A REPORT OF THE COMMUNITY NUTRITION PROJECT CONDUCTED IN A VILLAGE IN COIMBATORE DISTRICT.

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I. INTRODUCTION.

Nutrition is one of the major factors responsible for maintenance of normal health and physical fitness. The state of nutrition of any community or group of people depends largely on the quality and quantity of food they consume (Indian Council of Medical Research (1951)[1]. However, as the Food and Agriculture Organisation (FAO) (1957)[2] states, humanity has not yet been able to solve the problem of food and the right kind of food for everybody. According to the figures given in the Census of India (1961)[3], 79.3 million tons of food grains were produced above the target fixed in the Second Five Year Plan, but still the country has not attained self sufficiency, because of increased explosion of population. Hence, today there are millions of people who do not have enough food to eat and millions who do not have enough of the right kind of food that would make them healthy and strong.

The problem of food shortage is the result of many different but closely related factors such as natural conditions, economic forces, low standards of living, influences of social and cultural traditions, working habits and lack of education. As Subramaniam (1957)[4] points out, today, although more food is produced than at any other

period in the past, and much work has been done in nutrition, there is still a long way to go before everybody will have enough food. Because of increased population and ignorance of people about nutritional facts, there are widespread dietary deficiencies. According to Aykroyd (1964)[5], the result of insufficient food -- lack of calories -- is under-nutrition and the wrong sort of food, that is, a diet deficient in essential nutrients produces mal-nutrition.

Diet surveys carried out in our country over the last several years show that the diets of a good proportion of our population are inadequate according to accepted standards, (Aykroyd et al (1963)[6]. The dietary deficiencies, which are both qualitative and quantitative, are reflected in the wide prevalence of mal-nutrition among the low and middle income groups in the country. The FAO (1962)[7] reports that frank signs of mal-nutrition develop more rapidly in vulnerable groups, namely, infants, growing children and pregnant and nursing women because they need relatively more of the body building and protective foods than others. It has been estimated that much of the mal-nutrition in the world, particularly among children, is due to ignorance, poverty and shortage of nutritious foods - Aykroyd (1964)[5].

Therefore, malnutrition could be prevented if people know how to make better use of the foods, available to them.

The need for educating the people in the right selection of available foods and to produce what is not available is crucial. Hunscher and Macy (1951)[8] point out that knowledge of the dietary intakes of people is essential for any interpretation of their nutritional status as basis for planning nutrition education programme. A study of existing dietary conditions is therefore a prerequisite for planning nutrition education programme. As the FAO (1962)[7] points out well considered diet surveys help to ascertain the percentage of the population that is inadequately fed, and nutrition surveys are helpful and necessary to evaluate the problems in a community scientifically. Aykroyd (1948)[9] and Pandit and Rao (1960)[10] consider that diet surveys give useful and accurate picture of the food intakes of groups and several reveal the basic defects in their diets. According to the Indian Council of Medical Research (1951)[11] diet surveys are needed for basic research and for developing practical nutrition programme. A clear understanding of the effect on health of different kinds of foods consumed by groups living under different environmental conditions will facilitate the planning of local, national and international food policies on a sound, scientific basis. Pandit and Rao (1960)[10], Eppright (1957)[12] and Gopalan and Rao (1961)[13] observe that a great deal of useful information on the nutritional conditions of population in different regions could be collected through diet and nutrition surveys.

In planning any programme of nutrition education the first requisite is a clear delineation of the purposes for which it is designed, the tools to be used and the outcomes to be accomplished - within the framework of available resources of time, finances, space, personnel and equipment.

Since 80 per cent of India's population live in villages, the need for improving the dietary practices and food habits is essential. This community nutrition project was, therefore, undertaken to study the dietary pattern and food habits of a selected rural community in the village of Kalappanaickenpalayam in Perianaickenpalayam Block of Coimbatore District. The following were the specific objectives of the study.

A. To gain experience in conducting socio-economic, dietary and nutritional surveys in selected rural families, with special reference to the food intake of adolescent boys and girls;

B. To plan and conduct a nutrition education programme for the families based on the findings of thesurvey;

and C. To evaluate the nutrition education programme.

II. PLANNING THE PROJECT.

According to Leagans (1961)[14], good programme planning is primarily an intellectual activity for it usually involves a study and use of facts and principles. Such planning requires:

1. Skill in understanding the nature and function of planning;
2. Skill in formulating planning procedures;
3. Skill in identifying problems and needs;
4. Ability to decide on objectives and goals;
and 5. Skill in formulating means and wise courses of action to attain objectives.

Based on the above principles, the steps in planning this project were:

A. Planning the surveys;
B. Conducting the surveys;
C. Analysis of the findings of the surveys;
D. Planning and conducting nutrition education programme;
and E. Evaluating the nutrition education programme.

III. PLANNING THE SURVEYS.

Planning the surveys involved:

1. Selection of the village.
2. Selection of the families.
3. Evolving the schedules needed,
and 4. Selecting the techniques for conducting the surveys.

1. Selection of the village:

The village Kalappanaickenpalayam of the Perianaickenpalayam Block in Coimbatore District was selected for the project, since the village was only six miles away from the college, and the people were found to be co-operative.

2. Selection of the families:

Twenty-three families were selected for conducting the surveys on random basis out of 150 families. From these 23 families/which ten had adolescent boys and girls were selected for the dietary surveys.

3. Evolving the schedules needed:

The survey schedules needed for this project were:
(a) The village survey form to get information about topography, population and main crops of the village.

(b) The family survey form to elicit information about the socio-economical condition, expenditure pattern and food practices of the families; and (c) The dietary schedules to record the dietary intakes with special reference to adolescent boys and girls.

The three different types of the survey forms were developed, pretested with five families in the Municipal Colony located near the college, who were not included in the study and finalised as given in Appendix A.

Diet surveys are used to obtain qualitative information from individuals or groups about the types and qualities of food consumed during a definite period of time. Trulson (1952)[15] points out that dietary survey gives important base line information and serves as a tool to measure the effectiveness of a nutrition education programme. The unit for enquiry can be a family, institution or an individual depending upon the specific objectives for the particular enquiry. Young (1950)[16] points out that the family surveys are better than individual surveys. The ICMR (1951)[11] and Norris (1959)[17] list several forms of carrying out dietary surveys as described below.

(a) Questionnaire.

(b) Diet history or recall.

(c) Interview.

(d) Inventory or log book method.

(e) Food List Method.

(f) Precise weighing.

(g) Chemical analysis

and (h) Food Balance Sheet.

(a) Questionnaire Method:

The questionnaire method is designed to discover the kinds and amounts of food eaten during a predetermined length of period in the near past. Gopal (1964)[18] states that the schedule questionnaire is the device which is most frequently used for gathering data on the dietary pattern and foods eaten. The questionnaire is convenient for gathering rapidly and inexpensively information regarding attitudes, opinions or facts of a situation in a given field.

Pasricha (1959)[19] recommends the questionnaire method as the most suitable one for the computation of the dietary intakes of individuals because of its easy applicability and reasonable practicability, which is dependent upon the intelligence and co-operation of the subject and the patience and training of the investigator. She further points out that the oral questionnaire method has the practical advantage of being less time consuming than the weighment method.

(b) Diet history or recall:

Berg and Mayer (1954)[20] consider dietary history as an

usual method to obtain the pattern of food consumption. Scrimshaw (1950)[22] states that diet histories may be obtained by having the subjects record her diet for a limited period of time or by having a dietitian determine the diet for a long or short period. Chalmers et al (1952)[23] point out that one of the most widely used methods in dietary studies has been the dietary method record which consists of listing all the foods consumed over a given period. This method is not as exhaustive as the food list method.

(c) Interview method:

Trulson (1952)[15] and Young (1959)[28] observe that good diet interview is a suitable method of assessing the dietary intake and interview method is the most successful method when skilfully done. The interview should be done by someone with a good knowee knowledge of foods who is also a skilled interviewer, who is sympathetic and who arouses a co-operative response. Interviews conducted for these purposes require patience, judgment and considerable time.

