



A plan for nutrition education in Lebanon
by Nuha Ibrahim Farraj

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE in Home Economics
Montana State University
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Abstract:

This study was to show the need for better foods and nutrition education in Lebanon. The need is urgent because of the growing imbalance between population and food supply. This leads to malnutrition, but can be helped if the public is informed as to how to use their available resources to the fullest.

It was recognized that one remedy for this deficiency in formal situations is to include foods and nutrition information in the curriculum of the elementary, secondary, college and university programs.

In informal situations the deficiency can be helped by including nutrition information in materials presented to the general public by the use of the presently available health and community centers as well as mass media.

Based on the nutritional status of the Lebanese population and areas lacking in information, a plan was proposed for education of the public. Ways to apply the plan to different levels and situations of education were shown. The plan can be used in its entirety in health or foods and nutrition classes and can be easily adapted to the student's level of understanding. It can also be integrated into other subject matter if there is careful program planning. Examples of activities and information that the student can comprehend at each level are presented.

Methods of presenting nutrition principles to the public through health, community centers and mass media were demonstrated as a further extension of the plan. Examples of how foods and nutrition education could be promoted through mass media were prepared. The advantages of each medium and their limitations were pointed out.

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Date May 25, 1971

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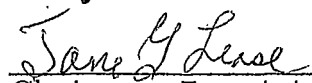
MASTER OF SCIENCE

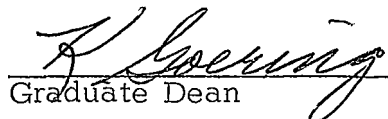
in

Home Economics

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Bozeman, Montana

June, 1971

ACKNOWLEDGMENT

Deep appreciation and thanks are extended to Dr. Keiser, Head of the Home Economics Department, for her counsel and advice in writing the manuscript. Gratitude is extended to Dr. Lease, Professor of Home Economics Research and the writer's major advisor, and to Dr. Robbins, Associate Professor of Chemistry, for their offered assistance and time spent on the graduate committee.

A special word of thanks is due to Mrs. Sara Steensland, Head of the Home Economics Department at the University of Montana, for her help in making the material relevant to the purpose intended.

The writer is sincerely grateful to the American Home Economics Association and to Montana State University Home Economics Department for the assistantship which made graduate study possible.

In appreciation of their encouragement, help and endurance this work is lovingly dedicated to the writer's family.

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ABSTRACT

This study was to show the need for better foods and nutrition education in Lebanon. The need is urgent because of the growing imbalance between population and food supply. This leads to malnutrition, but can be helped if the public is informed as to how to use their available resources to the fullest.

It was recognized that one remedy for this deficiency in formal situations is to include foods and nutrition information in the curriculum of the elementary, secondary, college and university programs. In informal situations the deficiency can be helped by including nutrition information in materials presented to the general public by the use of the presently available health and community centers as well as mass media.

Based on the nutritional status of the Lebanese population and areas lacking in information, a plan was proposed for education of the public. Ways to apply the plan to different levels and situations of education were shown. The plan can be used in its entirety in health or foods and nutrition classes and can be easily adapted to the student's level of understanding. It can also be integrated into other subject matter if there is careful program planning. Examples of activities and information that the student can comprehend at each level are presented.

Methods of presenting nutrition principles to the public through health, community centers and mass media were demonstrated as a further extension of the plan. Examples of how foods and nutrition education could be promoted through mass media were prepared. The advantages of each medium and their limitations were pointed out.

CHAPTER I

INTRODUCTION

Importance of Study

Lebanon, a developing country, is facing a population growth of 2.5 per cent a year. The food supply, on the other hand, is not increasing as rapidly, thus resulting in a serious situation in regard to the nutritional status of the population. Part of the solution can be increases in quantity and improvement in the quality of food produced. A more important factor will be better utilization of the existing food supply. Nutrition education will allow the public to make better use of the available resources and help them improve their nutritional status.

The causes of malnutrition in Lebanon are not always based on the economics of food production. A large percentage of available food is lost in the fields, in the villages, at home or in the market, due to lack of knowledge of food handling. Even more food waste is caused by choice in Lebanon. It is strongly influenced by custom, habit, religion, and prejudice, all of which stem from the cultural pattern, and often result in poor selection of food and poor nutritional practices.

All people, particularly those changing from production to a market economy, find themselves altering their food habits. This

sometimes leads to an improvement but frequently results in a deterioration of family diet. People living in an emerging economy do not always get the best value for their money. For instance, frequently they do not know how to buy food which will provide a balanced diet, nor do they have the knowledge of suitable weaning practices or of the general rules of good child feeding. They do not understand that the price of food on the market may have little to do with the food's nutritional value.

It is well understood that nutrition education is not the prerogative of a single discipline but comes within the scope of all workers who are in direct contact with families or who are carrying out programs in communities. It is a part of food and nutrition education, health education, and community development. Indeed it is a part of all basic education. A well planned and well organized effort in food and nutrition education is needed to induce people to improve their food habits.

Need for the Study

Nutrition education is universally needed regardless of income, geographic location, cultural, social or economic pattern or level of education. There is no instinct that guides man to select those foods which meet the nutritional needs of the body, and knowledge is not inherited. Each new generation must be taught what foods to select

and why, and how foods affect health. One cause of malnutrition in Lebanon is ignorance of what constitutes good nutrition and what foods will furnish it. Food and nutrition education at present does not play a significant role in the fundamental education of school children in Lebanon. The Nutrition Survey of Lebanon in 1962 stressed the importance of nutrition education to help alleviate the nutritional problem in Lebanon (1).

Objectives of the Study

With this in mind this thesis hopes to put forward an approach of how food and nutrition education can help the Lebanese to achieve better nutrition by:

1. Presenting information basic to foods and nutrition education needs in Lebanon.
2. Indicating ways in which this plan can be included in the school curriculum in Lebanon.
3. Pointing out methods of presenting food and nutrition education to the general public through community action and mass media.

CHAPTER II

LITERATURE REVIEW

History and Background

"Lebanon is a country of some 10,400 square kilometers in area, with a population of 2,000,000 people, barely pinpointed on a world map, at the eastern end of the Mediterranean, along ancient and modern trade routes, highways of land, sea and air. A land whose shores are washed by the bluest of seas. A narrow coastal strip alternating between sand and rock which has felt the stamp of conquering armies, and seen the departure of its own 'legions'. Two mountain chains run parallel to each other, with a fertile valley between; its fertility is in striking contrast with the barrenness of neighboring countries, watered by several rivers, none large. A temperate climate, kind to the inhabitants. A land of striking contrast, of rugged mountain folk and shrewd businessmen, a mixture of old and new, a terrestrial Garden of Eden. The importance of this land lies in its strategic position. From time immemorial, trade routes have wound their way through it, and its ancient galleys have plied the seas. Invading armies have trampled its soil and left their inscriptions carved in its rock. Its mountains have provided refuge for the persecuted, and the rocky soil has yielded a scanty living. Its inhabitants are a mixture of races and creeds, both peaceful and turbulent, unaffected by the passage of time. Past and present are one, and intermingle harmoniously." (2).

Background

Lebanon is a young country of ancient origins. The Phoenicians settled around Tyre and Sidon in about the thirteenth century B.C. (3). As a crossroads of east and west it has felt the impact of many cultures and races. Assyrians, Persians, Greeks and Romans successively ruled the country in the pre-Christian era, and were followed by Arabs, Crusaders, Mamelukes and Turks. Between World Wars I and

II, Lebanon was under a French mandate. Independence was declared in 1941 and full sovereignty granted in 1943 (4).

Lebanon is a Republic in which a unicameral Chamber of Deputies, elected by the people for four years, elects the President for six years. The latter appoints the Prime Minister and heads of Ministries upon approval by the Deputies. The Chamber of Deputies has proportional representation by religion as well as by region. Of the several ministries with responsibility for some aspect of nutrition may be listed the Ministries of Health, Agriculture, Education and Fine Arts, Defense, Economics, Social Affairs and General Planning (1).

Administratively, the country is divided into four districts, North Lebanon, Mount Lebanon, South Lebanon and the Beka'a, as seen on the map of Lebanon (Figure 1). Each district is governed by a Muhafiz (mayor) appointed by the Minister of the Interior. Physically, this small country encompasses a varied topography and climate. East of the narrow, warm Mediterranean coastal plain, the Lebanon Mountains rise abruptly to peaks that in some places are over 10,000 feet and frequently snow-covered. Beyond the mountains lies the Beka'a Valley which is hot and dry in summer and cold in winter. The eastern border of the country with Syria is the crest of the Anti-Lebanon Mountains. Precipitation is relatively high along the coast and the western slopes of the Lebanon Mountains, twenty to thirty inches a year. East of the mountains the rainfall is less. The rainy

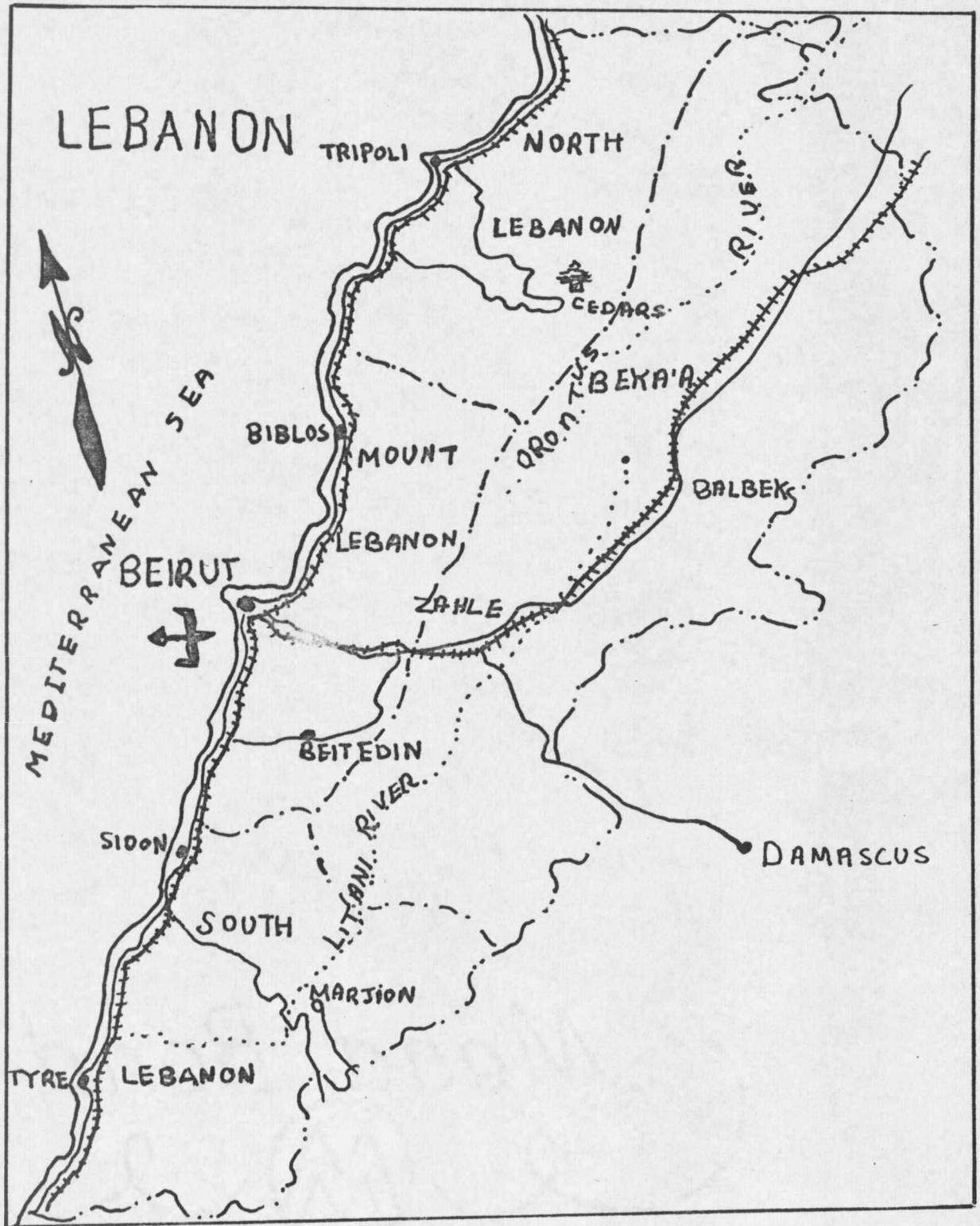


Figure 1 . -- Map of Lebanon.

season is November to March. Almost no rain falls from May to September when hot winds blow from the Syrian desert to the east.

The annual rate of growth of the population of Lebanon is about 2.5 per cent. Most of the people live in a village of a few hundred families and are often interrelated. About 137,000 Arab, Palestinian refugees live in 16 United Nations Relief and Work Agency (UNRWA) centers throughout the country. Of this number 83 per cent receive the UNRWA rations and 94 per cent are Moslems (1).

Lebanese are predominantly Arab, although the population also includes groups of Armenians, Syrians, Egyptians, Palestinians and Europeans. Many Lebanese emigrated to the Western hemisphere in the late nineteenth and early twentieth century to escape land pressures, and more people of Lebanese origin now live abroad than in the country. The official language is Arabic (Syrian dialect). French is the second language. There are about an equal number of Moslems and Christians in the country, the Moslems for the most part belonging to the Sunni or Shia sects. Most Christians are Maronites, although there are also Greek Catholics and members of the Greek and Armenian Orthodox churches (1).

Lebanon is a center of culture for the Near East. Its two outstanding universities are world-renowned, the American University of Beirut and the Universite' St. Joseph, frequently known as the French

University. The literacy rate in Lebanon is high, estimated at 65 to 80 per cent (5).

The economy of the country is based on trade and agriculture. Beirut, the capitol and chief port, is a leading commercial center for much of the Middle East, with a rapidly growing population, now over half a million. About five per cent of Lebanon's population might be considered well-to-do, 25 per cent middle class and the rest lower income. A survey of Beirut in 1964 indicated that half the families spent more than 50 per cent of their income for food. Living costs have risen about seven per cent a year since that time. Government policies in economics are designed to attract foreign capital and promote trade. Private enterprise is encouraged. These policies have helped maintain a stable economy (5).

