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FAMILY DIETARY SURVEYS INCLUDING WEANING FOODS

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INTRODUCTION

The fundamental causes of malnutrition are an insufficient supply of the necessary foods and / or an uneven distribution of the food that is available. It can be a "hungry" season at the end of the agricultural year, or the food can be unevenly distributed in the country or region as a whole, or within the family itself. The child is, in most developing countries, underprivileged and gets what is left after the males of the household have taken the best and largest portions of the meal, which means that the most vulnerable group gets mainly carbohydrate food. The malnutrition may also be due to poverty, foods rich in proteins are more expensive than carbohydrate foods. Most people are conservative in their food habits, and it is therefore better to base the applied nutrition programme on the traditional feeding habits whenever possible.

In order to get the basic data needed for a nutrition programme one should obtain the dietary data of the community. Here I will take up some of the problems involved in this work and also the type of information one can get through this dietary survey.

1. Dietary Surveys at the Local Level.

1.1. Background data:

When an area or a community is designated for a survey, working plans must be made which require some prior knowledge of the locale. A preliminary visit is usually necessary, even if all sources of useful information from government offices, libraries have been explored.

A census for the community will provide a basis for the selection of the survey sample and can also give a picture of the population. Information on the agricultural situation, temperature, transportation can influence both the organization of the survey and the interpretation of the results. Very seldom statistics are available.

Anthropological data on the area will provide most useful information in organizing the field work and also about food taboos which otherwise may be obstacles to the success in building up an applied nutrition programme. The officials in the government or the province must be informed of the proposed survey in the area. This should be done by official letters of introduction. This first visit also means an introduction to the village leaders in order to explain the purpose of the study.

If too little information has been obtained about the food habits in the area through the literature, it gives a chance to learn more by making contact with the local people who can give a general picture. With this information it is easier to avoid putting too much emphasis on dishes which may play a minor roll in the community and therefore can be ignored from the nutritional point of view. Of course this will be only a guideline when starting and one should never generalize in this kind of work.

1.2. Personnel:

The best one to carry out a nutrition survey is obviously a nutritionist with a sound knowledge of the composition of different food items and how they change in nutritive value through different ways of preparation. With this background it will be easier to know the kind of information needed when a new dish appears during the survey.

In Ethiopia we have worked in 2 teams which means a shorter period in the area for the field staff and a more concentrated period for the information obtained

Interpreter: Most often the survey must be conducted by trained personnel from outside the area with the help of interpreters. Since the persons to be interviewed are usually women, the interpreter should preferably be female. In countries where the status of women is low, it is easier to obtain a good contact with the female interpreter than with the male. In Arab communities a male interpreter is sometimes not allowed to enter the house when the mother is alone and one has to ask a relative or a neighbour to be in the house, or the interview has to take place outside. All this can mean less reliable information than if working alone with the mother.

Usually the interpreter is not trained in nutrition. She may speak the working language fluently, but her knowledge of the English or French names for the local food stuffs can be wrong. Therefore she may need special training. It is best to visit a local market, go through the local food items and prepare a list of the different names, preferably in the local language and the working language. The interpreter should also be trained to translate as exactly as possible. The lack of nutrition background can easily give wrong information. A typical example: I asked the mother: "At what age did you start to give the baby additional food" and heard the interpreter ask: "At what age did you start to give the baby enjera and wot"? For her, "food" meant the Ethiopian staple and nothing else. It is often necessary to recheck the information obtained, a time-consuming work for all people involved.

The interpreter must be trained to translate even if people

are suspicious of the food consumption survey. It is much better to meet these misplaced fears as early as possible and again explain the purpose of the survey. This training of the interpreter needs several days, sometimes a week and is one of the most important and difficult tasks before the survey can start.

1.3. Type of dietary survey:

In order to get basic data it is necessary to obtain dietary data for the community or a group in the community. Dietary surveys are time-consuming and therefore we must consider what type of information is needed. The quantitative data for the group can be obtained through a survey in the family, having their food measured and weighed over a given period of time. A less time-consuming method is to rely on inquiry, when people have to remember the consumption of foods during the previous day (24-hours recall). This type of survey was carried out with schoolchildren and factory workers in Addis Ababa[1]. The subjects could estimate the enjera eaten and the amount of sauce, but of course it was impossible to know the quantity of fat or protein-rich food put into the sauce. We were, however, in the favourable position of knowing the average composition of the sauce because we had carried out dietary surveys in the same economic group in Addis Ababa.