(d) The inventory or log book method:

For family inquiries the inventory or log book method is suggested. In this method an inventory is taken of the food on hand at the beginning and at the end of the period

of survey. A record is kept of all the foods brought to the house. The consumption of food is equivalent to food available minus the food left at the end of the investigation. Corrections are made for foods eaten outside by the members and for food given to visitors during the period of the survey. Steele et al (1951)[24], Young et al (1952)[25] and Trulson (1954)[26] found that the seven day records for collecting the data about the dietary patterns and intakes of boys and girls proved to be good.

(e) The Food List Method:

The food list method is similar to the log book method, but there is indirect measurement of foods. The amounts of foods used during a given period are assessed from the estimates supplied by the housewife herself. The cost of this method is relatively low. The food list method gives a fairly accurate measure of the food brought or other procured by the individual USDA (1949)[27].

(f) Precise weighing:

In precise weighing all the foods are weighed before cooking every meal, for a given number of days. Every item of food is weighed however small the quantity may be. Pasricha (1959)[19] points out that weighment method yields reliable data regarding the dietary intakes, but time consuming.

(g) Direct chemical analysis of foods:

In direct chemical analysis, duplicate amounts of all the foods the individual consumes are weighed and analysed for the different nutrients. Thomas et al (1950)[28] point out that in their studies difference existed between the calculated and analysed values of food intakes. While this type of survey offers great accuracy, it is very expensive and time consuming.

(h) The food balance sheet:

The food balance sheet technique is used to calculate quantities of various foods available for per capita consumption at the retail level from the net supply figures. The calorie and nutrient value of supplies per person per day is calculated by applying figures from appropriate Food Composition Tables.

4. Selecting the techniques for conducting the surveys:

Since a majority of the people in the village were illiterate, and could not enter their replies to the questionnaire independently, the interview-cum-questionnaire technique was selected as the technique of survey in the study. This is in accordance with the recommendation of Trulson and Mecann (1959)[29] that any one method would not

give the full details and hence a combination may be used.

Through direct interview the investigator gathers data in a face to face contact (FAO 1953)[30]. The advantages of this method are that information can be obtained even from illiterate people, the investigator can read between the lines, and casual observations are possible.

IV. CONDUCTING THE SURVEYS.

Blanchard (1949)[31] observes that home visits make an excellent basis for programme planning and programme completion. Accordingly, by ~~these~~ home visits thrice a week day, the investigator was able to build good rapport and win the confidence and co-operation of the people.

For conducting surveys for this project, the investigator stayed in the village for 17 days. During the first week, surveys were conducted in 23 families, both in the mornings and evenings, when the homemakers were available. At other times the villagers were busy with their work in the fields.

From the 23 families, thus surveyed, ten families who had an adolescent boy or girl were selected, for the weighment surveys. These weighments of the raw foods were conducted when the families started to cook the meals. The foodstuffs used for breakfast were firstweighed early in the mornings. At noon, the foods to be used for the lunch were weighed, and in the evenings, the foods for dinner were weighed if dinner was prepared separately. However, in most of the families, the meals prepared for the lunch were used for the dinner also. The weighment of foods was carried out in the ten families, for a period of seven days.

V. FINDINGS OF THE SURVEYS.

The findings of the surveys pertain to:

A. The Village.

B. The families.

C. The adolescents,

and D. The problems located.

A. Details of the Village:

The village Kalappanaickenpalayam is situated about six miles from the College, and belongs to the Periyanaickan-palayam Block of Coimbatore District. The total population of the village is about 700 out of which 343 are women. The main crops produced in the area is cholam and the main occupation is agriculture. There is an elementary school where the children get education up to 5th standard. There is a public radio for the whole village, which provides the villagers with latest news and some recreation also.

B. The families:

The findings of the survey in the 23 families are summarised under the following heads:

1. Size.

2. Caste.

3. Language spoken.

4. Occupation.

5. Educational level.

6. Income.

7. Expenditure on food.

8. Expenditure on cereals and pulses.

9. Foods commonly used.

10. Methods of cooking.

11. Methods of food preservation and storage.

12. Diets given at different stages.

13. Foods for festivals and functions,

and 14. Home production.

1. Size of the family:

The sizes of the 23 families surveyed in terms of the Consumption Unit* are given in Table I.

TABLE I.

SIZES OF FAMILIES SURVEYED.

Consumption Unit.	Number of families.
1.5	3
2.5	5
3.5	4
4.5	5
5.5	6
	23

* Consumption Unit - Scale of co-efficients considered accurate enough for practical nutrition work (1963)[6].

As can be seen from Table I, the number of Consumption Units in the families ranged from 1.5 to 5.5 with the majority having between 3.5 to 5.5 Consumption Units. In all, there were 108 members in the 23 families.

2. Caste:

All the 23 families, except one which was of 'Naidu' caste, belonged to the 'Gounder' caste.

3. Language spoken:

Twenty-two families spoke Tamil, while one family had Telugu as its mother tongue.

4. Occupation:

The main occupation of 19 families was agriculture. In the remaining four families, the heads were working in mills for wages.

5. Educational level:

Among the 108 members in 23 families only 45 have had schooling, of whom 28 had completed V standard, two the XI standard, and others varying from I to V standard. There was no relationship between sex and educational background.

6. Income:

The average monthly income of the families is given in Table II.

TABLE II.

THE DISTRITUTION OF THE FAMILIES ACCORDING TO MONTHLY INCOME.

Range of monthly income.	Number of families.
Rs.	
25 - 50	7
51 - 75	3
76 - 100	4
101 - 125	4
126 - 150	2
151 - 175	2
176 - 200	1
	23

From Table II, it can be observed that the monthly income of the families varied from Rs.25 to Rs.200. The largest number of the families, namely 17, had a monthly income below Rs.100.

7. Expenditure on foods:

The expenditure on food, in terms of the percentage of income of the families is given in Table III.

TABLE III.

DISTRIBUTION OF THE FAMILIES ACCORDING TO PERCENTAGE OF INCOME SPENT ON FOODS.

Percentage of income spent on food.	Number of families.
40 - 50	2
51 - 60	1
61 - 70	2
71 - 80	3
81 - 90	4
91 - 100	1
101 - 110	3
111 - 120	5
121 - 130	2
	23

It is seen from Table III, that the food expenditure pattern of the families varied from 40 to 130 per cent of the income. Thus a major portion of the income is spent eh on foods. In ten families the expenditure on food was more than the income, resulting in the debts, the families had incurred. The investigator found that the home makers were eager to impress her that they were spending much in trying to get good food. Therefore, the figures given by them are somewhat questionable.

8. Expenditure on cereals and pulses:

The expenditure incurred by the families on cereals and pulses is given in Table IV.

TABLE IV.

PERCENTAGE OF FOOD EXPENDITURE ON CEREALS AND PULSES.

Percentage of food expenditure.	Cereals.	Pulses.
	Number of families.	Number of families.
3 - 6	--	7
6.1 - 9	--	6
9.1 - 12	--	5
12.1 - 15	--	5
		23
31 - 50	12	
51 - 60	6	
61 - 90	5	
	23	

From Table IV, it is observed that the percentage of food expenditure spent on cereals varied from 31 to 90 and that on pulses ranged only from 3 to 15.

9. Foods commonly consumed:

The different foods used by the families and the frequency of their uses are given in Table V, with details in Appendix B.

TABLE V.

FREQUENCY OF USE OF DIFFERENT FOODS.

Frequency.	Rice and cholam	Ragi, rice and cholam.	Rice alone.	Pulses Red Gram.	Pulses Bengal Gram.	Vege-ta-bles.	Fruits.	Flesh foods.	Milk.
	No. of families using								
Daily	18	1	4	23	21	-	-	-	20
Once a week.	-	-	-	-	2	23	-	1	3
Once a month.	-	-	-	-	-	-	23	1	-

As can be seen from Table V, the staple foods of the majority of the families were rice and cholam. Ragi was also used in one family, while four families used rice alone. All the families used pulses and vegetables. From Appendix B, it can be observed that brinjal, and ladies finger were the most commonly used vegetables. Fruits were used only once a month except in two families who used bananas once a week. Onion was also used daily by the families. Greens

were used only once in a week. Twenty families took milk daily. Animal foods were consumed only once a month. Only six families had eggs once a week.

10. Methods of cooking:

The methods of cooking used for different foodstuffs are given in Table VI.

TABLE VI.

METHODS OF COOKING DIFFERENT FOODS.

