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NUTRITION PLANNING FOR SIERRA LEONE AND CAMEROON

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Prepared for

Office of Nutrition (DS/N)
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Introduction

This report is submitted in partial fulfillment of the requirements of Indefinite Quantity Contract No. AID/SOD/PDC-C-0085, Work Order No. 1. It includes information related to work performed in Sierra Leone and Cameroon by Dr. George V. Poynor, during the period September 7-24, 1978.

Scope of Work

The scope of work included in Work Order No. 1 calls for the services of a nutrition planner, who in each of the two countries named above was to:

1. Participate in formal and informal presentations of findings of the national nutrition surveys, and discussions of their implications;
2. Provide guidance and written recommendations to the AID Missions and host government officials on appropriate intervention programs, policy and planning approaches toward resolution of the nutritional problems; and
3. Assist in initial planning of survey follow-up activities.

Background

The surveys whose findings were being presented in Sierra Leone and Cameroon were conducted jointly by the host governments of the two countries and the Nutrition Assessment Unit of the University of California at Los Angeles, with financial support from the Office of Nutrition (DS/N), AID/W. John McKigney of DS/N was the AID project officer; Dr. Derek Jelliffe of UCLA was the principal investigator for the work contracted to UCLA; Dr. Alfred Zerfas of the UCLA Nutrition Assessment Unit was the investigator in charge of the project; Mr. William Clay was responsible for survey management in Sierra Leone; and Mr. Irwin Shorr was responsible for survey management in Cameroon.

Analysis of survey results and reporting of findings was done by the

UCLA Nutrition Assessment Unit, with participation by host country analysts. Mrs. Gladys Carrol, Chief Nutritionist in the Ministry of Health, represented the GOSL in the analysis; and Mr. Alphonse Tabi and Mr. Jean Marc Hie were the representatives of the GURC who participated in the analysis. Mr. Tabi is from the Ministry of Economy and Plan, and Mr. Hie is from the Cameroonian Bureau of the Census.

Final reports in draft form were presented to the two governments during the period September 11-15 (Sierra Leone) and September 18-22 (Cameroon). These presentations offered an opportunity for discussions with host governments and AID Missions concerning nutrition policy and programs, and next steps that might be taken, in the light of the survey findings. Dr. Poynor assisted in these discussions, pursuant to the above scope of work.

The Surveys

The purpose of the national nutrition surveys was to provide estimates of nutritional status for young children and their mothers, in order to make comparisons among selected areas of the countries, and to provide information about relationships between nutritional status and factors that are known to influence it.

Nutritional status was measured using anthropometry (height-for-age, weight-for-height, and arm circumference); clinical signs; and hemoglobin assessment. Interviews were conducted with the mothers or their substitutes in order to obtain information on household characteristics, child health, and diet. Laboratory tests were performed to determine the presence of malarial parasites in the blood, and intestinal parasites in stools. Thin blood films were made to study blood structure, and hemoglobin electrophoresis was done to study sickle cell anemia.

A multi-stage, cluster sampling technique was used, in accordance

with methodology developed by the Center for Disease Control in Atlanta, to select the families included in the survey. The sample was chosen in such a way to permit descriptions of prevalence rates of undernutrition for the principal cities, provinces (or certain provincial groupings in the case of Cameroon), and for the urban and rural populations.

The Sierra Leone Findings

The enumeration areas of the 1974 Sierra Leone Census of Population were used in determining the sample in Sierra Leone. Survey sites were chosen in each of the 163 censal enumeration areas. A sample of children was then taken at random from each site. The sample thus selected consisted of 4,880 children within the 3-59 month age range (0-59 months in Freetown); 3,724 mothers; and 1,965 households.

The findings of the survey are presented in summary form as given in the country presentation in Annex III: Overview and Findings -- Sierra Leone. We have chosen a few of the more important findings for inclusion in the body of this report:

1. The survey showed that almost one-fourth of all children surveyed had sufficiently poor growth, as measured by height-for-age, to indicate a long-term shortage of calories or protein available to the body tissues (chronic undernutrition).

2. Undernutrition was most prevalent among the children 6-24 months of age, and was most severe in rural areas.

3. Child mortality rates, as measured by the survey, were much higher in those households where undernourished children were encountered.

4. Almost 60 percent of the children in the survey were anemic; and malaria and roundworm infestations were found to be common throughout the country.

5. Maternal undernutrition, as measured by arm wasting, was about

twice as high in pregnant women as in others.

The Cameroon Findings

The sample populations used for the national nutrition survey in Cameroon was chosen on the basis of the provisional results of the 1976 Population Census. It consisted of 5,698 children between 3 and 59 months of age; 3,350 mothers; and 3,383 households. Clusters of 30 children were taken at each of 190 cites, with one site chosen for each enumeration area of the census.

The descriptions of prevalence rates of undernutrition were obtained for five provincial groupings: (1) Center-South; (2) East; (3) North; (4) South-West/Littoral; and (5) North-West/West; as well as for the two principal cities of Douala and Yaoundé. In addition descriptions were obtained for the urban and rural populations outside of Douala and Yaoundé; and according to the ecological regions defined by the World Bank for Cameroon.

The findings of the survey are presented in summary form as given in the country presentation in Annex IV: Overview and Findings -- Cameroon. Below we have given a few of the more important findings of the survey:

1. Roughly 22 percent of the children under five years of age in the survey were found to be chronically undernourished.

2. Approximately 45 percent of the children surveyed had anemia, as defined by the WHO standards.

3. The problem of chronic undernutrition exists throughtout the country, but was found to be more prevalent in the North, the East, and the West.

