EVOLVING THE CRITERIA AND A STANDARD SCHEDULE FOR THE EVALUATION OF PRE-SCHOOL FEEDING PROGRAMME

By

BANUMATHI, P

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INTRODUCTION

Life is the noblest gift of God and health is one of its greatest blessings. That is why Health is considered as Wealth. "Good Nutrition" is an important component of Health (Devadas 1975).

Nutrition is necessary for all, from the most exalted scientist to the humblest foetus, from the contractor feeding an army to the solitor spinster, from the over developed government to the emaciated and underdeveloped starvelin (Williams, 1973).

Childhood is the most important period in man's life. The Prime Minister of India, Srimathi Indra Gandhi (1980) points out that, our century is century of the child. Good nutrition in childhood and throughout the life span is of paramount importance in fostering the physical, mental, emotional and social growth of population (Devadas et al 1973).

Sheshadri (1978) states that children below 60 months constitute 15 per cent of the population in India, as against 10 per cent of in the developed countries. The results of Mc Cord and Kielrann (1978) referred that children less than one year old have an increased risk if they are below 60 per cent of standard weight for age, but above one year there is no increased risk until they are below 70 per cent of standard weight. Thus by this criterion what is

significant malnutrition at one age is not significant at another age. According to Devadas (1977) and Chandrasekhar (1979) fifty per cent of the pre-school population, especially in the rural areas suffer from under nutrition and malnutrition.

Chronic and severe malnutrition in childhood increases the chances of children becoming poor readers and poor writers (Cravioto et al, 1971). These, in turn may lead to defects in neuro-integrative functioning, school failure and subsequent sub-normal adaptive abilities (Bhansali et al, 1979). Malnutrition lowers a community resistance to disease resulting in higher morbidity which has extensive social consequences (Devadas, 1972 and Sukhatme, 1979).

The main causes for malnutrition are poverty, poor socio-economic status, inadequate food intake, ignorance, false believes, traditions, caste, poor living and recreational facilities and family food habits. (Birch, 1972; Gopalan, 1977; Scrimshaw, 1978; Devadas et al, 1979 and Food and Agricultural Organisation (FAO), 1980).

Protecting the children, developing the abilities and guiding their character are the vital tasks of the

society. According to Rajagopalan (1974) feeding the children of different ages adequately will reduce the morbidity and mortality rates. The objectives of feeding programmes are usually multiple being non-nutritional and nutritional (Singh et al 1978). Devadas et al (1975 and 1978) stresses that the nutritional feeding programme should comprise of nutrition and health education, feeding the target groups and evaluation. The pre-school feeding programmes, should have local feeds, local participation, good organisation and integration with health services (Tara Gopaladas, 1978).

The main feeding programmes launched in the country under the auspices of the central and state Governments and Voluntary agencies are Special Nutrition Programme, Applied Nutrition Programme, Composite Nutrition Programme, Demonstration Feeding, Family and Child Welfare Programme, Children Feeding through Balwadies and Mid-day Meals Programme (Husaini and Darwin 1981).

Among these, the Balwadi feeding programme is an effective tool to reach nutrition for pre-school children. It helps to develop food habits, social living and hormony. The Balwadi feeding programme not only looks after the inadequacies in their diet but also the deficiencies in the personal behaviour and character formation of children on collective basis (Gopalan, 1972 and Pondy, 1972).

A huge sum of money is being spent through these feeding programmes but still the impact of these programmes have not been evaluated extensively. The systematic evaluation of the feeding programme alone can reveal the beneficial effects of the programme, existing situation and suggestions for the further improvement, of the programme (Devadas et al 1971). For any systematic evaluation on a larger scale standardised criteria schedules are very essential. However no effort has been made so far to standardise the criteria and evolve schedules for evaluating the feeding programmes. Hence the present study is an effort in that direction. This study aims at

a) Evolving a standard criteria for the evaluation of pre-school feeding programmes and
b) Develop a standard schedule for the evaluation of feeding programmes through testing in a few selected feeding centres around Coimbatore.

II REVIEW OF LITERATURE

The literature for the study entitled, "Evolving the criteria and a standard schedule for the evaluation of pre-school feeding programmes" is reviewed under the following headings:

A. Prevalence of malnutrition among pre-school children in India

B. Feeding programmes for pre-school children in operation in Tamil Nadu and

C. Need for evaluation of feeding programmes

A. Prevalence of malnutrition among pre-school children in India

Malnutrition is a serious health hazard for two thirds of the world's children and it is likely to hinder their growth and development (Devadas, 1978). Malnutrition affects adversely the growth potential of a nation and it is an abstacle to national development (Gopalan and Vijayaraghavan, 1971). Malnutrition is a proven killer of young children on a horandus scale which represents a severe economic loss to society, (Gopalan, 1978; Devadas, 1978 and Reddy 1979).

Futrel et al (1971), National Institute of Nutrition (1970), Scrimshaw et al (1978), Barooah (1979), Narasinga Rao (1979), Pellet et al 1980, 1981) and Allen (1981)

have enumerated the factors leading to malnutrition as poverty, faulty habits and beliefs, large family size, infection and infestations, illiteracy, failure of breast feeding, lack of health and medical services and lack of nutrition knowledge of mothers.

Briers et al (1975) found evidence that episodes of chronic malnutrition during the first year or two of life may lead to impaired ability to grow in height, resulting in relatively short stature after puberty. Mccardy (1979) pointed out, that inadequate nutrition during the three to three and a half years of life, when rate of growth is normally maximal, will lead to stunting. A study is normally by Mexican B parediatrician Mecance (1971) and Myron Winick (1981) demonstrated that the earlier in life the malnutrition occur, the more severed the physical and mental growth failure and the more likely it is to be permanent.

In a prosperous community, children with height and weight below the norms for age and sex are likely to be well nourished (Sandstead et al (1971). However in economically disadvantaged countries, somatic growth at levels below the norm may be mainly associated with poverty and malnutrition (Goldstein, 1971).

The main causes given by Ball meg, (1972) and Balagopal Raju et al (1970) for morbidity and mortality are malnutrition, as a primary or secondary cause to some illness or other and acute and chronic infections due to lowered resistance as a result of malnutrition and poor environmental hygiene. Nearly half of the children die in India before they reach adulthood. The mortality among pre-school children in India is more than thirty times that of the technologically developed countries,

U S A	1	to	5/1000
U K	1	to	5/1000
Japan	1	to	5/1000
Ceylon	1	to	30/1000
India	21	to	35/1000

A study by Sunderlal and Madan (1979) in slum areas of Rohtak city indicated that severe (Grade III and IV) malnutrition prevailed to the extent of 14 ₊5 per centage, grade II, 28.5 percentage and grade I amongset 30 percentage of pre-school children. Kamaraj and Krishnaswamy (1977) reported that 14.6 percentage of the pre-school children remained in grades III and II malnutrition and 31.5 percentage of children manifeasted grade I malnutrition.

Morbidity among pre-school children is an important index of the health status of a community (Sharma et al 1978

and Bhansali et al 1979). Malnutrition, diarrohea and enteritis contribute 95.7 per cent of morbidity and mortality among the children. More than 85 per cent of the illness among children examined were due to deficiencies of nutrients (51.7%), diseases of the lymphatic system,(10.3%), respiratory system, (10.1%), eye, (7.1%) and dental diseases (6.6%). The mortality rate observed was 957,9/1000. Amongest the nutritional disorders 56.8 per cent, 52.42 per cent 38.93 per cent, 34.57 per cent and 15.70 per cent of children had vitamin A deficiency, anemia, vitamin D deficiency, nutritional marasmus and riboflavin deficiency respectively (Bhansali et al, 1977).

A study conducted by Gopalan et al (1974) showed that the percentage prevalence of kwashiorkar for all the age groups as judged by the presence of clinical oedema, was about1.0 per cent. The peak prevalence was between two to three years except in Delhi and Bombay, where the peak prevalence was observed between three to four years.

Another study by Phadke et al (1970) revealed that approximately 12 per cent of the pre-school children, examined had protein calorie malnutrition. About 10 per cent had vitamin A deficiency and about five per cent had evidence of rickets.

There has been a recent increase in interest and concern for vitamin A deficiency as a major cause of blindness in several parts of the world (Oomen, 1974 and Van Veen, 1974). In the year 1976, WHO estimated the prevalence of vitamin A deficiency in preschool children to be about three to eight per cent and in school going children to be about 10 to 15 per cent (Cravioto and Delicardie 1976).

A recent estimates showed that in India atleast 2,50,000 people are blind from xeropthalmia / keratomalacia (WHO, 1979). A high prevalence of xerophthalmia among six yearsold children was noticed in rural children. Among them 12.5 per cent had developed bitot's spots, when their serum vitamin A level was 10 to 15 mg/100 ml (Devadas and Saroja, 1980). It was evident from this study that the males are more susceptable to xerophthalmia (1-3 years boys 5.6% girls 2.6% and 4-6 years boys 9% girls 2.5%) (Mohanram et al, 1977).

Anaemia of nutritional origin has a global distibution constitutes one of the major public health problem throughout the world (Oomen, 1980). Though anaemia occurs in all sections of the population it occurs much more frequently among women, particularly pregnant women and pre-school children (Mejia et al, 1977). A countrywide

survey to determine the extent of the problem showed that 50 per cent of the children in the 1-3 year age group, belonging to rural families, of the poor socioeconomic group were anaemic, while 34 per cent of the older age group of three to five years had anaemia (WHO, 1974). Magaloblastic anaemia has been reported in as high as 40 per cent of such children in one area, and less than 50 per cent in another, (Gopalan - C, 1971).