Foodstuffs.	No. of families using	
	Absorption method.	Excess water method.
Rice	10	13
Pulses	2	21
Vegetables	3	18

From Table VI it is seen that ten out of the 23 families cooked rice by the absorption method and the rest by excess water method, where the cooking water is thrown out. In cooking vegetables also, the excess water was discarded. As for the pulses although they were cooked in excess water, the cooking water was used in other food preparations.

11. Methods of food preservation and storage:

Pickling was the only preservation method known. Out of the 23 families, ten 13 preserved mangoes, limes and 'narthangai' as pickles.

Mud pots, called 'modas' were used for storing rice and other cereals. Bamboo baskets were used to store fruits and vegetables. Tins and bottles were used to store oils, condiments and spices.

12. Diets given at different stages:

No special diet was being given to for any stage. During sickness, liquid food preparations like 'kanji' were given because of their easy digestibility.

13. Foods for festivals and functions:

Festivals like 'pongal', 'adi pandigai' are celebrated with the food preparations , payasam, vadai, kachayam* and others.

14. Home production:

Out of the 23 families, four had small kitchen gardens in which vegetables like brinjal and ladies finger were grown

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*kachayam - A preparation made from wheat flour and jaggery.

in small quantities. Six families maintained small poultry units. Eleven families owned cattle. Besides taking a small quantity of milk for the family's consumption, they sold the rest.

C. Food intake of the adolescents:

According to Wharton (1963)[32], knowledge of the nutritional intakes of selected age groups for different sections of the country, is needed for a better understanding of the needs of the local areas.

Eppright (1957)[33] points out that the teen-agers stand first in the list of children who need food guidance, and nutrition education should aim at helping them to acquire an overall view of nutrition and its importance to the long-time health. Johnston (1948)[34] stresses that the increased rate of metabolism and growth increases the nutritional requirements of the adolescents.

Goumois (1953)[35] points out poor diet is alarmingly common among the adolescents of all socio-economic levels. Martin (1954)[36], Proudfit and Robinson (1953)[37] and Bogert (1960)[38] stress that all the nutrient intakes reach the peak at the stage of adolescence.

The food intake of the families and the nutritive value of the diets were calculated from the data obtained

from the weighment of raw foods for seven days in the selected families with adolescents. The amounts of the different foods consumed by each family for the seven days were found out, the average consumption per day computed, and divided by the total number of consumption units in the family to derive the intake per consumption unit. The consumption of the adolescents in the families was next computed using the scale of co-efficients as given by Aykroyd et al (1963)[6] and compared with the Recommended Allowances for that age group as shown in Table VII and Appendix C.

TABLE VII.

AVERAGE DAILY NUTRIENT INTAKE OF THE TEN ADOLESCENTS.

Serial No.	Age and Sex.	Calories.	Protein. Gms.	Calcium. Mgms.	Iron. Mgms.	Vit. A I.U.	Vit. B 1 Mgms.	Vit. B 2 Mgms.	Vit. C Mgms.
R.A.	M	2500	81	1000	10 - 30	2000 - 3000	1	1 - 1.5	50
Average Intake	M	1517	39	320	22	680	1.03	1.00 - 0.66	11
R.A.	F	2100	81	1000	10 - 30	2000 - 3000	1	1 - 1.5	50
Average Intake	F	1712	43	693	18	873	1.15	1.19	16

R.A. - Recommended Allowances.

M - Male. F - Female.

From Table VII, it is evident that the diets of the adolescents are deficient in calories, protein, calcium, vitamin A and vitamin C. The diets were adequate with regard to vitamin B_1 and B_2 except that in the case of the average content of male the diets are inadequate in vitamin B_2.

D. The problems located:

The data collected through the surveys in the 25 families, and through the weighment of foods in the ten families, were analysed. They indicated the following nutritional problems:

(a) Low intakes of vitamins A and C.

(b) Low intake of iron.

(c) Infrequent use of greens in the diets.

(d) Wrong methods of cooking rice.

and (e) Non-availability of proteins from animal sources.

VI. NUTRITION EDUCATION PROGRAMME.

Philip (1964)[39] and Kymal (1964)[40] stress the importance of promoting good dietary habits among the people. According to FAO (1957)[2], improving the nutritional status of people depends upon education, which is an essential for solving the problem of food as in any other field. Education in nutrition is not merely telling people what they ought to eat, but teaching people how to produce or obtain the right kinds of foods or substitutes and use them. Nutrition education seeks to bring desirable changes in knowledge, skills and attitudes in relation to food intake and habits. Eppright (1957)[12] stresses that nutritional education helps to impart particularly to teen agers new food habits and attitudes and to overcome certain dietary problem.

According to Ensminger (1959)[41] and Leagans (1961)[42], extension methods are most useful for imparting education in nutrition. Extension starts where people are and with what they are, and gradually helps them to become what they ought to be. The FAO (1962)[43] defines extension as informal, out of school educational service for training and influencing farmers to adopt improved practices in food production and conservation. The Ministry of Community Development and Co-operation (1961)[44] considers extension education as an educational process of imparting knowledge, to rural people and helping them to take decisions with their specific local situations.

The various steps in planning and conducting a nutrition education programme were:

A. Setting up objectives.

B. Selecting methods.

and C. Conducting the nutrition education programme.

A. Objectives for the nutrition education programme:

Any educational programme should have properly conceived and stated objectives. The Ministry of Community Development and Co-operation (1961)[44] points out that nutrition teaching requires specific and clearly defined teaching objectives. Before nutrition education, through extension, can attain maximum effectiveness, the specific changes desired in the behaviour of the people should be identified. Good extension teaching starts with, and continues towards specific and significant objectives. The objectives must meet with the following criteria:

(i) They must be within the limitation;

(ii) Attainable; and

(iii) Specific about the kind of behavioural changes to be attained.

When objectives are thus stated, the teaching process

contains four different aspects:

(1) People to be taught.

(2) Behavioural changes to be brought about.

(3) Content or subject matter to which the behaviour is related.

and (4) The situation in which the teaching is to take place.

These facts and problems located in the 23 families formed the basis for planning the nutrition education programme conducted in the village. The following objectives were set for the nutrition education programme:

(a) To raise kitchen gardens in seven houses where there was place to raise kitchen gardens, specially to grow greens.

(b) To urge all the ten families who had adolescents to use sprouted green grams which is rich in vitamin C.

(c) To teach the families the absorption method of cooking rice, through the introduction of hay box* as a device.

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*Hay box - It is an improvised fireless cooker, so called because hay is used as an insulating material (1963)[45].

(d) To urge the adolescents and the home makers to consume the eggs from their poultry.

(e) To explain to the families the importance of the multi-purpose food and use of animal protein foods.

The detailed plan drawn for the programme showing the problems located, the supporting facts and the objectives are given in Appendix D.

B. Selecting Methods:

In planning the nutrition education programme, the relative merits of several extension methods were considered and the appropriate ones selected and used. Leagans (1961)[42] has brought about the usefulness of various extension methods such as:

i. Individual contacts.
ii. Method demonstrations.
iii. Result demonstrations.
iv. Meetings - mass contacts.
v. Film shows.
vi. Exhibitions.

vii. Field trips.

viii. Radio programmes.

and ix. News letters.

Devadas (1963)[46] urges that an extension worker needs to use a wide variety of teaching methods to stimulate the interests of the homemakers and to make learning permanent. According to her, the use of audio visual aids such as posters, exhibits and pictures are helpful in facilitating learning.

One of the most effective methods for nutrition education is demonstration, where the learner tries to practise the methods shown, until she learns them fully. Another effective method is result demonstrations which enable observers to see the difference in the results between the new and old practices. Through the use of a combination of methods the education tries to stimulate interest of the home makers.

C. Conducting the nutrition education programme:

The nutrition education programme was planned and carried out for 5 days in Kalappanaikenpalayam. During these days, the investigator stayed in the village and contacted

the people whenever they were free from their work in the fields. The learning experiences planned and the methods used were as follows:-

1. Home visits:

According to the Leagan (1961)[42] home visits or contacts are effective in educating the people individually and intensively. At the same time, they are time consuming and laborious.

In order to gain the confidence and willing co-operation of the village families during the nutrition education programme, the first day was used to make the people aware of the purposes of the education programme. Since one of the objectives of the nutrition education programme was to raise kitchen gardens in the families and to provide seeds for those who had already raised them, the home visits were utilised to distribute seeds of brinjal, beetroot, knol-khol and greens. Figure 1 shows a family interested in kitchen gardens.