Sometimes it is necessary to know the general feeding habits of children and how frequent different food items can be used in the families. There is no use to build up a nutrition programme based on food items which most families cannot afford to buy. The best thing is to make this study in the home because:

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1) N.H. Areskog, R. Selinus, B. Vahlquist
Physical work capacity related to nutritional status. J.A. Clin. Nutr.

1. The mother is more relaxed at home and therefore it is easier to obtain information.

2. In the house it is possible to relate the information to the hygienic standard, the economic situation and the type of household equipment available.

Most valuable data will be through a dietary survey combined with a questionnaire about the general feeding habits of children.

1.4. The sample size:

The sample should be of a size which offers the minimum of errors within the limits of the money, trained personnel and time available. In Ethiopia we decided to take a sample of 10 - 20 percent of the number of families with children.

1.5. Time for dietary survey:

If the diet is monotonous only a few days should be required. In Ethiopia the orthodox christians have a large number of fasting days and fasting periods (110 - 150 days per year) when no animal foods are consumed. In those areas it is needed to carry out longer studies in order to include both non-fasting and fasting days. (every Wednesday and Friday are fasting days). A too short survey may make it possible for the family to eat better food than usual, but this is most often impossible for one whole week. Therefore we decided to study the dietary habit during 7 consecutive days. The disadvantage with such a long study is that the mother becomes tired of the visits and also that the staff

has to work at week-ends. On the other hand it is easier to get better information when a good contact is established after a few days.

In most rural areas, food supplies and food consumption are subject to variation during the year. At certain times of the year food supplies may be at a maximum or minimum. The survey should therefore preferably be undertaken at different seasons in order to see the seasonal variations.

One must avoid periods of feasts and fasts, because during these periods it will be either a lack of special food items or an overconsumption of some food, and this will also disrupt the diets of pre-school children. Sometimes the dietary study is carried out at the same time as the medical examination. The mother will be away for hours because this visit to the doctor is a special occasion in the village and is often combined with visits to neighbours. Therefore if we interfere with the general food intake of the family and the child, the mother will give the child what is easiest and the family have one meal less or may be an easily prepared meal. Quite often therefore the data obtained under these conditions are not representative.

1.6. Dietary Survey:

When the households are selected it is important to visit the families, explain the purpose of the study and ask the husband's permission. In Ethiopia the main object was to study the nutritional status of pre-school children and therefore the sample was taken from families with small children. The traditional way of eating in most parts of Ethiopia is to take the food from one communal dish or plate. This makes it impossible to know the individual intake of food. However, the small children usually have their food on a separate plate or in a

beaker and for these children separate data could be obtained. The data were taken during several visits each day, preferably at the time of food preparation. The raw ingredients were weighed or measured whenever possible in order to get the food consumption data for the whole family. In some families we were not allowed to touch the food, but the custom in Ethiopia is to buy small amounts of food once or several times a day and in those families quantitative data could be obtained. When weighing prepared food such as bread it was important to lift it in a plastic bag without touching the bread and then put it on the scale. The amount of food given to the pre-school child was measured and therefore it was necessary to know the total amount of the dish in order to calculate the child's intake. The most common dishes were prepared in the houses for laboratory purposes. The raw food stuffs were bought either from the family or in the local market and the mother prepared the dish while we recorded all steps. The raw and the prepared foods were transported frozen to the laboratory. In this way it was possible to take the loss in cooking into consideration.

Few examples show the importance of taking the preparation of foods into consideration. Fenugreek (Trigonella faenum graecum) with a content of around 24% of protein is a common baby food, but the investigation showed that a decoction containing ½% of protein was given. Or we were weighing the amount of wheatflour which should be used for the infant, but found during the preparation that the mother made a dough which was squeezed and only the thin carbohydrate liquid was given to the child. Sometimes one can find that the leaves from starchy roots are also used for the dish and this will increase the nutritive value of the prepared food. In some areas a low fat sour milk cheese was made and this was used by the whole family. This protein rich food was important to take into consideration when building up a nutritron programme. When working

in a village we also tried to see if there were some wild fruits and plants in the area which could be used in the home-made weaning food. During the study in the house we could note what household equipment was available and could be used as measurements and utensils in the applied programme.