4. Measles was found to be widespread throughout Cameroon, and contributed to 25 percent of all deaths in young children.

5. Goiter in mothers was found to be endemic in the East Province and in certain pockets of the North, North-West, and Central-South Provinces.

Recommendations

In both Sierra Leone and Cameroon, formal and informal discussions were held with government and USAID officials, and in each country a set of written recommentations was prepared. These recommendations were intended to point to actions which could be taken to address nutrition problems highlighted by the national surveys.

Sierra Leone. In Sierra Leone, recommendations were prepared by a team consisting of Dr. George V. Poynor; Dr. Alfred Zerfas and Mr. William Clay of the UCLA Nutrition Assessment Unit; and Mrs. Gladys Carrol, Chief Nutritionist with the Sierra Leone Ministry of Health.

Background information concerning GOSL policies and programs was obtained from documentation and from meetings with a number of GOSL, AID, and PVO officials. Annex I. contains a list of the names of these officials.

These recommendations were presented to the Minister of Health; to technical personnel in health, nutrition and related fields at the time of the presentation of survey findings; and to USAID officials.

The recommendations are:

A. That activities, both government and non-government, to improve nutrition be coordinated at the national level. It was recommended that an existing mechanism that can be used for this coordination is the Council for Health Education and Nutrition, an inter-ministerial body created by Cabinet action in 1969, with the following functions:

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 and training; and

4. Policy recommendations for improving nutrition through the Ministries of Health, Agriculture, Education, Social Welfare, and other agencies.

In order to carry out an expanded role in policy and program coordination, it was also recommended that the Council be provided with:

1. A permanent technical and administrative staff, with appropriate office and facilities, for assuring the necessary continuity and technical backstopping required by this expanded role;

2. The necessary technical and management support to carry out coordination and review of policies and programs;

3. Regular contact with policy makers, possibly through the publication of a newsletter, as well as through the periodic meetings of the Council.

B. <u>That an important area of future program activity be in nutrition education.</u>

1. It was recommended that the use of mass media, such as radio, be studied as a possible means of reaching target group mothers with messages related to weaning habits and the use of home-produced weaning foods.

2. It was recommended that special attention be paid to the nutritional needs of the rural population, and that programs and projects which use village-level workers -- health delivery programs, social welfare programs, and agricultural extension programs -- should be used more effectively, and in a coordinated manner.

3. Increased attention to nutrition education in the primary and secondary schools, as well as in teaching institutions, was recommended.

4. The provision of in-service training in nutrition, and its relationship to the responsibility of the professional and administrative staff in various sectors, was recommended as an important area of nutrition education.

5. It was recommended that curricula in all areas of nutrition training be reviewed in order to assure that they are appropriate.

C. <u>That agricultural policies and programs 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.</u>

D. <u>That efforts within the health sector which address nutritional needs</u>

be strengthened and expanded, particularly the following: (1) the maternal and child health care programs; (2) the health education program, especially as it relates to nutrition; and (3) the Nutrition Unit of the Ministry of Health.

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.

Cameroon. In Cameroon recommednations were prepared by a team made up of Dr. George V. Poynor; Dr. Alfred Zerfas and Mr. Irwin Shorr of the UCLA Nutrition Assessment Unit; and Mr. David Eckerson, a New Transcentury Foundation nutrition planner assigned to the Cameroonian Ministry of Economy and Plan.

Annex II. gives the names of GURC, AID, and PVO officials consulted in the process of preparing these recommendations. The draft recommendations were discussed at length with the Cameroonian Technical Advisory Committee. This committee was the GURC-appointed body responsible for study and approval, at the technical level, of the survey methodology, conduct, and findings. It was chaired by Dr. Dan Lantum of the Cameroonian University Medical School.

The resulting set of recommendations was presented to the Director of Planning of the Ministry of Economy and Plan. The recommendations were accepted in principle, subject only to certain changes in wording to conform to Cameroonian style of presentation. The Director of Planning presented these recommendations at the same meeting in which the survey presentation was made.

The recommendations are:

A. A Nutrition Planning Structure. In the light of the need for a multi-sectoral approach to nutrition planning in Cameroon, there is a need

for a governmental structure which can plan and coordinate nutrition and nutrition-related activities on a wide scale, both for the short term and for the longer term. Such a structure should be established in a ministry where a global outlook and harmonization of sectoral perspectives can be maintained. Membership of such a body should include, at least, representatives of those sectors whose policies and programs relate to nutrition. It should have a technical working group that continues to analyze problems, prepare projects, evaluate their execution, and derive feedback for further planning of nutrition programs.

B. Actions over the Next Year. There are several actions which can be undertaken relatively quickly to deal with priority areas identified in the National Nutrition Survey. They include the following:

1. To tackle problems of undernutrition which relate to weaning practices, and to problems of intra-family food distribution (particularly among children between 6 and 24 months of age). The most effective strategy will be one that makes mothers and other family members aware of the problems. Such a strategy should provide for education in the use of specific, concrete remedial measures that can be used at the family level. Further, such a strategy must be able to reach large segments of the population at reasonable cost, since the problem is widespread. A key component in such a strategy will be to mount coordinated action through health, community development, and other extension services whose outreach programs extend to the family level. These coordinated efforts can be backed up by the use of mass media, including the national radio network, the press, and others.