Agriculture is second only to trade in its contribution to the national income. Approximately 50 per cent of the people are engaged in farming. Due to the mountainous terrain only about 30 per cent of the land is suitable for cultivation. Most farms are small and owner-operated. Relatively few have more than 25 acres, with scattered plots. Farmers often work part-time in construction or manufacturing to supplement their income. The two principal farming areas are the coastal plain and the Beka'a Valley. The wide range of altitude and climate makes it possible for Lebanon to produce a profusion of crops seldom found in one country of such small size. They include citrus

fruits, bananas, dates, olives, grapes, figs, apricots, peaches, apples, potatoes and cereals. Stock raising is much less important than crop production due to lack of pastures and fodder crops. Goats are the most common livestock (2).

Lebanon has about 2,400 miles of roads, of which 2,200 miles are hard-surfaced. Most are good roads. The chief highways are the coastal road, the Beirut-to-Damascus road across the mountains, and the road through the Beka'a Valley. Most transportation is by trucks, buses and cars. The railroads are used mainly to transport freight long distances. The two main rivers of the country, the Litani and the Orontes, flow through the Beka'a, the former southward and the latter northward. Beirut International Airport, the largest and most modern airport in the region, is served by a number of international airlines (4).

"The Ministry of Health reported in 1965 that Lebanon had 1,440 physicians, or one for every 1,062 of the population. At that time there were 132 hospitals, 608 nurses and hospital attendants, 450 registered pharmacists and 356 midwives. Most of the physicians, however, were located in the large population centers." (5).

Since 1952 the United States has taken part in a number of programs in Lebanon aimed at improving agricultural practice, water supplies and irrigation, rural electrification, highways and adult education. A few examples of this assistance are the Litani River

development project which when completed will provide electricity to rural villages, and bring agricultural information to farmers through extension service-type work. The U. S. Operations Mission has assisted in the organization of the Lebanese Management Association and, with the Government of Lebanon and the Association of Lebanese Industrialists, helped establish the Industry Institute which serves as a consultant for technical assistance to industries in Lebanon and Neighboring countries (5).

Education System in Lebanon

The historical and cultural background of Lebanon has had a tremendous impact on the state of education found at present in Lebanon. These forces explain the strong European influences existing in the various school systems and why the country is still struggling to build up a type of education which can, for the first time, respond to the needs and aspirations of the nation (6).

It was not only through direct foreign control that the Arab world came into contact with the West, but also through schools and universities set up by lay and foreign missions which started to show interest in the area at the beginning of the nineteenth century. They made a vital contribution to the spread of Western ideas. All these cultural, historical, economic, social and educational influences have been summed up very comprehensively by an "axis of cleavage" designed

by D. K. Wheeler (Figure 2). "The radial lines indicate transformation or socio-cultural changes that are in process and the ensuing conflicts, potential or actual, that are relevant to education and the promotion of the educational system" (7). Some of the questions that arise are closely related to the transition from colonial status to independent nationhood. Others relate to the transition from a traditional society to a more complex industrialized one. Both changes bring up questions concerning the extent that the educational orientation can be changed from academic to vocational, the place education can fit into national planning, and the extent to which it can be made universal. Other issues might be related to effects of technology and mass media, increasing urbanization, the manpower needs of the community, and the growth of the questions or issues are interdependent or might be considered so (7).

The preceding paragraphs are intended to give the reader a glimpse into the kind of educational conflict and problems that Lebanon and the Arab countries have faced and are still facing. These obstacles and challenges parallel those of developing countries all over the world, for they are all trying to resolve the conflict successfully by educating people to answer the country's needs.

At present the educational system in Lebanon is a mixture of public and private education, both sectors functioning separately within a broad national context. There is no evidence of a

Materialism

Independence

internationalism

national language in schools

Nationalism

National education

Vocational education

Koranic education

oral communication

village life

subsistence agriculture

feudal system and land problems

Traditional Society

position of women

family and clan structure

Religion

planned economy

democracy

modern state structure

Modern Society

man power needs

social mobility

Industrialization and technology

urbanization

mass media

western education

"academic" education

colonial language in schools

colonialism

Arabization

Laissez-faire economy for colonial powers benefits

private education

Colonialism

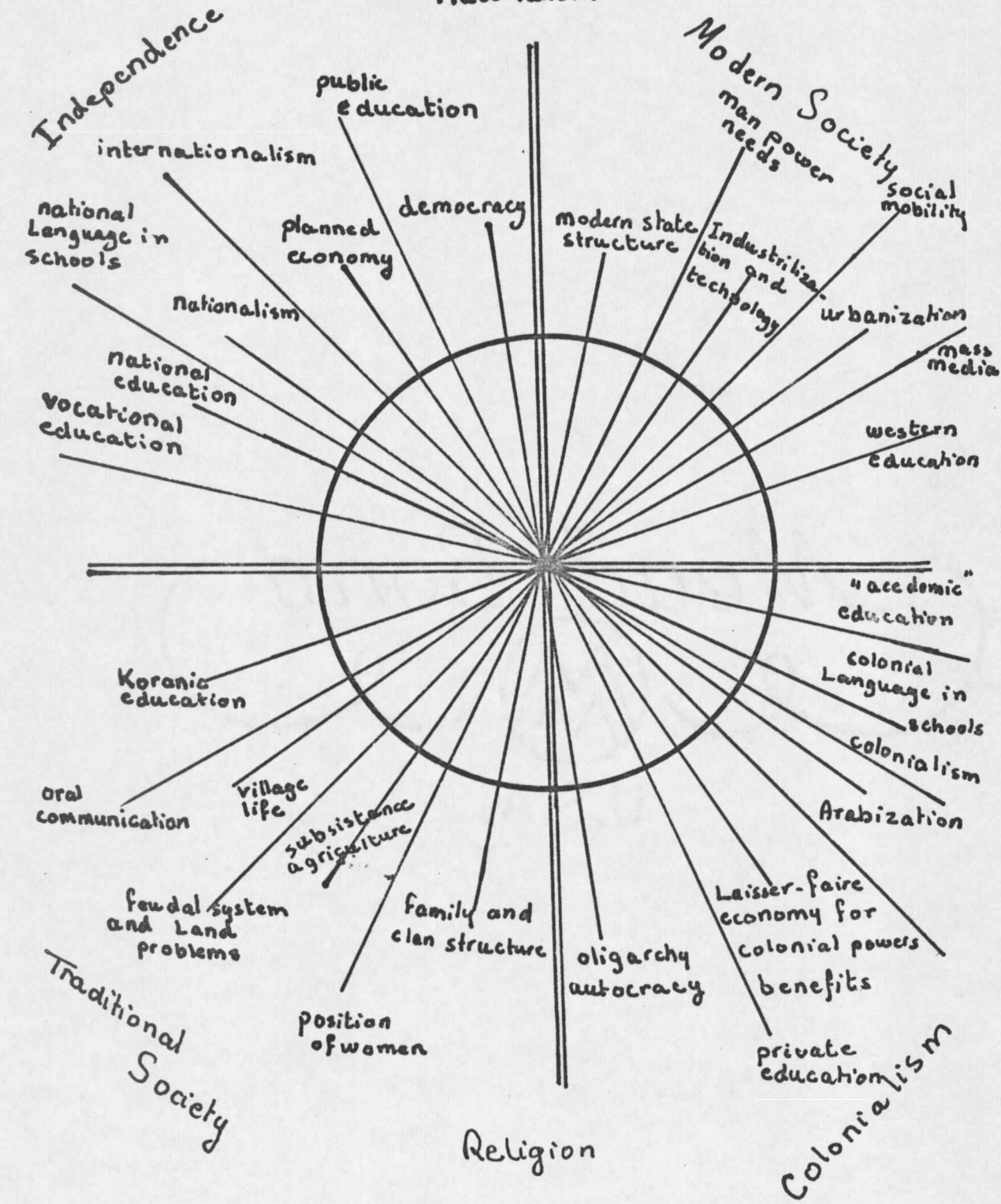


Figure 2.--"Axis of Cleavage" (7).

well-defined educational policy that coordinates the activities of public and private education. As was mentioned previously, the colonial powers have influenced the present systems of organization and administration. The French system of five to seven years is still common in Lebanon, five years of primary education being followed by three years of complementary and four years of secondary education.

At the end of each stage a public examination held by the Ministry of Education is administered. Since the British and the American Missions have their own schools also, Lebanon as a result has three separate major systems:

- (a) the Latin (largely French) system followed by the Catholic University of St. Joseph;
- (b) the Anglo-Saxon system typified by the Protestant colleges and the American University of Beirut;
- (c) the national system.

Responsibility for education, particularly secondary education, is shared by the public and private sectors of the economy. Sixty per cent of the children are in private schools and forty per cent are in government schools. In the private area, a dozen religious faiths (Druze, Sunnite, Maronite, Greek Orthodox, Greek Uniate, Armenian, several Catholic orders, and Protestant) operate schools. In addition, there are English, French, German, Italian and American schools (7).

The organizational structure of the educational system gives greater emphasis to academic education at the expense of vocational-technical education. The academic stream, accommodating 87.4 per cent of the total student population on the secondary level, is out of proportion to the 10.8 per cent in the vocational-technical stream and the 1.8 per cent at teachers' institutes.

A deep traditional respect and desire for learning which dates from the time of Mohammed not only provides solid sanction in public opinion for the development and support of education, but insures pupil motivation that is amazing to Westerners (8).

Mohammed issued the following injunctions concerning learning and education which carry the weight of religious edicts in a theocratic society: "To seek learning is the duty of every citizen man and women"; "Seek ye learning from the cradle to the grave"; and, "The ink of the learned is as precious as the blood of martyrs" (9).

In Lebanon, although the literacy rate is the highest among the Arab States, secondary education is still limited to a narrow sector of the people who can intellectually and economically afford it, because the great majority of secondary schools are fee-paying private institutions. One major problem that confronts educators is how to educate a rural population in order to make life easier and more productive. Because of the shortage of finances, buildings and teachers, education is more readily available to those who live in the large cities and

the towns or larger villages. Even so, the bright boys from rural areas who are trained to return to educate their fellows are, by the end of their training, often unwilling to do so, for they wish to remain in the more populous areas where life is more comfortable and more exciting.

The Lebanese Ministry of Education is working toward a unified educational system in which efforts are being made to introduce technical and vocational training even in academic secondary schools; and attempts are being made to change the idea that education equals book-learning, and to shift the weight of tradition which is still on "academic" schooling (9).

Teacher Education

The rapid expansion of education in Arab countries since World War II has placed a heavy burden on those responsible for teacher-training. Concrete evidence of this expansion is seen not only in the large number of schools being built but also in the tripling of expenditures for education by the Lebanese government (10).

In Lebanon, teachers spend three years after the complementary stage (that is, after nine years of schooling) at a college which functions as a secondary institution with a special curriculum. Men and women attend this college; men may receive instruction in agriculture and handicrafts, while women receive special instruction in domestic

science, child care, nursing and art, in addition to the regular courses. The number of class hours per week in teachers' colleges is high compared to Western standards, ranging from thirty to forty. There are many subjects in the curriculum. For example, sixteen subjects are offered in the first year. These include: Arabic, English or French, history, geography, mathematics, science, child psychology, educational psychology, sociology, civics, curriculum construction, hygiene, art, music, and physical training. The syllabi for these courses show a strong predilection for theory as against practical applications for teaching. There is not much integration of knowledge, either in general or professional subjects. The curriculum is fractured into discrete subjects which are even further compartmentalized by the examination system. Teacher candidates spend much of their energy studying for examinations rather than teaching, simply because examinations have a stranglehold on education at all levels, including teacher education. They in turn teach their students for the government examinations since passing them has become the criterion of good teaching. The government teachers' college described above graduates fifty teachers annually against a recognized shortage of one thousand elementary teachers each year (10).

It must be noted that teacher-education curricula are at present under study and are being revised, and it is hoped that the curricula will find focus for integration and realism which has been lacking (10).

Foods and Nutrition Education in Lebanon

High School Level

Foods and nutrition information at the high school level is incorporated in the Home Science courses that are present in most of the American and British schools and some other private schools. The Home Science course is a three-semester sequence; students are required to take the first two courses and can substitute home nursing for the third if desired. The Home Science course also includes home furnishings, child care, and clothing construction.

The books that are used are in most cases old editions of secondary Home Economics textbooks printed in the U. S. A. or Great Britain. The material that is taught is seldom relevant to the needs of the students. Some practical experience in food preparation can be found in some crowded laboratories but adequate facilities are almost nonexistent.

A great emphasis is given to baking sweets and preparing gourmet dishes. Less time is given to nutrition principles and the preparation of foods needed for a balanced diet. Menu planning and food costs are seldom included.

At the public or government schools in which sixty per cent of the students are enrolled and forty per cent terminate at the elementary level, there are no food and nutrition courses offered, except the

information included in science courses. The main reason for this is that the curriculum is geared to the government examination and no provision in the curriculum is made for Home Economics-type instruction.

A new program is being developed in the mountain villages where the elementary stage is extended by one year for girls. The President of the Village Welfare Society, Mrs. Najjar, describes the program as follows: "Feeling that the program leading to the elementary certificate does not fulfill the needs of the village girl, but on the contrary gives her inadequate education, unwelcome pride and disdain for house work, the Village Welfare decided to introduce a rural course into the subjects taught. A year is to be added to the curriculum to include foods and nutrition, sewing, handicrafts, practical agriculture, animal husbandry, cottage industries and other subjects of practical value to the girl in her daily village life." Unfortunately this new program at present has only six centers; their major problem is a shortage of Arabic speaking specialists in Home Economics to train local leaders in order to carry out the instruction in the different schools and a syllabus of study adapted to the need of the rural people of Lebanon (11).

University Level

The School of Agriculture at the American University of Beirut offers a Bachelor of Science degree in Food Technology and Nutrition as well as a Master of Science degree in the same field. The number of graduates on the Bachelor level averages between twelve and sixteen per year, most of whom come from neighboring countries.

Other schools that offer courses in Foods and Nutrition are the School of Public Health, the Department of Community Health Practices, and the Department of Environmental Health. The School of Nursing includes three courses in Foods and Nutrition in its curriculum (12).