The amount of food given to the pre-school child was weighed. Sometimes the food for the whole day was put on the plate if the mother was to be away and thus the child could eat whenever hungry. When milk was given it was important to investigate how this was diluted at home. Fairly often the milk bought in the local market was also diluted and this was impossible to take into consideration when obtaining the data. The consumption from neighbours was difficult to avoid. When the mother was co-operative we could get information from her or we had to visit the neighbours. As far as investigation goes this extra food mainly consists of hard toasted cereals "qolo", a food difficult for the children to digest or sugar cane. The quantity of breastmilk was, as in most developing countries impossible to get data about. When the child cries it is put to the breast.

It was noted, however, when the child was breastfed only at night. This was often the practice at the end of the weaning period, or if the mother had to be away for the whole day.

During the dietary surveys, the general feeding practice of the children in the families was also investigated. In this way data about traditions in feeding habits could be obtained, the length of breastfeeding and the age of the infant when being introduced to additional food and staple food.

The conditions for the survey should be as favourable as possible. If the mother is tired e.g. after carrying water it is better to come

back later. Interviews need the entire attention of the subject and the nutritionist and the interpreter should sit down in order to obtain a quite situation. As few people as possible should be in a team as especially in communities where they are not so used to visitors. Sometimes neighbours or children want to hear what it all is about and can seriously disturb the interview. All this must be handed diplomatically but firmly. The same applies if the husband is at home and will answer the questions instead of the wife.

2. Evaluation of the Data Obtained during Dietary Surveys.

The Childrens' Nutrition Unit has carried out investigations in 5 ecologically different areas in Ethiopia. The studies have included sociological, medical, biochemical and dietary investigations. Here I will report some of the data obtained from four places. This will show differences important to know for an applied nutrition programme.

2.1. Feeding habits of children:

Most children are breastfed, the time varies in the different places from around 1 to 3 years. Butter and femigreek decoctions are often given from the very first day. Such additional foods as milk, a watery gruel or linseed water can be given from 1 - 3 months of age, and the child is introduced to the staple food from the age of 1 - 2 years - in some places from 3 years. The weaning is often abrupt and good weaning food is nearly non-existant in Ethiopia. When the child is introduced to adult food it is first given few pieces of toasted cereals or a piece of bread.

2.2. Staple food:

The staple food the small child is introduced to differs in the different parts of Ethiopia. In Addis Ababa and Ijaji, the staple food consists of enjera, made of the grain available in the house (tef, corn, sorghum) and in Ethiopian sauce (wot or alicha) with the main ingredience one kind of legume with addition of onion, spices and fat (oil or butter). Animal foods are used in very small quantities most for feast days. Nutritive value of this diet: most of calories and nutrients are derived from cereals mainly tef. Tef contains about 10% of protein but the biological value of the protein is low, because tef is deficient in lysine. The baked enjera is even more deficient in this amino acid, as some lysine is destroyed during the fermentation and baking process. Legumes are rich in lysine, but deficient in methionine which tef is rich in. Therefore, legumes can to a certain extent supplement tef. However, the amounts of legumes used in this diet are too low in order to give an optimal proportion. This diet supplies too little of proteins of good quality, Calcium, Vitamin A and Ascorbic acid.

Sidamo. In part of the Sidamo province the staple diet consists of Ensete (Ensete ventricosum). This crop contains about 1% of protein and 50% carbohydrate. Together with this starchy food is eaten Ethiopian kale (Brassica oleracea) which contains about 4% of protein. Sometimes cornbread is eaten instead of ensete. Through the kale the diet gives a high supply of Calcium, Iron, Vitamin A and Ascorbic acid.

Arussi. In Arussi province we have investigated the dietary patterns

in one area where the main crop is corn. These farmers are semi-nomadic; and can get very little out of the land. They keep many cattles, and part of the year they have a good supply of milk. The family diet consists of cornbread or porridge and buttermilk, when this is available. Part of the year the crops are nearly-finished and at the same time the cows give low amounts of milk, because of poor breeding. This diet supplies insufficient quantities of calories, Vitamin A and Ascorbic acid.