2. Demonstrations:

In order to urge the people to use sprouted green grams a demonstration was conducted for the ten families with adolescents. During the demonstrations, homemakers were explained the importance of Vitamin C which is supplied by

FIGURE 1.

INTRODUCING KITCHEN GARDEN.

sprouted grams. Another demonstration was given on the absorption method of cooking rice through the use of hay box. The advantages of using the hay box were explained to the members present.

3. Film shows:

Since another objective of the nutrition education programme was to urge the adolescents to consume protein rich foods, film shows were arranged about poultry keeping, to produce eggs and the importance of milk in the diet.

4. Field trips:

The members from the village were taken to the State Agricultural College, which is at a distance of seven miles from the village to see the Agricultural Exhibition, an ideal kitchen garden, and the orchard in which they evinced much interest.

5. Exhibitions:

On the last day of the education programme, a valedictory function was organised. On that occasion, an exhibition was arranged to stress the importance of good nutrition for healthy body and mind.

6. Leaflets:

Leaflets were prepared, as shown in Appendix E using

simple terms in the regional language about the foods needed for good health and the nutrients they provided and distributed to those who could read.

7. Skit:

In order to impress upon the people the importance of good nutrition, a skit was written by the investigator as given in Appendix F, and staged with the help of the school going girls in the village, as seen from Figure 2, during the valedictory function. The importance of different foods needed for good nutrition was thus stressed once more.

The deficiencies in their diets, located during the surveys, were explained to the villagers through a skit when the investigator visited the villagethe first time after the survey. The skit consisted of a summary of the work done in the village during the stay there and the type of foods eaten by them.

8. Songs:

The children of the village were taught songs about good nutrition and its relation to health.

FIGURE 2.

CHILDREN ENACTING THE SKIT.

VII. EVALUATION OF THE NUTRITION EDUCATION PROGRAMME.

Chitambar (1961)[47] quotes Klineberg in defining evaluation as "an effort to learn changes that take place during and after an action programme and what part of the changes can be attributed to the programme" and Moss in saying that evaluation is "measuring performance against a predetermined goal".

Chitambar (1961)[47] lists the objectives of evaluation as:

1. Helping in the understanding and study of the factors which enhance, and those that retard the progress towards the goals set up in the programme.
2. Making workers examine the entire programme in terms of their objectives.
3. Helping workers limit the objectives to those they can actually accomplish.
4. Increasing confidence in the programme both in the workers and in the rural people.
5. Facilitating the presentation of results for public support.

and 6. Providing means for testing methods, approaches and techniques used in the programme.

Evaluation should have definite criteria which have been stated by Chitambar (1961)[47] as:

(a) Clearly defined objectives.

(b) Valid instruments of measurements.

(c) Objectivity.

(d) Reliability.

(e) Accurate evidence of change,

and (f) Practicability.

Objectives of the evaluation:

In order to find out how far the nutrition education programme in Kalappanaickenpalayam had been successful and how far its objectives had been fulfilled, an evaluation was carried out, after an interval of three months. Since the objectives of the programme had aimed at bringing about changes in the knowledge, skills and attitudes of the people, the evidence that were looked for as the outcomes of education programme were, whether or not,

(i) Kitchen gardens were raised, particularly, with greens; (a change in the practices of the people in the selection of foods was expected to include leafy vegetables at least three times a week, whereas previously only one family was using greens daily.)

(ii) People were consuming sprouted green grams as demonstrated;

(iii) Families had changed their methods of cooking rice and used hay box for the purpose;

and (iv) There was increased in the intake of animal foods.

Methods used:

The methods used for the evaluation were:

(a) Individual visits to the families to see the kitchen gardens started.

(b) Weighment of foods consumed, to assess whether or not the quality and quantity of foods consumed by the people have been enhanced, and whether or not they used greens and animal foods.

(c) A questionnaire was given to find out the attitudes of the people towards the introduction of hay box.

FINDINGS OF EVALUATION.

1. Kitchen Gardens:

The evaluation showed that all the eleven families who were supplied seeds have been growing some vegetables along

with greens. Thus, the villagers showed enthusiasm about having kitchen gardens and they asked for more seeds.

2. Nutrient intake of adolescents:

Table VIII gives the average nutrient intake of the adolescents before and after the education programme with details in Appendix G.

TABLE VIII.

AVERAGE INTAKE OF NUTRIENTS BY THE ADOLESCENTS BEFORE AND AFTER THE NUTRITION EDUCATION PROGRAMME.

	Calories.	Protein. Gms.	Calcium. Mgms.	Iron. Mgms.	Vit. A I.U.	Vit. B 1 Mgms.	Vit. B 2 Mgms.	Vit. C Mgms.
Before	1615	41	507	20	777	1.14	0.93	14
After	1733	43	605	16.9	931	1.11	0.91	15

Table VIII reveals that the intakes of all the nutrients are increased except iron, vitamin B_1 and vitamin B_2, though not markedly.

The results of the weighment method conduted in the ten families for three days revealed that changes in the dietary pattern of these families have taken place. From

Appendix 6, it can be observed that out of ten families, surveyed in seven families the intake of protein had increased, due to the inclusion of milk products. The calorie intake has also increased in six families. With regard to the minerals the intake of calcium and iron has not changed, although in some cases, the consumption has increased. The intake of Vitamin A has increased in seven families and this may be again due to the fact that the families have started to include more milk and milk products. The intake of other Vitamins has not changed.

3. Adoption of Hay Box:

With regard to the introduction of hay box, for cooking rice by the absorption method, rice had become suddenly scarce, due to the food crisis. People did not get an enough rice during that period. Therefore, these families had started to use wheat instead of rice and hence did not use the hay box.

4. Use of sprouted green grams:

Two families were found to include the sprouted green grams in their diets.

5. Teaching songs:

The villagers had gained knowledge with regard to good nutrition and its relation to good health. The children remembers the songs and sang them with much much enthusiasm.

VIII. SUMMARY AND CONCLUSION.

A project was conducted in the village Kalappanaickenpalayam and the socio-economic dietary nutritional status of the people were studied. Based on the findings of the data collected, a nutritional education programme was conducted for the families surveyed. The evaluation of the programme was conducted and the improvements in the dietary patterns and food habits were also studied.

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APPENDICES.

APPENDIX A.

VILLAGE SURVEY FORM.

1. Name of village. ..
2. Date. ..
3. Situation. ..
4. Nearest Town ..
   Post Office ..
   Railway Station ..

Panchayat	Block	District	Road connection.

Type of village:

(a) Nucleated.

(b) Bylateral.

4. Population:

Age Range	Number	Men	Women	Children Boys	Children Girls	Total.

5. Caste:

Caste or Community	Number of families

6. Education:

Number of balwadis.

Number of primary schools.

Number of other schools.

Number of literate persons:

Men

Women

Number of school going children.

Number of adult education centres.

7. Number of children in the schools.

Age Range	Class	Number

8. Occupation:

Main	Subsidiary	No.of men employed.	No.of women employed.	Total.

9.
10. Socio-economic data:

(a) Income

Average per capita income:

(b) Sources of Income.

Source	Percentage of families

c. Main Industries:

i.
ii.
iii.
iv.

d. Main Crops.

Crop	Annual production in the village

10. Foods commonly used:

Staple.

Others.

11. Diseases prevalent:

12. Women's role in the community:

Members of Mather Sangams.

Members of Panchayat.

Others.

13. Recreational facilities:

14. Health facilities:

15. General problems:

FAMILY SURVEY FORM.

1. Serial Number of the family.
2. Date:
3. Name of the head of the family.
4. Occupation of head:
5. Mother tongue:
6. Size and composition of the family:

No.	Name of member.	Relationship to the head of the family.	Education.	Age.	Sex.	Occupation.	Income per month.	Vegetarian or non-vegetarian.	Consumption Unit.