At Beirut College for Women, a four-year college of liberal arts, a Bachelor of Arts degree is offered in Home Economics with a Foods and Nutrition option. The number of graduates in this option ranges between three and nine a year.

Foods Available in Lebanon

Legumes and Cereals

Legumes and cereals are of particular significance since they are the major sources of dietary calories and protein throughout Lebanon and the Middle East. Pulses, seeds and beans are usually included under the general term legumes.

Beans that are grown in Lebanon are the black broad, selva, kidney and lima and are the most popular legumes. Others are chick peas, dry green peas, cowpeas, lupin and lentils. Soybeans are rarely eaten (13).

The seeds of squash, watermelon, pumpkin and sunflower are dried and roasted and used widely as condiments.

"Tehineh", a decorticated product of sesame, is an oily paste incorporated in many dishes, and is used as a salad and fish dressing (14).

Of the cereal products that are grown in Lebanon, wheat is by far the most widely consumed. Wheat is mainly used for making the two types of bread, "markouk" and "khubz-abyad", eaten with every meal. Both types of breads are prepared from high extraction flour.

Another very popular wheat product used in Lebanon and throughout the Middle East is "burghol" (bulgur). This product is prepared on a small scale in the villages by heating wheat grains two hours in boiling water in an uncovered copper kettle, then spreading on jute bags in the sun to dry. The wheat is turned over once or twice a day. This drying process requires three days. The resulting product, which is hard and yellow brown in color, is then packed in jute bags or in tins and can be kept without difficulty until the next harvest, or if necessary for several years. Its appearance is similar to that of cracked wheat, with which it is often confused. Before being

used for food, the dried burghol is ground in a burr stone mill. Before grinding, the dry wheat is sprinkled with just enough water to moisten it, and after grinding it is sieved and separated into three sizes of grains. The largest grain is used for cooking, as rice might be used. The medium size is used in making the Lebanese national dish "kibbeh", in which it is cooked with meat and the Lebanese salad "tabboule". The finest in texture is used for making "kishk" (described later) and in poultry feed (15).

Rice is also a popular cereal, but the consumption of corn, sorghum, teff and barley in Lebanon is not significant (16).

Fruits and Vegetables

Fruits and vegetables constitute a significant portion of the Lebanese diet, being second only to cereals and legumes in frequency of consumption. Some fruits and vegetables consumed more by the Lebanese than by Americans are: Swiss chard, chicory, colocasio, coriander, Jew's mallow, leeks, okra, quince, water cress, green almonds, fresh dates, greengage plums, jujube, loquat, mulberry, and prickly pear (17). Olives are produced locally; they are cured in brine and stored for eating through the year. A dish of olives appears with every meal. Much of a year's local harvest is reduced to oil which is used in many food preparations.

Milk and Milk Products

Milk and milk products contribute only two per cent of the caloric content of the Lebanese diet compared to nine per cent in the American diet (18). Milk is seldom drunk as a beverage but is usually consumed as a "laban", the equivalent of Turkish yoghurt. It is prepared in the same manner as yoghurt by using fresh milk inoculated with a remnant of the previous day's culture. A number of products are prepared from laban; after straining off the whey, the most popular is labneh, often used as a spread for bread (18). "Samné" is another milk product favored by the small Bedouin population as well as the village people in Lebanon. Samné is prepared from sheep or goat milk. The fresh milk is added to some sour milk from the previous day and is left to stand and become sour. The layer of fat that floats to the surface is taken off. The sour fat layer is heated until all the water has evaporated and the butter melted. It is then cooled. The acid reaction protects it from deterioration. People who consume this product like the sour taste of it better than western butter which they consider tasteless. This product is used as a spread for bread and as a cooking fat (19).

The four most popular cheeses consumed in Lebanon are:

Akkawi cheese — medium hard cheese from whole cow's
milk.

Mountain cheese — medium hard cheese from whole goat's milk.

Arisheh cheese — medium hard cheese from the acidified whey of the mountain cheese preparation.

Shanklish cheese — Prepared from fermented defatted goat's milk (yoghurt) mixed with thyme and sesame seeds (20).

"Kishk" is used extensively by the village people in rural Lebanon. This food is prepared by adding powdered burghol to laban and drying the mixture in the hot sun. The proportions used vary according to preference but the result is a dry powder of high nutritive value. It is used in the form of porridge or soup (21).

The meat dish most consumed in the villages is "kawarma", which is small pieces of fried mutton preserved in sheep tallow and dried in the sun. Kawarma is used as basis for stew, for stuffing vegetables, for making kishk and for frying eggs.

These four food products, laban, burghol, kishk, and kawarma are being subjected to a careful study at the American University of Beirut food science and nutrition laboratory. They are products that developed by necessity in a climate where food preservation is difficult and refrigeration is not available. Laban has often been referred to as a food agent to insure a healthy intestinal flora. In actual fact,

it is a method of preserving the milk against more destructive organisms. Burghol, while prepared in a manner that retains the vitamin content of whole wheat, is essentially a means for keeping wheat over a prolonged period. Kishk may be looked on as the historical precursor of dried milk, and kawarma as the precursor of dehydrated meat. From this point of view they are of unusual interest to the food technologist (18).

Prestige Foods

Most of the thirty per cent of the population that comprise the middle and upper classes of Lebanon live in the large cities. They represent a concentration of wealth with access to an abundant supply of local as well as imported food stuffs from all over the world. It is a population of sophisticated tastes.

William H. Adolph, a late professor of Nutrition at the American University of Beirut, found that the food intake of student groups and well-to-do families in the city of Beirut showed a dietary pattern not unlike that pictured for the United States (Figure 3). He also mentioned that visitors to the Near East whose itinerary is limited to those urban centers which have a high standard of living comparable to that of American society, will have no conception of the monotonous, poorly balanced, and often severely restricted diet of the less privileged classes in the rural areas (18).

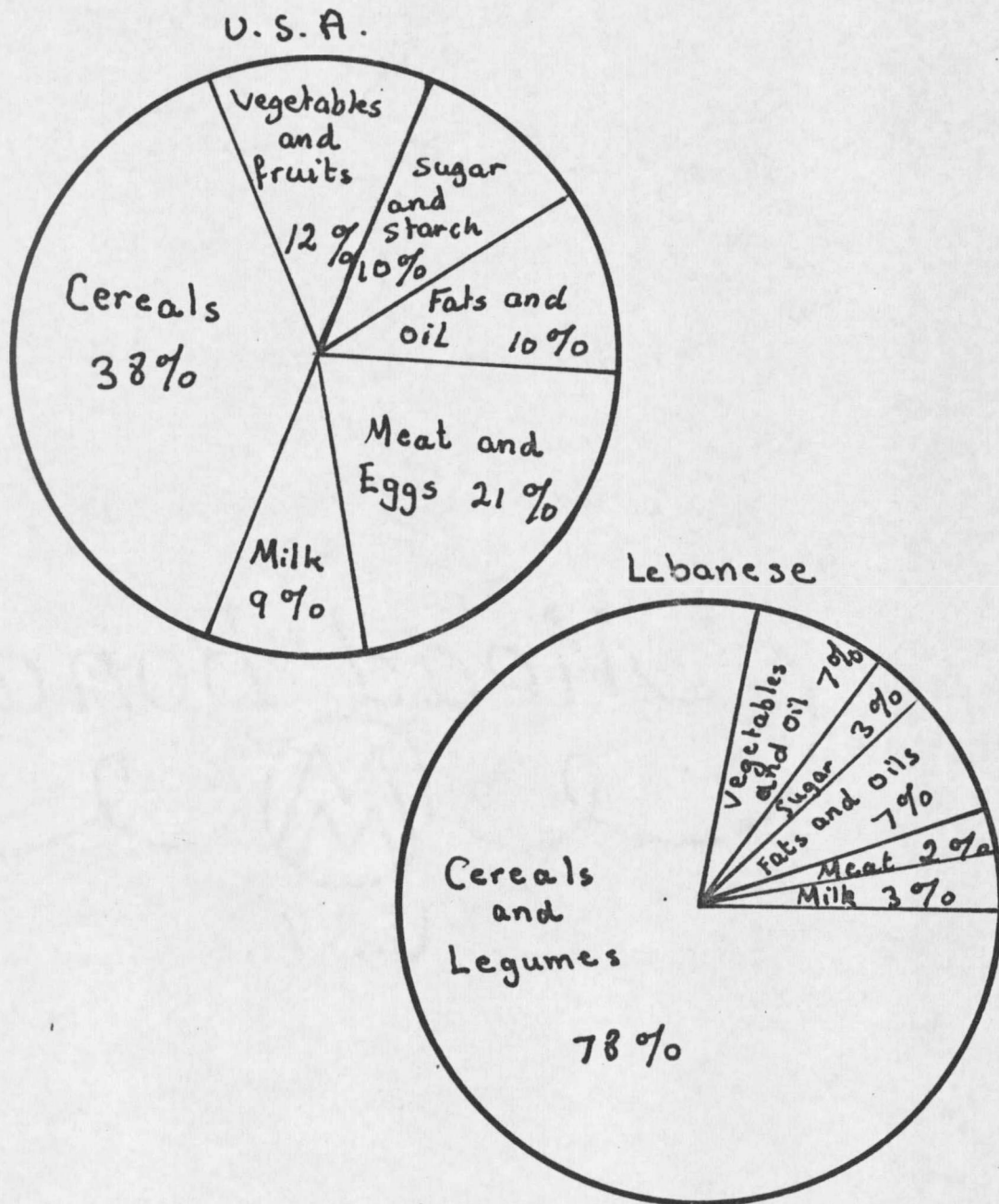


Figure 3. -- Comparison of Dietary Patterns in United States and Lebanon, in Percentage of Caloric Content (18).

Food Habits in Lebanon

The average Lebanese family eats three meals daily, with the entire family being present for breakfast and the evening meal. For the most part meals are served to individuals on separate plates. It is the custom in rural villages for the husband or father followed by the other "productive" members, such as the older sons, to have first choice of foods. Mothers and toddlers are often the last to be considered.

Bread is eaten at every meal. Two types of flat bread, markouk and khubz-abyad, are very popular in the villages. Because of the nature of the flat bread, the loaf is normally broken into bite-size pieces and each piece used as a spoon. Every bite of food thus taken contains bread, making the bread intake a high percentage of the total meal. In fact, the size of the meal consumed is usually gauged by the amount of bread eaten (22).

Along with bread, foods commonly eaten for breakfast include: labneh, jam, pickles, olives, and tea or Turkish coffee sweetened heavily with white sugar. A typical menu for the mid-day meal may include: bread, laban and pickles, a hot dish such as "moujadarah" (lentils and rice), if available, a raw vegetable such as cucumber, turnip, or carrot. The supper is usually a light meal, eaten between six and seven o'clock and may include bread, laban or cheese, pickles, and leftovers. Eating between meals is not a common

practice, but those who do eat between meals usually eat fruits or vegetables. The most popular fruits are grapes, figs and apples in summer and oranges and bananas in winter. The fruit intake in summer exceeds that in winter for the simple reason that village people eat in summer what is grown on their land. In winter fruits are replaced by sweets and jams by most families (23).

Fresh vegetables and fruits are available throughout the year in Lebanon. In winter production is limited to the coastal areas and prices in the mountain villages are high. As a result, during this period, most of the vegetables eaten are either dried or pickled, and fruit consumption is limited. Various green, leafy plants prepared in different ways constitute a significant portion of the diet of the rural population in the rainy months of late winter and spring (22).

A woman's diet is not significantly changed during pregnancy. In most cases she eats more of the usual food during pregnancy and lactation and continues this increased consumption until the next pregnancy or until the child is weaned. Almost all infants are breast-fed for at least one year. Some supplementary milk is given if it is available. After weaning, the children eat from the table with the rest of the family and usually do not receive special foods (24).

Nutritional Status of the Lebanese

In 1954 it was reported that cereals were the main component of the Middle East diet and that legumes were used in considerable amounts. Adolph and associates showed later that the nutritive values of legume proteins and legume plus wheat products in the Near East diets were high. In addition the widely used "homos" (chick peas) and the burghol were shown to be an adequate source of protein in a cereal and vegetarian type of diet (15).

When the United States Interdepartmental Committee on Nutrition for National Defense (US-ICNND) conducted surveys in Lebanon in 1961, previous findings were supported (1). The population of Lebanon was divided into four segments, children age 0-14 years, the military, the Palestinian refugees and the rest of the Lebanese population. The findings of the survey are the following:

1. The caloric intake of the average adult Lebanese is adequate. There were a significant number of individuals who were underweight (more common among Palestinian refugees) and a significant number who were overweight (more common among the non-refugees). In all groups studied, between fifty and sixty per cent of the total calories were taken in the form of cereals.
2. Protein intake was adequate for all segments except for children surveyed in baby clinics and supplementary feeding centers. These children who need supplementary feeding were suffering from kwashiorkor or marasmus.
3. Average intake of carbohydrates, fat, niacin, vitamin C, and calcium were adequate.

4. The enlargement of the thyroid gland producing endemic goiter reflected a country-wide nutritional deficiency of iodine. Over forty-five per cent of all persons examined had goiter, even in the sea port of Beirut.
5. A widespread deficiency of riboflavin was encountered in all segments of population and in all regions of the country.
6. The intake of thiamine was "acceptable" according to the dietary studies but deficient when analyzed by urinary tests. This suggested that there was a significant loss of thiamine during the preparation of foods.
7. A considerable proportion of the Lebanese population exhibited a moderately low level of hemoglobin reflecting iron deficiency; iron deficiency anemia was prevalent among infants one to two years of age.
8. During the seasonal shortage of foods rich in vitamin A activity (green and yellow vegetables containing carotene) deficiencies were noted.
9. Dental findings revealed prevalent periodontal disease and tooth decay.
10. Widespread infestation of foods with a variety of intestinal parasites was encountered.

Recommendations given by this committee for improving the nutritional status of the Lebanese population were the following:

1. Iodization of salt to control endemic goiter and cretinism. This would cost approximately ten Lebanese pounds or three dollars and fifty cents per ton.
2. Enrichment of white flour with riboflavin, iron and thiamine, to alleviate ariboflavinosis and anemia and to improve the thiamine status of the population. This would cost approximately 0.75 Lebanese pounds or twenty-five cents per ton.
3. Improved feeding of infants and preschool children from the age of six months, with special attention to the needs of the weaning and toddler age groups.