In the enjera eating community the child is introduced to the adult food in the form of fit-fit (a mixture of the enjera and the sauce). The amount of enjera is usually large compared with the amount of sauce which means a too carbohydrated diet. In the ensete area the small child will get the diet which contains extremely small quantities of protein. In addition to this we must take into consideration that the child is underprivileged and the father, guests and adult boys are eating first and what is left over is given to the women and the small children.

2.3. Adequacy of the diets for pre-school children:

Figure I shows the nutritive value of the diets for children in the age group $\frac{1}{2}$ - 5 years in four different places. The information obtained from a 7 day dietary survey with individual intakes recorded. The intake of Protein, Calcium, Vitamin A, Thiamine, Riboflavine and Niacin has been compared with the intake recommended by FAO/WHO. The requirements for protein are calculated on the basis of NPU = 60 as the main part of the protein is derived from cereals. For calories and iron, the figures from Food and Nutrition Board have been used and for ascorbic acid the minimum requirements. All figures must be taken with the background that the time of breastfeeding varies

between the different places. In all places the supply of calories is too low, but it must be noted that some of the infants are getting breastmilk in addition.

The intake of proteins is lowest in the Sidamo area. The children in Arussi had the highest intake of protein, but one must take into consideration that the supply of calories is low and therefore some protein may be used for energy .

The iron intake is high in all groups, most of this is derived from cereals, mainly tef and green leafy vegetable in the Sidamo province. Because of the high consumption of cereals the need for Thiamine is met in all groups except in Sidamo with a low figure for cereals. This figure shows the average intake calculated for the different areas. The range between the children is high and Table I shows the percentage of pre-schoolchildren getting very low quantities of calories and nutrients.

2.4. Percentage distribution of calories from Protein, Fat and Carbohydrate:

Figure II shows the calorie percentage derived from Protein, Fat and Carbohydrate. The protein calorie percentage is lowest in the Sidamo province where the intake of protein is insufficient both in quality and quantity. This area also presents the highest figure for calories from carbohydrates and the lowest figure for calories derived from fat. Table II shows the percentage of children with low values of calories derived from protein and fat and also that not less than 80% of the Sidamo children get more than 70% of the calories from carbohydrate.

2.5. Percentage of animal protein of total protein:

The total percentage of animal protein is shown in figure III which should be compared with Table III showing the percentage of children getting 0 - 5 % animal protein of the total intake, respective 5 to 25 percent.

2.6. Seasonal variation:

In most places of Ethiopia the crops get more expensive at the end of the agricultural year. The habit is usually to buy for a certain amount of money and therefore an increase in price means that the uantity consumed will be less. In the areas with cattles, the dry season means a poor breeding and less milk being available and will give big seasonal variations in the nutritive value of the diet.

2.7. Adequacy of the diet during the long fasting period in Ethiopia:

A dietary survey carried out in Ethiopian orthodox families during the long fasting period (8 weeks before Easter) shows that even if the small children are exempted from fasting, they are in fact fasting, because no animal food is available in the community and the mother does not like to touch animal food. The investigation showed that the pre-school children received a lower quantity of protein and an increased percentage of calories derived from carbohydrates[2)].

These investigations show that each area, each community has its own problems which must be tackled in its own way and that an applied

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2) K.E. Knutsson, R. Selinus
Fasting in Ethiopia - An Anthropological and nutritional study
(to be published)

nutrition programme should be based on the information obtained during dietary surveys[3].

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3) R. Selinus
Home-made weaning foods for Ethiopian Children (to be published).

PRE-SCHOOL CHILDREN (AGE 1/2 - 5 YEARS)

Percentage of adequacy of supply of CALORIES and NUTRIENTS *

Reported in Percentage of Numbers

Place	Number	Calories less than 60%	Protein less than 60%	Calcium less than 60%	Iron less than Rec.intake	Vit.A less than 60%	Thiamine less than 60%	Ribo-flavine less than 60%	Niacin less than 60%	Ascorbic acid less than 80%	Breast-milk in addi %
Addis Ababa	100	76	21	53	38	82	32	65	74	92	28
Ijaji	66	88	29	71	19	72	29	66	86	88	31
Sidamo **	16	73	61	55	38	65	67	60	81	37	25
Arussi	44	69	28	43	45	64	40	27	92	86	19

