

| | |
|--|------------------|
| AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D.C. 20503 BIBLIOGRAPHIC INPUT SHEET | FOR AID USE ONLY |
|--|------------------|

| | | |
|---------------------------|---|----------------|
| 1. SUBJECT CLASSIFICATION | A. PRINCIPAL: Food production and nutrition | ASCG-0000-6220 |
| | B. SECONDARY: Human nutrition--Sierra Leone | |

2. TITLE AND SUBTITLE
 Sierra Leone national nutrition survey; summary report and recommendations

3. AUTHOR(S)
 (101) Calif. Univ., Los Angeles, School of Public Health

| | | |
|--------------------------|----------------------------|----------------------|
| 4. DOCUMENT DATE 1976 | 5. NUMBER OF PAGES 23p. | 6. ARC NUMBER ARC |
|--------------------------|----------------------------|----------------------|

7. REFERENCE ORGANIZATION NAME AND ADDRESS
 Calif.--LA

8. SUPPLEMENTARY NOTES (if reporting organization, Publisher, Availability)
 (Final report, 349p.; PN-AAG-482)

9. ABSTRACT

| | |
|--|--------------------------------------|
| 10. CONTROL NUMBER PN-AAG-483 | 11. PRICE OF DOCUMENT |
| 12. DESCRIPTORS Nutrition surveys Health Malnutrition Children Diets Surveys Food consumption Sierra Leone | 13. PROJECT NUMBER 931022500 |
| | 14. CONTRACT NUMBER AID/ta-C-1240 |
| | 15. TYPE OF DOCUMENT |

SIERRA LEONE

National Nutrition Survey

Summary Report and Recommendations



Office of Nutrition
Development Support Bureau
Agency for International Development
Washington, D.C. 20523

SIERRA LEONE
NATIONAL NUTRITION SURVEY

Undertaken By
The Government of Sierra Leone

SUMMARY REPORT
AND
RECOMMENDATIONS
OCTOBER, 1978

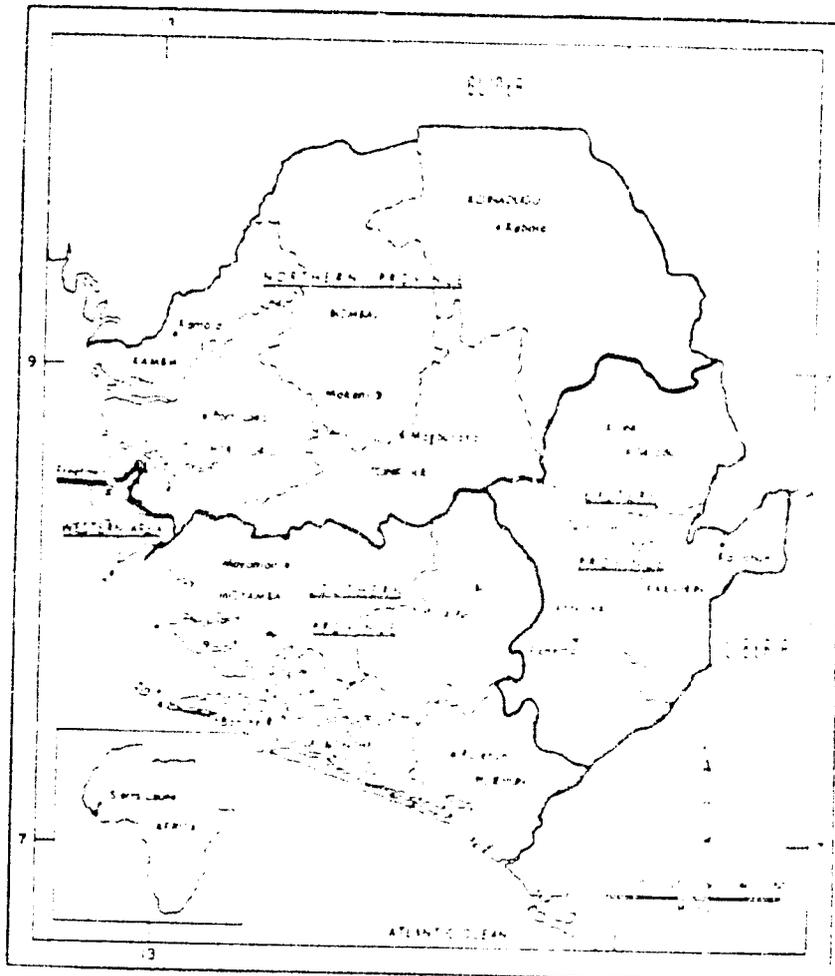
With the Assistance of the
UCLA Nutrition Assessment Unit
Division of Population, Family and International Health
School of Public Health
University of California
Los Angeles, California, U.S.A.
In Cooperation With
The United States Agency for International Development