4. Education at many levels concerning environmental sanitation, personal hygiene, food hygiene and sanitation in order to reduce the food-borne infections and infestations. Such understanding can be developed through incorporation of relatively simple concepts in primary and secondary school teaching, especially in Home Economics courses, in adult education at the extension and public health level, and in "on the job" training of food handlers such as cooks and those engaged in processing food.
5. Greater incorporation of nutritional subject matter into all educational areas, especially the professional training offered in the universities, medical schools and schools of agriculture.
6. Education in oral hygiene aimed at reduction of periodontal disease which can be done also in schools.
7. Intensified research directed toward the nutritional problems identified by this survey and others.

Other Nutritional Studies in Lebanon

One study was concerned with the method of preparation and use of wild plants in the Lebanese diet and their nutrient composition. The green plants were found to be an important source of vitamin A and carotene especially when consumed frequently (25).

The object of a second study was to develop a protein-rich food that could be produced at a reasonable cost. The result was "Laubina" made of sixty per cent wheat, thirty per cent chick peas, and ten per cent dry skim milk. The mixture was also supplemented with minerals and vitamins A and D (26). This supplement can replace normal

amounts of egg yolk, cereal, and vegetables used to supplement mother's milk (27).

The third study was concerned with lack of growth in infants after four to six months. This was credited to nutritional deficiencies, especially iron (28).

CHAPTER III

A PLAN FOR NUTRITION EDUCATION IN LEBANON

Nutrition education affords the greatest opportunity for the individual to control the quality of his health and well being. Its effectiveness is proportional to the quality of informal and formal education, beginning with the parents in the home, enlarging in a sequential pattern throughout the elementary and secondary schools, and continuing throughout life to meet the particular needs of people in various stages. Surveys of the state of nutrition made in Lebanon during the past decade have shown that much malnutrition exists, and education in nutrition at all levels is an essential part of the policies aimed at its reduction and eventual elimination.

Definition of Nutrition Education

Nutrition education for the general public is the process by which beliefs, attitudes and understandings about food lead to habits that are nutritionally sound, practical and consistent with individual needs and available food resources.

Criteria

The plan should be adapted to the needs of the Lebanese people. In order for it to be functional it should be carried out at all levels of the community by formal and informal learning situations.

The material should be selected so that it can be explained with the language, foods, and terms of the Lebanese people. The methods used should be geared to the level of education of the learner and his previous experiences.

Focus on Content

The plan proposed here emphasizes the areas that should be the basis of foods and nutrition education. This can be adapted to the formal and informal teaching situations as will be demonstrated.

Introduction

Food provides the basis for man's mental and physical growth and development. Food has been the primary concern of man in his physical environment throughout all recorded history. By food, or its lack, the destinies of men are greatly influenced. Man eats to live, and what he eats will affect to a high degree his ability to keep well, to work, to be happy and to live long.

Peoples' attitudes toward food are significant when the individual makes his daily food choices. Over the centuries the many

religious, national and work backgrounds in Lebanon have surrounded food with prescriptions and restrictions, likes and dislikes, beliefs and emotional associations which became related to the food eaten. Some examples of factors that influence the attitude toward food consumption in Lebanese culture are:

Regional influence: In urban Beirut, butter and French bread are consumed, while in the mountain villages "ghee" and mountain bread are preferred.

Religious influence: Moslems do not eat pork and abstain from drinking alcoholic beverages. Some Christian denominations exclude animal products from the diet for weeks on end.

Other factors that influence certain patterns of food consumption are the meanings attached to food as: a way to celebrate events, a display of prestige and status, a token for security or an opportunity for fellowship. Food is the mode of life of the family.

A basic principle in educational procedures is to start with what is known and lead the learner to the unknown. Because this aspect of food is known to all ages of Lebanese people, it is important to classify these relationships and resultant food habits during the first stage of the plan in order to relate the nutritional status to the food habits and food intake.

The introduction should be outlined as following:

The meaning of food

The cultural heritage

habits

beliefs

Emerging food patterns

number of meals

time and place eaten

holiday feasts.

Determining Nutritional Needs

The second part of the plan should deal with the frequencies and symptoms of nutritional deficiencies. A historical review showing the development of the science of nutrition and consequently the determination of nutritional needs should follow. Determine how many countries have developed or are developing daily food guides based on the food consumption patterns of the people. The purpose of these guides is to help people realize that many different combinations of foods provide the essentials needed for an adequate diet.

The nutrition survey conducted by US-ICNND defined the major nutritional problems in 1962 (1). The work included clinical examinations, biochemical assessment, and dietary intake studies. Practical recommendations for improvement of nutrition were made, including a Daily Food Guide for Lebanon. The use of the guide should be emphasized in teaching the planning of adequate diets, because it is based

on the food composition patterns of the country and incorporates foods that help eliminate nutritional deficiencies.

Types of Food the Body Needs

The third part of the plan should focus on the types of foods the body needs, relating them to the Daily Food Guide.

Body building foods. — the protein foods in the diet. They are found both in the animal and plant kingdom. The main body building material in the Lebanese diet comes from cereals and legumes. Supplementation with other plant and animal proteins is essential to achieve the required amount of protein in the diet for optimum health.

Energy foods. — are mainly carbohydrate and fat foods. These supply the body with energy to live and work. Weight and weight changes are indicators of the relationship of energy food intake to body needs.

Regulatory foods. — are mainly the fruits and vegetables in the diet. They provide a large portion of the vitamins and minerals needed. Along with other foods they play an essential role in many regulatory functions of the body, as well as being essential for building and maintenance of tissues.

Meal Planning

The fourth part of the plan deals with the importance of meal planning. This rests on the practical application to everyday meals of the food and nutrition information studied earlier. Many combinations of foods or patterns of eating lead to an adequate diet. The Daily Food Guide is helpful in the selection and planning of the diet, but should not be regarded as an inflexible standard against which to assess the adequacy of the diet. In addition to the continuous application of the principles of nutrition, good meal planning calls for an understanding of family needs, and careful management of time, money and energy.

Food Handling and Sanitation

The fifth part of the plan deals with the importance of sanitation in food handling, storage and preparation so there will be minimum loss of nutrients. It is essential that food be safe for human consumption even though the nutritive value may be slightly impaired. This is particularly important in Lebanon because of the high incidence of intestinal disease due to food contamination.

Food Habits and Social Well Being

This part of the plan reviews the material introduced earlier by relating food acceptability, nutritive quality, and safety to the

as a whole. The last part dwells on the relationship of food availability to social well being.

A continuation of the outline follows:

Determining nutritional needs

historical development of nutrition

development of daily food guides

1962 Nutrition Survey of Lebanon

the Daily Food Guide for Lebanon

Types of food the body needs

Body building foods

the importance of cereals and legumes in the Lebanese diet

animal products and their contribution to the Lebanese diet

supplementary combinations of animal and plant protein.

Energy producing foods

foods producing energy and body building material —
cereal, seeds, legumes

high energy foods

—fats and oils

—sweets

overweight and underweight

Body regulatory foods

fruits

vegetables

Meal planning

planning meals using the Daily Food Guide

effective use of family resources

Food handling and sanitation

proper handling to minimize nutrient loss

- nutrient loss during food storage
- nutrient loss in food preparation

safe food for human consumption

- food sanitation and nutrition
- personal hygiene and food sanitation

Food habits and social well being

acceptability

nutritive quality

safety

Food availability and human well being

Adapting the Plan to Lebanon

Education in nutrition always needs to be adapted to local conditions, whatever the methods used. Methods and procedures cannot be standardized. Those designed for application in one country may be unsuitable in others. Language variation, technical differences in food preparation practices, and socio-cultural incompatibility are a few of the problems encountered when western textbooks are used in the Near Eastern Region. Traditionally, nutrition education programs in Lebanon have used foreign standards and books, as a result of the different educational systems. The success of these programs has been doubtful. People learn better when nutrition education deals with the actual local problems and conditions in their particular geographic area, and when the medium of education is directed toward

their standard. This can be achieved by using familiar words, terms, foods and family situations to which the learner can relate.

The plan proposed earlier can be adapted to learning better nutrition in Lebanon, because it is based on the cultural aspects, food habits, and nutritional status of the Lebanese population. For the purpose of this study one section of the plan has been developed to show how the information can be made relevant to the situation in Lebanon. The section on body building foods was chosen, because getting enough protein is a major nutritional problem especially during infancy and preschool years.

The general objectives of the following section are to understand the importance of body building foods, to realize that the amount of protein needed in the diet differs with people, and to learn how to make the best use of supplementary animal and plant protein. Figure 4 is an example of content with accompanying instructional aids and student activities. Charts and posters can be seen in Appendix A.

Figure 4. Example of How to Expand the Body Building Food Concept.

| Content | Instructional Aids and Student Activities |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The human body's first need is energy. | Examples of activities in daily life and needed energy: high — running moderate — standing low — sleeping |
| Energy is produced by the food consumed | Compare the burning of gasoline in an automobile engine to the oxidation of foodstuffs in the body. |
| Food supplying energy in the Lebanese diet is adequate. | Refer to U.S. ICNND nutritional study of 1962 on caloric intake. |
| Overweight and underweight result from an imbalance of energy foods | Display a poster showing height and weight of three persons (same age and sex). One overweight, one normal and one underweight. |
| The total amount and kinds of food vary with the individual's needs. | Students record foods eaten in a 24-hour period. |
| Many countries have developed a food guide using local food products (29). | Distribute copies of the Daily Food Guide for Lebanon. Students circle the names of foods in his day's menu, that are listed under energy foods. |
| Cereals and legumes comprise the major food intake in Lebanon (13). | Students determine the number of servings per meal of energy foods. Compare results of students. Compare student's idea of serving size by demonstration: Use foods which represent what constitutes an average serving size of each of the varieties listed in the energy food group. |

Figure 4. (Continued)

Energy is supplied by foods containing carbohydrates, fats and proteins.

The high consumption of energy foods in the Lebanese diet is significant because they also contribute most of the protein in the diet.

Protein and carbohydrate gram per gram supply equal amounts of energy.

The proteins of food are the source of building blocks (amino acids) for body tissues. They are essential for normal growth and body repair.

Protein is found in both the plant and animal kingdoms.

Protein foods vary in the amount and kinds of building blocks (amino acids) which they provide.

Protein needs are dependent on:

1. Size
2. Age
3. General health.

Protein needs of the fetus are supplied by the mother's diet during pregnancy.

The most rapid growth period throughout the life cycle is between six and eighteen months of age; therefore, the protein needs are greatest per body weight.

Recognize that foods generally high in carbohydrates are listed under the energy food group.

Students watch a demonstration:—
87 grams of sugar — 350 calories
100 grams of burghol — 350 calories—
12.5 grams of protein.

Cereals and legumes contain protein for body building.

Refer to the Daily Food Guide.
Note: Group I (energy foods) represent the plant kingdom, and Group II represent the animal foods.

Use a bar graph to show the amount of protein in plant food compared to animal food.

Demonstrate by using a chart, these requirements: One gram per kilogram weight, increased during growth period, pregnancy, lactation, and recovery from illness.

Figure 4. (Continued)

The post-weaning diet of the infant must be planned to meet adequate protein needs.

Students plan a post-weaning diet including adequate protein foods, without liquid milk.

In the US-ICNND Survey (1):

1. Protein intake was adequate in all segments except for preschool children.
2. It was recommended that the food of infants and preschool children from the age of six months be improved with special attention to the needs of weaning and toddler age groups.

Animal products provide complete protein.

Animal products are the most expensive source of protein in the Lebanese diet; and represent only five percent of the total caloric intake (18).

The scarcity and high cost of protein makes it important to make the most economical use through combinations of plant and animal protein.

Students extrapolate, from their daily record of food intake, examples of economical protein supplementation.

Teacher uses other examples, if necessary, of a set of typical menus.

Distribute recipe for Laubina. Students prepare a recipe of Laubina.

Students prepare recipes using Laubina mixture. For example:

1. Beverage
2. Bread
3. Sweets
4. Soup
5. Stew

Figure 4. (Continued)

Protein cannot be stored in the body and therefore must be supplied regularly.

Students refer to their daily records of food intake, to show the frequency of protein foods in the diet.

Teacher emphasizes the importance of protein foods in every meal by using a typical menu of the area.

Adapting the Plan to Formal Learning Situation

Formal education in Lebanon encompasses institutional learning in private or government schools. Private schools are high schools founded by missionaries in the late eighteenth and early nineteenth centuries. The school system has six years of primary school terminated by a government examination. The secondary school is a six-year program terminated also by a government examination. Higher education is selective. Students must pass university entrance examinations before admission.

Nutrition Education at Elementary School Level

The age of elementary school children ranges from six to twelve years. Children in the elementary school years are going through a stage of rapid growth and development. They require considerable amounts of energy at this age level. Good health in later years will depend upon adequate nutrition in the formative years; therefore it is very important and essential that sound nutrition education be given during the elementary school years (30).

The health and nutritional status of a child supports or undermines his ability to learn and to take advantage of the opportunities given him through his school environment. An alert and healthy individual contributes to his community.

As nutrition is the foundation of good health, education is the cornerstone of good nutrition. To attain adequate nutrition standards, the child must be guided in food selection and environment control conducive to the utilization of the nutrients provided by the food. Getting the proper nutrients every day is not achieved by man through instinct. It is accomplished through the application of knowledge acquired from childhood.

By the time the child enters school he is accustomed to certain foods and associates his eating patterns with the food of the home. A child's food habits develop by exposure to the habits of the adults in the family. The younger the individual, the less fixed are his eating habits and the greater the possibility of changing or substituting new habits. Nutritional habits tend to become more fixed as children advance through childhood into adolescence. Thus there is a need for proper guidance and training in nutrition while the child is young (31).

Psychologists trace the majority of eating habits of adolescents and adults directly to those formed early in childhood. While the parents and the home are largely responsible for early training, there is much that the school can do to help a child acquire and form better habits and attitudes in relation to his daily diet.