* Calories FNB; Protein FAO/WHO NPU = 60; Calcium FAO/WHO; Iron FNB; Vit.A FAO/WHO; Thiamine FAO/WHO; Riboflavine FAO/WHO; Niacin FAO/WHO; Ascorbic acid Min-requirement

** Small sample

PRE-SCHOOL CHILDREN (AGE 1/2 - 5 YEARS)

Percentage distribution of calories from Proteins, Fats and Carbohydrates

Reported in Percentage of Numbers

Place	Numbers	Protein		Fat			Carbohydrate
		0 - 10 %	10 - 15 %	0 - 10 %	10 - 15%	60-65%	More than 70%
Addis Ababa	100	11	6[illegible]	28	31		67
Ijaji	66	11	64	25	26		53
Sidamo *	16	80	12	43	37		80
Arussi	44	11	45	2	6	29	13

* Small sample

TABLE III

PRE-SCHOOL CHILDREN (AGE 1/2 - 5 YEARS)

Percentage animal Protein of total Protein

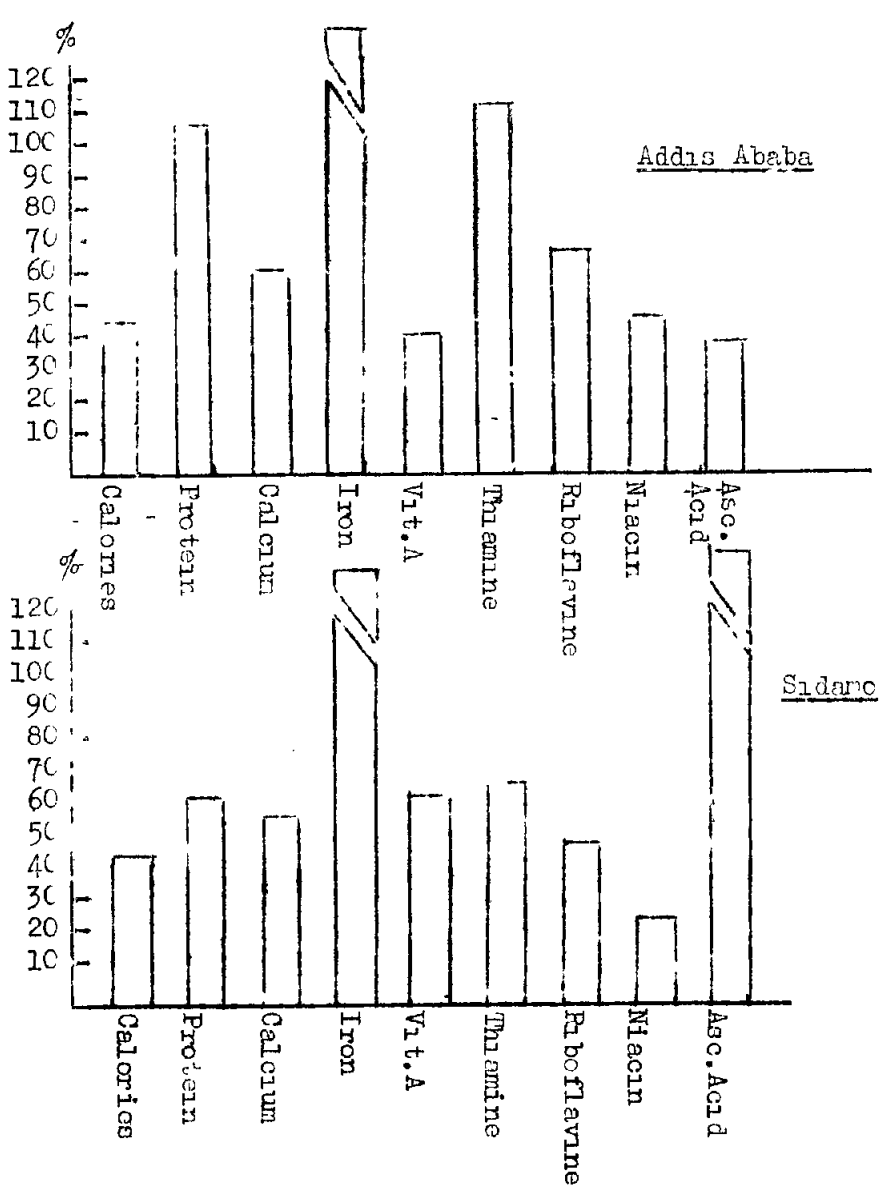
Reported in Percentage of Numbers

Place	Numbers	0 - 5 %	5 - 25 %	25 - 50 %
Addis Ababa	100	41	25	8
Ijaji	66	30	31	13
Sidamo*	16	33	19	25
Arussi	44	11	7	39