2. There is a need in the near term for building awareness, and for the facilitating the exchange of ideas and information concerning nutrition problems, among decision makers and program technicians. A national workshop involving key decision makers and technicians from various sectors could be

an effective means for initiating this process. Regional seminars could then follow to focus attention on particular regional needs and problems.

3. There are some activities which by their very nature demand long term action. Some of these can be initiated immediately through short term pilot projects; others may require more study before project proposals are developed.

a. One activity which is important to begin within the next 12 months is the study and design of a goiter intervention strategy, to form the basis for long-term remedial action against this problem. This activity could entail the creation of a system for producing and distributing iodized salt throughout the country. Once action has begun, a surveillance team could be organized to ensure the proper attainment of objectives, through planning, execution and development of alternative methods and strategies.

b. The problem of anemia requires careful study, because it is complex. Research activities into the causes of anemia should be organized as soon as possible. This could be done through the existing institutions of Cameroon, such as the University of Yaoundé, ONAREST, OCEAC, and the health services system.

c. A need exists for future, longitudinal surveys of nutritional status, as a means of refining information, and of increasing knowledge of seasonal and regional nutrition problems. These surveys should be begun on a pilot basis as soon as possible. They could provide information for the planning of surveillance strategies in certain priority areas. They can be the first step in more in-depth research aimed at a better understanding of the nutrition problem in Cameroon. One research model to consider would be the setting up of centers which would integrate the three components of dietetic research, experimentation with new nutritional concepts, and the

the practical training of nutrition workers,

d. Because of the significance of measles as it relates to child mortality, it is of high priority that existing immunization programs be strengthened and expanded to cover the entire country.

C. The Long Term. In order to plan long-term activities, careful attention to a global, long range strategy is of first order importance. For this to be effected, the national planning body mentioned above (in paragraph A.) will play the major role in strategy development and coordination. As the problem of malnutrition is of global concern, international collaboration appears imperative if any inroads are to be made in the immediate future. It will also demand unusual commitment by the following ministries: Ministry of Economy and Plan; Ministry of Agriculture; Ministry of Health; Ministry of Education; Ministry of Social Affairs; and Ministry of Information and Culture.

An area of primary importance in the long run is education and training of nutrition manpower at various levels. In the same light, sutrition should be accorded a very important place in the curricula in all schools in the country, from primary schools to the university.

ANNEX I.

CONTACTS MADE -- SIERRA LEONE

1. Dr. Belmont Williams
   Director MCH Services and Deputy Chief Medical Officer
   Ministry of Health

2. Hon. Harry Williams
   Minister of Health

3. Hon. S. Kassebama
   Deputy Minister of Health

4. Mrs. P. Whyndam
   Deputy Secretary
   Ministry of Health

5. Dr. S. George
   Medical Officer, MCH Division
   Ministry of Health

6. Mr. Prince Nicol
   Public Relations Officer
   Ministry of Health

7. Mrs. Gladys Carrol
   Nutritionist
   Ministry of Health

8. Mr. Robert Huddleston
   AID Affairs Officer

9. Mr. Norm Sheldon
   AID Agriculture Officer

10. Dr. Daniel Chaytor
    Director
    Institute of Marine Biology and Oceanography
    and
    Professor
    Fourah Bay College

11. Mrs. Pamela Greene
    Regional Director for Africa
    AHEA - IFPP

12. Dr. M.J. Khan
    Public Health Administrator and Team Leader
    W.H.O.

13. Mrs. Nancy Minett
    Child Care Specialist
    CARE

14. Father Rocca Serra
Programme Director
Leprosy Control Program

15. Mr. Peter Metcalfe
Acting Resident Representative
UNDP

16. Mr. S. Nhongo
Junior Programming Officer
UNDP

17. Mr. Lynn V. Marshall
Programme Director
CRS

18. Mr. Lawrence Barbieri
Deputy Director
CRS

19. Miss D. Johnson
Secretary
Christian Health Association for Sierra Leone

ANNEX II.

CONTACTS MADE -- CAMEROON

1. Mr. Njoya Minlend
   Director of Planning
   Ministry of Economy and Plan

2. Dr. Patrice Mandang
   Chief
   Human Resources Division
   Ministry of Economy and Plan

3. Mrs. Elizabeth Tankeu
   Assistant Director of Planning
   Ministry of Economy and Plan

4. Mr. Alphonse Tabi
   Director of Nutrition Survey
   Human Resources Division
   Ministry of Economy and Plan

5. Mr. Jean Marc Hie
   Bureau of the Census

6. Mr. Jacob Tayo
   Bureau of the Census

7. Mr. David Eckerson
   Transcentury Foundation
   Ministry of Economy and Plan

8. Dr. Dan Lantum
   C.U.S.S.

9. Dr. Tangaye
   Special Assistant to Minister of Education

10. Mrs. Nji
    Director of Women's Action
    Ministry of Community Development

11. Dr. Jean Claude Lowe
    Chief
    Nutrition Unit
    Ministry of Health

12. Mme. Ekani
    Assistant Chief
    Nutrition Unit
    Ministry of Health

13. Mr. Phillippe Beleng
    Technician
    Nutrition Unit
    Ministry of Health

14. Mr. David Fongieng
Assistant Director
Ministry of Vivrieres (MIDEVIV)

15. Mr. Gabuin Johnson
Assistant Director
Ministry of Agriculture

16. Mr. Eric Witt
Economist
AID

17. Mr. Fritz Gilbert
Acting Director
AID

18. Mr. Tex Ford
Agriculture Officer
AID

19. Mr. Richard Thornton
Assistant Health Officer
AID

20. Mr. Douglas Palmer
Health Officer
AID

21. Mr. Andreivich
Director
World Food Program

22. Mr. Nickopolis
Water and Sanitation Technician
CARE

23. Assistant Director
Ministry of Information and Culture

24. Director of English Language Programming
Ministry of Information and Culture

25. Mr. Joe Payton
Assistant Director
CRS

ANNEX III.