7. Annual income of the family through
   (a) Occupation:
   (b) Other sources:
8. Expenditure per month:

Item	Amount Spent
Food	
Clotning	
Shelter	
Transport	
Education	
Entertainment	
Health	
Miscellaneous	

9.
10. Expenditure on food items:

Food Items.	Weekly		Monthly	
	Quantity	Value Rs.nP.	Quantity	Value Rs.nP.
Cereals				
Pulses				
Leafy vegetables				
Roots and Tubers				
Other vegetables				
Spices				
Fruits				
Flesh foods				
Milk & milk products				
Nuts and Oils				
Miscellaneous				

10. Frequency of use:

Foods	Frequency of use			Reason
	Daily	Monthly	Occasionally	
Cereals				
Pulses				
Leafy vegetables				
Roots				
Other vegetables				
Spices				
Fruits				
Milk & Milk products				
Flesh foods				
Nuts & Oils.				

11. Family meal patterns:

Name of the meal.	Contents.	Time of cooking	Time of eating	Menu commonly used

12. Methods employed for cooking:

Foods	Absorption	Boiling	Steaming	Roasting	Frying

13. Preservation of foods:

Foodstuff preserved	Quantity per year.	Name of the preserved item	Reason for preserving	Method of pre-servation.	Method of using pre-served item.

14. Storage of foods:

Foodstuffs	Method of storage	Duration of storage.	Keeping quality.

15. Preparations for special occasion:

Occasion	Special food preparation.	Significance

16. Foods given during special conditions and diseases:

Condition.	Foods / Food preservations		Reasons.
	Specially given	Avoided	
Childhood (below 3 years)			
Pregnancy			
Lactation			
Old age			
Diet in disease:			
Small-pox.			
Jaundice			
Fevers			
Others			

17; Beliefs regarding food:

Belief	Reason

18. Home production of foods:

(a) From vegetable garden.
Amount.

(b) From dairy: Number of cattle.
Quantity of milk/day.
Amount of milk sold.
Amount consumed at home.

(c) From Poultry: Number of layers.
Number of eggs/month.
Number sold.
Reason for selling.
Amount consumed at home.

19., Problems faced by the family.

1. Economic.

2. Health.

3. General.

4. Others.

DIETARY SURVEY FORM.

Purpose: To study the dietary intake and the nutritional status of the adolescent boys and girls in the village of Kalappanayakanpalayam.

1. Serial No. of the family.
2. Date of Survey:
3. Name of the head of the family.
4. Occupation. Income/Month.
5. Address:
   Door No. Street.
6. Mother Tongue.
7. Caste.
8. Size and composition of the family.

No.	Name of member.	Relationship to the head of the family.	Education.	Age.	Sex.	Occupation.	Income per month.	Vegetarian or non-vegetarian.	Consumption Unit.

9. Income from other sources.
   (a)
   (b)
   (c)
10. Total income/month:

11. Expenditure:

Item	Expenditure per month. Rs. nP.
Food	
Clothing	
Shelter	
Transport	
Education	
Entertainment	
Health	
Miscellaneous	

12. Distribution of monthly expenditure on foods:

Foods	Amount bought	Frequency of use	Money spent	Amount produced at home	Cost
1. Cereals:					
Parboiled rice					
Raw rice					
Wheat					
Ragi					
2. Pulses:					
Bengal gram					
Red gram					
Black gram					
3. Leavy vegetables.					
4. Roots and Tubers					
5. Other begetables.					
6. Nuts and seeds.					

(contd.)

7. Fruits.
8. Milk and milk products.
9. Condiments and spices.
10. Fleshy foods.

---

13. Menu during the survey period:

Meals	Cooking Time.	Serving Time.	Food preparations 1	2	3	4	5	6	7
Breakfast									
Lunch									
Tea									
Dinner									
Others									

---

14. Dietary Survey tabulation form:

Foods	Quantities used during 7 days. 1	2	3	4	5	6	7	Foods eaten outside	Total foods used for 7 days.	Food used per Consumption Unit.
1. Cereals:										
Raw rice										
Parboiled rice										
Cholam										
Ragi										
Others										

Foods.	Quantities used during 7 days. 1	2	3	4	5	6	7	Foods eaten outside.	Total foods used for 7 days.	Food used per Consumption Unit.
2. Pulses:										
Bengal gram										
Red Gram										
Black gram										
Green gram										
Horse gram										
Others										
3. Leafy vegetables.										
Agathi										
Amaranth										
Mint										
Orienter										
Drumstick leaves										
Others										
4. Roots & Tubers.										
Beat root										
Onion big										
" small										
Potato										
Carrot										
Radish										
Yam										
Sweet potato										
Others										

Foods.	Quantities used during 7 days. 1 2 3 4 5 6 7	Foods eaten outside.	Total foods used for 7 days.	Food used per Consumption Unit.
5. Other vegetables.				
Ash gourd				
Bitter gourd				
Brinjal				
Beans				
Cluster beans				
Drumstick				
Ladies finger				
Plantain				
Snake gourd				
Sundekai				
Others				
6. Nuts and Seeds.				
7. Fruits.				
Plantain				
Mango				
Banana				
Others				
8. Milk & milk products.				
Cow's milk				
Buffalo's milk.				
Curds				
Butter				
Ghee				

Foods.	Quantities used during 7 days. 1	2	3	4	5	6	7	Foods eaten outside.	Total foods used for 7 days.	Food used per Consumption Unit.
9. Condiments & spices.										

15. Analysis of nutritive values of the average daily food intake per Consumption Unit.

Foods.	Average per C.U.	Calories.	Protein. Mgm.	Calcium. Mgm.	Iron Mgm.	Vit. A. I.U.	Vit. B 1 Mgms.	Vit. B 2 Mgms.	Vit. C. Mgms.
1. Cereals.									
Raw rice									
Parboiled rice.									
Ragi									
Cholam									
Others									
2. Pulses.									
Bengal gram									
Black gram									
Red gram									
Green gram									
Others									
3. Leafy vegetables.									
Agathi									
Amaranth									
Mint									
Drumstick leaves									

Foods.	Average per C.U.	Calo-ries.	Pro-tein. Gms.	Cal-cium. Mgm.	Iron Mgm.	Vit. A I.U.	Vit. B 1 Mgms.	Vit. B 2 Mgms.	Vit. C Mgms.
4. Roots and Tubers.									
Beet root.									
Onion big									
" small									
Potato									
Carrot									
Yam									
Sweet potato									
5. Other vegetables.									
Ash gourd									
Bitter gourd									
Beans									
Brinjal									
Cluster beans									
Drumstick									
Ladies finger									
Plantain									
Snake gourd									
Others									
6. Nuts and Seeds.									
Almond									
Cocoanut									
7. Fruits									
Guava									
Jack									
Tomato									
Melon									
Orange									
Plantain									
Others									

Foods.	Average per C.U.	Calo-ries.	Pro-tein. Gms.	Cal-cium. Mgm.	Iron. Mgm.	Vit. A I.U.	Vit. B 1 Mgms.	Vit. B 2° Mgms.	Vit. C. Mgms.
8. Milk & milk products.									
Cow's milk									
Buffalo's milk.									
Curds									
Ghee									
9. Condiments & spices.									
Tamarind									
Mustard									
Pepper									
Chillies									
Garlic									
Fenugreek									
Others									

16. Comparison of the nutrients with Recommended Allowances:

Nutrients	Recommended Allowances	Provided by diet per Consumption Unit	Remarks
Calories			
Protein			
Calcium			
Iron			
Vitamin A			
Bitamin B_1			
Vitamin B_2			
Vitamin C			

17. Methods employed for cooking:

Foods	Absorption.	Boiling.	Steaming.	Roasting.	Frying.	Others.
Cereals						
Pulses						
Leafy vegetables						
Roots & Tubers						
Other vegetables						
Fruits						
Others.						

18. Special foods given or restricted during adolescence:

Stage	Foods given	Reasons	Foods restricted	Reasons
Boys:				
Attainment of puberty.				
Girls:				
(a) Attainment of puberty.				
(b) Menstruation.				

APPENDIX B.

FREQUENCY OF USE OF VEGETABLES.

Name of Food.	No.of families using		
	Daily	Weekly	Monthly
Amaraths	-	7	2
Agathi	1	10	4
Cabbage	-	7	5
Yams	-	9	4
Brinjals	-	15	8
Onions	10	-	2
Ladies fingers	-	14	15
Plantains	-	2	17
Mangoes	-	-	1
Oranges	-	2	-
Mutton	-	1	20
Eggs	-	6	7
Milk (for coffee)	20	-	-

APPENDIX C.