* Small sample

FIGURE I

PRE-SCHOOL CHILDREN (AGE 1/2 - 5 YEARS)
Percentage of adequacy of supply of Calories and Nutrients
Breast-milk in addition



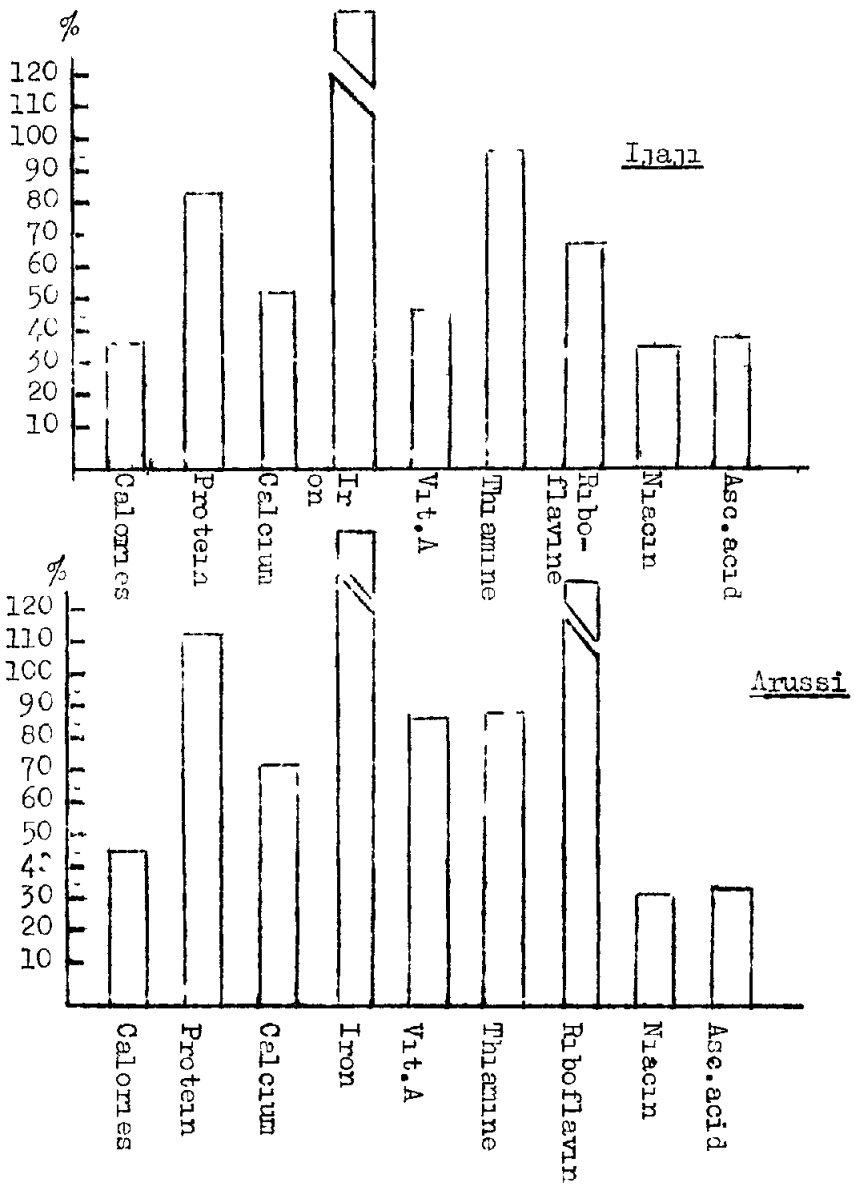
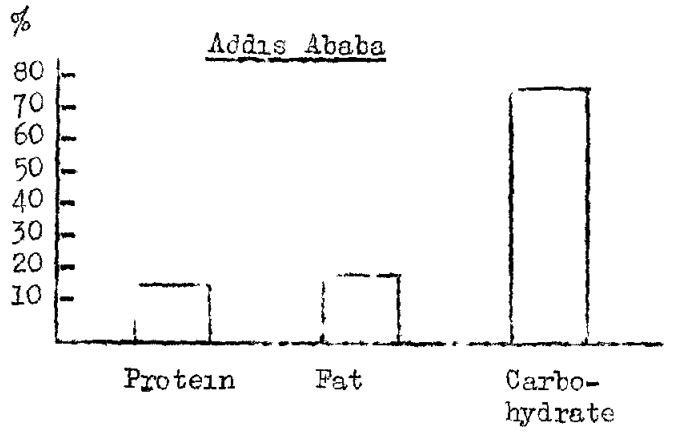
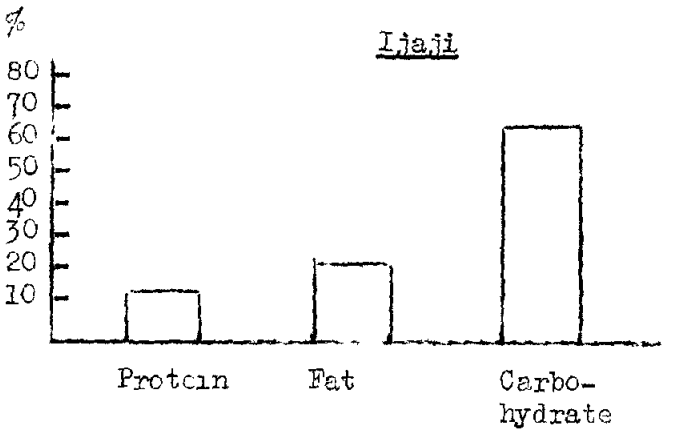
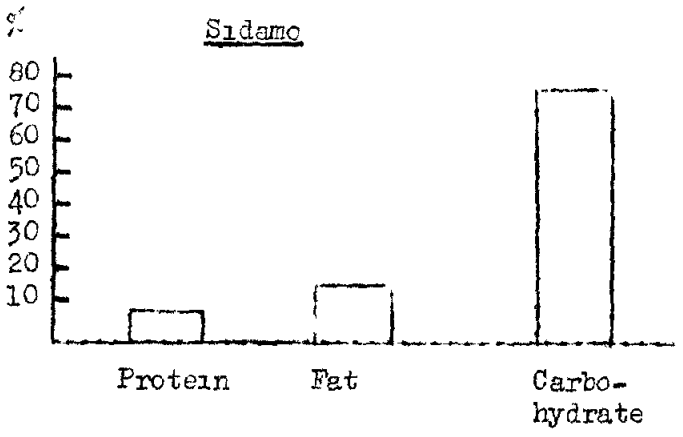