OVERVIEW AND FINDINGS -- SIERRA LEONE

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 (GOSL) to the United States Agency for International Development (USAID), the University of California, Los Angeles (UCLA), Nutrition Assessment Unit, School of Public Health, 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, USAID, UCLA, and the Leprosy Control Programme (LCP).

A complete list of participating organizations and survey personnel appears in Appendix III.

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 co-operative 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.

TECHNICAL 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 (9). 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.

Stastically 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 (approximate 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. <u>ANTHROPOMETRIC EXAMINATION OF CHILDREN UNDER FIVE YEARS OF AGE</u> (excluding 0-2 months)

<u>Chronic Undernutrition</u> (or Chronic Protein-Calorie Malnutrition)
A child measuring less than 90% of the expected height for a reference child of the same age was 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 12 months of age and reaches 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 were 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 of chronic undernutrition were least in Freetown (10.3%) and lower in urban (17.4%) compared with rural Sierra Leone (26.6%). The rates were very similar in each province, ranging from 23.7% to 25.8%. The actual numbers of children affected were 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 on the survey. Its prevalence was significantly greater in the following:

Household Factors
- Source of water a river
- Household head a male
- Household head a Farmer

Maternal Factors
- Mother could not read English
- Was not caring for the child
- Spent comparatively less money at the matket

Child Factors
- Birth place not in a hospital or clinic
- Aged 18-23 months and still breast fed
- Aged 3-11 months and not receiving other milk

These associations must not be regarded as casual. 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 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, association may be used as guidelines in determining some of the factors leading to undernutrition. Some of the association (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 was 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 ex-

pected 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 wasting might not be present at that time, but evidence of 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 was 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 had acute undernutrition.

This result indicates 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 an adverse seasonal influence on nutrition at another time, such as during or near the rainy season, would not be reflected in the acute undernutrition rates seen in this survey.

The only significant associations found with acute undernutrition concerned the 3-11 month old child outside Freetown, who was less likely to have acute undernutrition when having breast milk and less likely when the child had other milk as well as the breast.

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 was 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 was lowest in children aged 3-5 months, increases rapidly after six months and reached a peak throughout the second year of life, reducingslightly after this.

The underweight prevalence was 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.

Factors associated with underweight tended to be similar to those with chronic undernutrition. Certain additional associations with underweight were found in the survey. Underweight prevalence was higher in Freetown children (but not those outside Freetown) aged 3-11 months who fed from a bottle.

2. ANTHROPOMETRIC EXAMINATION OF MOTHERS

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

In Sierra Leone, 8.2% of mothers were short (i.e. height less than 150 cm or 4 ft. 11 in). The distribution of short mothers was similar throughout the country. A slightly greater proportion of "tall" mothers (over 166 cm.) were seen in Freetown (10.5%) and the Northern Province (9.2%).

Maternal stature was used to consider the genetic component of stature in young children. Based on the survey's findings, the differences in maternal height throughout the country are minimal. That environmental factors are the most important determinant of a young child's growth (stature) were supported by the general results of this survey. In Sierra Leone, 30% of the young children of short mothers and 19% of those with mothers not short, had chronic undernutrition. More than 84% of children with chronic undernutrition had mothers who were not short.

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

The correlation coefficient between stature of mothers and percentage height for age of their children was .20. This low value would suggest that the genetic component of short stature in children was not a dominant factor, compared with other factors, such as diet and poor health.

Low Measures of Arm Circumference and Fatfold

In Sierra Leone, 6.1% of the mothers had evidence of arm wasting (less than 23 cm. arm circumference) and 35.5% had evidence of fat wasting (less than 7.5 mm. fatfold). Throughout the country, mothers showed a similar prevalence of arm wasting; however, approximately twice the prevalence rate of undernutrition was found in pregnant mothers. Fat wasting was 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 have undernutrition compared with the rest of the country of which an important basis may be diet. It should be noted that other factors, such as activity may influence maternal arm measures. A much larger proportion of mothers with large arm (over 29 cm circumference) are seen in Freetown (22.9%) and the urban areas (20.6%) compared with the rural areas (12.3%).

3. OEDEMA IN YOUNG CHILDREN

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

4. 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 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)

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 alonge is only sufficient to meet a child's nutritional needs until the sixth month, after which 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 (TYPES OF FOODS EATEN)

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 food 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, 80% of the children outside Freetown were receiving a cereal staple.

Protein-Rich Foods

Vegetables proteins 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 animal protein (mainly fish). However, far fewer children (up to 70% fewer), particularly those under 12 months, received any high protein foods.

Dark Green Leafy Vegetables

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 percentages 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.

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 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 cannot be investigated in this report.

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 programe 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.