Nutrition education, while vital to all children, is especially beneficial to those in the elementary grades. At least forty per cent of all students in Lebanon terminate formal education at the end of the

elementary school years. To incorporate nutrition education into the curriculum at this level should do much to improve nutritional standards of the country.

A dynamic and flexible program is desirable to meet the needs, interests and abilities of students. A constructive nutritional program would include activities that would help children to (32):

1. Develop or maintain wholesome attitudes toward food.
2. Establish and/or maintain desirable eating habits.
3. Gain an understanding of the advantages of adequate nutrition.
4. Learn how good nutrition may be achieved through wise food selection.

Suggestions of Level of Teaching. — It is important to apportion the teaching of food and nutrition education carefully so that each class will have new aspects and problems to study and new activities from which to learn. The plan proposed earlier should not be incorporated as a whole at each class level, but teachers of the elementary school concerned should plan an outline of the total program and agree on what should be emphasized at each class level.

Lower Primary School: — In the lower classes of the primary school the program should try to teach children to choose and enjoy a variety of foods. The objective is to get them accustomed to an

adequate diet and help them understand that there is a connection between food and growing tall, strong and healthy. Lessons might be on subjects such as: (1) foods that we find in our neighborhood; (2) where these foods come from; (3) all living things need food; (4) why we keep food clean; (5) how plants and animals help us; (6) how we stop food from spoiling; (7) people who grow foods for us, etc.

A direct or indirect approach may be used in teaching nutrition. The former is usually presented as a unit on health or nutrition, while the latter is incorporated in other subjects within the curriculum, such as science, geography, social science or mathematics.

In the lower grades each lesson should be very short and there should be plenty of pupil participation and illustrations. Examples of practical activities which might be carried out in connection with the above-mentioned lessons that fit in the nutrition plan proposed earlier are:

1. Conduct simple demonstrations with plants, such as sprouting seeds. Grow some plants in the classroom and compare those where the light enters with those in dark places, and those with sufficient water with those without.
2. Learn to care for and feed pets and watch them grow during animal feeding experiments. Illustrate the principle that food eaten makes a difference in physical appearance.

3. Do demonstrations with foods such as dissolving sugar in water, melting butter, and cooking eggs.
4. Visit a farm, a market, a mill or a dairy to observe how food is produced and marketed.
5. Prepare simple dishes such as salads and beverages.
Arrange tasting parties to try new foods.
6. Learn about food and health through stories, songs, poems and games especially designed to teach important points.
7. Practice habits of cleanliness and acceptable social behavior during meals.
8. Make a simple scrapbook from pictures of foods, plants, and animals cut out or drawn in class, photographs, pressed leaves or other material of interest. When children can read and write, include simple stories or poems composed in class or found in books.

The teacher can weigh and measure the children, sometimes with the assistance of parents. He can make simple inquiries as to what the children eat at home, by means of discussion and comparison with food models and pictures, and through conversation with parents. These kinds of activities will provide the teacher with a base from which to work and enlist the cooperation of the parents.

Upper Primary School: — In the upper classes of the primary school emphasis can be more on the "why". The children should study why plants, animals and humans need food; why certain foods are better than others; what happens to young animals that do not have the right kind of food, whether children need the same kinds of food as young animals; whether the meals which they eat have enough of the necessary foods; which foods are less expensive and plentiful, and which would make their meals more nutritious. They should be introduced to an experimental approach at this age and lessons should encourage curiosity and the spirit of adventure.

Boys and girls of nine to twelve years should continue to grow in their appreciation of the need for good food, and strengthen their attitudes toward acceptance of a wider variety of food. By this age they are ready to learn that food does make a difference in growth and development.

They should gain an increased appreciation of the value of a pleasant meal environment and the habits of people of various cultural groupings. They should have the ability to select adequate meals and show improvement in food acceptance. Children in the last year of primary grades should be thoroughly familiar with the Daily Food Guide for Lebanon and should be able to evaluate their own diets in terms of these groups. They are still not ready for technical details of nutrition science including the nutrients, their functions, or their

food sources. The introduction of this type of information is more likely to bore the child than to interest him.

Some practical activities suitable for upper primary pupils might be:

1. To weigh each other and for each to make pictorial growth record.
2. To make visits to markets to price food; make menus for adequate meals which can be acquired at low cost; purchase the selected foods, prepare meals and serve them to the class. (If no kitchen is available, a stove or a charcoal pot may be used.)
3. To learn to preserve foods grown in the school or their home gardens.
4. To prepare charts, posters and models on food and health, and continue scrapbooks at a more advanced level.
5. To carry out simple experiments on foods. For example, separate milk into cream, churn cream to make butter; make "laban" and "labneh"; add an acid to curdle; test with blotting paper to find which foods contain fat.
6. To prepare reports, plays and exhibits on the nutrition learning experiences of the class.

Interest in good food habits and adequate nutrition may be increased in both school and community by activities which overlap

with youth clubs and camps. This serves to enhance the knowledge gained at school.

Nutrition Education at the Secondary School Level

The average age of secondary school children is between thirteen and eighteen years. Children who attend schools that offer Home Science courses will have a significant opportunity if more emphasis is given to nutrition education. For many students, however, the only nutrition education available must be incorporated in the sciences, health, physical education, social studies and school activities.

Boys and girls at this stage are ready to analyze why food makes a difference in one's growth and development, to learn the signs of adequate and inadequate nutrition, and to acquire basic knowledge of nutrients in foods and the functions of those nutrients. Their appreciation and understanding of the food supply should increase through study of the complexity of the food industry, including farming, processing, marketing and the importing of foods found on the market. They should know the role of industry and public health agencies in maintaining a safe food supply and some of the important principles concerned with the best use of money in food selection. The attitude toward a wider variety of food acceptance should continue.

At this age level the students should be exposed to the basic concepts of nutrition. These are not just facts to be memorized as such, but they should serve as guidelines for the selection of content, learning experiences and teaching materials in an educational program.

The basic concepts in nutrition are (33):

1. Nutrition is the food you eat and how the body uses it.
 - We eat food to live, to grow, to keep healthy and well, and to get energy for work and play.
2. Food is made up of different nutrients needed for health and growth.
 - All nutrients needed by the body are available through food.
 - Many kinds and combinations of food can lead to a well balanced diet.
 - No food by itself has all the nutrients needed for full growth and health.
 - Most nutrients do their best work in the body when teamed with other nutrients.
3. All persons throughout life need the same nutrients but in varying amounts.
 - The amounts of nutrients needed are influenced by sex, age, size, activity and state of health.

—Suggestions of kinds and amounts needed are made by trained scientists.

4. The way food is handled influences the amount of nutrients retained, its safety, appearance and flavor.

—Handling means everything that happens to food while it is being grown, processed, stored and prepared for eating.

For the purpose of this study the section on the importance of handling food to emphasize what should be taught at secondary school level is expanded.

Food is handled by many persons from the time it is harvested to the time it is consumed. In Lebanon the food preparation practices need improvement in order to decrease the nutrient losses during food preparation. The general objective of the following section designed for secondary school level is to understand that adequate nutrition is promoted by handling food in a way that minimizes nutrient losses; see Figure 5.

Upon completion of high school, the student should begin to understand the functions and specific food sources of nutrients. He should be able to make good decisions in selecting an adequate diet, and should have an understanding of cultural factors affecting food choices. He should have appreciation of the many factors affecting the cost of foods, and should be able to use his money with

Figure 5. Example of How to Expand the Concept of Proper Food Handling at the Secondary School Level.

| Content | Instructional Aids and Student Activity |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Nutritive value may be decreased by removal of nutrients during processing and preparation by mechanical means.</p> | <p>Exhibit samples of white milled flour, and whole wheat flour. In the refining process the bran and germ of the wheat has been removed which contains the majority of the minerals and vitamins.</p> <p>Exhibit samples of dry whole milk and dry skim milk. The vitamin A was removed when the milk was defatted.</p> <p>Exhibit sample of "laban" and "labneh". The calcium has been removed when the "laban" was strained to make "labneh".</p> <p>Demonstrate scrubbing versus peeling fresh carrots, noting that the thicker the peeling the greater the loss of nutrients.</p> <p>Potatoes cooked whole and unpeeled have maximum nutrient retention.</p> |
| <p>The nutritive value of a food may be decreased by removal of nutrients during preparation by solution.</p> | <p>Demonstrate vegetable cookery, stressing the proper use of the water media as:</p> <ol style="list-style-type: none"> <li data-bbox="807 1593 1297 1684">1. A green succulent vegetable (Jews mallow) in a small amount of water. |

2. A fresh vegetable (peas) covered with water. Preserve the water containing the nutrients to use in soup.
3. Cook peeled and sliced potatoes in the water which they have been soaked in.

The longer the cooking time the greater the nutrient losses.

Compare the flavor of stuffed artichokes cooked just until tender to those cooked for an extended period of time.

The nutritive value of food may be decreased during preparation due to reactions that produce chemical changes.

Refer to Shamma and Adolf research (15), including thiamine loss during sun drying of wheat to make "burghol".

Nutrient loss due to oxidation.

Ascorbic acid loses its potency by exposure to oxygen; examples:

1. Store orange juice in a sealed container.
 2. Store "tabbouli" in a covered dish.
 3. Package produce in vapor-proof material.
 4. Limit the amount of exposed surface in food storage.
 5. Limit the length of storage period.
-

increasing skill in making food purchases. Knowledge of reliable sources of information and the desire to keep up-to-date on newer findings in foods and nutrition are of paramount importance.

Nutrition Education and the University and College Level

The age level of students in higher education is between eighteen and twenty-two years, with a small percentage in a higher age bracket. At this level the student may have had a formal course in nutrition but more likely it will have been incorporated in other subject matter areas. At the university level he may be enrolled in courses designed just for nutrition and food preparation. These courses will provide the student with an opportunity to study the nutritional concepts in greater depth, with practical applications.

Integrated with the study of anthropology and/or sociology, the student should gain a thorough understanding of his cultural heritage as related to food selection and eating patterns. With the acquisition of a knowledge of the physical sciences the student should be able to understand the processes of digestion and absorption of food substances.

As an introduction to the nutritional status of the local culture he should explore the findings of the US-ICNND Nutrition survey for Lebanon (1) in depth. The objectives of this exercise are to understand the techniques of conducting a nutritional survey, the recording

of findings and assessment and analysis of the investigations. From the results of such a survey, the student should be able to evaluate socio-economic changes that would improve the nutritional status.

The study of individual nutrients and their functions, as well as their food sources, might best be approached with those that were found to be adequate. For example, the availability and consumption of citrus fruits and dark green vegetables in relation to ascorbic acid and vitamin A needs.

The continuation of the study of the nutrients can progress in a sequence of those "acceptable" (e.g., thiamine) to those that were deficient, causing malnutrition; common examples are iron deficiency anemia and protein malnutrition causing kwashiorkor in infants.

Students should now be able to apply the recommendations of the survey team to the tasks of food selection and preparation. Hopefully the student will also be motivated to bring about social change, such as food enrichment, improved environmental sanitation and better distribution of food.

Education for better nutrition means much more than teaching physiology and chemistry. It involves psychology, anthropology, sociology, economics, the humanities and the other sciences. The increased food production, so necessary in underdeveloped countries, can benefit from efforts in every field. Society needs to provide facilities, legislators to establish effective regulations, writers and

broadcasters to mold public opinion and transmit information. In the rural societies food production is not just a matter for farmers and agricultural technicians but depends on the whole way of living, the culture and values of the nation.

The unparalleled growth rate of the world population is replacing distribution as the major problem in food availability. Although they are not likely to face serious food shortages in the near future, the developed countries may have difficulty in maintaining and improving human well-being as they cope with current population growth. Today most developing countries face acute food supply problems, possibly impending famines, as a result of the rate of population growth. The interacting combinations of a social order are responsible for food availability in a given situation. This current and controversial issue throughout the world was chosen for expansion for students in higher education with these two general objectives in mind:

1. That the student identify the numerous factors contributing to the availability of food.
2. That the student be able to make a judgment concerning the distribution of food in a given population of maximum utilization.

Figure 6. Example of How to Expand the Concept of Food Availability at the University Level.

| Content | Instructional Aids and Student Activity |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Food distribution within society takes place by reciprocal sharing. | Refer to barter system between blood related families in the mountain villages. |
| Food distribution within society takes place by voluntary or involuntary, redistribution. | Trace the socio-economic organization of food redistribution by describing the following: <ol style="list-style-type: none"> 1. Village market day. 2. Beirut vegetable "souk". 3. Family-owned grocery shops. 4. Spenies, Limited, supermarket chains. |
| Food distribution among countries takes the form of: | |
| 1. Unrestricted trade on the basis of the world prices. | Invite the Danish food corporation representative to talk about their food distribution and exports. |
| 2. Trade restricted by barriers of many kinds: | |
| a. Import taxes | Compare the prices of several items produced in Lebanon to the same imported items; examples: salt, beer, canned tomato sauce, orange juice, olive oil. |
| b. Political | The export of Jaffa navel oranges is prohibited in the Arab countries. |
| c. Concessional exchange. | Reference: "Daily Star" November 15, 1965, p. 1, "Lebanon to exchange apples for BE 11 (British made jet) for the Middle East Airlines." |

Figure 6. (Continued)

The availability of food as a factor in a "Food Consumption Pattern" is a function of:

1. The kinds and amounts of accessible food material.
2. The number of people dependent upon them.
3. The effectiveness with which it is distributed according to needs and wants.

Food distribution everywhere and at all levels is accompanied by more or less waste, and failure to meet individual needs.

The availability of food to meet world population needs in the immediate and predictable future will depend primarily upon more effective use of food resources at both production and consumption levels.

Reference: Lesson of the '60's — Challenges of the '70's, David Rockefeller. War on Hunger, A Report from AID, Vol. III, No. II, November 1969, pp. 1-3.

Students compare in the above article the national average of food supply per capita of Lebanon (and neighboring countries) to the recommended minimum requirements.

Read the US-ICNND's report on the Nutrition survey of Lebanon (1962).

Analyze the findings with regard to three segments of the population as to:

- a. Nutritional status.
- b. Geographic location.
- c. Food availability.
- d. Causes of uneven distribution.