B. Feeding programmes for the Pre-school children in operation in Tamil Nadu

To meet the nutritional deficiencies among prescholers, especially those belonging to the lower economic strata the Government of India has started several feeding Programmes (Swaminathan, 1974; Yaro Gandra, 1976 and Gopalan, 1979). Supplementary feeding programmes have focused attention mainly on the improvment in nutritional status of the beneficiaries (Swaminathan, 1979 and Devadas et al, 1971 and Emmons et al, 1972).

The fedding programmes in operation in Tamil Nadu are as follows:

1. Special Nutrition Programme
2. Pre-school feeding programme
3. Applied Nutrition Programme
4. Modified Special Nutrition Programme

5. Special programme for pre-schoolers (Kushandaigal Kappagam)
6. CARE Programme through Health Department
7. Integrated Child Development Services
8. Nutrition to children through aided Balwadi and Day Care Centres.

The pattern of operation of the programmes may differ from state to state. The non-governmental organisations like CARE and CRS have also joined the efforts of the Government in some of the states by providing food to various feeding programme (Margaret Cameron and Ingue Half Vander 1976).

1. Special Nutrition Programme

This programme, launched in November 1970 by the State Department of Social Welfare is 100 per cent Central Government sponsored and is in operation in the urban slums and in tribal areas. This programme is extended to 1,57,629 children (Devadas, 1972 and Natarajan, 1973). The nutritional supplements consist of 300 calories and 10 to 15 gms of protein for children and 500 calories and 25 gms of protein for pregnant women and nursing mothers (Natarajan and Panicker, 1973)

2. Pre-school feeding Programme

The pre-school feeding programme was started by the state Department of Social Welfare with assistance, from CARE.

Nearly 1,88,370 pre-school children, 2,24,910 pregnant mothers and 34,540 nursing mothers are the beneficiaries, supplied with Balahar/bulgar wheat (80 gms/day/beneficiary), and salad oil (7 gm/beneficiary / day) for 300 days in the year, (NIN 1973).

3. Applied Nutrition Programme

Applied Nutrition Programme was launched in the year 1962-63 with the aim of raising the levels of nutrition of local populations, particularly mothers and children in rural areas. This programme covers 27,780, 4 to 11 years old children, pregnant and lactating mothers, supplied with SFB and CSM (about 80 gms / beneficiary/ day) and salad oil, (7 gm/beneficiary/ day), (Natarajan and Panicker, 1973).

4. Modified Special Nutrition Programme

The special nutrition programme was modified in 1976 by the State Department of Social Welfare. The beneficiaries under this programme are supplied with Balahar on a take-home basis at the rate of 700 gms/week/beneficiary, the supply being made once in a week. Through these centres nearly 1,30,000 pre-school children, pregnant and lactating mothers are covered,

5. Special programme for Pre-schoolers (Kushandaigal Kappagam)

This programme provides one supplementary meal to Balwadi children of 2½ to 5 years of age, and also to non-Balwadi children of the same age, and expectant and nursing mothers. The programme is under the control of the State Departments of Rural Development and local administration and Social Welfare (ICMR, 1970).

The programme is in force in the rural areas since 1972. The programme operates in totally 1,298 centres of the state. These centres cover nearly 88,200 pre-school children, expectant and nursing mothers, with a supply of Bulgar wheat (80 gms/ beneficiary / day and 7 gm salad oil, (Praphad Rao, 1977).

6. CARE programme through Health Department

Under this programme, totally 3,046 centres cover nearly 1,05,050 pre-school children, expectant and nursing mothers, who are supplied with bulgar wheat/balahar or CSM (80 gm / beneficiary / day) and salad oil (7 gm/beneficiary/ day) for 300 days in a year (C A R E 1974).

7. Integrated Child Development Services

The ICDS was launched in 1975 in collabaration with and full assistance from the Government of India, Ministry of

Education and Social Welfare in all the States of the Indian Union (Nutrition Review, 1978). In Tamil Nadu the ICDS is managed by the State Department of Social Welfare (Rajagopalan, 1973). Through this programme nearly 1,400 pre-school children expectant and nursing mothers are supplied with soaked gram (40 gms/ beneficiary/ day) and a seasonal fruit (8 gm/ beneficiary/ day) (Rameshwar Sarma, 1974).

8. Nutrition to children through aided Balwadies and day care centres

The programme is sponsored by the State Social Welfare Board since 1971 - 72 covering 137 balwadies with 4110 to 6650 pre-school children. Feeding is carried out for 300 days in a year, supplied with rice/uppuma/pongal (about 80 gms/beneficiary/day). The diet is so planned as to provide 300 calories and 15 gms of protein (Devadas, 1976).

All these feeding programmes in general aim at comprehensive use of indigenous foods, local participation, good organisation and integration with other health educational services (Srikantia, 1973).

C. Need for evaluation of feeding programmes

Evaluation is a necessary component of any nutrition programme (Zeilten, 1977 and Allen Berg, 1981). Evaluation is a working tool which makes it possible to judge what has

been accomplished and to draw the consequences (U S D A, 1979). Evaluation uses a mixture of value judgements and statistics and data which are defined when the training programme is in preparation and are obtained in the course of supervisory visits (Villod, 1981).

To evaluate means to appraise carefully, that it is to judge, measure or estimate with care, the value, goodness or position of something (Milner, 1976). Evaluation is a recent scientific concept and more comprehensive than mere measurements (Bhatia, 1977). Evaluation is not just a testing programme. Tests are but one of the many different techniques (such as observation, checklists, questionnaires, interviews etc) that may contribute to the total evaluation of programme (Greene, Harry, 1977). Evaluation serves as a rational method for programme monitaring and development (Martin, 1977).

According to Bradfield et al (1977) the process of evaluation involves the following steps:

i) Formation of the objectives of programme

ii) Imparting learning experiences in accordance with the objectives

iii) Devising tools of evaluation in accordance with the objectives

iv) Arriving at results by using the above tools

v) Interpretation of the results and

vi) Modifications to be suggested

Evaluation is a process of arriving at a considered judgement, and essential to planning and implementing programmes (Hotzel, 1966).

The methods and procedures for obtaining the data for evaluation include; analysis and statistics - health, agriculture, trade and commerce, employment, interviewing and visits, records and reports, observations of markets, eating places, changes in attitudes and food practices, taking of anthreprometric, dietary and clinical data, personnel and member of the population served (PAHO/WHO, 1967). Fundamentally, the purpose of programme is the focal point in evaluation; to achieve the purpose, specific objectives must be set; to attain the objectives definite goals must be reached (Devadas, 1972).

In one of the evaluation of nutrition education for pre-school children, Devadas et al (1972) used puzzles of vegetables and fruits, songs, story telling and a set of picture cards. The U S D A (1981) study of 104 schools indicated that lunches generally met or exceed maximum standard for all nutrients, except vitamin A which was low in some programmes. Gajral and Chaudhri (1981) attempted to

explore the effects of mid morning snack programme on nutritional status of Pre-schoolers as judged by their physical growth and biochemical status. Metha et al (1980) and Mehtha (1972) evaluated nutrition programme from four angles,

1. Effect on growth of children
2. Effect on dietary intake
3. Effect on mortality and
4. Changes in attitudes towards feeding of infants and children in the beneficiary families.

Several of these evaluation studies of the feeding programmes have revealed that the children participating in the lunch programme are better off than their counterparts not participating, in terms of their heights, weights blood haemoglobin levels, school attendance, performace and nutritional knowledge. Greater mental ability, better behavioural aspects such as tolerance, piety, obedience and general cleanliness are also observed in these children (Devadas et al, 1981).

Thus research on evaluating the types of actions to be interpreted and target groups to be served, should be under taken to maximise the benefits (Belli, Pedro, 1971).

III EXPERIMENTAL PROCEDURE

The experimental procedure for this investigation entitles "Evolving the criteria and a standard schedule for the evaluation of pre-school feeding programmes" consisted of the following steps:

A. Evolving a criteria schedule

B. Finalising the major criteria and the items with the help of experts

C. Developing a schedule for the evaluation of feeding programmes and

D. Testing and arriving at a standard schedule with scores

1. Selection of feeding centres and the subjects

2. Collection of data

a) Anthropometric measurements

b) Clinical assessment

c) Assessment of nutrient intake of the children and

d) Observation and administration of the questionnaires

and 3. Processing of data

A. Evolving a criteria schedule

As a first step in evolving a standard schedule for the evaluation of pre-school feeding programmes a set of

major criteria were evolved. This list was prepared with the help of the literature available, (Devadas, 1971; Devadas et al, 1975; 1975 and 1977; Saraswathi, 1980, Nirmala 1981 and Saraswathi, 1981) and also through discussion with the experts available in the college. As a result of these discussions a list of 28 major criteria which were thought might be useful in evaluating the feeding programmes was prepared (Appendix A).

Apart from this, a list of sub items were prepared under each major criteria, so that using the sub items the major criteria could be applied (Appendix A). For eg. under the major criteria, "Nutritional status of children", anthropometric measurements, blood haemoglobin levels, clinical picture of children and nutrient intake of the children were listed as sub items to be evaluated. The development of these two schedules formed the initial step in evolving the standard criteria schedule in this study.

B. Finalysing the major criteria and the sub items with the help of experts

The two schedules developed were sent to 35 experts all over the country. The judges included Directors and Assistant Directors of institutions, Principals, Professors, Assistant Professors and Nutritionists concerned with the field work.

The judges were asked to rate the 28 major items on a nine point continuum ranging from least important to most important with neutral mid point. Stanine scoring technique developed by Guilford with the modification by Canfield (1951), that suited to many socio-psychological researches, was utilised in the present study.