5. ANAEMIA IN YOUNG CHILDREN AND PREGNANT MOTHERS

Anaemia, as defined by WHO based on a low haemoglobin value, was present in 58.1% 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 (48.4%). Anaemia prevalence was lowest in the Special Group (33.3%) and Freetown (25.7%). There was little or no difference between the provinces. Sixty-five pregnant mothers had their haemoglobin levels determined, and 30.7% were diagnosed as anaemia, based on a haemoglobin of under 11 Gm/100 ml.

An anaemia blood picture was found in 51.5% of Sierra Leonean children. Anaemia was very rarely found (3.7%) in Freetown children and was most common in the South 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.

6. 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%).

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.

7. 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 (6.9%). Hookworm may also be an important contributing factor to 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 incidence rate is seen in Freetown (25.4% vs 18.8% for total Sierra Leone).

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

OVERVIEW

The results would 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.

- Almost 60% of all children in Sierra Leone are anaemic as defined by low haemoglobin. The rate in Freetown is less than half that.

- Malaria is endemic throughout the country except in Freetown and is a factor contributing to anaemia. Hookworm infestation may also contribute.

- Ascaris infestation is common throughout the country (18.8%).

- Maternal undernutrition as defined by arm wasting, is about 6.0% throughout the country, but is almost twice that high in pregnant women.

- Full breastfeeding is widely practices 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 foods from the vegetable protein and oil 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.

ANNEX IV.

OVERVIEW AND FINDINGS -- CAMEROON

EXTRAIT DU RAPPORT PRELIMINAIRE

3. RESUME TECHNIQUE

L'objectif de l'Enquête Nationale sur la Nutrition au Cameroun a été de fournir une estimation du statut nutritionnel des jeunes enfants et de leurs mères au Cameroun, de comparer le statut nutritionnel entre des régions données et de fournir des informations sur certaines associations avec le statut nutritionnel, telles que les facteurs diététiques, socio-économiques et démographiques.

L'anthropométrie (mesures du corps), les signes cliniques et l'évaluation de l'hémoglobine ont fourni une description du statut nutritionnel. Des entretiens avec les mères ou leurs substituts furent menés pour recueillir des informations sur le ménage et les caractéristiques familiales, la santé et le régime de l'enfant.

Un "groupe spécial" de 506 enfants de moins de cinq ans choisis dans des zones de Douala furent mesurés. Ces enfants appartenaient à des familles ayant un statut socio-économique relativement élevé et l'on présuma que leur statut nutritionnel était "optimal" pour le Cameroun. Les résultats furent comparés avec ceux d'un groupe de référence international pour confirmer qu'une telle référence était applicable au Cameroun.

L'échantillonnage pour le Cameroun fut basé sur les résultats provisoires du Recensement Démographique de 1976. L'échantillon comprenait 5698 enfants âgés de 3 à 59 mois (jusqu'à cinq ans), 3350 mères et 3383 ménages. On utilisa une méthode d'échantillonnage par groupe, à plusieurs niveaux, basée sur la proportionnalité de la population. Un groupe se composait de 30 enfants choisis au hasard dans 190 sites, chacun dans une région énumérée.

Des descriptions statistiquement valables des taux de prévalence de la malnutrition furent obtenues pour cinq groupements provinciaux (Centre Sud, Est, Nord, Sud-Ouest/Littoral et Nord-Ouest/Ouest et pour les deux principales villes (Yaoundé/Douala). En outre, le Cameroun (Yaoundé/Douala exclus) a été décrit de deux autres manières: par groupes urbains et ruraux et

selon les régions écologiques définies par la Banque Mondiale. Chaque zone ou groupe comprenait environ 30 sites. Chaque site comprenait 30 enfants échantillonnés.

Tous les résultats nationaux ont été tirés en équilibrant (grâce à un ajustement statistique approprié) toutes les provinces et les principales villes selon la proportionnalité de la population. Ainsi, les estimations de la prévalence pour les enfants de moins de 5 ans (de 0 à 2 mois exclus) ont été basées sur le nombre total de ces enfants dans la République Unie du Cameroun (environ 1.300.000) sur une population totale de 7.600.000.

Les résultats de l'enquête peuvent se résumer brièvement comme suit:

3.1 EXAMEN ANTHROPOMETRIQUE DES ENFANTS AU-DESSOUS DE CINQ ANS

a. Sous-Alimentation Chronique (ou Malnutrition Chronique Protéino-Calorique)
Un enfant mesurant moins de 90% de la taille définie comme étant celle d'un enfant du même âge fut classé comme étant sous-alimenté chronique. La proportion des enfants classés de cette manière donne une estimation de la prévalence de la sous-alimentaiton chronique dans une population donnée.

La sous-alimentation chronique chez les jeunes enfants reflète des épisodes récurrents ou une période prolongée de déficience en calories et/ou en protéines utilisables par les tissus. Cette déficience nutritionnelle a généralement commencé au moins six mois avant le moment de l'examne. Elle est généralement le résultat d'un régime et/ou d'une santé faibles avec une référence particulière à des infections aigües ou à une maladie diarrhéique.

Au Cameroun, 22,1% des jeunes enfants souffrent de sous-alimentation chronique, ce qui indique un nombre total d'environ 250.000 enfants pour l'ensemble du pays. La prévalence est plus faible chez les bébés, commence à augmenter après 12 mois pour atteindre un plafond de 18 à 59 mois. En utilisant les mêmes critères, seuls 4,2% des enfants appartenant au groupe spécial de Douala ayant un statut socio-économique relativement élevé souffrent de sous-alimentation chronique. La différence entre le taux national de prévalence (22,1%) et celui du groupe spécial (4,2%) représente l'amélioration potentielle qui pourrait eventuellement être obtenue grâce à un meilleur environnement nutritionnel.