PREFACE

The Government of Sierra Leone has made a commitment to better the country's health status. To help with that commitment, the Ministry of Health recognized the need for a statistically valid assessment of Sierra Leone's nutritional status. Following a request of the Government of Sierra Leone to the United States Agency for International Development (AID), the Nutrition Assessment Unit of the University of California at Los Angeles (UCLA) was contracted to provide technical and administrative support for a National Nutritional Survey from November, 1977, to March, 1978.

The Survey was made possible through the combined efforts of the Ministry of Health, AID, UCLA, and the Leprosy Control Programme. A list of participating organizations appears at the end of the Summary.

Many thanks go to all those who were involved in the Survey. The determined efforts of the Survey members under difficult circumstances facilitated the Survey's smooth operation. Special thanks go to the thousands of children and mothers who were cooperative throughout the exercise. Appreciation is also extended to all of those Sierra Leoneans whose warmth and hospitality contributed in no small measure towards the Survey's success.



- International boundaries
- Provincial boundaries
- District boundaries
- National, provincial, and district headquarters
- Provincial and district headquarters
- District headquarters

Figure 1. Republic of Sierra Leone

SUMMARY

The purpose of the Sierra Leone National Nutrition Survey was to provide an estimate of nutritional status of young children and their mothers in Sierra Leone, to compare nutritional status between selected areas, and to provide information about certain associations with nutritional status such as diet, socio-economic, health and demographic factors.

Anthropometry (body measurement), clinical signs and haemoglobin assessment provided a description of nutritional status. Interviews with the mother or her substitute were conducted to assess information on household and family characteristics, child health and diet. Laboratory tests were done to determine the presence of malaria parasites in the blood and intestinal parasites in stools. Thin blood films were made to study cell morphology and haemoglobin; electrophoresis was done to study sickle cell anaemia.

The survey sample for Sierra Leone was based on the provisional results of the 1974 Population Census. The sample comprised 4880 children aged 3-59 months (0-59 months in Freetown), 3724 mothers and 1965 households. A multistage, cluster sampling technique was used, based on population proportionality. A cluster consisted of 30 children randomly sampled from 163 sites, each within an enumeration area.

Statistically valid descriptions of undernutrition prevalence rates were obtained for Freetown and each province. In addition, Sierra Leone, apart from Freetown, was described by urban and rural groupings. Each area or grouping consisted of at least 30 sites with each site containing 30 sampled children.

All national results were derived from weighting (appropriate statistical adjustment) all the province and Freetown results according to population proportionality. Thus prevalence estimates for children under five years (excluding 0-2 months) were based on the total number of these children in Sierra Leone (approximately 470,000) in a total population of 2.7 million.

The findings of the survey are briefly summarized as follows:

1. ANTHROPOMETRIC EXAMINATION OF CHILDREN UNDER FIVE YEARS OF AGE (excluding 0-2 months)

Chronic Undernutrition (or Chronic Protein-Calorie Malnutrition)

A child measuring less than 90% of the expected weight for a reference child of the same age is classified as being chronically undernourished. The proportion of children classified in this way gives an estimate of the prevalence of chronic undernutrition in any population.

Chronic undernutrition in young children reflects recurrent episodes, or a prolonged period, of nutritional deficiency of calories and/or protein available to the body tissues. This nutritional deficiency usually has an onset at least six months prior to the time of examination. The deficiency is usually the result of poor diet and/or health with particular reference to acute infections and diarrheal disease.