Figure II

PRE-SCHOOL CHILDREN (AGE 1/2 - 5 YEARS)
Sources of Calories in percentage of total Calories provided.
Breast milk in addition







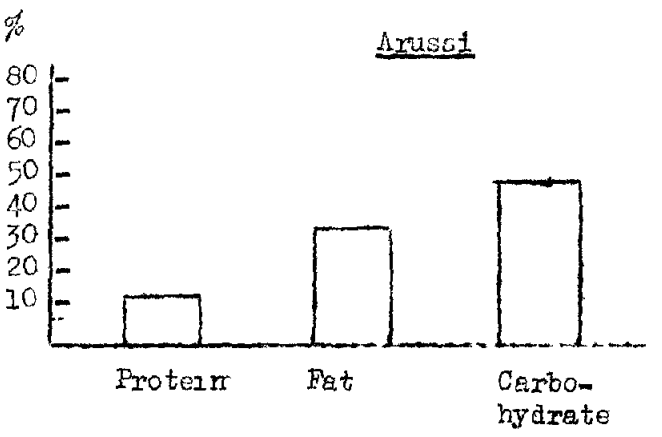


Figure III

PRE-SCHOOL CHILDREN (AGE 1/2 - 5 YEARS)

Percentage of animal protein of total Protein

Breast-milk in addition