Les taux de prévalence de la sous-alimentation chronique sont les plus bas à Yaoundé/Douala (11,8%). Ils sont moins élevés dans le Cameroun Urbain

que dans le Cameroun Rural (19,4% - 22,4%). Le nombre réel des enfants affectés est plus élevé dans le Nord (70.000 - représentant 28% des 250.000 atteints de sous-alimentation chronique dans l'ensemble du pays.

b. Sous-alimentation aigüe (ou Malnutrition Protéino-Calorique aigüe)

Un enfant mesurant moins de 80% de la taille définie comme étant celle d'un enfant du même âge pris dans la référence a été classé comme étant sous-alimenté aigü. La proportion des enfants classés de cette manière do donne une estimation de la prévalence de la sous-alimentation aigüe dans une population donnée.

La sous-alimentation aigüe chez les jeunes enfants reflète une période récente de déficience nutritionnelle en protéines et/ou en calories utilisables par les tissus, ayant commencé généralement pas plus de quelques semaines avant le moment de l'examen. La prévalance de la sous-alimentation aigüe est censée être beaucoup plus basse que celle de la sous-alimentation chronique. Dans une enquête quadrillée, un enfant est examiné une seule fois. Ainsi, l'épisode aigü prouvé par l'amaigrissement peut ne pas exister à ce moment-là, mais la preuve d'épisodes cumulatifs sera apparente dans une croissance ralentie.

Au Cameroun, seuls 1,0% des jeunes enfants souffrent de sous-alimentation aigüe. Cette rpévalence est basse dans toutes les régions du pays. Aucun enfant du groupe spécial ne souffre de sous-alimentaion aigüe.

Ce résultat indique qu'il n'y a pas eu de situation de famine ou de quasi famine dans les régions décrites au moment de l'enquête. Il est fortement probable que las conditions, au moment de l'enquête, ont été relativement favorables et qu'une influence saisonnière défavorable à la nutrition à un autre moment, comme par exemple pendant ou juste après la saison des pluies, ne serait pas reflétée dans l'évaluation de la sous-alimentation aigüe effectuée dans cette enquête.

Lorsqu'un degré moindre de sous-alimentation aigüe était considéré (moins de 87% du poids d'un enfant pris dans la référence), il apparaissait que les enfants âgés de 0 à 59 mois dans le Nord avaient une prévalence plus élevée que dans les autres régions. Ceci peut suggérer que le problème de la sous-alimentation aigüe est sous-jacent et que toute détérioration due à un faible environnement à d'autres moments de l'année peut être suffisante pour faire pencher la balance.

c. Poids Insuffisant (Malnutrition Protéino-Calorique de Durée Indéterminée)

Un enfant mesurant moins de 80% de la taille définie comme étant celle d'un enfant du même âge pris dans la référence a été classé comme ayant un poids insuffisant. La proportion des enfants classés de cette manière donne une estimation de la prévalence du poids insuffisant dans une population donnée.

Un poids insuffisant par rapport à l'âge chez un jeune enfant reflète une déficience en protéines et/ou en calories, dont le début et la durée sont inconnus. Du fait que le squelette contribue beaucoup au poids de l'enfant, la prévalence de poids insuffisant pourrait être semblable à celle de la sous-alimentation chronique, particulièrement lorsque la prévalence de la sous-alimentation aigüe (poids faible pour la taille) est relativement basse.

Au Cameroun, 21,1% des jeunes enfants ont un poids insuffisant, beaucoup plus que ceux du groupe spécial (3,6%). La prévalence du poids insuffisant est la plus basse chez les enfants de 3 à 5 mois, elle commence à augmenter après 6 mois et atteint son maximum tout au long de la seconde année de la vie, diminuant légèrement après cela.

La prévalence du poids insuffisant est la plus basse à Yaoundé/Douala (10,8%) et beaucoup moins importante dans le Cameroun Urbain (13,6%) que dans le Cameroun Rural (23,0%). Le Nord a nettement la prévalence la plus élevée, de même que le plus grand nombre d'enfants ayant un poids insuffisant dans tout le Cameroun.

Résumé

Un grand nombre des variables énumérées associées avec une prévalence élevée de la sous-alimentation chez les jeunes enfants correspond aux résultats des régions rurales comparées aux régions urbaines (hors Yaoundé/Douala) enregistrés dans la section sur la sous-alimentation par région.
Ces variables indiquent un statut socio-économique faible, peu d'accès aux services publics, un mauvais régime et peut-être un surpeuplument.

Par suite de l'insuffsisance de l'échantillon, il n'a pas été possible de rechercher complètement l'association entre les variables et la sous-alimentation pour chaque province. Par exemple, dans le Nord, presque toutes les mères sont illetrées, par conséquent, ce facteur ne peut pas servir à distinguer les enfants sous-alimentés des enfants normaux.

D'autres études, sur une base longitudinale, sont nécessaires pour rechercher les facteurs causatifs réels.

3.2. EXAMEN ANTHROPOMETRIQUE DES MERES

Le statut nutritionnel maternel est plus difficile é définir en utilisant les mesures enthropométriques que celui de sjeunes enfants.