This procedure converted the raw data, into continuous single digit form which was fit for further manipulations. The stanine score guide for the nine points is presented below:

Nine Point Scale	Total No. of criteria to be alotted	S.No. of the selected criteria as given in Form A (Appendix A)
Most important	1	
Very Important	2	
Much important	3	
Slightly important	5	
Neutral	6	
Slightly not important	5	
Much less important	3	
Very much less important	2	
Least important	1	
	28	

In the second schedule (Form B) the sub items were listed under each major criteria. The judges were asked to indicate against every sub items in the list, whether it would be relevant or not for judging that major criteria.

The forms were sent to the judges with a request to return the filled in forms within a period of 15 days. Twenty five forms were received during the first 20 days. The data obtained on the above mentioned 28 items from the 25 judges were ranked according to their preferences i.e. the weightages were given to all the criteria, was given the rank 1 and the least important one was given the rank 28.

Under the scale, "Very important" two criteria were allowed to mark. This was regarded as tie and the scores given to each one was 2.5 (Sidney Siegal, 1956). Likewise ranks were given for all the criteria and the results are presented in Appendix B. The consolidation of the data gave the total scores gained by each one of the 28 criteria from 25 judges.

In the next step all the criteria were rearranged according to the total weightages received from the judges. The rearranged list of criteria is given in Table I.

TABLE I

LIST OF CRITERIA USEFUL FOR THE EVALUATION OF FEEDING PROGRAMME

Order of importance	Criteria	Number as given in the schedule	Total scores given by the Experts
1	Nutritional status of the children	12	69.5
2	Environmental sanitation	17	101.0
3	Quality of the food	19	178.0
4	Quantity of the food	18	196.5
5	Health check-up of the children	7	237.5
6	Number of days of feeding against the requirements	3	249.5
7	Water supply	14	253.5
8	Morbidity levels among the children	4	263.0
9	Food habits of the children	10	277.5
10	Enrolement in the Feeding programme	1	279.0
11	Attendance of the beneficiaries	2	286.0
12	Personal hygiene of the children	8	300.5
13	kitchen facilities and other requirements to run the programme	13	329.0
14	Nutritional knowledge of the children	9	353.0

Table I Contd...

Order of importance	Criteria	Number as given in the schedule	Total scores given by the Experts
15	Supervision of the Programme	23	361.0
16	Nutritional knowledge of the preschool teacher	24	365.0
17	Hygienic practices of the cook	21	390.0
18.	Dining area	15	417.5
19.	Presence of kitchen garden	16	424.0
20	Opinion of the parents about the programme	27	425.5
21	Help from the public	25	450.0
22	Participation of children in activities	26	463.0
23	Availability of a cook	20	478.5
24	Nutrition knowledge of the parents	26	483.0
25	Nutritional knowledge of the cook	22	491.5
26	Performance of children in the preschool	6	523.0
27	Economic benefits of the programme	28	551.5
28	Social behaviour of the children	11	608.5

In order to see the agreement among the judges Kendall's coefficient of concordance was worked out (Sidney Siegal, 1956). Test of significance was carried out to findout whether there was significant agreement in the scores given by different judges (Appendix C). The test revealed perfect agreement among the judges and the calculated χ^2 was significant at one per cent level. Among the 25 judges, 17 reported that almost all the 28 criteria sounded useful in evaluating the feeding programme. Hence the first 24 criteria from the rearranged list were taken into account for further processing.

The results obtained for the second proforma showed that all the sub items listed under the major items were agreeable to a majority of the judges (Appendix D) and there was no need to omit any of the sub items. Based on the above tests the major criteria and the sub items to be tested were finalised.

C. Developing a schedule for the evaluation of feeding programmes

The final evaluation schedule was formed by including questions to test every sub items of the major criteria. It was found out that for testing every major criteria there were certain observation items as well as

TABLE II

PROFILE OF THE FEEDING CENTRE

S. No.	Centre	Location	Sponsoring Agency for Feeding	Managing authority	No. of children fed	No. of Feeding days & in months	Cost of meal/ head Ps.	Menu followed
1.	Saibaba Colony Balwadi	Urban	Women's Voluntary Service	Womens Voluntary service	25	150	30	Rice, cooked in varieties with vegetables.
2.	College Puthur Balwadi	Rural	District Social Welfare Board	Extension Officer(C.W) & Block Commissioner	40	150	25	Uppuma with vegetables
3	Pappanaicken-palayam Balwadi	Rural	Central Social Welfare Baord	Sri Avinashi-lingam Home Science College	25	150	30	Rice cooked in varieties with vegetables
4	B Colony Balwadi	Urban	Sri Avinashi-lingam Home Science College	-do-	40	150	25	Uppuma with Greens
5	Venkittapuram Balwadi	Rural	District Social Welfare Board	Extension Officer(C.W) & Block Commissioner	40	150	25	Uppuma with vegetables
6	Vadamadurai Balwadi	Rural	District Social Welfare Board	Extension Officer(C.W) and Block commissioner	40	150	25	Uppuma with vegetables

questions to children, teacher and the parents to be administered. Hence after framing all the questions the initial schedule was rearranged under four heads,

General observations schedule
Schedule for pre-school teacher
Schedule for pre-school children and
Schedule for the parents (Appendix E).

D. Testing and arriving at a standard schedule with scores

1. Selection of feeding centres and the subjects

Six pre-school feeding centres in and around Coimbatore were selected for testing and evolving a standard schedule with scores. Among the six centres two were sponsored by the private organisations and the remaining four were sponsored by the Central and District Social Welfare Boards. The profile of the six feeding centres is given in Table II.

In all the six centres good co-operation was available from the teachers and the parents. Among the six centres, three were administered by Sri Avinashilingam Home Science College while the other three were supervised by the officials from the Block Development Office. Except in two centres where rice was fed, all the other centres fed CSM or Soy fortified bulgar wheat uppuma. The number of feeding days and cost of feeding were almost same in all the six centres.

From each of the six centres 20 children were randomly selected for the study. It included equal number of girls and boys.

2. Collection of data

The required data was collected by the investigator through,

A) Anthropometric measurements
B) Clinical assessment
C) Biochemical estimation
D) Assessment of nutrient intake of the children and
E) Observation and administration of the questionnaires.

A. Anthropometric measurements

Heights and weights were recorded for the randomly selected 20 subjects in each centre. The body weights were recorded using a spring balance. The balance was checked against a constant weight as advised by Gurney (1969). The weights were taaken in the mornings after emptying the bladder and before meals. The children were made to stand erect with bare feet, arms hanging and looking straight in front and the weight was taken to the nearest 0.1 kg.

The heights of the beneficiaries were measured in the standing position. A fibre glass tape was fixed against the wall. The subjects were made to stand erect on the flat floor, bare-footed against the tape with the arms hanging at the sides in a natural manner. A wooden scale was placed gently on the head perpendicular to the wall and the height was measured from the tape, correct to 0.1 cm, (Davidson and Passmore, 1973).

B. Clinical assessment

This was done for all the selected subjects in six pre-school feeding centres, with the help of a physician. The required form was included in the evaluation schedule itself.

C. Biochemical estimation

The biochemical parameter selected was the blood haemoglobin level of the children. The blood haemoglobin concentration of all the selected children was estimated colorimetrically using cyanmethaemoglobin method of Varley (1963).

D. Assessment of nutrient intake of the children

According to Devadas (1973) diet surveys severe to assess the existing conditions and problems with regard to food intake of individuals and group as basis for finding out ways and means of improving them.

A three day food weightment survey was conducted for randomly selected three children in each centre. Weight of the raw foods used and the total cooked food for the entire group was taken, and the weight of the cooked food consumed by the children was also weighed. From these weights, nutrient contents of the diets consumed by the children in the feeding programme was calculated.

E. Observation and administration of the questionnaires

The investigator administered all the four schedules developed, in each of the six feeding centres and collected the

required information through observation and individual contact. The children as well as the teacher helped in locating the families of the 20 randomly selected subjects in order to get the data from the parents.

3. Processing of data

The data obtained was consolidated centre wise and percentage calculated for each answer given and observations made. They were further consolidated so that for every major criteria tested, the percentage values obtained for every centre could be tabulated (Appendix F).

It was felt that a criteria had to be evolved to identify a programme with good performance, average performance and below average performance. For this purpose the mean and standard deviation for each value was worked out and are presented in Appendix F.

By assuming that the observations follow the student 't' distribution with degree of freedom 5, the 0.5 probability value which is 0.73 was taken to multiply the standard deviation in order to get the confidence interval. Thus, mean - 0.73SD was taken as the lower condifence limit for the average group and mean + 0.73 SD was taken as the upper confidence limit for the same group, i.e. if in any category the average exceeds mean + 0.73 SD it was considered as above

average and the in between levels were taken for the average performance. Following this procedure it was possible to judge each centre for every criteria in terms of average, below average and above average performance. The feeding centres could do not be efficient, or inefficient or average in all the 24 criteria uniformly due to various influencing factors. Thus an overall index was essential to judge the efficiency of the feeding programme and the following method was used to arrive at the final scoring.

For every criteria score 3 was given to a feeding centre if it stood efficient, score 2 was given if it was average and score 1 was given if it was inefficient. Hence the maximum index value a feeding centre could secure was 72, the minimum was 24 and the average was 48. Based on this the following ranges of values were considered for the index to decide whether a balwadi was efficient, average or inefficient.

Scores above 60 indicated efficient conduct of the programme scores between 36 to 59 indicated average efficiency and values below 36 indicated inefficient conduct of the programme . Using this procedure the overall efficiency of the six feeding centres was judged.