In Sierra Leone 24.2% of the young children are chronically undernourished, affecting a total of about 111,000 children in the whole country. The prevalence is lowest in infants, increases after 10 months of age and reached a plateau from 21 to 59 months. Using the same criteria, only 2.1% of those children belonging to the Special Group of relatively high socio-economic status are chronically undernourished. The difference between

the national prevalence rate (24.2%) and that of the Special Group (2.1%) represents the potential improvement that eventually might be obtained with a better nutritional environment.

The prevalence rates for chronic undernutrition are least in Freetown (16.3%) and lower in urban (17.4%), compared with rural Sierra Leone (26.6%). The rates are very similar in each province, ranging from 23.7 to 25.3. The actual numbers of children affected are highest in the North (45,000--representing 41% of the 111,000 with chronic undernutrition in the whole country).

Certain factors associated with chronic undernutrition were revealed by the survey. The prevalence of undernutrition in the Sierra Leone Sample was found to be significantly greater when:

- a household's source of water was a river rather than a tap or well;
- a household head was a male;
- a household head was a farmer;
- a child's mother could not read English;
- someone other than the mother was primarily responsible for the child's care and feeding;
- the mother spent comparatively less money at the market;
- a child was not born in a hospital or clinic;
- a child aged 18-23 months was still breast-feeding;
- a child aged 3-11 months was receiving no other milk

These associations must not be regarded as causal. In addition, they may be explained by other factors. For example, chronic undernutrition may be higher in children aged 18-23 months still being breast fed because either they are not receiving food other than milk or are more likely to live in rural areas where services are poorer.

With due caution, however, associations may be used as guidelines in determining some of the factors leading to undernutrition.

Some of the associations (child's birthplace, source of water) indicate the roles that health services and poor environment have in influencing nutritional status. Likewise, other characteristics associated with poor health indicate that cultural and socio-economic conditions are also influential. Taken together these and other associations indicate that poverty, ignorance and disease interact with diet and other factors in a child's environment to determine his nutritional status.

Acute Undernutrition (or Acute Protein-Calorie Malnutrition)

A child measuring less than 80% of the expected weight for a reference child of the same height is classified as being acutely undernourished. The proportion of children classified in this way gives an estimate of the prevalence of acute undernutrition in any population.

Acute undernutrition in young children reflects a recent period of nutritional deficiency of protein and/or calories available to the body tissues with a usual onset no more than a few weeks prior to the time of examination. The prevalence of acute undernutrition is expected to be far less than that for chronic undernutrition. In a cross-sectional survey a child is examined at one time only. Thus the acute episode evidenced by cumulative episodes resulting in chronic malnutrition will be apparent through reduced growth in height.

In Sierra Leone, 3.0% of the young children are acutely undernourished. This prevalence is low throughout all areas of the country, but it reached a peak of 9.3% at 12-14 months. Only 0.6% of the Special Group are acutely undernourished.

This result indicated that there was no famine nor near-famine situation in any area described at the time of the survey. It is highly probable that conditions at the time of the survey were relatively favourable, and that adverse seasonal influences

on nutrition occurring at other times of the year (such as during the rainy season) would not be reflected in the acute undernutrition rates seen in this survey.

The only significant associations found with acute undernutrition concern the 3-11 month old children outside Freetown, who are less likely to be acutely undernourished when being breast-fed. They are also less likely to be undernourished when having supplemental milk as well as breast milk.

Underweight (Protein-Calorie Malnutrition of Unspecified Duration)

A child measuring less than 80% of the expected weight for a reference child of the same age is classified as being underweight. The proportion of children classified in this way gives an estimate of the prevalence of underweight in any population.

Underweight-for-age in young children reflects a nutritional deficiency of protein and/or calories available to the body tissues, but the onset and duration is not known. Because the bony skeleton contributes greatly to the weight of a child, the prevalence of underweight might be similar to that of chronic undernutrition, especially when the prevalence of acute undernutrition (low weight-for-height) is relatively low.