Au Cameroun, 13,1% des mères sont "courtes" (c'est-à-dire de moins de 1,52 m ou 5 pieds). Les mères courtes sont très courantes dans les Provinces de l'Est et du Nord-Ouest (24,8% et 22,5%) et les mères "grandes" (plus de 1,65 m ou 5'5") sont plus courantes dans le Nord (17,7%). Comparée avec le reste des provinces, la taille moyenne est plus élevée à Yaoundé/Douala (1,598 m ou 5'3") et dans le Nord 1,59 m ou 5'2 3/4".)

La stature des mères a été utilisée pour examiner la composante génétique de la stature des jeunes enfants. Si l'on se base sur les conclusions de l'enquête, la prévalence de la sous-alimentation chronique des enfants dans le Nord est peut-être sous-estimée puisque leurs mères sont plus grandes que celles des autres provinces. Ces facteurs environnementâux sont encore les déterminants les plus importants de la croissance d'un jeune enfant (stature) et ils ont été confirmés par les résultats de cette enquête. Au Cameroun 33% des jeunes enfants ayant une mère courte et 19% de ceux dont la mère n'est pas courte souffrent de sous-alimentation chronique. Plus de 86% des enfants souffrant de sous-alimentation chronique ont des mères qui ne sont pas courtes.

Il faut noter que la stature des mères peut également refléter des facteurs environnementaux en rapport avec la nutrition et qui ont influencé leur croissance dans leur enfance.

Le coefficient de corrélation entre la stature des mères et le pourcantage taille pour âge de leurs enfants est de 0,20. Cette faible valeur peut suggérer que la composante génétique d'une stature courte chez les enfants n'est pas un facteur dominant, comparé aus autres facteurs tels que le régime et la mauvaise santé.

Au Cameroun, 7,3% des mères montrent un amaigrissmenet du bras (moins de 23 cm de circonférence) et 13,6% montrent un manque de graisse (moins de 7,5 mm de pli cutané). Dans la Province du Nord, les mères montrent la prévalence la plus élevée de tour de bras (11,6%) et de pli cutané (23,7%0 insuffisants. Ceci tend à prouver qu'une proportion plus éelvée des mères du Nord souffrent de sous-alimentation comparées au reste du pays, cette sous-alimentation pouvant avoir pour base importante le régime. Il faut noter que d'autres facteurs, tels que l'activité peuvent influencer les mesures de bras des mères.

3.3 REGIME CHES LES JEUNES ENFANTS

Au Cameroun, 44,7% des enfants âgés de 6 à 59 mois sont anémiques d'après les critères de l'OMS. Les taux de prévalence sont similaires chez les enfants âgés de 6 à 23 mois et chez ceux de 24 à 59 mois. Il y a peu de doffférence dans l'importance de l'anémie dans l'ensemble du pays, exception faite du Plateau de l'Ouest où le taux est de 29,3%. Une conclusion inattendue, si l'on considère les faibles prévalences de la sous-alimentation, est l'absence de différence entre le groupe spécial, Yaoundé/Douala, et le reste du pays. Si c'est là un résultat valable, il peut s'expliquer par les factuers communs affectant l'anémie mais affectant à un moindre degré la sous-alimentation, par exemple le paludisme. La prévalence du paludisme est probablement moindre dans les Hautes Terres de l'Ouest où le taux d'anémie est plus faible.

3.4 L'OEDEME CHEZ LES JEUNES ENFANTS

La proportion des enfants affectés d'oedème est faible (0,6%), ce qui est compatible avec la faible prévalence de la sous-alimentation aigüe. L'oedème n'identifie qu'un certain type de grave sous-alimentation, le Kwashiorkor.

3.5. LE GOITRE CHEZ LES MEPES

Le goitre évident des mères, d'après les critères II et III de l'OMS, a été trouvé chez 4,4% de toutes les mères examinées. Les taux de goitre sont plus élevés dans la province de l'Est (16,8%), mais ios sont également importants dans les Provinces du Nord-Ouest (7,4%), et du Centre-Sud 3,1%). Ailleurs que dans l'Est et dans certaines régions populeuses du Nord, on a trouvé, au cours de cette enquête, dans certaines poches, par exemple dans le Centre-Sud (région au nord de Yoko, près de Bafia et de Bokito), dans l la Porrince du Nord-Ouest, au nord du Plateau de Bamenda et à un moindre degré dans des zones dissméminées autour de Bamenda, Dschang et Bafoussam.

Bien que la prévalence du goitre soit plus élevée dan sl'Est, le nombre réel des mères affectées est plus élevé dans la Province du Nord. Il faut noter, que dans cette enquête, l'on a considéré uniquement le goitre évident. Si l'on avait inclus le goitre à tous ses stades, les taux de prévalence auraient été beaucoup plus élevés.

Il est clair qu'il existe un problème important du goitre au Cameroun dans l'Est et dans d'autres régions. Des méthodes utioisées dand d'autres

pays pour réduire la prévalence du goitre, telles que l'iodisation du sel, l'absorption d'huile iodée par injestion eu par voie orale sont présentées dans ce rapport./

3.6. METHODES DIETETIQUES

a. Introduction

L'évaluation du régime a été effectuée sur deux groupes d'enfants. Les personnes interviewées ont été interrogées sur les modèles d'alimentation de l'enfant. Une évaluation plus détaillée du régime des 24 heures passées a été faite pour tous les enfants de 3 à 24 mois et la personne alimentant l'enfant en tant qu'indice du modèle alimentaire de la famille.
Un total de 2235 listes de régimes a été analysée aussi bien pour l'enfant que pour la personne alimentant l'enfant.