IV RESULSTS AND DISCUSSION

This investigation aimed at evolving the criteria and a standard schedule for the evaluation of preschool feeding programmes. Before evolving a standard schedule with scores for wider use, an accepted list of criteria was evalved with the help of a group of 25 experts involved in this area of study from different parts of the country. The major criteria arrived is already detailed under Experimental Procedure. Based on the criteria arrived, a detailed schedule was formulated and tested. Scores were given for each of the 24 criteria enabling the use of the evolved schedule as a standard one for the evaluation of feeding programmes. Throughout the results and discussion the six feeding centres studied have been numbered as follows:

Saibabha Colony Balwadi	- Centre No 1
College Pudur Balwadi	- Centre No 2
Pappanaickenpalayam Balwadi	- Centre No 3
B Colony Balwadi	- Centre No 4
Venkittapuram Balwadi	- Centre No 5
Vadamadurai Balwadi	- Centre No 6

The 28 criteria thus tested and standardised were grouped under seven major headings and the results of the study are presented accordingly as given below:

A. General conduct of the feeding programme

B. Quantity and quality of foods supplied

C. Hygienic practices of the children and the cook

D. Healthiness and activeness of the children

E. Nutrition knowledge of the children, parents and teachers

F. Opinion of the parents about the programme

G. Help available from the public and

H. Overall conduct of the feeding programme

A. General conduct of the Feeding programme

Among the 24 major criteria chosen, 10 were pertaining to the general conduct of the feeding programme. Table III presents the summarised picture of the general conduct of the feeding programme in the six centres studied. The details of scoring have been presented in Appendix F.

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The observations made and the conclusions drawn are presented under the following headings:

1. Enrolement of children in six centres
2. Attendance of the beneficiaries
3. Number of days of feeding against the requirements
4. Kitchen facilities and equipment to run the programme
5. Water supply
6. Adequacy of dining area
7. Presence of kitchen garden
8. Environmental sanitation
9. Health check up of children and
10. Presence of adequate supervision

1. Enrolement of children in six centres

The maximum number of children allowed for feeding was 40 for centres No 2,4,5 and 6 and 25 for centres No 1 and 3. Except in Saibaba Colony (Centre No 1) and College Pudur centres (Centre No 2) all had enrollment below 100 per cent.

The enrollment percentage was worked out for all the six balwadies included in the study. The mean enrollment percentage was found to be 90.42 and the standard error 8,46.

Since the size of the sample was small, the distribution was assumed to be student 't'. The five per cent of value of this 't' corresponding to the degrees of freedom 5 from the table was found to be 0.73.

Mean + 0.73 SD=96.60 was taken as the lower limit for the efficient feeding centre and mean - 0.73 SD=84.24 was taken as the upper limit for the inefficient feeding centre and the in between range (84.24 - 96.60%) was considered as average. Thus among the six centres tested centres No 1 and 2 were judged to be efficient centres and no centre was found to be inefficient in this regard.

2. Attendance of the beneficiaries

Attendance percentage for the last three months was worked out for all the six feeding centres included in the sample. It ranged from 85 per cent in centres No 1 and 4 to 58 per cent in centre No 6. The mean attendance percentage was found to be 72.66 and the standard error 7.54, since the size of the sample was small, the distribution was assumed to be student 't' corresponding to the degree of freedom 5 from the table was found to be 0.73.

Mean + 0.73 SD = 80.20 was taken as the lower limit for the efficient centre and Mean - 0.73 SD =65.12 was

taken as the upper limit for the inefficient feeding centre and in between range (65.12 - 80.20%) was considered as average.

Accordingly in this study, the first and fourth balwadies were found to be above average, centres No 5 and 6 were below average while the remaining two centres were judged to be average in maintaining regularity of attendance in the feeding centres.

3. Number of days of feeding against the requirements

Percentage of feeding days was worked out for all the six feeding centres studied. The mean percentage of feeding days was found to be 87.62 and the standard error 11.83.

Mean + 0.73 SD=96.26 was taken as the lower limit for the efficient centre and the mean - 0.73 SD = 78.98 was taken as the upper limit for the inefficient centre and the in between range (78.98 - 96.26%) was considered as average.

Centre No 1 alone was considered to be efficient and the remaining were considered to be average in this criteria. No centre was found to be inefficient in this criteria.

4. Kitchen facilities and equipment to run the programme

The facilities taken into account under this major criteria were, having separate kitchen, presenteof sufficient

space to work , facilities for storage of provisions and availability of utensils for cooking and serving.

While evaluating this criteria, the possession of each item mentioned got the score one, and the non-possession was given a score zero. Thus the maximum score which this criteria could get was 8 and the minimum was zero and they were converted into percentages for calculation purposes (Appendix F).

The mean score obtained for the six feeding centres was 69.58 and $S\bar{x}$= 19.26. Using the 't' values as in the previous cases, the lower limit for the efficient balwadi was worked out to be 88.84 and upper limit for the inefficient balwadi was worked out to be 50.32. Thus if feeding centre possesses more than 88.84 per cent of the facilities needed it can be taken as an efficient centre if it possesses less than 50,32 per cent of the required facilities it can be considered as an inefficient. centre.

Among the six centres studied centres No 2, 4 and 5 were adjudged to be efficient and centres No 1 and 6 were poor while the centre 3 was average in this criteria.

5. Water Supply

Under this major criteria adequacy and source of water, easiness with which it is obtained, storage facilities

and use of boiled water for drinking were included as the sub items.

The mean scores obtained for this major criteria for six centres was found to be 59.79. Using 't' values, the lower limit for the efficient feeding centre was worked out to be 75.61 per cent and upper limit for the inefficient centre was worked out to be 43.97 per cent. Thus if a feeding centre gets a score more than 75.61 per cent it can be judged as an efficient centre and if the score is lower than 43.97 per cent it has to be regarded as inefficient. The inbetween values indicate average standard of the centres. Among the six centres studied except centre No 6 which was below average, all the centres had average water supply.

6. Adequacy of dining area

Adequacy of space and seating arrangements were rated under this criteria. The lower limit for the efficient feeding centre was found to be 79.93 per cent and centres No 1 and 2 were reaching this standard. The upper limit for the inefficient centre was found to be 46.51 per cent and no centre was judged to be poor in this criteria. The remaining four centres were rated as average in this facility.

7. Presence of kitchen garden

None of the centres had kitchen garden in their campus hence scores could not be arrived for this criteria. They complained of either no place, no water or no protection and hence even though the idea of kitchen garden in feeding centres were appreciated by all the judges in their rating the feasibility of maintaining one is still under question.

8. Environmental sanitation

This criteria included presence of washing area, drainage facilities, toilet facilities and cleanliness of the area. The lower per centage limit for the efficient feeding centre was 76.59 and the upper limit for the inefficient centre was found to be 45.81 per cent. It was discouraging to note that none of the centres were ranked as efficient, the first five of them were average in this criteria while the last balwadi was below average in environmental sanitation. This result indicates that the existing feeding centres are having poor facilities for sanitation which may lead to grave situations and steps need to be taken to improve this situation immediately.

9. Health checkup of children

The conduct of check up, periodicity and the person conducting the examination were noted underthis criteria.

The mean score obtained for the six centres was 59.70 and SE 15.33. The lower limit for the efficient balwadi was found to be 75.03 per cent and the upper limit for the inefficient balwadi was found to be 44.37 per cent. Among the six centres studies centres No 1 was found to be above average, centres No.2,3 5 were average and centres No 4 and 6 were below average in this criteria.

10. Presence of adequate supervision

Under this major criteria, aspects supervised by the teacher, authorities and parents and the periodicity of supervision were taken into consideration.

The mean score obtained for six feeding centres was 60.09 and SE 10.22. The lower limit for the efficient centre was found to be 70.31 per cent. The upper limit for the inefficient centre was found to be 49.87 per cent.

Among the six centres studied centres No 1 and 3 were above average and centres No 2,5 and 6 were below average and the centre No 4 was rated as average.

All the 10 criteria put together centres No 1 and 2 were found to be good in the general conduct of the programme. Centres No 3,4 and 5 were judged to be average while centre No 6 was poor in the general conduct.

B. Quantity and quality of the foods supplied

Quantity of the foods supplied included the satisfaction of participations of the beneficiaries buying food items from outside and consumption of home food along with school food.

Quality indicated the availability of nutrients mainly calories and proteins through the feeding programme. Table IV presents the mean percentage scores obtained by the six centres for both the criteria.