NUTRIENT INTAKE PER CONSUMPTION UNIT OF THE TEN FAMILIES SURVEYED BEFORE THE NUTRITION EDUCATION PROGRAMME.

Family No.1

Food Stuffs.	Qty. used per C.U. gm.	Calo-ries.	Pro-tein. gm.	Cal-cium mg.	Iron mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	418	1455	26.50	38	16.7	--	0.80	0.40	--
Wheat	37	128	4.30	16	1.8	39	0.20	0.04	--
Black Gram	5	17	1.40	8	.5	3	0.02	0.01	--
Red Gram	42	149	9.40	31	2.4	93	0.18	0.21	--
Onion (small)	8	4	0.10	3	0.1	2	0.07	--	0.01
Potato	5	4	0.18	1	0.1	2	0.06	0.01	0.1
Groundnut Oil	46	414	0.18	--	--	--	--	--	--
Cow's milk	566	370	18.10	843	1.1	849	0.20	1.00	11
Tamarind	9	26	1.50	15	0.9	9	--	0.01	0.3
Chillies	9	22	--	14	0.2	52	0.08	0.04	5.0
Jaggery	8	30	--	6	0.9	--	--	--	--
Total (provided by diet).		2619	61.40	975	24.7	1049	1.61	1.72	16.41

Family No.2

Food Stuffs.	Qty used per C.U. gm	Calories	Protein gm	Calcium mg	Iron mg	Vit A I.U.	Vit B-1 mg	Vit B-2 mg	Vit C mg
Parboiled rice.	272	946	17.40	25	10.8	..	0.57	0.030	..
Rambu	44	157	5.10	114	6.3	97	0.14	0.060	..
Wheat	36	125	4.20	116	1.8	38	0.16	0.070	..
Black gram	6	21	1.40	9	0.5	4	0.02	0.020	..
Red gram	31	110	6.90	23	1.8	68	0.13	0.150	..
Avarai	2	10	0.09	1	0.02	2	0. 001	0.002	..
Cabbage	4	1	0.07	2	0.03	80	0.002	0.001	5
Onion (small)	13	8	0.23	5	0.15	3	0.01	0.06	.3
Brinjal	32	3	0.44	6	0.16	39	0.01	0.03	4
Groundnut Oil	11	99	..	..	..	..	..	..	..
Tamarind	10	28	0.31	16	0.36	10	..	0.007	0.3
Chillies	10	25	1.50	17	1.10	57	0.09	0.04	5
Jaggery	14	54	0.05	11	1.60	..	0.002	..	..
Total		1587	37.69	345	24.62	398	1.135	0.470	14.6

Family No.3

Food Stuffs.	Qty. used per C.U. gm.	Calories.	Protein. gm.	Calcium. mg.	Iron mg.	Vit. A µg. I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	183	666	11.70	18	5.10	..	0.380	0.16	..
Wheat	15	52	1.70	7	0.7	16	0.060	0.010	..
Black Gram	10	34	2.40	15	0.9	6	0.040	0.03	..
Red Gram	25	78	5.70	18	1.4	55	0.110	0.12	..
Onion (small)	15	8	0.27	6	0.2	4	0.010	..	0.3
Brinjal	8	2	0.11	1	0.1	19	0.003	0.01	0.9
Drumstick	3	1	0.07	1	0.2	6	0.001	..	3.6
Oil	11	99	..	..	..	..	..	..	..
Cow's milk	343	269	11.20	511	0.9	514	0.500	0.60	6,8
Tamarind	10	28	0.31	17	1.1	10	..	0.07	0.3
Mutton	6	12	1.10	9	0.2	2	..	0.01	..
Jaggery	13	49	0.05	10	1.5	..	0.003	..	..
Total.		1298	34.69	613	13.3	623	1.107	1.01	11.9

Family No.4

Food Stuffs.	Qty. used per C.U. gm.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	253	900	16.1	25	7.0	..	0.050	0.20	..
Wheat	31	107	3.6	15	9.6	33	0.130	0.03	..
Black gram	24	83	5.7	36	2.2	15	0.090	0.08	..
Red Gram	38	135	7.8	27	2.2	84	0.170	0.19	..
Onion (small)	8	4	0.1	3	0.1	2	0.010	0.001	0.1
Brinjal	5	1	0.1	1	0.1	7	0.002	0.005	0.6
Drumstick	3	1	0.1	1	0.1	6	0.001	0.002	3.6
Oil	8	72	..	..	..	..	..	..	..
Cow's milk	172	105	5.5	256	0.3	258	0.080	0.30	3.4
Tamarind	13	1	0.1	22	1.4	13	..	0.009	0.4
Chillies	3	7	0.1	5	0.1	17	0.020	0.010 ~~0.009~~	1.5
Jaggery	14	53	0.1	11	1.6	..	0.002	..	..
Total.		1469	~~39.2~~ 39.3	~~247~~ 402	24.7	435	0.555	0.827	9.6

Family No.5

Food Stuffs.	Qty. used per C.U. gm.	Calories.	Protein. gm.	Calcium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	249	867	15.9	22	10.0	..	0.520	0.22	..
Wheat	25	86	2.9	12	2.8	12	0.120	0.07	..
Black gram	34	118	8.1	52	3.1	22	0.140	0.12	..
Red gram	22	78	4.9	16	1.2	48	0.080	0.12	..
Onion (small)	10	6	0.2	4	0.1	3	0.008	..	0.2
Brinjal	8	2	0.1	..	0.4	10	0.003	0.02	1.2
Oil	20	180	..	..	..	..	..	..	..
Cow's milk	270	180	8.6	382	0.5	405	0.100	0.40	5.4
Tamarind	8	18	0.2	13	0.8	8	..	0.01	0.2
Chillies	10	25	1.5	16	0.2	57	0.090	0.04	5.0
Jaggery	11	47	0.1	10	1.4	..	0.002	..	..
Total.		1607	42.5	527	20.5	565	1.063	1.00	12.0

Family No.6

Food Stuffs.	Qty. used per C.U. gm.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron. mg.	Vit. A I.U.	Vit. B1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	55	191	3.5	4	0.3	..	0.11	0.04	..
Cholam	99	345	10.2	24	5.7	78	0.34	0.20	..
Thinai	109	361	13.4	34	14.0	59	0.64	0.08	..
Horse Gram	21	67	4.6	60	1.7	25	0.08	0.04	..
Amaranth	10	5	0.4	39	2.5	920	0.003	0.01	9.9
Brinjal	12	13	0.2	2	0.1	15	0.004	0.01	1.4
Oil	7	63	..	..	..	..	..	..	..
Tamarind	10	28	0.3	17	1.9	10	..	0.007	0.3
Chillies	2	5	0.1	3	0.1	11	0.018	0.008	1.0
Jaggery	10	38	..	8	1.0	..	0.002	..	..
Onion Small	8	5	0.1	3	0.1	2	0.006	0.04	0.2
Potato	3	3	..	..	..	1	0.003	0.001	0.5
Yam	13	14	0.2	8	0.2	17	0.009	..	..
Total.		1138	33.9	202	27.6	1138	1.215	0.436	13.3

Family No.7

Food Stuffs.	Qty. used per C.U. gm.	Calories.	Protein. gm.	Calcium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	271	943	17.3	24	10.8	..	0.56	0.24	..
Cholam	79	276	8.2	19	4.5	..	0.29	0.22	..
Wheat	26	90	3.1	10	1.2	28	0.11	0.03	..
Black gram	7	20	1.4	11	0.6	4	0.02	0.02	..
Red gram	25	88	5.5	18	1.5	55	0.09	0.11	..
Amaranth	10	2	0.4	38	2.4	874	0.002	0.009	9.4
Onion small	12	7	0.2	5	1.4	3	0.009	0.05	0.2
Brinjal	3	1	..	1	..	4	0.001	0.003	0.4
Drumstick	3	1	0.1	1	..	5	0.001	0.005	3.0
Oil	8	72	..	..	..	..	..	..	..
Cow's milk	128	84	4.0	192	0.2	192	0.06	0.2	2.5
Tamarind	8	22	2.4	13	0.9	8	..	0.005	0.20
Chillies	5	13	0.7	8	0.1	29	0.04	0.002	2.5
Jaggery	9	34	..	7	1	..	0.001	..	..
Total.		1653	43.0	347	24.9	1202	1.184	0.894	18.20