b. Alimentation au sein

L'alimentation au sein est presque générale (98% de tous les bébés) dans l'ensemble du Cameroun (y compris Yaoundé/Douala) jusqu'à 11 mois et continue à être courante pendant la seconde année de la vie. Après 21 mois, 50% de tous les enfants prenaient encore du lait au sein. Ce pourcentage est même plus élevé dans le Nord (70%). La comparaison de ces résultats avec les autres pays africains est favorable.

c. Autre Lait

La consommation de lait frais est limitée presqu'entièrement au Nord (7% de tous les enfants de 3 à 23 mois). L'alimentation au lait artificiel ou commercial est courante à Yaoundé/Douala (c'est-à-dire 25% des bébés) et beaucoup moins courante dans le reste du pays (c'est-à-dire 3% des bébés). L'alimentation au biberon est fréquemment utilisée pour les bébés à Yaoundé/Douala (30%) pour les enfants de 3 à 5 mois, dans la province du Centre-Sud (24%) et dans les Provinces de l'Ouest (10%). Environ 50% des biverons utilisés sont stérilisés, le reste est "propre".

d. Aliments Ingérés

Au Cameroun, 46% des enfants âgés de 3 à 5 mois, 80% des enfants âgés de 6 à 11 mois et 95% des enfants dans la seconde année de leur vie reçoivent des aliments autres que du lait. Ces taux sont plus bas dans le Cameroun Rural pour les bébés, en particulier dans les Provinces du Nord et de l'Est et plus élevé dans les régions urbaines.

Environ 40% des bébés au Cameroun reçoivent des alimentss pécialement préparés (tels que des bouillies) de 3 à 11 mois. Cette prévalence décroit jusqu'à 25% pendant la seconde année de leur vie. A peine plus que la moitié des enfants de 6 à 11 mois reçoivent des aliments partagés avec la famille. Un plus grand nombre d'enfants du Nord reçoivent des aliments spéciaux (par exemple de la bouillie de mil ou de sorgho) beaucoup plus longtemps que les enfants des autres provinces. Ils reçoivent aussi des aliments familiaux moins souvent.

De loin, l'aliment spécial le plus courant dans la plupart des provinces autres que celle du Nord est la bouillie de maïs. Le pain et la farine de blé sont très couramment consommés dans la Province du Centre-Sud et à Yaoundé/Douala. Les aliments commerciqux de sevrage sont consommés par 30% des bébés âgés de 3 à 11 mois à Yaoundé/Douala et par presque 15% dans la Province du Centre-Sud.

3.7 PAERCU GENERAL

Les résultats auggèrent les conclusions suivantes:

a. Plus du cinquième (c'est-à-dire 250.000) des enfants camerounais jusqu'à cinq ans sont sous-alimentés de façon chronqiue. Le statut nutritionnel de ces enfants pourrait être amélioré si l'on se base sur la comparaison avec le groupe spécial de Douala ayant un statut socio-économique relativement élevé, dans un environnement plus favorable.

b. Les enfants âgés de 3 à 5 mois sont généralement bien nourris et convenablement protégés grâce à l'amimentation au sein.
Après six mois tous le types de sous-alimentation deviennent plus prévalents pour atteindre leur maximum pendant la seconde année.

c. Les problèmes nutritionnels sont plus prévalents dans les régions du pays hors de Yaoundé/Douala et en particulier dans le Nord, l'Ouest et l'Est.

De 6 à 11 mois, l'alimentation au sein continue pour presque tous les enfants, mais au moins 30% des enfants de ce gourpe d'âge ne reçoivent pas d'autres aliments que le lait. Sur les enfants âgSs de 6 à 11 mois qui reçoivent d'autres aliments, 60% mangent uhe seule nourriture généralement une céréale ou un tuberculen le premier souvent sous forme de bouillie. Moins de 40% de tous les enfants de cet âge reçoivent une protéine végétale (par exemple

haricots, graines, noix); moins de 30% reçoivent une protéine animale (autre que le lait); environ 20% pangent des légumes à feuilles vert foncé; 20% seulement mangent un fruit ou un légume et de 20 à 60% reçoivent de l'huile, selon les régions du pays.

Vers 18 mois, la plupart des enfants reçoivent les mêmes types d'aliments que la famille. Même à ce stade, la proportion des familles qui mangent des protéines végétales est de 60 à 70%, des légumes à feuilles vert foncé 40%, des fruits et des légumes environ 50% et de l'huile de 50 à 90%, selon les régions du pays.

Il faut noter que la quantité des aliments ingérés et/ou le fait qu'ils sont mangés ensemble ou séparément sont inconnus. Toutefois, il semble qu'il y ait deux problèmes principaux. La disponibilité de la nourriture pour la famille (par exemple, le type des aliments) et la distribution des aliments (quand ils sont disponibles pour la famille) ai jeune enfant. Ces problèmes sont gégnéraux (hors de Yaoundé/Douala) dans l'ensemble du Cameroun, mais plus particulièrement dans les Provinces de l'Est et du Nord.

d. Le goitre évident des mères a été constaté chez 4,4% de toutes les mères. Les taux sont plus éelvés dans l'Est (16,8%), mais également importants par rapport au nombre total des mères affectées, dans le Nord, le Nord-Ouest et le Centre-Sud.

e. L'anémie existe chez 44,7% des jeunes enfants. Elle est qussi prévalente dans les régions urbaines (y compris Yaoundé/Douala) que dans le reste du Pays.