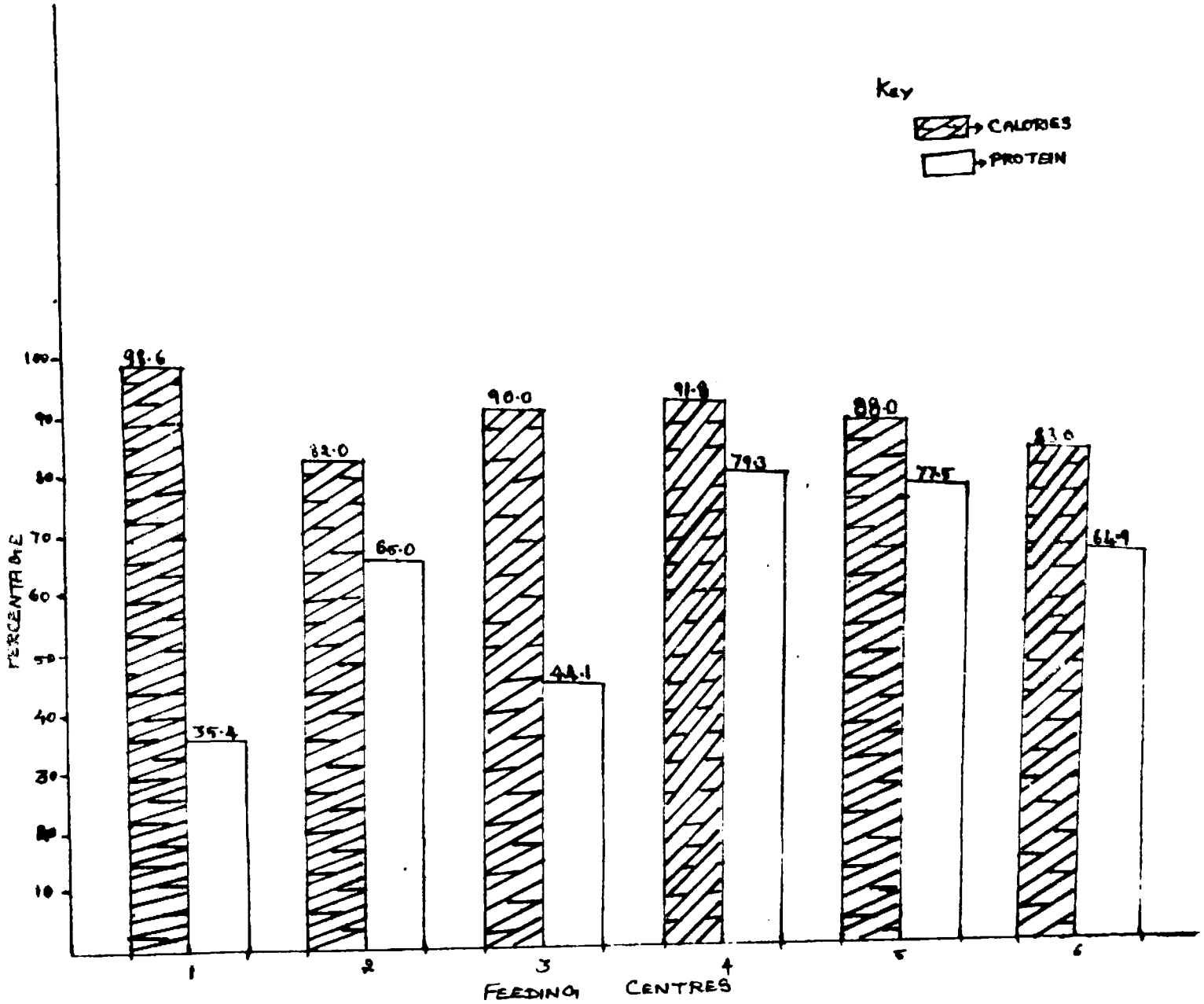

FIGURE - 1

CALORIE AND PROTEIN SUPPLY OF THE FEEDING PROGRAMME IN SIX CENTRES.

It was clear that the none of the centres supplied 100 per cent expected calories and protein through meals (Figure 1). Both quality and quantity of meals put together centre No 4 (B Gobony balwadi managed by Sri Avinashilingam Home Science College) alone stood above average, centres No 2 and 6 were below average and the rest were graded as average in these aspects.

C. Hygieneic practices of the children and the cook

Table V presents the details of observation made in six centres regarding the hygienic practices followed by the children and the cook and the food habits of the children.

The observations under this criteria included details of taking both, cleaning hands before and after eating, conditions of hair, nails, teeth and dress for the children. For the cook condition of hair, clothes, nails and general obsefvations on her cooking practices were included. For the food habits of the children, interest shown in food, time taken to eat, food wastages and cleanliness during eating were observed.

The lower limit obtained for the efficient feeding centre was 90.22 per centage and the upper limit obtained for the inefficient centre was 63.62 percentage with regard to the hygienic practices of the children. In the case of cook, the limits for the average was 80.13 to 98.43 per centage and for the food habits of the children the range was 40.27 - 48.47 percentage. The values above this indicated above average and the values below this indicated below average condition.

Among the six centres studied centres No 1 alone was having good hygienic practices of the children and the cook . The two centres No 5 and 6 below average in this regard, centres 2,3 and 4 were average in the hygienic practices of children and above average in the practices of the cook. Centres No 3 and 4 were rated as above average for the food habits of the children and centres No 1 and 6 were rated as average centres.

D. Healthiness and activeness of the children

Table VI presents the health condition of the beneficiaries in all the six balwadies and their activeness in the classroom situation.

2.

3

The health aspect included the results of height and weight measurements blood haemoglobin levels of children clinical picture and disease free condition, where as the activeness of the children included their participation in story telling, singing, drawing, playing, answering the questions and other physical activities (Appendix F).

For the total health of the children scores between 78.67 to 86.01 per cent indicated the average health condition of the children. Centres 1 received values above average and centres 5 and 6 received scores below average. For the participation in activities 48.4 to 65.8 per cent was the scores received by the children rated as average. Except children in centre No 1 who were above average the children in all the five balwadies were only average in their activeness in classroom activities. When the morbidity pattern (Number free from diseases) was taken into consideration centres No 2 and 4 above average, centres No 1 and 6 were average while centres No 3 and 5 were rated as below average.

E. Nutrition knowledge of the children, parents and teachers

Table VII presents the nutrition knowledge of the children, parents and teacher observed in six centres.

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Under nutrition knowledge of the children aspects such as need for good food, foods needed for health, eye sight, good blood, bones and teeth, reasons for including milk green leafy vegetables etc. wete included (Appendix F).

All the three major criteria put together centre No 1 alone was found to have sound nutritional knowledge of the children, parents and the teacher. Centres No 5 and 6 were poor while the remaining centres were graded as average in these three criteria put together.

F. Opinion of the parents about the programme

Under this criteria, awarness of the existence of feeding programme, knowledge on the quantity and quality of the foods supplied and the satisfaction of the parents about the feeding were gathered (Appendix F).

The lower per centage limit for the efficient feeding centre was found to be 74.43 and the upper limit for the inefficient centre was found to be 55.0 percentage. The inbetween values indicated average level. Among the six centres studied, centre No 1 (79.0%) was rated as good, centre No 6 (37.0%) was rated as poor while the remaining centres (No 2 - 70.00%; No 3 - 72.85%; No 4-69.42% and No 5 - 63.42%) were rated as average. It could be noted that consistently centre 1 was judged to be good in all the aspects

covered and centre 6 was consistently judged to be poor in all aspects studied.

G Help from the public

Through this major criteria was considered essential by all the judges, initially and included in the list, it was found that none of the centres received any help from the public for running the feeding programme and hence received the score zero. It indicates that efforts need to be geared towards mobilising the potentials from the public in future towards the successful conduct of the feeding programmes.

H Over all efficiency of the feeding programmes

Table VIII presents the overall efficiency of the six feeding programmes tested in the present investigation based on the judgement made for each criteria selected.

TABLE VIII

RATING THE FEEDING CENTRES FOR THEIR OVER ALL CONDUCT OF THE FEEDING PROGRAMME

S. No.	Criteria	Centres 1	2	3	4	5	6
1.	Nutritional Status of the Children	2	2	2	3	1	1
2	Environmental Sanitation	2	2	2	2	2	1
3	Quality of the feed	2	1	2	3	2	1
4	Quanity of the food	3	1	3	3	2	1
5	Health Checkup of the children	3	2	2	1	2	1
6	Number of days of feeding against the requirements	3	2	2	2	3	2
7	Water supply	2	2	2	2	2	1
8.	Morbidity levels among the children(Free from illness)	2	3	1	3	1	2
9	Food habits of the children	2	1	3	3	1	2
10.	Enrolment in the feeding programme	3	3	1	2	1	2
11.	Attendance of the beneficiaries	3	2	2	3	1	1
12	Personal hygiene of the Children	3	2	2	2	1	1
13	Kitchen facilities and other requirements to run the programme	1	3	2	3	3	1
14	Nutritional knowledge of the children	3	2	2	3	2	1

contd..

Table VIII (Contd....)

S. No.	Criteria	1	2	3	4	5	6
15.	Supervision of the Programme	3	1	3	2	1	1
16.	Nutritional knowledge of the Preschool teacher	3	2	3	2	1	1
17.	Hygienic practices of the cook	3	3	3	3	1	1
18.	Dining area	3	3	2	2	2	2
19.	Presence of kitchen garden	0	0	0	0	0	0
20.	Opinion of the parents about the programme	3	2	2	2	2	1
21.	Help from the public	0	0	0	0	0	0
22.	Participation of children in activities	3	2	2	2	2	2
23.	Availability of a cook	3	3	3	3	3	3
24.	Nutritional knowledge of the parents	3	3	3	2	2	2
	Total scores	58	47	49	53	58	31

Note: 60 indicates above average performance
< 36 indicates below average performance
36 - 59 indicates average performance

Centres No 1,2,3,4,5 and 6 received total scores of 58, 47, 49, 53, 38 and 31 respectively. Since none of the centres received the score 60 which indicates the effieient conduct it was concluded that no centre stood above average in its performance of the feeding programme. The average range of scores (36-59) were recorded by centres 1,2,3,4 and5 while the last centre was judged to be poor in its performance because of its lowest score namely 31.

V SUMMARY AND CONCLUSION

The present investigation aimed at evolving the criteria and a standard schedule with scores for the evaluations of pre-school feeding programmes. For evolving the criteria, a list of 28 major criteria was prepared with the help of the literature available and experts available in the college. A list of sub-items was also prepared under each major criteria. These two lists were sent to 35 experts all over the country. The judges were asked to rate the 28 major items on a nine point continum ranging from least important to most important with neutral mid point using the Sten score guide. In the second list the judges were asked to indicate against every sub-items whether it would be relevent or not for judging that major criteria. Twenty five forms were received back from the experts in a period of 20 days. Weightages were given to all the 28 criteria and they were rearranged in a descending order of their importance and the first 24 criteria were chosen for formulating the final evaluating schedule. It was found statistically that there was a perfect agreement among the scores given by different judges. All the sub-items listed under the major items were found to be agreeable to a majority of the judges.