Guest Panel

"Problems of Food Waste"

1. Homemaker.
2. Public restaurant owner.
3. Shopkeeper.
4. Wholesale Distributor (storage and distribution).
5. Farmer.

Class Debate

Increasing farm productivity is essentially one of creating radical changes in agricultural technology.

vs

Rural hunger occurs in areas where modern machinery has displaced

Figure 6. (Continued)

hand labor, and so previous agricultural laborers are treated as dispensable.

The "miracle seeds" of the Green Revolution will push back the date of the population-food doomsday.

vs

The "miracle seeds" of the Green Revolution may be susceptible to new "miracle plant disease".

Choices at the consumer level can increase the effectiveness of utilization of food resources.

Read the Power of Food, A Progress Report on the World Food Programme.
FAO, PI, 192750, November 1969 (a new kind of multilateral aid).

Using system approach to nutrition (starting with an understanding of the resources) frame some policies to help achieve the highest nutrition possible for the family members who need it most.

- a. high yield farm technology.
 - b. use of "miracle seeds".
 - c. educational expansion.
 - d. reforms in administrative, political, economic and social agencies.
-

Nutritional Aides for Lebanese Villages

The program aim is to give a one-year education in foods and nutrition to village students, so that they may become nutrition aides at the village level. The students hold a high school diploma from the major high schools of the villages. They are selected on the basis of scholastic achievement, homemaking background, and the commitment that they will stay as a resident of the particular village they represent.

The objective of this program is to stimulate the nutrition aides to improve the nutritional status of the rural people by making maximum use of the food resources available, through foods and nutrition education.

At the completion of the foods and nutrition course, the nutrition aides will receive a certificate attesting to the fulfillment of the requirements. The receiver is then eligible to teach a similar course at the Village Welfare Society schools to students of low income families between the age of fourteen and sixteen.

The general plan fits the objectives of the village program in this manner. It is of paramount importance for the nutrition aides to understand the psychological, sociological and physical importance of food to man and to realize the importance of food to man and his nutritional well being. A knowledge of the emerging food patterns is essential to understand the food habits practiced. The effects of food

fads, superstitions and misconceptions on food habits should be analyzed before any change is attempted. The importance of a thorough understanding of the Daily Food Guide for Lebanon and its use in meal planning using the resources available will be studied. A knowledge of the nutrients that are essential to man is one of the major objectives. Emphasis will be placed on effective meal planning that will alleviate nutritional deficiencies. Laboratory lessons in food preparation will put into practice theoretical information and will stress the importance of proper handling of food during storage and cooking to minimize the nutritive loss. The program will also focus on the importance of family planning, stressing that the chances of small families being well fed are greater than those of large families, when the resources available are the same.

Adapting the Plan to Informal Situations

Informal teaching does not follow the rigid classroom instruction method. It is designed to reach groups varying in size and interests: group meetings, extension work, clubs, organizations and clinics. The subject to be taught relates to the interest and previous experience of the group. Another aspect of informal teaching is through the mass media. By sparing use of technical terms, and use of monosyllabic words as much as possible, the information can be

put in a form understandable by the young and illiterate, without being too elementary for the well-educated.

Learning is a personal matter and people learn only when they want to. They either learn in order to satisfy some need which they recognize consciously or subconsciously, or to avoid some nuisance or unpleasant situation which would occur if they had not learned. This applies to both adults and children. The five stages of the learning process are awareness, interest, evaluation, trial and adoption. Nutrition education cannot be considered complete until all stages have been achieved.

Mass Media

These allow simultaneous presentation of information to a large number of persons in varying locales. Radio, television, newspapers and magazines are included. These tools can be effective in furthering nutrition education of the public.

Radio: — Between 85 and 90 per cent of the population of Lebanon have radios. More families in Lebanon have radio sets than have telephones, ranges, or refrigerators or any other convenience developed in modern times.

The Lebanese government sponsors broadcasts in the public interest, convenience, and necessity. Programs for better nutrition come in these categories, thus radio stations will not only sponsor

nutrition education programs but pride themselves on being alert to community needs.

Radio reaches almost everywhere and can give regular contact with the audience that is interested. People can listen to radio while doing other things. A homemaker can iron or bake while picking up tips from radio; thus radio can inform as well as serve as a companion. On the other hand many listeners must be motivated to tune in.

Programs of nutrition education should not last more than fifteen minutes. A nutrition message can be included in many programs such as "new products", "farmer's program", "mothers of tomorrow" and "the homemaker". Spot announcements of 60 to 90 seconds that use a single premise or theme can be effective in passing nutritional facts, if the same message is repeated at various intervals during the day to create the desired awareness.

Guidelines for broadcasting a public nutrition program are:

1. A single message or objective.
2. A theme or basic premise.
3. An easy to follow story or information.
4. Simple and understandable words and themes.
5. A variety of techniques to capture the fancy of the public.
6. The well known and respected source of information included.

7. To know the techniques of the medium and the people in control of programming.
8. To know local personalities, like the YWCA director, public health center personnel, nutrition education teachers, who could help create interest in the community.

An example of a radio script that pertains to the types of food the body needs and especially adapted to the Lebanese situation is given in Appendix B.

Television: — Television has been acclaimed "the most important educational tool since movable type: (34). Much of television's success in teaching is its unique combination of sight, sound and motion. This coupling of audio and visual stimuli is one of the most effective tools in changing human behavior.

A television broadcasting service was established in Lebanon, the first commercial station in the Middle East, and regularly scheduled broadcasts began in 1959 (35). Since 1959, eight operating stations, three broadcasting in Arabic, three in French, and two in English, reach an estimated 70 to 80 per cent of the Lebanese public. From the time regular broadcasting began in 1959 until 1970, 180,000 sets were purchased. Sixty per cent are owned by low income people; although the initial price is high it is the cheapest source of entertainment. At first, the purpose of most commercial television in Lebanon was to delight and amuse the audience. At present,

however, more programs are planned to have an educational content.

In Lebanon at present there is a potential for televised nutrition information for the public. All the day-time programs on television are essentially "women's programs", for their audiences are primarily feminine. During the morning programs there can be effective use of the medium for teaching the homemaker. Nutrition education, however, should not be limited to the female viewer. Programs of nutrition information should be integrated into the entire day's programming to stimulate maximum nutrition awareness within the population. Advertisers could be encouraged to use nutritional facts in promoting their products and children's programs can emphasize nutrition information through story telling.

Meal planning, care and handling of foods, and importance of food choices in weight control would be of interest. Program planners need to use listeners' questions as a guide to problem areas.

When planning programs it should be remembered that it is possible to use video tapes and filmed presentations. This feature provides a saving of time compared with face-to-face productions. Many kinds of teaching aids such as the flannelgraph, charts, still and motion pictures, posters, exhibits and models can be incorporated.

In Appendix B there is a sample TV script and visuals which would be of interest to the average Lebanese television viewer.

Newspapers: — No city in the world has as high a proportion of newspapers as does Beirut (36). Recent figures on press licenses issued by the Lebanese government show that the country has 49 daily newspapers, 30 of which are in Arabic and 19 in Armenian, French, or English. The largest daily newspaper, L'Orient (French), has a circulation of 150,000; many others exceed 15,000 and the smallest may sell only one hundred copies.

Almost every newspaper in Lebanon has a page especially designed for the female reader. The "women's page" usually includes emphasis on advice and information on matters which concern the home, the family, the community and the woman herself. Some straight news stories of special interest to women are also included. Nutrition education is readily adaptable to this approach and could take the form of interviews with homemakers, teachers, and local celebrities; a straight news story such as effects on care of fruits sprayed with DDT, a product widely used in Lebanon; or reports of research.

In each of these approaches a mass media technique is applied to a question of current consumer interest. In its development there should be a lead paragraph, which should tell the reader the basic facts of the story, answering who, when, what, where and why (29). The story may then go into further detail. "Woman's Page" coverage may include recipes and other "how to" information, in sequence of

importance. If the story must be cut for space, it is cut from the end, and this should be possible without loss of news value or information. An example of a newspaper article is shown in Appendix B.

Magazines: — Lebanon has about 150 weekly and 100 monthly magazines, written in Arabic, French, English, Armenian and Greek. Thirty-nine of the weekly magazines and twenty-five of the monthly magazines cater to women (36).

Many magazines have food editors; these should have specific foods and nutrition training besides journalism, to understand the needs of their readers. Food editors should be familiar with their readers' mail in order to pinpoint food interests. Submission of articles of interest, especially recipes using new products, would be most helpful in promoting nutrition education. In developing such an article it is important to keep the language simple, clear, and attractive. An example of a magazine article promoting the use of a new product is shown in Appendix B.

Adapting Nutrition Education to Community Services

Maternal and Child Health Services

In each of the five districts of Lebanon there are four public health centers, three of which are maternal and health clinics. At the village level confidence and goodwill are engendered by the treatment

of ailments and through the delivery of children and care of the mother. Health center personnel could help in the promotion of nutrition education by correlating it with their clinics, extension workers, nurses, midwives and other health workers.

Nutrition education topics to be taught to mothers through maternal health centers will vary from place to place and will be indicated by local forms of malnutrition, types of infections, food production problems, environmental factors and the villager's own felt needs. Nutrition education should emphasize the improvement of the diet of the whole family, with specific reference to young children. It should also encompass methods of improving village food production, storage and preservation, as well as prevention of infections. Customs that lead to poor nutrition should be discouraged.

When adapting the plan suggested earlier, materials should be related to the pregnant and lactating mother as well as the feeding and handling of food for the young child. In order to interfere as little as possible with the normal functioning of the clinics, a series of folders should be developed for the health workers, to leave with each mother. In this way the instructions of the health worker regarding diet and care could be re-emphasized and "how to" information would be available for each individual. Such leaflets should be attractive and easy to understand. Probably pictures rather than words should be used.

A daily food guide has been developed for the pregnant mother to use in planning meals for herself and her child. It can be seen in Appendix B.

Basic information included in the educational leaflets are:

1) Values of breast feeding

Breast feeding should be started as soon as possible after birth, given on demand and supplements started between the fourth and sixth month. If pregnancy occurs the mother should be encouraged to continue breast feeding for the first three months and then wean the infant slowly over the last six weeks of this period. The economy, prestige and modernness of breast feeding should be stressed.

2) Dangers of bottle feeding

Bottle feeding is expensive and may be dangerous if the bottles are not properly cleaned. When it is necessary to use supplementary food, the use of feeding cup and spoon must be demonstrated to the mother.

3) Weaning foods

Weaning foods should be introduced between the fourth and sixth months, depending on the lactation ability of the mother. The mother should be instructed as to the type of food, its preparation, cooking and serving, quantities and frequency of feeding.

4) Use of protein supplements

Various protein foods suitable for young children should be suggested to the mother for use in her child's diet. The use of powdered skim milk and Laubina can be demonstrated.

5) Need for sunshine

The need for sunshine for proper development of bone is important for every infant. Swaddling the infant to ensure that he grows straight promotes rickets. Mothers should be persuaded to abandon this practice and allow the infant to be exposed to the beneficial effect of sun and air.

6) Ways of including legumes and green leafy vegetables in the diet

Legumes of different kinds can provide a high proportion of protein in the infant's diet. Demonstrations on how to include them as well as green leafy vegetables is important. The latter are good sources of the minerals and vitamins that the infant requires for proper growth.

7) Correct cooking methods

How to minimize nutrient loss in food preparation is essential information for every mother. The food should be prepared in a manner that is suitable for the child. The flavor, texture and appearance should be taken into consideration.

Community Centers

The village community centers are a focal point for meeting a wide variety of neighborhood needs. These government-sponsored centers in every village are for the purpose of maintaining good relationships between the government and people, as well as serving cultural and recreational needs. Many times the structure is the boast of the village people. More important are the services that are rendered: literacy classes of all sorts, village and community meetings,

inoculations and immunizations, libraries, recreational programs. Homemaking education, health and nutrition education should be included in these activities. This is a place to direct nutrition activities to fathers who always control the household budget. Another target for nutrition education can be the grandmother or the mother-in-law, who often has a considerable say in the method of child rearing as well as the food habits of the family.

In these centers the following two types of nutrition education can occur: (1) government sponsored classes which emphasize budgeting, better use of local foods, the relation of food to health, and (2) a poster campaign.

A sample lesson for government classes follows; the lesson shows how good budgeting is essential for providing the family with nutritious foods.

Posters would probably reach a far greater number of people than organized classes. They can be displayed at the community center for a designated period. This will serve to emphasize nutrition classes and activities as well as to educate. To be effective they must attract attention, and offer one idea only. Many of the visuals used in the adaptation of the plan to Lebanon could be made into posters (see Appendix B).