In Sierra Leone 30.5% of the young children are underweight, far more than in the Special Group (5.1%). The prevalence of underweight is lowest in children aged 3-5 months, increases rapidly after six months and reaches a peak throughout the second year of life, reducing slightly after this.

The underweight prevalence is least in Freetown (18.3%) and less in urban (29.3%) compared with rural Sierra Leone (32.4%). The East (26.0%) has the lowest prevalence rate of the provinces.

The factors associated with underweight tend to be similar to those associated with chronic undernutrition; however, certain additional associations are also shown. The most striking of these is that in Freetown the prevalence of underweight is six

times higher in bottle-fed infants than in breast-fed infants.

Arm Circumference

Mid-upper arm circumference is determined by bone size, muscle and fat. As bone size is relatively unchanging, thin arms (which are a key clinical sign of undernutrition) reflect muscle and fat bulk.

The arm circumference-for-age and arm circumference-for-height indices were used on this survey to confirm the results of the other measures of undernutrition, such as underweight (low weight-for-age) and acute undernutrition (low weight-for-height). It should be noted however, that the arm and weight indices do not measure exactly the same aspects of undernutrition.

The arm indices showed similar trends to those of weight in comparing undernutrition based both on age and area distribution. In addition, the correlation coefficient ("r" value) of arm circumference-for-age with weight-for-age was 0.75 and arm circumference-for-height with weight-for-height was 0.80. These values vary slightly depending on the age group considered.

Arm circumference results from the survey may be used as a basis for future surveys and surveillance, particularly if adequate equipment for weight and/or height are unavailable or too costly.

2. NUTRITIONAL STATUS AND MORTALITY

Mortality information was obtained concerning each of the surveyed families. The derived mortality rates are approximations for the under-five's death rates, and are similar for each province, ranging from 31.4% to 33.3%. The rate in Freetown is much lower (20.0%). Rural(33.3%)/urban(27.3%) differences are also seen.

Correlation coefficients, relating the mean undernutrition prevalence rates and the mean mortality rates for each site, were obtained to investigate the relationship between nutritional status and retrospective mortality rates. The results indicate that for all of Sierra Leone more deaths are likely to occur in those families that have an undernourished child under five years (determined by being either chronically undernourished, underweight, or by showing arm wasting) than in those families without an undernourished child.

3. OEDEMA IN YOUNG CHILDREN

The proportion of children with oedema is low (0.2%), which is consistent with the low prevalence of acute undernutrition. Oedema identifies only a certain type of severe undernutrition florid kwashiorkor.

4. ANTHROPOMETRIC EXAMINATION OF MOTHERS

Maternal nutritional status is more difficult to define using anthropometric measures than is the status of young children.

In Sierra Leone, 8.2% of mothers are short (i.e. height less than 150 cm or 4 ft. 11 in.). The distribution of short statured mothers is similar throughout the country.

In view of the large number of different tribal groups in Sierra Leone maternal stature is used to consider the genetic component of stature in children. This genetic component has some influence in that 30% of the young children of short mothers (under 150 cm or 4'11") are chronically undernourished, compared with 19% of those with mothers who are not short (over 150 cm). However, the evidence indicates that the environmental factors associated with chronic undernutrition in young children (including diet and poor health) are much more important than genetics in determining a child's stature. This evidence

included:

1. The vast majority (84% of children classed as chronically undernourished have mothers who were not short).

2. Children of individual tribal groups have a much lower prevalence of chronic undernutrition in Freetown compared with outside Freetown (e.g. in one tribal group the prevalence in Freetown is 1.2% and outside Freetown was 27.3%).

3. The difference in maternal height between Freetown and the rest of the country is very small compared with the differences in chronic undernutrition.

4. The correlation coefficient between the stature of mothers and the percentage height-for-age of their children is small (0.20).

It should also be noted that maternal stature might also reflect nutrition-related environmental factors which influenced growth in her childhood.