A final evaluation schedule was formed by including questions to test every sub-items. The questionnaire was finally divided into four schedules namely, general observation

schedule, schedule for pre-school teacher, schedule for pre-school children and schedule for the parents. These schedules were administered in six feeding centres (pre-schools) around Coimbatore. The data obtained was consolidated centre wise and percentages calculated for each answer given and observations made. Criteria were statistically evolved to identify a programme with good performance, average performance and below average performance.

The results of the study revealed the following:

1. Three months attendance percentage of the beneficiaries put together feeding programmes registered a score range of 84.24 to 96.60 per cent for average performance.

2. Feeding centres with average performance fed for 78.98 to 96.26 per cent of the expected feeding days.

3. Average efficient centres possessed 50.32 to 88.84 per cent of the expected kitchen facilities and equipment to run the programme.

4. The water facilities fell within a range of 43.97 to 75.61 per cent for feeding centres graded as average.

5. The adequacy of space and seating arrangements for dining purposes fulfilled 46.51 to 79.93 per cent of the expected level.

6. Environmental sanitation including drainage and toilet facilities fell within the range of 45.81 to 76.59 per cent for an average centre.

7. An average feeding centre had to score 44.37 to 75.03 per cent for the facilities for health checkup.

8. Teachers, authorities and parents had to supervise the programme from 49.87 to 70.31 per cent of the expected level.

9. An average centre should get a score range of 53.50 to 88.00 per cent for the quantity of the food supplied and 66.39 to 92.17 per cent for the quality of the food supplied in the feeding programme.

10. When the hygienic practices followed by the children was studied an average feeding centre received a score range of 63.62 to 90.22 per cent. For the hygienic practices of the cook the range of scores received was 80.13 to 98.43 per cent.

11. The healthiness of children included their heights, weights, blood haemoglobin levels and clinical picture. All these criteria put together a score range of 78.67 to 86.01 per cent was necessary to rate a feding programme as average. The percentage of children free from diseases should range from 54.85 to 70.97 for an average centre in a period of three months.

12. The beneficiaries of a feeding programme rated as average needed to participate in class room activities, to an extent of 56.46 to 78.70 per cent of the expected level.

13. The precentage of scores for the food habits of the children ranged from 40.27 to 48. 47 for average performance.

14. The score ranges obtained for the children, parents and the teacher for their nutritional knowledge were 31.51 to 46.81, 33.88 to 61.06 and 43.09 to 67.95 per cent respectively.

15. The opinion of the parents about the programme was favourable to an extent of 55.00 to 74.43 per cent in average graded programmes.

16. When a feeding centre scored higher than the upperlimit of the ranges given, it was considered as above average in that particular criteria. When a feeding centre scored lower than the lower limit given in the range, it was considered as below average in that criteria. It was found that when all the criteria were put together scores above 60 indicated the efficient conduct of the feeding programme, scores between 36 to 59 indicated average efficiency and values below 36 indicated inefficient conduct of the programme. Among the six centres tested the first five centres were found to be average in their overall efficiency of the programme and centre No 6 recorded the lowest score namely 28 and rated as below average centre.

It is recommended that the standard schedule with scores evolved in this investigation could be used to test the efficiency of the pre-school feeding centres with on the spot cooking and feeding. Using this, not only the overall efficiency could be judged but also criteria wise judgement is possible enabling one to locate the exact lacuna in the programme and execute the required improvements to make a centre average or above average in its performance. The present study in six centres brought to the notice that in

none of the centres a kitchen garden could be maintained and public help could be utilised. Efforts need to be geared to change the present situation and mobilise all the possible resources towards the good conduct of the feeding programmes.

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APPENDICES

APPENDIX - A

LIST OF MAJOR CRITERIA AND SUB ITEMS SENT TO EXPERTS

(Copy of the Letter Sent)

From

Miss P.Banumathi
II M.Sc. Foods & Nutrition Students
Sri Avinashilingam Home Science College for Women
Coimbatore-641043

To

Respected Sir/Madam,

I am a II M.Sc. student of Foods and Nutrition major. As part of the requirements for my dissertation, I am attempting to evolve suitable criteria for the evaluation of preschool feeding programmes. In this effort, I am gathering the opinions of experts in the field. I am enclosing a copy of the criteria listed for your critical comments and experts based on the responses received from you, I will proceed further.

The list carries 28 ceriteria (Form I) considered to be useful for the evaluation of preschool feeding programmes. I request you to kindly classify the 28 items in the nine point scale provided, according to their importance in your judgement, However, to every point in the scale only an allotted number of criteria could be put. For example among the 28 criteria, only one could be said as most important and only two items could be said as very important according to the sten scale of scoring. According I request you to kindly put the exact numbers of the criteria(as given in Form I)in the small boxes provided against each point of the nine point scale.

Nine point scale	Total No. of criteria to be alloted	No. of the selected criteria as given in Form I.
Most important	1	
Very important	2	
Much important	3	
Slightly important	5	
Neutral	6	
Slighly not important	5	
Much less important	3	/
Very much less important	2	
Least important	1	
	28	

In the second list enclosed (Form B) I have listed the sub-items to be included under each major criteria. I request you to please indicate against every sub-items in the list, whether or not it would be relevant for judging that major criteria.

I humbly request you to kindly fill the two forms and return them within a fortnight after the receipt, using the stamped envelope provided for the purpose. I seek your co-operation and help for the success of my study. I am expecting an early response and encouragement from you.

Thanking you,

Yours sincerely,

sd/-

(P.Banumathi)

FORM - A

LIST OF CRITERIA SELECTED FOR THE EVALUATION OF FEEDING PROGRAMME CRITERIA

No.	Criteria
1.	Enrolment in the feeding programme.
2.	Attendance percentage.
3.	Number of days fed against the requirement.
4.	Morbidity levels among the children
5.	Participation of children in actvities.
6.	Performance of children in the preschool
7.	Health check-up of the children.
8.	Personal hygiene of the children.
9.	Nutritional knowledge of the children
10.	Food habits of the children.
11.	Social behaviour of the children.
12.	Nutritional status of the children.
13.	Kitchen facilities and other requirements to run the programme.
14.	Good water supply
15.	Adequacy of dining area
16.	Presence of a kitchen garden
17.	Environmental sanitation
18.	Adequacy of the quantity of the food supplied.
19.	Adequacy of the quality of the food supplied.
20.	Availability of a cook.
21.	Hygienic practices of the cook
22.	Nutritional knowledge of the cook.

23. Presence of adequate supervision

24. Nutritional knowledge of the preschool teacher

25. Help from the public

26. Nutritional knowledge of the parents

27. Opinion of the parents about the programme.

28. Economic benefits of the programme.

FORM - B

LIST OF SUB ITEMS UNDER MAJOR CRITERION HEADS

No.	Items selected	Relevant	Irrelevant
I.	PARTICIPATION OF CHILDREN IN ACTIVITIES		
1.	Singing songs		
2.	Hearing and telling stories		
3.	Interest in play activities		
4.	Drawing picture		
5.	Reading and writing in the class		
II	PERFORMANCE OF CHILDREN IN THE SCHOOL		
1.	Mean marks obtained by the children		
2.	Awards received on occasions.		

No.	Items Selected	Relevant	Irrelevean
III.	HEALTH CHECKUPOF THE CHILDREN		
1.	Frequency of the checkup		
2.	Persons who do the checkup.		
IV.	Personal Hygiene of the Children		
	1. Condition of Hair		
	Nails		
	Teeth		
	Dress		
2.	Regularity in bathing		
3.	Cleaning the hands before and after eating.		
V.	NUTRITIONAL KNOWLEDGE OF THE CHILDREN		
1.	Naming and identifying the vegetables and fruits		
2.	Functions of foods		
VI.	FOOD HABITS OF CHILDREN		
1.	Paid likes and dislikes		
2.	Attitudes towards food serving		
3.	Assessment of food wastage		
4.	Time taken for eating		
5.	5.Cleaning eating habits without spilling.		
6.	Washing the plates.		

(1)	(2)	(3)	(4)
VII	SOCIAL BEHAVIOUR OF CHILDREN		
1.	Play habits		
2.	Friendship		
3.	Generosity		
4.	Punctuality		
5.	Orderliness		
6.	Respect for elders		
7.	Co-operation		
8.	Emotions		
VIII	NUTRITIONAL STATUS OF CHILDREN		
1.	Anthropometric measurements		
2.	Blood haemoglobin levels		
3.	Clinical picture of children		
IX	FACILITIES AND OTHER EQUIPMENT TO RUN THE PROGRAMME		
1.	Availability of a room		
2.	Facilities for the storage of items.		
3.	Adequacy of cooking utensils.		
4.	Adequacy of Serving vessels.		
X.	ADEQUACY OF GOOD WATER SUPPLY		
1.	Availability of water		
2.	Adequacy of water		
3.	Storage facilities		
4	Use of boiled water for driniking		
5.	Cleanliness of the source of water		

(1)	(2)	(3)	(4)
XI	ADEQUACY OF DINING AREA		
1.	Adequacy of space for all the children to dine.		
2.	Seating arrangement used.		
3.	Cleanliness of the work area		
4.	Covering of the food.		
X.XII	NUTRITION KNOWLEDGE OF THE COOK		
1.	Nutrition present in food		
2.	Functions of nutrients		
3.	Methods of cooking		
4.	Foods given in diseases and special conditions.		
XIII	PRESENCE OF ADQUATE SUPERVISION		
1.	Supervision of balwadi teacher during cooking and serving.		
2.	Supervision of authorities concerned		
3.	Supervision of the parents and local people.		
XIV	NUTRITION KNOWLEDGE OF PRESCHOOL CHILDREN		
1.	Nutrients present in food		
2.	Balance diet		
3.	Functions of nutrients		
4.	Foods given in diseases and special conditions.		
XV	HELP FROM THE PUBLIC		
1.	Availability of help in the form of kind and cash.		