Family No.8

Food Stuffs.	Qty. used per C.u. gm.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	137	476	8.7	12	0.50	..	0.28	0.12	..
Wheat	23	79	2.6	9	1.10	25	0.11	0.03	..
Black gram	9	31	2.1	14	1.50	5	00.10	0.09	..
Red gram	26	92	5.7	19	0.13	57	0.11	0.13	..
Drumstick	3	1	0.1	2	0.12	5	0.001	0.005	3.0
Onion small	10	6	0.2	4	0.04	2	0.008	0.001	..
Yam	4	3	..	2	0.07	4	0.002	..	..
Brinjal	4	1	0.1	1	..	5	0.001	0.004	0.5
Oil	10	90	..	..	1.20	..	..	..	..
Cow's milk	614	411	19.6	914	1.20	921	0.300	1.100	12.0
Tamarind	5	14	0.2	8	0.60	5	..	0.003	0.20
Chillies	1	2	0.1	1	0.02	5	0.009	0.004	0.50
Jaggery	13	50	0.1	10	1.40	..	0.002	..	..
Total.		1256	39.5	996	6.58	1034	0.923	1.487	16.2

Family No.9

Food Stuffs.	Qty. used per C.U. gm.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	360	1252	23.0	32	0.4	..	0.75	0.320	..
Cholam	27	94	2.8	7	1.3	21	0.09	0.070	..
Wheat	35	121	4.1	15	1.7	38	0.15	0.040	..
Black gram	7	24	1.4	10	0.6	4	0.02	0.020	..
Red gram	33	117	7.3	24	1.9	72	0.14	0.160	..
Amaranth	4	2	0.1	15	1.2	368	0.001	0.003	2.9
Onion small	14	8	0.3	6	0.2	4	0.001	0.070	0.3
Brinjal	21	5	0.3	3	0.1	26	0.008	0.020	1.3
Cluster Beans	1	1	..	1	..	3	0.009	0.001	0.5
Oil	12	108	..	..	..	..	..	..	..
Cow's milk	128	84	4.1	192	0.2	192	0.060	0.200	0.3
Tamarind	9	25	0.3	15	1.0	9	-.	0.006	0.3
Chillies	2	5	0.3	3	0.1	11	0.010	0.008	1.0
Jaggery	11	42	..	8	1.2	..	0.002	..	..
Total.		1888	44.0	331	9.9	748	1.240	0.918	6.6

Family No.10

Food Stuffs.	Qty. used per C.U. gm.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	185	644	11.8	17	7.4	..	0.38	0.16	..
Wheat	60	207	7.0	24	6.9	64	0.27	0.07	..
Black gram	6	21	1.4	9	0.5	4	0.02	0.03	..
Red gram	26	92	5.7	19	1.5	57	0.11	0.13	..
Onion Big	5	2	0.1	9	..	..	0.004	0.001	1
Onion Small	7	3	0.1	..	0.1	2	0.005	0.001	..
Drumstick	8	20	0.2	2	0.4	15	0.004	0.005	10
Potato	17	16	00.3	2	0.1	7	0.010	0.001	3
Yam	2	2	..	1	..	3	0.001	..	..
Oil	36	324	..	..	..	..	..	..	..
Cow's milk	408	273	13.0	607	0.8	612	0.200	0.700	8
Tamarind	4	11	0.1	..	0.4	4	..	0.002	..
Chillies	2	5	0.1	3	..	11	0.010	0.008	1
Jaggery	8	30	..	6	0.9	..	0.001	..	..
Total.		1650	39.8	699	19.0	779	1.015	1.108	23

APPENDIX D.

THE OBJECTIVES FOR THE NUTRITION EDUCATION PROGRAMME.

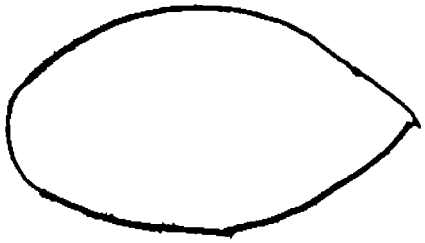
Problems.	Facts supporting.	Objectives.
Low intake of iron and vitamin A in the diets of ten families.	In the 23 families surveyed only one family used greens daily. 7 families use Amarath o once a week and the rest of the families do not use greens at all.	Out of 23 families, 2 have already got kitchen gardens. To raise kitchen gardens specially for greens. In the case of families whre there is place to raise kitchen gardens, to give seeds of the greens to enable them use greens daily.
Low intake of vitamin C.	The vitamin C intake was from 6 to 15 mgms.	To urge people in these families to use sprouted green which is rich in vitamin C.
Loss of nutrients specially vitamin B complex due to the excess water method of cooking rice.	All the families use rice daily. Out of 23 families, 10 families use the absorption method of cooking. The rest of homemakers use only excess water method of cooking rice.	Toteach the absorption method of cooking rice. To introduce hay box in the families where they do not have.

(contd.)

Problems.	Facts supporting.	Objectives.
Though the protein intake of the adolescent boys and girls are nearly adequate, it is mainly of vegetable origin. Animal protein is not present. Except in one family, the other families do not get adequate amount of protein.	Only one family uses mutton once a week. In ten families, 2 have got poultry. The rest of them do not use eggs nor do they consume mutton once a week.	To urge the adolescents girls and the home makers to consume eggs from their poultry. To inform them the importance of multi-purpose food ~~which~~ as source of protein.

APPENDIX E

புரத சத்துள்ள பொருட்கள்



முட்டை

மீன்

பால்

மாமிசம்

இவை உடல் வளர்ச்சி-
-யும் தேக ஆரோக்கியமும்
உண்டாகும்.

APPENDIX F.

S K I T.

Kannamma is a ten year old girl who is always reluctant to take any type of food. As usual, one day she refuses to take proper food, when her mother compels her to eat, telling her, how important it is to have a healthy body and mind to run about and play. But Kannamma does not listen. She gets a head ache. At that time, the different nutrients namely carbohydrates, protein, fat, vitamin A, C, and others come to her in human forms and tell her, their importance in the diet. Each of them explains to her how it is important for her to have them in the diet in order to lead a happy life. The young girl gets convinced about this and starts taking all the nutrients in proper proportion in the diet thereafter.

APPENDIX G.

NUTRIENT INTAKE PER CONSUMPTION UNIT OF THE TEN FAMILIES SURVEYED AFTER THE NUTRITION EDUCATION PROGRAMME.

Family No.1

Food Stuffs.	Qty. used per C.U. gms.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	507	1749	34.4	51	15.7	..	0.4	0.15	..
Wheat	42	145	6.0	17	2.06	45	0.189	0.05	..
Black gram	13	45	3.0	20	1.10	8	0.050	0.04	..
Red gram	44	16	9.8	32	2.50	17	0.050	0.22	..
Potato	13	13	..	1	0.09	5	0.010	0.001	2.2
Ridge gourd	15	2	0.1	6	0.24	8	0.100	0.001	0.7
Pumpkin	13	3	0.2	2	0.10	11	0.007	0.005	0.2
Oil	38	342	..	..	..	..	..	..	..
Tomato	5	1	..	2	0.02	29	0.006	0.003	1.3
Milk	566	667	24.0	1188	1.10	905	0.280	1.000	11.3
Tamarind	9	25	..	15	0.90	9	..	0.006	0.3
Jaggery	8	30	..	6.	0.90	..	0.001	..	..
Total.		3038	77.5	1340	24.71	1037	1.093	1.476	16

Family No.2

Food Stuffs.	Qty. used per C.U. gms.	Calo-ries.	Pro-tein. gms.	Cal-cium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	171	660	11.6	17	5.3	..	0.15	0.05	..
Wheat	33	114	3.8	13	1.6	35	0.14	0.03	..
Black gram	10	34	2.4	15	0.9	6	0.04	0.03	..
Red gram	15	53	0.2	6	0.2	4	0.01	0.003	0.3
Onion small	6	3	..	2	0.1	2	0.004	0.001	0.1
Ridge gourd	15	2	0.1	6	0.2	8	0.010	0.001	0.8
Oil	7	63	..	..	..	..	..	..	..
Milk	100	118	4.3	210	0.2	160	0.040	0.100	3
Jaggery	10	..	..	1	1.1	..	0.020	..	..
Total.		1047	22.4	270	9.6	215	0.414	0.215	4.2

