas 14.4% of the males died from injury and poisoning compared to 8.4% of females.

In contrast, certain conditions originating in the peri-natal period were higher among females (15.3%) than males (10%). The percentage of deaths from all other causes were virtually the same for males and females.

Diseases of the circulatory system contributed to 25.3% and 32.0% of deaths among Bahraini and non-Bahraini, respectively. Deaths due to infective and parasitic diseases were doubled among Bahraini (6.4%) than non-Bahraini (3.0%).

Table (20): The percent distribution of registered deaths by geographical region and main causes of death for the period (1976-1980), in Bahrain.

Causes of death	Geographical region		Total %
	Urban %	Rural %	
Infective and Parasitic Diseases	4.6	9.1	5.8
Neoplasms	4.7	5.3	4.9
Diseases of the Circulatory System	28.6	20.3	26.5
Diseases of the Respiratory System	9.1	9.1	9.1
Congenital Anomalies	1.7	4.3	2.4
Certain Conditions Originating in the Perinatal Period	10.7	15.8	12.0
Symptom and Ill Defined Conditions	17.8	13.4	16.7
Injury and Poisoning	12.1	12.2	12.1
Others	10.7	10.5	10.5
Total	100.0 N=(3370)	100.0 N=(1160)	100.0 N=(4530)

Table (21): The percent distribution of registered deaths by age and main causes of death for the period (1976 - 1980), in Bahrain.

Causes of death	Age (years)					Total	
	< 1 %	1 - 4 %	5 - 19 %	20-49 %	50-69 %	70- %	%
Infective and Parasitic Diseases	12.8	12.0	6.9	4.3	2.4	2.8	5.8
Neoplasms	-	1.0	2.7	5.1	8.2	6.5	4.9
Diseases of the Circulatory System	3.2	5.3	8.8	29.6	43.8	33.5	26.5
Diseases of the Respiratory System	6.3	11.5	5.3	4.5	10.3	15.8	9.1
Congenital Anomalies	7.2	3.6	2.7	1.2	0.5	0.7	2.4
Certain Conditions Originating in the perinatal Period	53.0	4.7	1.1	0.4	0.4	0.7	12.0
Symptom and Ill Defined Conditions	6.1	15.6	18.0	18.6	18.6	23.5	16.7
Injury and Poisoning	1.6	32.8	41.3	26.2	6.1	4.4	12.1
Others	9.8	13.7	13.2	10.1	9.7	12.1	10.5
Total	100.0 (977)	100.0 (192)	100.0 (261)	100.0 (936)	100.0 (1298)	100.0 (866)	100.0 (4530)

INFORMATION PRESENT ON THE LABEL OF PREPACKAGED
FOODS AVAILABLE IN THE MARKET OF BAHRAIN

Abdulrahman O. Musaiger and Zohair S. Aldalal

The purpose of labelling is to provide consumers with facts they require in order to make informed choices in the market place. This report aimed to study the information declared on the label of various foods available in the market of Bahrain. The following information were studied; production date, expiry date, storage instruction, Arabic description, list of ingredients, net weight and type of food additives. A special sheet was designed to obtain these information from 1896 different kinds of food in the market of Bahrain. The foods were divided into 18 groups.

The results showed that expiry date and Arabic description were not declared on 55.6% and 60.3% of the label of foods studied respectively (Table 22). It is interesting to note that the production date was not declared on 60.8% of the labels of infant foods compared to 55.9% of milk and milk products. Additionally, Arabic description regarding preparation of infant foods was not declared on 55% of the labels of these foods. It is recommended that labels should be designed to provide the necessary information about the appropriate use of these products as well as it should be written on appropriate language in order to be easy readable and understandable. This is important, since Arabic is the main language in Bahrain and the great majority of people can not read English or any other foreign language. As a result mothers may incorrectly prepare infant formula and this adversely affect the health status of the child.

Table (22): Information present on the labels of prepackaged foods available in the market of Bahrain.

Information on the labels	Declaration on food labels					
	Declared		Not-declared		Total	
	No.	%	No.	%	No.	%
Production date	713	37.6	1183	62.4	1896	100.0
Expiry date	842	44.4	1054	55.6	1896	100.0
Storage instruction	396	20.9	1500	79.1	1896	100.0
Arabic description	752	39.7	1144	60.3	1896	100.0
List of ingredients	1738	91.7	158	8.3	1896	100.0
Net weight	1842	97.2	54	2.8	1896	100.0
Types of food additives	445	23.5	1451	76.5	1896	100.0

STATE OF BAHRAIN
MINISTRY OF HEALTH
NUTRITION UNIT PUBLICATIONS

The following publications are available at no charge from the Nutrition Unit, Public Health Directorate, P.O. Box 42, Manama, Bahrain.

1. Assessment of Dietary Services in Hospital in Bahrain - A.O.Musaiger, 1981, pp 49 (A)*, pp 30 (E)**.
2. Social and Economic Factors Affecting Food Consumption in Bahrain - A.O.Musaiger, 1981, pp 55 (E).
3. Food Habits in Bahrain, Dietary Practices and Social Occasions - A.O.Musaiger, 1981, pp 62 (A).
4. Food and Nutrition Indicators for Bahrain - A.O.Musaiger , 1981, pp 95 (E).
5. Food Purchasing Habits of Consumers in Bahrain - Z.S.Aldalal, 1981, pp 19 (A), pp 12 (E).
6. Dietary Habits of Pregnant Mothers Visiting Health Centers in Bahrain - K.H.Alshehabi, 1981, pp 19 (A).
7. Food Practices and Preferences of College Students in Bahrain - Z.S.Aldalal and K.H.Alshehabi, 1982, pp34 (A).
8. Some Factors Influencing Causes of Death in Bahrain (1976-1980) - A.O.Musaiger and Z.S.Aldalal, 1983, pp 15 (A), pp 45 (E).
9. Information Present on the Label of Prepackaged Foods Available in the Market of Bahrain - A.O.Musaiger and Z.S.Aldalal, 1984, A/E (in press).
10. Studies on Nutrition in Bahrain - A.O.Musaiger, 1984, pp 41 (E).

*(A), available in Arabic only.

** (E), available in English only.