Low Measures of Arm Circumference and Fatfold

In Sierra Leone, 6.1% of the mothers have evidence of arm wasting (arm circumference less than 23 cm.) and 35.5% have evidence of fat wasting (fatfold less than 7.5 mm.). Throughout the country, mothers show a similar prevalence of arm wasting; however, approximately twice the prevalence rate of undernutrition (arm wasting) is found in pregnant mothers. Fat wasting is more prevalent in the Southern Province (29.7%) and in rural (28.0%) compared with urban (20.0%) areas. This might suggest that a higher proportion of Southern and rural mothers are undernourished compared with the rest of the country. Inadequate diets may be the basis, but it should be noted that other factors, such as activity, also influence maternal arm measures. A much larger proportion of mothers with large arms (over 29 cm circumference) are seen in Freetown (22.9%) and the urban areas (20.6%) compared with the rural areas (12.3%), and this could indicate higher calorie reserves.

5. DIETARY INVESTIGATIONS

Dietary information pertaining to milk availability and the onset of other food was collected on all children 30 months or younger. More detailed information was collected from a dietary subsample of 1380 children and their families selected from throughout the country. A 24-hour dietary recall method was used to gather the subsample information. Analysis compared the dietary patterns of families to that of their children in one of four age groups (3-6, 6-11, 12-17 and 18-30 months) and for each area of the country. The dietary investigations were only concerned with the types of foods eaten, not the quantity.

INFANT FEEDING AND WEANING

Breastfeeding is widely practiced throughout Sierra Leone: 95% of the rural children in the 12-17 month group are still breast feeding. In the urban areas and Freetown the rates drop to 82% and 79%. Non-breast milk is used extensively in Freetown (approximately 80%, 3-11 months), less so in the urban areas (40.5%) and least in rural areas (12.3%). Children frequently received both breast and non-breast milk.

The findings indicate that breast feeding is prolonged, which should be encouraged as a beneficial practice. However, breast milk alone is only sufficient to meet a child's nutritional needs until about the sixth month. At that time other foods are needed to provide the necessary nutrients required to maintain normal growth. In addition, it is important to note the necessity of obtaining an adequate diet for the lactating mother in order to ensure an adequate maternal nutritional status.

FOOD CONSUMPTION

Very few children 3-5 months receive any food with their milk other than a cereal pap, and since a child over 17 months

old usually receives the same types of foods as his family, the critical periods to watch are the 6-11 month and 12-17 month groups.

The following is a brief summary of food group consumption:

Staples (Cereals, tubers)

Cereals were the major staples throughout the country, being consumed by 99% of the families. Tubers/cassava were eaten by over 30% of the families, except those in the Northern Provinces (15%). A high proportion of children also received these foods. At 6-11 months, 30% of the children outside Freetown were receiving a cereal staple.

Protein-Rich Foods (Apart from Milk)

Vegetable proteins (beans, seeds or nuts) were eaten by the least proportion of families in the Southern Province (53%) and by just under 80% of the remaining families in the country. Over 97% of all families in the country consumed at least one type of animal protein (mainly fish). However, far fewer children, particularly those under 12 months, received any protein rich foods apart from milk. Of the children aged 6-11 months, only 24% consumed a food rich in vegetable protein, and 30% consumed any animal protein. Of children aged 12-17 months, 51% consumed vegetable protein and 72% consumed animal protein.

Dark Green Leafy Vegetables (DGLV's)

The proportion of families eating DGLV's ranged from 51% to 75%. The proportion of children 6-11 months eating these ranged from 13% to 30%. In the 12-17 month group the percentage of children receiving DGLV's rose, but the child/family deficits were still considerable.

Fruits

Fruits were eaten most commonly by families in Freetown and the Eastern Province. Children aged 6-11 months received about 50% less than their families, and those aged 12-17 months received 25% less.

Oils and Sugar

A high proportion of all families consumed oil in their diet. Fifty percent and 70% of children aged 6-11 and 12-17 months, respectively, also consumed oil.

Sugar was not widely consumed except in Freetown.

Discussion

A child's intake of food is dependent upon two factors:

1. Is the food available within the family?
2. If available, is it distributed to the child?

These results point to a widespread problem of food distribution within families. Only about a third of the children aged 6-11 months receive any vegetable or animal protein or any DGLV's when their families consume these foods. The proportion rises to about 70% for the children aged 12-17 months. Significant improvement in the diets of children under 18 months old could be realised by a more favourable distribution of food within families.