(1)	(2)	(3)	(4)
XVI	NUTRITION KNOWLEDGE OF THE PARENTS		
1.	Balanced diet		
2.	Functions of nutrients		
3.	Foods given in diseases and in Special condition		
4.	Methods of cooking		
XVII	OPINION OF THE PARENTS ABOUT THE PROGRAMME		
1.	Awareness of the programme		
2.	Benefits		
3.	Problems		
XVIII	PRESENCE OF KITCHEN GARDEN		
1.	Existence of the garden		
2.	Type of foods produced		
3.	Quantity of foods produced		
4.	Children's participation		
5.	Participation of the community		
6.	Utilisation of the produce.		
XIX	ENVIRONMENTAL SANITATION		
1.	Facilities of a washing area		
2.	Presence of drainage facilities		
3.	Presence of a toilet for the children		
4.	Cleaning of the kitchen and dining room before and after feeding.		

(1)	(2)	(3)	(4)
XX	Adequacy of the quantity of the food supplied		
1.	Satisfaction of the children		
2.	Buying food items from outside		
3.	Consumption of home food along with school food.		
XXI	ADQUACY OF THE QUANITY OF THE FOOD SUPPLIED		
1.	Availability of nutrients from the feeding programme.		
2.	Inclusion of fruits and vegetables		
3.	The gapin the nutrient supply before and after participation in feeding programme.		
XXII	AVAILABILITY OF THE COOK		
1.	Availability		
2.	Regularity of the person		
3.	Efficiency of the person		
XXIII	HYGIENIC PRACTICES OF THE COOK		
1.	Personal Hygiene		
2.	Hair		
3.	Dress and		
4.	Nails of the cook		
XXIV	ECONOMIC BENEFITS OF THE PROGRAMME		
1.	In terms of height increase		
2.	In terms of weight increase		
3.	In terms of nutrient intake.		

APPENDIX C

KENDALL COEFFICIENT OF CONCORDANCE TEST

The Kendall co-efficient of concordence (w) was used to findout the significance between the judges. The methods is as follows:

Let N be the number of criterias and 'k' the number of judges. Ranks given the 'k' judges to the N criterias will be from 1,23 - - - -N in some order. First we calculate the total rank obtained by each one of the criteria. These are denoted by R_1, R_2, R_3 etc. Now find the sum of these 'R' values and subsequently, the mean. Denote the mean 'R' Now Define 's' as

$$s = \sum_{s=1}^{N} (R_1 - \bar{R})^2 \qquad \text{and } W = \frac{s}{\frac{1}{2} p^2 (N^3 - N)}$$

This W stands for the concordance or the agreement among the judges. High value of 'w' indicates perfectness in agreement. The significance was tested using.

X^2 = k (N-1) W

$\bar{R}$ = 350.21

s = 2664015.53

W = 0.2348

X^2 = 157.95

Table X^2 at one per cent level is 46.96
Calculated X^2 at one per cent level is 157.95
Therefore Calculated X^2 is significant at 1^0 level of probability.
(i.e) There is perfect agreement among the judges

(i.e) There is evaluation is almost the same.

APPENDIX - D

OPENION OF THE JUDGES REGARDING THE SUB ITEMS

S.No. of sub items as given in Form B		Number of Judges			S.No. of sub items as given in Form B		Number of Judges		
		Relevent	Irrelevent	Doubted			Relevent	Irrelevent	Doubted
(1)		(2)	(3)	(4)		(5)	(6)	(7)	(8)
I	1	23	2	0		6	25	0	0
	2	23	2	0	VII	1	25	0	0
	3	21	3	1		2	25	0	0
	4	20	5	0		3	24	1	0
	5	15	10	0		4	22	3	0
	6	21	3	1		5	23	2	0
II	1	18	6	1		6	23	2	0
	2	25	0	0		7	24	1	0
III	1	24	1	0		8	16	9	0
	2	25	0	0	VIII	1	24	1	0
IV	1	21	3	1		2	23	2	0
	2	24	1	0		3	25	0	0
	3	23	2	0	IX	1	22	3	0
V	1	17	8	0		2	21	4	0
	2	18	7	0		3	22	3	0
VI	1	18	7	0		4	24	1	0
	2	24	1	0	X	1	22	3	0
	3	17	6	0		2	19	6	0
	4	25	0	0		3	23	2	0
	5	23	2	0		4	22	2	0

Appendix II (Contd....)

(1)		(2)	(3)	(4)	(5)		(6)	(7)	(8)
X	5	22	2	0	XVIII		25	0	0
XI	1	19	6	0		2	25	0	0
	2	24	1	0		3	23	2	0
	3	24	1	0		4	25	0	0
	4	24	1	0		5	23	2	0
XII	1	24	1	0		6	24	1	0
	2	25	0	0	XIX	1	24	1	0
	3	24	1	0		2	24	1	0
	4	21	4	0		3	24	1	0
XIII	1	22	3	0	XX	1	25	0	0
	2	22	3	0		2	23	2	0
	3	24	1	0		3	24	0	1
XIV	1	25	0	0	XXI	1	24	1	0
	2	24	1	0		2	22	2	1
	3	25	0	0		3	21	2	2
	4	24	1	0	XXII	1	22	1	2
XV	1	25	0	0		2	20	2	3
XVI	1	24	1	0		3	21	4	0
	2	25	0	0	XXIII	1	24	1	0
	3	20	5	0		2	22	0	2
	4	18	7	0		3	23	1	2
XVII	1	24	1	0	XXIV	1	15	3	2
	2	23	2	0		2	20	3	2
	3	24	1	0		3	16	4	5

APPENDIX - B

EVALUATION OF PRE-SCHOOL FEEDING PROGRAMME

A. OBSERVATION SCHEDULE

Name of the Interviewee: Date

Address of the Feeding Centre :

Name of the Balwadi Teacher:

I. ENROLEMENT IN THE FEEDING PROGRAMME

Maximum number permitted :

Number enrolled :

Percentage :

II. ATTENDANCE PERCENTAGE IN THE LAST THREE MONTHS FOR THE FEEDING PROGRAMME:

90 - 100% ☐

80 - 90% ☐

70 - 80% ☐

60 - 70% ☐

Less than 60% ☐

III. NUMBER OF DAYS FED AGAINST THE REQUIREMENT

Required number of days of feeding in last 6 months :

Number of days feeding took place :

Percentage :

IV. FA CILITIES AND OTHER EQUIPMENT TO RUN THE PROGRAMME

1. Is there a kitchen for cooking the food? Yes / No

2. Is the room spacious enough to work? Yes / No

3. Is there a place for storing of provisions? Yes / No

4. Are there enought containers for storage of items? Yes/No

5. Are there adequate cooking utensils? Yes/No

6. Is every child is provided wiht a plate and tumbler? Yes/No

7. Are there adquate serving vessels? Yes/No

8. Are there adequate plates to cover the vessels? Yes/No

V. ADEQUACY OF GOOD WATER SUPPLY

1. Do they get adequate water to run the programme? Yes/No

2. Through which source do they get water?

1. Tap water ▱
2. Well water ▱
3. River water ▱

3. Do they easily get water?

1. Well water to be carried from a long distance ▱
2. Nkm Water from a nearby well ▱
3. Tap water from far away well ▱
4. Water from a nearby place ▱

4. Is there adequate facilites for storing water?

5. How do they store the water?

By using tanks ▱

Drums ▱

Vessels 

Pots 

6. Is boiled water used for drinking in the fedding programme?

Yes / No

If no, the reasons:

VI. ADEQUACY OF DINING AREA

1. Is there enough space for all the children to dine?

2. Are they having the proper seating arrangement?

   1. Small benches 

   2. Mats 

   3. Others 

VII PRESENCE OF KITCHEN GARDEN

1. Is there a kitchen garden in the Feeding Programme?

Yes / No.