Figure 7. Example of How to Expand the Concept of Food Budgeting at the Village Level.

| Content | Instructional Aid |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The composition of the family and the general health of family members establish precise food needs.</p> | <p>Refer to the difference of foods needed by different families; e.g.,</p> <ol style="list-style-type: none"> 1. A married couple with a one-year-old child. 2. A family of four children, including parents and grandfather. 3. An elderly couple. |
| <p>Individuals differ in their nutrient needs as they differ in age, sex, size and activity. Family food needs are the composite of individual food needs.</p> | <p>Examples:</p> <ol style="list-style-type: none"> 1. It costs more to feed a man than a woman of the same age unless she is pregnant or lactating. 2. It costs more to feed boys than girls after they reach the age of nine. 3. It costs more to feed a six-year-old than a three-year-old. |
| <p>Families of similar composition have the same food needs although they may differ in expenditures for food.</p> | |
| <p>Like quantities of an assortment of nutrients can be purchased at widely differing cost.</p> | <p>Demonstrate by using two shopping bags of food that have somewhat similar nutrient content but differ in cost and items. For example:</p> <ol style="list-style-type: none"> 1. One shopping bag has a roast of lamb, French bread, butter, fresh milk, imported tomato sauce. |

Figure 7. (Continued)

| | |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Very similar families may have quite different value systems that influence spending patterns.</p> | <p>2. The second shopping bag has ground meat, Arabic bread, "ghee", dry milk, local tomato sauce.</p> |
| <p>Knowledge of how much food to buy is an important aspect of food budgeting.</p> | <p>Give examples that relate to your audience aspirations, ownership of farm machinery, adding a room to the home, preparing for the coming new child.</p> <p>Refer to the good shopping practices, examples:</p> <ol style="list-style-type: none"> 1. If you have a large family, try to buy large sizes, you get more for your money. 2. If you have a small family, buy only what you can use up before the food spoils. 3. In any case don't buy what you don't have room to store. |
| <p>It is sensible to compare food prices to try to get most for money spent.</p> | <p>Explain that before putting something into the grocery bag, a person should look at prices. Some brands always cost less for the same nourishment.</p> |
| <p>Thrift in shopping can allow more money in the food budget to be spent on foods needed by certain members of the family.</p> | <p>Analyze a typical food budget showing where cuts can be made, and the money used for more nourishing foods like "laubina" for children and more dry skim milk for pregnant and lactating mothers.</p> |

Other Centers

Other community centers render services to the youth. These include the YWCA and YMCA and YMA (Young Moslem Association). Nutrition education blends naturally into youth projects. The organizations encourage community gardening, livestock work, and home gardening; they improve the image of farming and help provide better food for these organizations for their summer camps. The Ministry of Agriculture cooperates with the educational authorities of voluntary organizations in these small food-production experience programs. These should be coordinated with techniques of preserving vegetables, fruits and other produce. In this way crops are not wasted and are made available for later use. Emphasis should be placed on approved preservation methods which conserve the nutrients.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

Summary

The need for better food and nutrition education in Lebanon has been established. A better food and nutrition education program is urgently needed at the present in Lebanon, because of the imbalance between population growth and food supply. This education will help enable the Lebanese population to use their available food resources to the fullest and, it is hoped, to reduce malnutrition. A remedy for this deficiency in formal situations is possible by including foods and nutrition information in the curriculum of the elementary, secondary, college and university programs, and in informal situations by including nutrition information in materials presented to the general public by the use of available health and community centers as well as mass media.

A plan for teachers of nutrition was proposed. Ways to apply the plan to different levels and situations of education were given. The plan can be used in its entirety in health or foods and nutrition classes and can be easily adapted to the students' level of understanding. It can also be integrated into other subject matter if there is careful program planning. Examples of activities and information that the student can comprehend at each level is presented.

Methods of presenting nutrition principles to the public through health, community centers and mass media were demonstrated as further extensions of the plan. Examples of how foods and nutrition education could be promoted through mass media were prepared. The advantages of each medium and its limitations were pointed out.

Recommendations

The information and materials presented in this thesis are only the basis for what is needed in Lebanon. The plan proposed can be expanded to adapt to the teaching level concerned. Many more visual aids can be developed to convey messages intended to accompany the plan.

The teaching material (after being expanded) and the visual aids, should be translated into Arabic, Armenian and French. The leaflets to be developed for the maternal and health services should also be in these three languages.

The Lebanese government should be encouraged to promote training in nutrition for workers at various levels, ranging from professional and specialized nutrition workers to personnel in local services of various kinds, who can communicate some knowledge of nutrition to the people during their daily activities.

Since a sound program in foods and nutrition education must be based on an understanding of the needs of families, studies of

patterns of both urban and rural family living should be conducted constantly. Information about food habits, nutritional status, child care practices, family traditions, values and relationships should be collected. It is necessary to provide a basis for a realistic foundation in program planning in food and nutrition education.

Further study is also recommended to determine what and how much preparation teachers need in the area of nutrition education to feel secure enough to guide their students in making wise food choices.

APPENDIX A

Examples of Visuals to be Used in Adapting the Plan to
Nutrition Education in Lebanon

Approximate Calories Used up Per Hour
Per Kilogram of Body Weight
by Activities.



Low

Sleeping
1.0 calories
per kilogram
of Body
weight



Moderate
Standing
1.4 Calories
per kilogram
of Body
weight



High

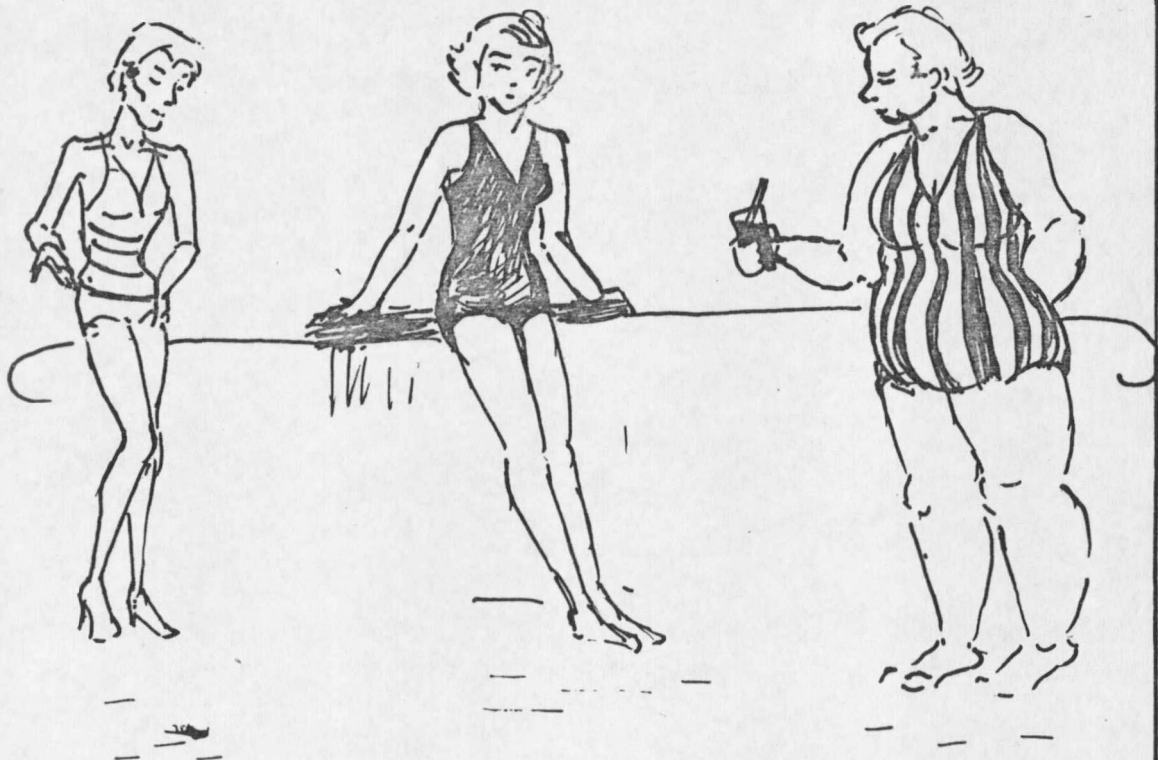
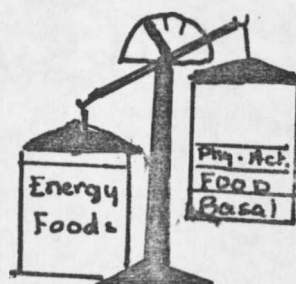
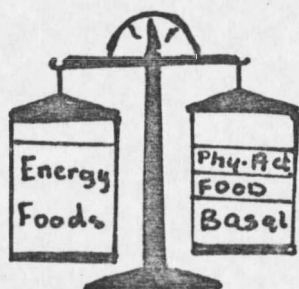
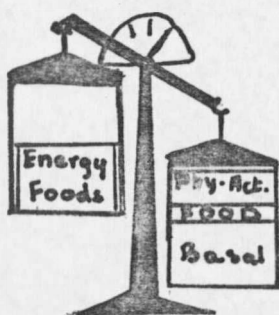
Running
3.7 Calories
per kilogram
of Body
weight

Energy Balance

Loss in Body Weight

Stationary Body Weight

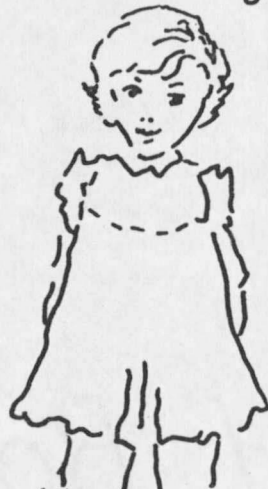
Gain in Body Weight



Grams of Protein Required Per kilogram of body weight



2.5g/kg of body weight



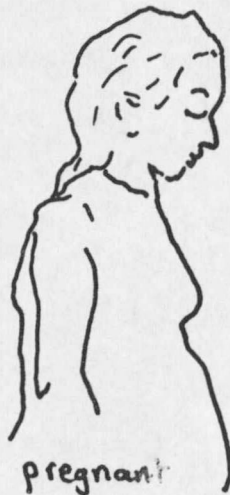
3-6 years
2.2g/kg of body weight



15-18 years
1g/kg of body weight



18-35 years
1g/kg of body weight

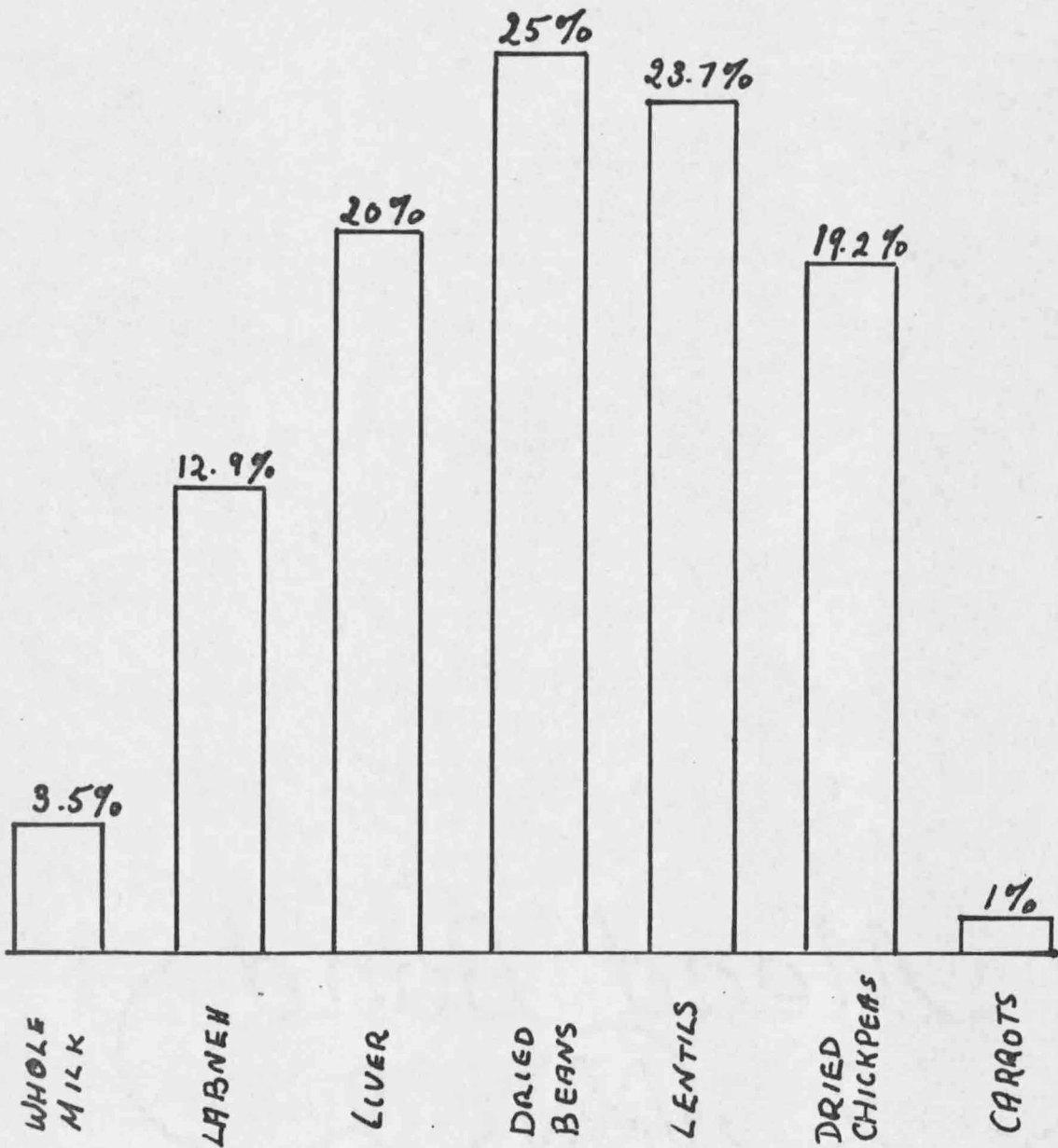


pregnant
1.4g/kg of body weight




1g/kg of body weight

PERCENTAGE PROTEIN (BY WEIGHT)
FOR VARIOUS FOODS



Foods with The Same Amount of Protein

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|  <p>Meat Medium Serving 85 grams Boneless</p> |  <p>Poultry medium Serving 85 grams Boneless</p> |  <p>Fish Medium Serving 85 grams</p> |
|  <p>Eggs 3</p> |  <p>cheese 85 grams</p> |  <p>Labneh 3/4 cup</p> |
|  <p>Laban 1 cup</p> |  <p>milk 2 glasses</p> |  <p>Green Beans 1/4 cup</p> |

APPENDIX B

Examples of Adaptation of Nutrition

Education to Lebanon

THREE-MINUTE RADIO SCRIPT

Good Nutrition Makes Healthy Babies

From the time your baby is born, he needs good nutrition. This means enough energy foods to go on and enough protein foods to grow on.

During the first months you will probably breast feed your baby. This is a good practice and is sanitary if the breasts are kept clean. Even though mother's milk is the best food for the baby, it lacks some of the essential food nutrients. The addition of orange juice and egg yolk to his meals will be sufficient during the first months. During this period the child usually appears to be healthy and happy.

After weaning, the child usually starts eating from the food prepared for the rest of the family. Foods like potatoes, rice, breads and sweets appeal to a child. As a result they compose the major part of his diet. Although these foods provide energy, they lack body-building materials.

The best body-building foods are protein foods. These include fresh or dried milk, cheese, laban, labneh, custard, "mahalabia", "ruz bilhalib", meats, dry beans, peas, chick peas, "burghol", and lentils.