There are also problems with the availability of food for the families. For example, vegetable protein and fruits are not widely consumed in the South; neither are DGLV's nor fruits in the North. In addition, the quantity of food available to a family or child is another important consideration, but is one that was not investigated in this survey.

In general then, whether a child over 17 months eats a particular food or not is dependent upon whether the family eats that

food. However, for a child under 17 months, his intake is determined not only by the availability to the family but also by the distribution within the family.

The development of a strong nutrition education program is needed to teach mothers about healthful infant feeding and weaning practices. The promotion of breast feeding and the utilisation of local foods for weaning, which are easily grown and obtainable, should be paramount objectives of the program.

6. ANAEMIA IN YOUNG CHILDREN AND PREGNANT MOTHERS

Anaemia, as defined by WHO based on a low haemoglobin value, (<10 Gm% for children 6-23 months and <11Gm% for those 24-59 months) was present in 55.7% of children aged 6-59 in Sierra Leone. The prevalence rates were higher in children aged 24-59 months (65.8%) compared with those aged 6-23 months (46.4%). Anaemia prevalence was lowest in the Special Group (33.3%) and Freetown (26.7%). There was little or no difference between the provinces. Sixty-five pregnant mothers had their haemoglobin levels determined, and 30.7% were diagnosed as anaemic (haemoglobin below 11Gm%).

An anaemic blood picture was found in 51.5% of Sierra Leonean children. Such a picture was very rarely found (3.7%) in Freetown children and was most common in the Southern Province (76.6%) and least common in the North (46.5%). The usual types of anaemia found were hypochromic and microcytic, and hypochromic and normocytic. Macrocytosis was less common, but occurred in a significant percentage (10%). Of all cases with anaemia, 73% were classed as mild, 26% as moderate and 1% as severe. Low haemoglobin levels and a hypochromic blood picture were shown to be closely associated with poor nutritional status.

7. MALARIA IN YOUNG CHILDREN

Thick blood films from 1953 children were examined for the presence of malaria parasites. Almost one third of all children aged 3-59 months in Sierra Leone had malaria parasites in their blood. The rates were highest from one to four years (33.2% - 42.0%), although the presence of parasites was also common in infants.

The prevalence rate in Freetown was strikingly lower than anywhere else in the country (4.0% - Freetown; 20.6% - urban; and 36.2% rural). Malaria is often a very important cause of anaemia.

8. INTESTINAL PARASITES IN YOUNG CHILDREN

Stool samples of 899 children aged 3-59 months from throughout the country were examined for intestinal parasites. Hookworm infestation was found to increase with age from 0.0% in children aged 3-11 months to a high of 10.6% in children 48-59 months. The incidence of hookworms in stool samples was lowest in Freetown (0.7%), followed by the urban (2.1%) and the rural areas (6.9%). Hookworm may also be an important contributing factor in producing anaemia.

Roundworm infestations which may produce a significant nutritional drain on a child, were also frequently seen. The prevalence of ascaris in stools reached a plateau of about 26% from 36-59 months. An interesting result is that the highest prevalence rate was seen in Freetown (25.4% vs. 18.8% for total Sierra Leone). This was also true for the semiquantitative examination.

Other intestinal parasites, apart from Trichuris, were relatively uncommon.

CONCLUSIONS

The results suggest the following:

- Almost one-fourth of all Sierra Leonean children up to five years of age have sufficiently poor growth to indicate a long term lack of calories and/or protein available to the body tissues (chronic undernutrition). Almost one-third of the children are underweight.
- All types of undernutrition become more prevalent during the second year of life.
- Nutritional problems are much more severe in the rural areas of the country.
- Child mortality rates are higher in those families that have an undernourished child.
- Maternal undernutrition, as defined by arm wasting, is about 6.0% throughout the country, however, it is almost twice that high in pregnant women.
- Almost 60% of all children in Sierra Leone are anaemic as defined by low haemoglobin. The rate in Freetown is less than half that.
- Poor diets, resulting in iron and, at times, folate deficiencies, are a major cause of anaemia.
- Malaria is endemic throughout the country, except in Freetown, and is another major factor contributing to anaemia. Hookworm infestation may also contribute.
- Ascaris (roundworm) infestation is common throughout the country (18.8%).
- Full breastfeeding is widely practiced throughout the country for the first year (over 90%; 80% in Freetown).