2. If yes, what are the types of foods produced in kitchen gardening?

3. How much of foods are produced in the garden?

4. In what way the children are participating in raising the kitchen gardening?

5. In what ways the community is helping in raising the kitchen garden?

How are the produced? Used for --

1 Food preparations ▱

2. For sale ▱

3. For free distribution ▱

7. If there is no kitchen garden, what are the reasons?

VIII. ENVIRONMENTAL SANITATION

1. Is there a separate washing are in the feeding programme? Yes/No

2. If not where is washing in done

3. Is there adequate drainage facilites Yes/No

4. What type of toilet facilites present for the children?

1. Separate toilet available ▱

Use the road side ▱

5. Is the area cleaned every day Yes/No

6. Is water provided for maintaining personnel hygiene? Yes/No

7. How often the kitchen is cleaned?

Every day before and after cooking ▱

Once a day ▱

Alternate Days ▱

IX. PARTICIPATION OF CHILDREN IN ACTIVITIES

		Able to participate	% of childre Participate
1.	No. of children could participate in all the activities.	▱	▱
2.	No. of chidlren could narrate the story told by the teacher	▱	▱
3.	No. of children singging ~~a~~ during the song session	▱	▱
4.	No. of children able to sing alone in the class	▱	▱
5.	No. of children able to draw simple diagrams by themselves	▱	▱
6.	No. of children interested in playing during the play time	▱	▱
7.	No. of children helping to clean the the dining ~~xx~~ area.	▱	▱
8.	No. of children able to answer the simple questions	▱	▱
9.	No. of children interested in serving the meal	▱	▱
10.	No. of children who could do the creative ~~xxxx~~ activity by themselves	▱	▱

I HYGIENIC PRACTICES OF THE COOK

1. Does personal hygienic practices being followed by the cook?

2. Is the ahir groomed properly?

3. Is she wearing cleanned cloths?

4. Are the nails cut and cleaned?

B. QUESTIONNAIRE TO THE PRE SCHOOL TEACHER

Name of the Teacher:

I. MORBIDITY LEVELS AMONG THE CHILDREN

1. What are the common diseases from which Balwadi children suffered during the last three months?

   a) Dysentry ☐

   b) Fever ☐

   c) Diptheria ☐

   d) Whooping Cough ☐

   e) Small pox ☐

   f) Others ☐

2. How many children took leave for sickness during the last 3 months?

3. Percentage of children suffered from illness:

   More than 60%

   40 - 60%

   20 - 40%

   10 - 20%

   Less than 20%

II. HEALTH CHECK UP OF THE CHILDREN

1. Is periodical health check up done for the child? : Yes / No

2. If yes, th at what frequency?

   Once a year :

   Twice a year :

   More than twice a year :

3. Health check up is done by

   Doctors :

   Nurses :

   Volunteers :

III. PRESENCE OF ADEUATE SUPERVISION

1. Is the Balwadi teacher have the facility of supervising the cooking of the food? : Yes / No

2. At what frequency the supervision is done?

   Daily :

   Occassionally :

   Irregularly :

3. Does the Balwadi teachers supervise during lunch time? : Yes / No

   If yes at what frequency?

   Regularly :

   Occassionally :

   Irregularly :

4. What are the aspects supervised by the teacher?

1. Seating arrangements	:
2. Preparation of the food	:
3. Serving of the food	:
4. Cleanliness of the area	:
5. Taste of the food	:
6. Quantity of the food consumed by the children	:
7. Food wastage	:
8. Hygienic practices	:
9. Attendance	:

5. What arrangement is made for cooking the food when cook is on leave?

6. Is the feeding programme is functioned when the teacher is on leave?

7. Is the programme being supervised by the concerned authorities?

8. Who comes for supervision?

9. How often they come for supervision?

10. What are the aspects supervised by the authorities?

1.

2.

3.

11. Whether the parents have the habit of supervising the programme? Yes / No

12. How often do they come for supervising the programme?

    1. Once a week

    2. Twice a month

    3. Occassionally

13. How many parents visit in weeks time?

24. What sort of the observations they make?

    1. Cleanliness

    2. Adequacy

    3. Taste of food

    4. Others.

15. Whether the local people have the habit of supervising the programme?

    Yes / No.

16. How often do they come for supervision?

    1. Once in two weeks

    2. Once in a month

    3. Occassionally.

17. How may of them visit in a week's time?

18. What sort of the observations do they make?

    1. Cleanliness

    2. Adequacy

    3. Taste bf food

    4. Others

IV HELP FROM THE PUBLIC

1. Whether the programme is getting help from the public?

   Yes / No

2. If yes, is what way?

    1. Kind

    2. Cash

V AVAIALABILITY OF A COOK

1. Wheather there is a separate cook? Yes / No

2. What arrangement is made for cooking the food when cook is on leave?

3. Is the feeding programme is function when the teacher is on leave?

VI. NUTRITION KNOWLEDGE OF PRE SCHOOL TEACHER

1. What are energy giving food?
   Name three foods?

2. What are the foods required for the growth of of thebody? Name three

   1.

   2.

   3.

3. What are the facts making a balanced diet?

4. Give oneimportant function for the following nutrients.

   1. Carbohydrates :

   2. Proteins :

   3. Fats :

   4. Minerals :

   5. Vitamins :

5. Give the ways through which you avoid wastage of nutrients while cooking?

6. Why should we include the following foods in the diet?

   1. Green leafy vegetables :

   2. Carrot. :

3. Pappaya

4. Amla

5. Egg

7. Do you give fruits when a person is suffering from fever?

8. Do you advise the parents to give lot of water during the diarrhoia to their children?

C. OBSERVATION SCHEDULE AND THE QUESTIONNAIRE TO BE ADMINISTERED TO THE PRE SCHOOL CHILDREN

Name of the children: Date:

How long the child had been participating in the Programme? AGE:

OBSERVATION

1. Clinical Picture of the Children

A. EYES

a. Conjuctiva

i) Absent glistering and moistey: ☐

ii) Slightly dry on exposure to sunlight for ½ minutes : ☐

iii) Conjuctiva very dry : ☐

iv) Bitot's spot present : ☐

b. Pigmentation

i) Normal colour : ☐

ii) Slight discoloration : ☐

iii) Moderate browning in patches : ☐

c. Xerosis

i) Absent : ☐

ii) Slight dryness : ☐

iii) Ulceration : ☐

d. Night blindness

i) Absent : ☐

ii) Present : ☐

B. MOUTH

a. Lips Condition

i) Normal :

ii) Angular Stomatits mild :

iii) Angular stomatits, marked :

b. Tongue colour

i) Normal :

ii) Pale white coated :

iii) Red :

iv) Red raw :

c. Gums

i) Normal :

ii) Bleading :

iii) Pyrrhoea :

iv) Retreated :

d. Fluorosis

i) Absent :

ii) Chalk teeth :

iii) Pitting of teeth :

iv) Mottled and discoloured :

e. Caries

i) Absent :

ii) Slight :

iii) Marked :

C. Hair

1. Normal ☐
2. Loss of lustre ☐
3. Discoloured & dry ☐
4. Sparse and brittle ☐

D. Skin

1. Normal ☐
2. Loss of lustre ☐
3. Discoloured & dry ☐
4. Sparse and britte ☐

II. PERSONNAL HYGIENE

1. Is the child taking bath regularly?

Every day ☐
Alternate days ☐
Once in 3 or more days ☐

2. Does the child clean the hands before and after eating?

Yes / no
Before ☐
After ☐

3. Condition of

a. Hair: Clean and well combed : ☐
Combed but not clean : ☐
Neither clean nor combed : ☐

b. Nails: Cut properly and have no dirt ☐

Not cut properly : ☐

Long nails and more dirt : ☐

c. Teeth: Clean ☐ Fairly clean: ☐

Dirty ☐

d. Dress: Washed properly: ☐

Fairly clean ☐

Dirty ☐

III. Food Habits of the Children

1. In the child showing interest in food: Yes / No

2. How long the child takes to finish the food?

Finishes fast : ☐

Very late ☐

Finishes along with others: ☐

3. Does the child ask for second serving? Yes / No

4. Does the child eat without spilling? Yes / No

5. If not the amount of spilling

Excessive ☐

Less spilling ☐

No spilling ☐

6. Is the food being wasted by the child? Yes / No

7. If yes, the amount of wastage:

Lot of wastage	:	☐
Little wastage	:	☐
No wastage	:	☐

8. Is the child washing his / her plate and tumbler?

Yes / No

9. If washing, how clear it is:

Well done	:	☐
Moderate	:	☐
Poorly done	:	☐

QUESTIONNAIRE:

1. Which are the foods you like? Name 3 foods.

   1.

   2.

   3.

2. Name three foods you dislike?

   1.

   2.

   3.

IV. NUTRITION KNOWLEDGE OF THE CHILDREN

1. Why do we need good food?

2. What are the foods required for good health?

3. What are the foods needed for good eye sight?

4. What are the foods needed for good R blood?

5. What are the foods needed for bones and teeth?

6. Why should we eat green leafy vegetables?

7. Why should we drink milk?

8. What will heppen if you don't take good food?

9. Name three raw vegetables that you can take?

10. Name five fruits?

V. ADEQUACY OF THE QUANTITY OF THE FOOD SUPPLIED

1. Do you like to take the school meal? Yes / No

2. Do you like to take the house meal Yes / No

3. What type of foods purchased from city shops after lunch?

4. After taken food, do you eat at house also? Yes / No

5. Do you bring any food from home and eat it along with school meal?

Yes / No

D. QUESTIONNAIRE TO THE PARENTS

I. Name of the Parent: Date:

II. Name of the child participating in the programme.

III. Address

IV. NUTRITION KNOWLEDGE OF THE PARENTS

1. Are you aware of the feeding programme?

Yes / No

2. Do you have any idea about the items served in the programme?

3. What are the foods making a balanced diet?

4. Give the functions of the following Nutrients.

a) Carbohydrates :

b) Proteins :

c) Fats :

d) Vitamins :

e) Minerals :

5. Give the ways through which you avoid wastage of nutrients while cooking

6. Do you give fruits and cereals whena person is suffering from fever?

7. Do you give lot of water during diarrhoea to the children.?

V. OPINION OF THE PARENTS ABOUT THE PROGRAMME:

1. Are the children receiving free lunch in the Balwadi?

Yes / No

What is the menu followed in the programme?

3. What food is supplied in the programme?

4. Who supplied the food to the programme?

5. What are the benefits of the programme?

6. Are you satisfied with the conduct of the Programme?

7. If not, what are the problems faced?

8. Name the fruits available in your place which helps to prevent night blindness.

9. What is the use of including Greens in Everyday menu?

10. What is the cause for anaemia?