A COMPARITIVE STUDY OF THE FUNCTIONING OF TWO INDUSTRIAL CANTEENS

By

SHAKILA, O.M.

A Thesis submitted to the University of Madras in Partial Fulfilment of Requirements for the Degree of Master of Science,

May, 1979.

A C K N O W L E D G E M E N T

The author extends her profound gratitude to Dr. (Mrs) Rajammal P. Devadas, M.A., M.Sc., Ph.D. (Ohio State), D.Sc. Principal, for her kind encouragement and able guidance to undertake this study.

She expresses her sincere and heartful thanks to Dr. (Mrs) Godavari Kamalanathan, M.S. (Cornell), Ph.D., Vice Principal, and Selvi. Tamilarasi, M.Sc. (Madras), for their valuable and expert guidance.

Greateful acknowledgement are due to the managers of the selected canteens for their full Co-operation and help in this study.

LIST OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

I INTRODUCTION

Man has always been faced with the necessity of providing food for himself. A well fed individual grumbles less and normally does not fret over small things, while a poorly fed individual is irritable, has no vitality and vigour, less resistance to infections and his life span is shortened (Devadas, 1968).

The custom of dining outside the home for some or all meals has become widespread within comparatively recent years. Not only do people tend to take their meals in factories, but children eat in schools, people travel further from home; and thus they must find their own meals and accomodation. Thus in a rapidly developing-country the food service industry grows from an insignificant industry to one of the leading industries in a very short time (Food and Agricultural Organisation, 1963; Chakravarthy, 1978). The trends of eating away from home; particularly among the urban people are largely due to the effects of the population growth, more women in the working force, more working hours, and the availability of subsidised food in institutional cafeterias.

Industrialisation in the Near Eastern countries and the consequent change of a large number of people from agricultural to industrial occupations is causing large changes both in the economy and social patterns of these countries (FAO/WHO, 1965). This trend towards urbanisation and the rapid growth of industrial enterprises together with the shortening of working hours and the increased employment of women, combine, to favour increased use of industrial feeding facilities in most countries. Even in areas where traditional feeding patterns militate against the taking of meals away from home, more people are eating at their place of work each year. Industrial feeding is only part of a large industry sometimes referred to as the "Food Service Industry" (FAO/WHO, 1965).

The importance of industrial feeding was not fully realised until the period of World War II, when manufacturing plants found that nutritious well balanced meals contributed much to the health, efficiency and the satisfaction of employees (West et al, 1977). The story of industrial catering or commercial feeding probably started in the twelfth and thirteenth centuries where monastries, well spread throughout the country, at the time were self supporting communities. Not only did they provide meals for those living within monastry walls, but gave hospitality to travellers on

the road. But it was not until the middle of the nineteenth-century that large scale feeding came into its own. Later there was general awakening in the minds of industrialists that health and production did have some relationship and gradually the abstract quality we call morale appears. Industrialists as well as the Government began to show a deeper appreciation of the worth of working people and a greater concern for their welfare than ever before. With the onset of the second world war the problem of feeding the workers grew a thousand fold; and the necessity to maintain the efficiency of the human element in industry was recognised. The outcome has been in the factory and office canteens as an integral part of industry, as a service of which the employer and the employee can justly be proud (New, 1957).

The nutritional policy should be concerned with all measures aimed at ensuring an adequate supply of food to all population groups, and the control of the environmental factors which condition the utilisation of nutrients (Devadas, 1978). A well qualified nutritionist, by applying the science of nutrition in the catering operation could provide optimal nourishment to the customers.

In many parts of the world inadequate food consumption is responsible for a lowered capacity for work and reduced working efficiency and the importance of feeding a strong healthy energetic work force to any national well being is

also known. Thus the importance of industrial feeding as a measure of promoting health and increasing working capacity and national income cannot be over emphasised (FAO/WHO, 1963, 1965; Department of Employment, 1972).

The primary aim of industrial feeding is to ensure a sufficient amount of food during working hours and to maintain an optimal working capacity. Both the quantity and quality of the food as well as the times of meals, affect the attainment of this goal.

At present canteens tend to provide meals that please the workers, though of less emphasis on the nutritive value. In most of the countries today canteens are regarded as an integral part of the plant organisation, (Terrel, 1977). There are two methods by which an industrial firm can set up a catering operation for the benefit of its staff; through contract caterers or by setting up a catering department within the firm itself (Lilliearp, 1971).

Since within recent years many industrial firms have come forward to provide catering facilities for their staff with-in the premises itself, the investigator took the topic of comparison of the functioning of two industrial canteens and intends to compare all the aspects regarding the working of those canteens in Coimbatore City.