Family No.3

Food Stuffs.	Qty. used per C.U. gms.	Calories.	Protein. gm.	Calcium. mgm.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	205	707	13.9	21	6.3	..	0.18	0.060	..
Wheat	36	20	4.2	15	1.7	38	0.16	0.040	..
Black gram	7	24	1.6	11	0.6	4	0.02	0.020	..
Red gram	20	71	4.4	14	1.1	44	0.09	0.160	..
Onion (small)	9	5	0.2	4	0.1	2	0.01	0.001	0.2
Ridge gourd	24	4	0.1	6	0.3	10	0.01	0.001	0.9
Oil	8	72	..	..	..	..	..	..	..
Milk	328	387	14.1	688	0.7	524	0.13	3.200	9.8
Beans (broad)	29	13	1.3	15	0.4	5	0.02	..	3.4
Jaggery	15	57	0.1	12	1.7	..	..	..	..
Total.		1360	39.9	786	12.9	627	0.64	3.482	14.3

Family No.4

Food Stuffs.	Qty. used per C.U. gms.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron. mg.	Vit. A mg.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	126	438	8.5	12	3.9	..	0.11	0.03	..
Cholam	144	502	14.9	36	8.3	113	0.53	0.40	..
Wheat	30	103	3.5	12	1.4	32	0.13	0.03	..
Black gram	9	31	2.1	14	0.8	6	0.03	0.03	..
Red gram	40	142	8.9	29	2.3	88	0.18	0.20	..
Onion small	18	10	0.3	7	0.2	5	0.01	0.003	0.4
Brinjal	9	2	0.1	2	0.1	11	0.003	0.009	1.1
Drumstick	12	3	0.3	4	0.6	22	0.006	0.001	14
Oil	50	450	..	..	..	..	..	..	..
Milk	173	204	7.4	363	0.4	276	0.060	0.100	5
Tamarind	15	42	0.5	25	1.6	15	..	0.010	0.5
Jaggery	19	72	0.7	15	2.1	..	0.003	..	..
Total.		1999	47.2	519	21.7	568	1.062	0.823	21.0

Family No.5

Food Stuffs.	Qty. used per C.U. gms.	Calories.	Protein. gm.	Calcium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	255	783 2026	14.4	20	0.9	..	0.27	0.20	..
Cholam	80	279	8.3	20	4.6	63	0.25	0.19	..
Wheat	70	242	8.2	18	4.0	75	0.31	0.08	..
Black gram	11	38	2.6	16	1.0	7	0.04	0.04	..
Red gram	32	113	7.1	23	1.8	70	0.14	0.16	..
Onion small	13	8	0.2	5	0.2	3	0.10	0.002	0.3
Yam	37	29	0.4	19	0.2	48	0.02	..	...
Pumpking	20	5	0.3	2	0.1	17	0.01	0.008	0.4
Oil	18	162	..	..	..	..	..	..	..
Milk	260	306	11.1	546	0.5	416	0.10	0.20	7.8
Red chillies	10	24	1.5	3	0.1	57	0.09	0.04	5
Jaggery	10	38	0.4	8	1.1	..	0.002	..	..
Total.		2028	54.5	680	14.5	756	1.332	0.92	13.5

Family No.6

Food Stuffs.	Qty. used per C.U. gms.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	103	355	7.0	10	3.1	..	0.09	0.03	..
Cholam	92	321	9.5	26	5.9	81	0.30	0.28	..
Wheat	96	332	11.3	39	4.7	103	0.43	0.11	..
Horse gram	16	51	3.5	45	1.3	19	0.05	0.023	0.2
Amaranth	22	10	0.9	87	5.6	2024	0.006	0.02	21
Onion small	8	4	0.1	3	0.1	2	0.006	0.001	..
Oil	40	360	..	..	..	..	..	..	..
Jaggery	11	42	0.04	9	1.2	..	0.002	..	..
Total.		1475	32.34	219	21.9	2229	0.884	0.481	21.2

Family No.7

Food Stuffs.	Qty. used per C.U. gms.	Calo-ries.	Pro-tein. gm.	Cal-cium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	89	310	5.7	8	3.5	..	0.18	0.07	..
Cholam	141	482	14.6	35	8.1	97	0.52	0.39	..
Wheat	67	232	7.9	27	3.2	72	0.30	0.08	..
Black gram	8	27	1.9	12	0.7	5	0.03	0.029	..
Red gram	29	103	6.4	21	1.7	64	0.13	0.14	..
Amaranth	13	5	0.5	51	0.5	1196	0.003	0.01	12.8
Onion small	24	14	0.4	10	0.3	6	0.01	0.004	0.5
Groundnut Oil	15	135	..	..	..	..	..	..	..
Milk	172	202	7.3	361	0.3	275	0.066	0.11	5.1.
Jaggery	10	38	..	8	1.7	..	0.002	..	..
Total.		1548	44.7	533	20.0	1715	1.241	0.833	18.4

Family No.8

Food Stuffs.	Qty. used per C.U. gms.	Calories.	Protein. gm.	Calcium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	110	382	7.0	10	4.40	..	0.23	0.09	..
Wheat	78	268	9.1	32	3.70	84	0.34	0.09	..
Black gram	7	25	1.6	10	0.63	4	0.03	0.02	..
Red gram	30	106	6.6	2	1.70	66	0.13	0.15	..
Onion bg	6	3	0.1	2	0.06	1	0.004	0.001	0.1
Bitter gourd	3	1	0.1	1	0.06	7	0.002	0.003	2.9
Ridge gourd	9	2	..	4	0.14	5	0.006	0.001	0.5
Brinjal	7	1	0.1	1	0.06	8	0.002	0.007	0.8
Ladies finger	3	1	0.1	2	0.04	3	0.002	0.003	0.4
Oil	6	54	..	..	..	..	..	..	..
Milk	149	100	4.8	222	0.29	223	0.01	0.26	Ø 3
Butter milk	22	3	..	4	0.01	..	..	..	..
Red Chillies	5	12	0.7	1	0.06	28	0.040	0.020	2.5
Jaggery	9	31	..	7	1.00	..	0.001	0...	..
Total.		1489	30.2	298	12.15	429	0.357	0.645	10.8

Family No.9

Food Stuffs.	Qty. used per C.U. gms.	Calories.	Protein. gm.	Calcium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	184	840	11.8	17	7.4	..	0.38	0.16	..
Wheat	120	415	13.1	49	5.8	129	0.54	0.14	..
Black gram	10	34	2.4	15	0.9	6	0.04	0.03	..
Red gram	33	117	7.3	24	1.9	26	0.12	0.09	..
Onion small	16	9	0.2	6	0.1	4	0.01	0.003	0.3
Brinjal	13	3	0.2	2	0.1	16	0.005	0.010	1.5
Oil	10	90	..	..	..	..	..	..	..
Milk	130	87	5.5	273	0.2	208	0.005	0.010	0.3
Jaggery	11	42	..	8	1.2	63	0.100	0.040	5.5
Total.		1637	40.5	394	17.6	452	1.20	0.483	7.6

Family No.10

Food Stuffs.	Qty. used per C.U. gms.	Calories.	Protein. gm.	Calcium. mg.	Iron. mg.	Vit. A I.U.	Vit. B 1 mg.	Vit. B 2 mg.	Vit. C mg.
Parboiled Rice	140	487	9.0	14	4.3	..	0.12	0.04	..
Cholam	70	244	7.2	17	4.0	55	0.32	0.19	..
Wheat	32	111	3.7	13	1.5	34	0.14	0.03	..
Black gram	27	93	6.4	41	2.4	17	0.11	0.09	..
Amaranth	14	6	0.5	55	0.5	1288	0.004	0.001	3.8
Onion small	9	5	0.1	4	0.1	2	0.001	0.001	0.1
Ridge gourd	4	1	0.1	7	0.3	9	0.010	0.001	0.9
Pumpkin	3	1	0.1	..	..	3	0.001	0.007	0.1
Oil	40	360	..	..	..	..	..	..	..
Milk	400	472	17.2	840	0.8	640	0.160	0.400	Ø/12
Jaggery	8	30	..	6	0.9	..	0.001	..	..
Total.		1819	44.31	997	14.8	2048	0.859	0.760	16.9