- Non-breast milk is frequently given to children in Freetown and the urban areas.

- Less than 25% of all children aged 6-11 months received vegetable protein; less than 30% received animal protein; 21% received DGLV's and only 15% received fruit (the quantity of food or the combination of foods eaten together are not known).

- At 12-17 months 51% of the children received vegetable protein; 69% animal protein; 46% DGLV's and 24% fruit.

- Families frequently ate these foods but they were often not given to the children. For example, with regards to vegetable and animal protein and DGLV's only 33% of the children aged 6-11 months and 72% aged 12-17 months received these foods when they were available (eaten by the family).

- The variety of food groups consumed in a daily diet was greatest in Freetown, followed by the Eastern Province.

- Fewer families consumed vegetable proteins and oils compared with the other food groups.

- Improvement in a child's diet may be realised by the combination of an improved intra-family distribution of existing foods and, in some areas, by increased availability of certain foods.

RECOMMENDATIONS

The following recommendations were formulated in Freetown in September, 1978, by the Ministry of Health Nutrition Unit, a Nutrition Planning Consultant from AID and the UCLA Unit representatives. These are presented to suggest initial approaches and methods that the Government of Sierra Leone might consider in order to improve the nation's nutritional status and health.

It is recommended:

- A. That activities (government and non-government) to improve nutrition be coordinated.

An existing mechanism for coordination is the Council for Health Education and Nutrition, which was set up in 1969 by Cabinet action.

The functions of the Council are:

1. Coordination of health education and nutrition activities within the various ministries and agencies of the government.
2. Review of Health Education and Nutrition Projects
3. Applied Nutrition Research.
4. Training projects.
5. Policy recommendations for improving nutrition through Ministries of Health, Agriculture, Education, Social welfare and other agencies.

In order to carry out an expanded role in policy and programme coordination, the Council would require:

1. A permanent technical and administrative staff, with appropriate office and facilities;
2. The necessary technical and management support to carry out coordination and review of policies and programmes;
3. Regular contact with policy makers, possibly through a newsletter as well as the periodic meetings of the Council.

B. That an important area of future program activity be in nutrition education.

1. An effective way to reach large number of people at relatively low cost is through mass media, such as radio. An example is the use of short (60 second) radio message, broadcast frequently, to encourage mothers to enrich home produced baby and weaning foods. Such programmes should be designed after careful study, including evaluation of past efforts of this type.

2. Another area of need for nutrition education involves specific attention to the rural population. These people can be reached through village level workers: health, social welfare, and agriculture agents in government programmes; and also through village level non-government programmes.

3. Increased attention to nutrition education in the schools and teaching institutions is desirable.

4. The provision of in-service training in nutrition, and its relationship to the responsibility of professional, and administrative personnel in various sections, is an important area of nutrition education.

5. Curricula from all areas of nutrition training should be reviewed to assure that they are appropriate.

C. That agricultural policies and programmes be assessed to assure that they are consistent with the nutritional needs of the population, and that where appropriate nutritional components be added to agricultural projects to help meet these needs.

D. That efforts within the health sector which address nutritional needs be strengthened, particularly the nutritional activities within: (1) the M.C.H. programme; (2) the health education programme; (3) the Nutrition Unit of the Ministry of Health; and (4) the Primary Health Care project.

E. That a nutrition surveillance system be developed, in cooperation with existing government and non-government data collection systems, to consist of periodic reporting of selected nutrition indicators, including anthropometric measures and nutrition-related morbidity and mortality data.

PARTICIPATING ORGANIZATIONS

The following Sierra Leonean Ministries and agencies were involved in the Survey.

The Ministry of health, particularly the:

Nutrition Unit;

Leprosy Control Programme;

Endemic Disease Control Unit; and the

National School of Nursing

The Central Statistics Office

The Ministry of Information and Broadcasting

The Ministry of Agriculture and Natural Resources