One way to insure your child is getting enough protein is to add Laubina to your child's diet. Laubina mixture was developed by Dr. Pellet and Dr. Assfour at the American University of Beirut from our

local products — wheat, chick peas and dry milk, enriched with some minerals and vitamins. Laubina looks like ground "smeed". It is used as a beverage or can be added to soups, sweets, and breads.

To mix Laubina as a drink, use the spoon provided with the package and measure two level spoons of the mixture into a cup of water. To be sure your child gets enough protein, he needs at least two cups a day.

When your child starts going to school, he will still be growing, and his demand for protein will remain high. You must be sure that he eats enough protein foods during his daily meals.

Remember, children need protein for normal growth and good health. During baby's first months most of his requirements are met by mother's milk. After weaning, he must continue to get enough protein from other food sources, such as milk and milk products, meat, Laubina, cereals and legumes.

THIRTY-SECOND SPOT ANNOUNCEMENT

All during the life cycle the human body needs protein foods for growth and repair of body tissues. During baby's first months most of the protein requirement is met by mother's milk. After weaning your baby must continue to get enough protein from other foods. Foods that are good sources of protein include milk and milk products, meat, eggs, Laubina, cereals and legumes.

3-Minute Television Script
 Good Nutrition Makes Healthy Babies

| Visuals | Script |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Picture of healthy baby----- ¹ | <p>→Does your baby look like this? He should have good color, eat heartily, and be alert and happy.</p> <p>This is the result of good nutrition. Good nutrition means enough energy foods to go on and enough protein foods to grow on.</p> |
| 2. Picture of a mother----- ² nursing her baby | <p>→During the first months you will probably breast feed your baby. This is a good practice and is sanitary if the breasts are kept clean. Even though mother's milk is the best food for the baby, it lacks some of the essential food nutrients.</p> |
| 3. Picture of adequate foods--- ³ during lactation: milk, orange juice, egg yolk. | <p>→The addition of orange juice and egg yolk to his meals will be sufficient during the first months. During this period the child appears to be healthy and happy.</p> |

Visuals

Script

-
- After weaning, the child usually starts eating from the food prepared for the rest of the family.
4. Picture showing rice and potato dishes, bread and sweets. ⁴→ Foods like potatoes, rice, breads and sweets appeal to a child. As a result they compose the major part of his diet.
5. Picture of undernourished baby. ⁵→ Although these foods provide energy, they lack body-building materials.
6. Picture showing the dairy products, milk, dried milk, laban, labneh, and milk dishes, custard, "mahalabia", "ruz bilhalib". ⁶→ The best body-building foods are protein foods. These include fresh or dried milk, cheese, laban, labneh, custard, "mahalabia", "ruz bilhalib",
7. Picture showing "mousaka'a", baked fish, "ejee", harissa, moujadara, and homos dishes. ⁷→ meat, dry beans, peas, chick peas, "burghol, and lentils.
- One way to insure your child gets enough protein is to add
8. Picture of Laubina package ⁸→ Laubina to your child's diet.
- Laubina mixture was developed by Dr. Pellet and Dr. Assfour at the American University of Beirut from our local products — wheat, chick

Visuals

Script

peas and dry milk, enriched with some minerals and vitamins.

Laubina looks like ground "smeed".

It is used as a beverage or can be added to soups, sweets, and breads.

9. Picture showing how to mix Laubina.

To mix Laubina as a drink, use the spoon provided with the package to measure two level spoons of the mixture into a cup of water.

10. Picture of a healthy child drinking a cup of Laubina.

Your child needs at least two cups a day.

When your child starts going to school, he will still be growing, and his demand for protein will remain high. You must be sure that he eats enough protein foods during his daily meals.

From the time your baby is born, he needs protein for normal growth and good health. During baby's first

Visuals

Script

months most of his requirements are met by mother's milk. After weaning, he must continue to get enough protein from other food sources, such as milk and milk products, meat, Laubina, cereals and legumes.

end

NEWSPAPER ARTICLE

What Salt Do You Use?

Iodized salt means prevention of the "swollen neck" for your family. Technically the "swollen neck" is called goiter. The cheapest and best method of preventing goiter is to use iodized salt every day.

Goiter has been known for centuries in Lebanon. Some families think it is a part of the normal growth. Most often girls and women are the ones most commonly affected. It occurs most often during adolescence when growth is most rapid and during pregnancy.

In 1962 the Nutrition Survey of the Republic of Lebanon recommended the widespread use of iodized salt to prevent goiter. Shortly thereafter the Parliament passed a bill requiring locally-produced salt to be iodized. This would cost about 3 piasters a year per person.

This resulted in the temporary removal of imported iodized salt from the market, so that there would be no competition with the local product. With the change of government, however, the program was set aside. Although imported iodized salt was allowed back on the market, it is twice as expensive as the local salt. Only people with high incomes can afford it.

Locally produced iodized salt would cost about one piaster more per kilogram than non-iodized salt. If you want cheap protection

against goiter, write your representative in Parliament and ask him to support the program to make the iodization of all locally produced salt mandatory.

FOUR-PAGE MAGAZINE ARTICLE

Powdered Milk Magic

There is magic in milk these days. The powdered milk you find in your market today will combine with water instantly. It gives you the liquid milk you have always wanted with just a twist of the wrist — powder to liquid with presto-chango action!

To store the new milk, you can place it on a cabinet shelf both before and after the package is opened. Keep it along with other staples, ready in an instant to increase the food value and improve the taste of many dishes served at every meal.

Low cost is one of the chief virtues of the new, instantly soluble dry skim milk. A package that gives three liters of skim milk when reconstituted costs 90 piasters. Compared to a liter of fluid skim milk which costs 65 piasters and a liter of whole milk costing 70 piasters, it is 30 to 35 piasters less.

The new milk, like the older product, is one of the most economical sources of protein (the body-building material) on the market; it has the same high quality protein as that found in meat, poultry, and fish. It also is among the cheapest contributors of calcium and riboflavin (a B vitamin).

There are two ways to use dry skim milk for cooking — as a liquid or simply sift with other dry ingredients.

Complicated? Not at all. Say, for example, a recipe calls for a cup of milk. The amount needed to make a cup — 4 tablespoons — is sifted with flour and baking powder. Then when the recipe says "a cup of liquid milk", a cup of water is added. It is easier to sift milk with dry ingredients when the recipe calls for milk to be used during cooking. Use as reconstituted liquid when milk is to be added to the food just before serving.

Now let's try a few recipes. A more nutritious Belila to begin your day is delicious when you make it this way:

Belila (wheat pudding)

- 1 cup medium grain burghol
- 2 cups water
- $\frac{3}{4}$ cup sugar
- $\frac{3}{4}$ teaspoon rose water
- $\frac{1}{2}$ teaspoon cinnamon
- 2 cups reconstituted instant skim milk

Over medium heat boil the burghol in the water for 15 minutes, then lower the heat and simmer until the mixture becomes very tender. Remove from heat. Add cinnamon, and mix thoroughly. Just before serving stir in milk. Serve warm or cold.

Skim milk makes Belila more nutritious!

Breakfast breads, such as "kubiz arabi" and "manakish" can all be enriched by the addition of dry skim milk. Just substitute 4 tablespoons flour with 4 tablespoons dry skim milk for each cup of flour

called for in the recipe. At luncheon, serve dishes made with eggs — egg plant omelet, cauliflower omelet, zucchini omelet. Four tablespoons of dry milk to every two eggs used will add a rich flavor and food value too!

For stews, another luncheon favorite, add 4 tablespoons of dry skim milk for every cup of water used. Try this:

Dried Beans Stew

- 1/2 kilo. dried lima beans
- 1/4 kilo. lamb, in 2-cm. cubes
- 2 cups water
- 1 medium onion, chopped
- 1 clove garlic, crushed
- 3 tablespoons margarine or "ghee"
- 8 tablespoons dry skim milk
- 1 cup tomato sauce
- 1 1/2 teaspoons salt
- 1/4 teaspoon pepper
- 1/2 teaspoon chopped coriander leaves

Wash beans and soak overnight in 2 cups of water. Simmer 45 minutes until tender. Drain, and reserve the water. Brown meat, onion and garlic in margarine. Reconstitute milk with water reserved from beans, add to meat mixture and simmer until tender. Add tomato juice, stirring continuously, then cooked beans and seasonings. Simmer for 15 minutes. Serve with rice or burghol.

Dry skim milk also can star in foods for dinner. Soup, the standard feature, can be enriched with skim milk. Add 3 tablespoons of milk for each cup of water used.

You can make the delicious dessert, "Kaek bi ajwa" (date cake) by using skim milk instead of water. This is a delicious version:

Date Cake

- 2 cups sifted flour
- 1/2 cup instant dry skim milk
- 2 teaspoons baking powder
- 2 tablespoons sugar
- 1/2 teaspoon salt
- 1 cup chopped dates
- 2 eggs, beaten
- 1 1/2 cups water
- 4 tablespoons melted butter or margarine

Grease a 20-cm cake pan. Sift together the flour, instant dry milk, baking powder and salt. Add dates, separating each piece with flour. Mix egg, water, and butter or margarine. Add egg mixture to dry ingredients, stir until flour is dampened (mixture will be lumpy). Do not beat the batter vigorously. Pour into the cake pan. Bake in preheated oven or on top of the gas range for 25 minutes at 204°C.

As you use dry skim milk you will find yourself experimenting with more and more ways to incorporate it in every meal. Only with experience can you really appreciate the true value of this inexpensive, nutritious food.

DEMONSTRATION ON CANNING FOR COMMUNITY CENTER

Introduction

Canning is preserving food by using heat to destroy organisms that cause food spoilage, and then sealing the food in containers. The heat will cook the food, change its flavor and appearance. Canning will not improve the quality of food, but will preserve it. For good canned products, you should select high-quality foods. Ripe fruits give the best canned products. Because changes occur rapidly in the flavor and texture of foods after they are picked, you should can them as quickly as possible.

There is a general canning procedure. When you know it, you can apply it to fruits of your choice. This method is only safe for canning fruits. The following step-by-step procedure for canning peaches will show how easily foods are canned.

| Equipment | Method |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| glass jars, lids, water (boiling), soap. | Begin by assembling needed equipment and examine the jars to see that there are no nicks or cracks, especially along the sealing edge. Wash the jars and lids in hot soapy water and rinse with hot water. Invert the jars on a cloth-lined tray on counter. |
| brush, water | Sort the peaches according to size and ripeness and wash thoroughly. Remove all decay or bruised spots. |

| Equipment | Method |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| range, pote with boiling water, pot with cold water | Dip the peaches into boiling water for about one minute and then into cold water. The skin will slip off easily. |
| paring knife | Cut the peach in half, remove the seed, and slip off the skin. |
| sugar syrup | Fruits are usually canned in a sugar syrup which should be prepared before fruits are skinned. Most fruits are packed in a medium syrup (1 cup sugar to 2 cups water). |
| hot jars, boiling syrup | For raw pack, place peaches in a jar cup-side down; for hot pack place the peach halves in boiling syrup for 3 minutes and then pack them into hot jars, cup-side down. |
| table knife or spatula | Fill the jar with syrup 1 cm from the top. Use a table knife or spatula to release the air bubbles that are trapped. Add more syrup, if needed, to bring the level to 1 cm from top. Wipe the top of the jar free of syrup and pulp. |
| flat lid, band | Place the flat lid on top of the jar and screw band firmly in place. |
| large pot | Place the jar in a large pot of boiling water. Add water to the pot to bring water level 2 or 4 cms over the jar tops. |
| lids | Cover the pot and bring the water to a rolling boil and process the recommended time, 25 minutes for peaches. Count the processing time after the water reaches a boil. |

| Equipment | Method |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cloth or newspaper | At the end of the processing time, remove the jars from the pot and place them, top side up, on several thicknesses of cloth or newspaper to cool. Space the jars 4 or 6 cms apart so that they will cool more quickly. Keep them away from draft. |

You can avoid canned food spoilage if you follow these rules: observe strict cleanliness; follow directions carefully; work quickly so that foods do not stand for some time before processing; and count processing time accurately.

A poster for community centers showing foods that provide energy but little body building materials

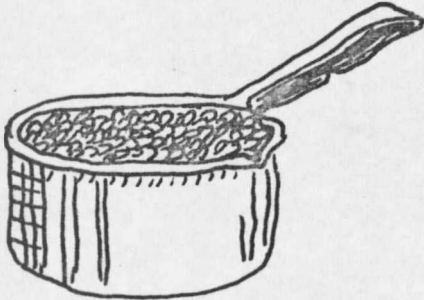
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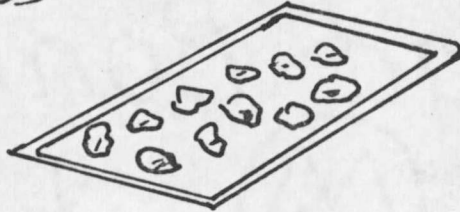
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APPENDIX C

Glossary of Foods

Glossary of Foods

- Akkawi Cheese — A medium hard cheese from whole cow's milk.
- Arisheh Cheese — A medium hard cheese from acidified whey from mountain cheese preparation.
- Belila — Wheat pudding.
- Burghol — Parboiled wheat.
- Ejee — Omelet.
- Ghee — Clarified butter from cow's milk.
- Harissa — A lamb dish with wheat.
- Homos — A chick peas dip.
- Kawarma — Small pieces of fried mutton preserved in sheep tallow.
- Khubz abyad — Flat white Arabic bread.
- Kibbeh — A dish with lamb and burghol.
- Kishk — Dried laban and burghol.
- Laban — Turkish yoghurt.
- Labneh — Spread for bread made by straining yoghurt.
- Laubina — A protein-rich food, made from wheat, chick peas, and dry skim milk.
- Mahalabia — Milk pudding with ground rice.
- Markouk — Large flat bread, characteristic of mountain areas.
- Moujadara — Rice and lentils dish.
- Mountain Cheese — Medium hard cheese from whole goat's milk.
- Pulses — Plants that have seed pods, like peas, beans and lentils.

Samne' — Sour butter made from sheep or goat's milk.

Shanklish Cheese — A cheese prepared from fermented defatted goat's milk mixed with thyme and sesame seeds.

Tabbouli — Burghol plus vegetable salad.

Tehineh — An oily paste prepared from decorticated sesame seeds.

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