II. REVIEW OF LITERATURE

The review of literature of the study, "The comparison of the Functioning of Two Industrial Canteens" are discussed under:

A. Scope of food service industry

B. Importance of industrial food service

C. Present situation of industrial canteens

D. Organisational and management aspects

and E. Need for expert nutritionists in food service industry.

A. Scope of food service industry:

Man can live in happiness without many earthly possessions, but not without good health. In the promotion and maintenance of health, the food we consume and the various factors which establish food habits and constitute the nutritional status have a vital part to play. (Devadas, 1968)

Food in the simple words of the dictionary means nourishment to satisfy hunger and secondly to satisfy the needs of the body for growth, maintenance and energy (Cronan et al 1965, Tohunter et al, 1968) Food has always been and is today more than a necessity to man and is a peace instrument when it is contributed to developing nations either directly or through agricultural aids (Bennet, 1965). Good food guards the power of a nation as much as guns and soldiers do. (Feeney, 1968)

Food service industry is one of the largest in most of the countries in the world (Chakravarthy, 1978). According to an estimate in U.S.A. the food service industry ranks fourth and employs approximately eight million persons. Canadian Restaurant Association estimates that in 1975, Canada had about 40,000 total food service outlets with an estimated sales volume of 40 billion dollars (Wheeln, 1975).

The trend in food service is towards separation of preparation from service both in time and place and towards centralised mass production of food for later reconstitution and service (Livingston, 1968).

The first coffee house that opened in Constantinople in 1554 is a far cry from any one of the myriand food service esta^blishments found in the United States today (Dietz, 1955). Food service is a combination of art and science, former produces a slow response which has high profit possibilities whereas latter produces a fast response item, one with low profit possibilities and to attract business both art and science must be part of an operation (Litman, 1978).

It is estimated that Americans eat twenty five per cent of their food outside home. Several million persons are busy in preparing and serving the meals and the food service industry is predicted to grow to an even larger volume in the near future (Blaker, 1971). Of the meals eaten away from home,

seventy three per cent are served in restaurants, industrial restaurants, hotels and hospitals and twenty seven per cent are served in schools, colleges clubs, transportation lines, department stores and a variety of other public institutions (Mayer, 1960).

The food service industry has had a 9.5 per cent average annual increase in growth over the last ten years, has an increasieng labour force, and has a slow increase in productivity (Livingston, 1974). The influence of food service industry upon the health of the nation has increased in importance, as more people have meals outside the home (Donald, 1957).

Eating out is not only a firmly established custom but a daily necessity for millions of people and account for over twenty per cent of the total amount spent for food in the United States (U.S. Dept of Health, 1961 and Daniel, 1959).

Food service industry is growing faster than the population with especially increasing rates in commercial food services offering specialised menus it has grown at a fantastic pace, so much that the grocery store industry is becoming today very concerned about its sales volume. About forty per cent of the family food budget is now spent in food service establishments, and this is expected to increase to fifty per cent by 1980 (Wilett, 1969 and Davis, 1977).

A food service system is thus an integrated programme in which the procurement, storage, preparation and service of foods and beverages and the equipment and methods required are fully co-ordinated to obtain minimum labour optimal customer satisfaction, quality and cost control, and the success of which depends on such factors as ability to predict and satisfy customer requirements, recruit, train and retain employees and promote and sell quantity menu items at a cost that provides a reasonable profit (Fresh Water, 1969 and Livingston, 1972).

B. Importance of industrial food service;

The term "industrial catering" means the provision of food or beverages to employees at work, regardless of the means used or who provides them (Department of Employment, 1972). It is not many years ago that workers in industry had to be satisfied with literally a "crust of bread and glass of water" to carry them through the long working day of perhaps 16-18 hours.

When a worker is poorly nourished his output is reduced and the quality of his work suffers. The importance of a strong, healthy energetic work force to any national well being and the close relationship between health and food in industrial feeding programme must also be emphasised. The health of the industrial worker will be conditioned not only by the quantity of the food that he eats, but also by the

quality of the food (FAO/WHO, 1963; 1965). Over the last half century however many developments have taken place which now ensure that all staff receive during their meal break an attractively presented meal, with good sized portions that are nutritionally well balanced (Lillicarp, 1977).

Industrial feeding has changed 50 years ago which was created for the sole purpose of keeping employees on the job and low cost meals were an employee benefit (William, 1963). From the stands point of public health, the industrial meals should carry atleast its own fair share of protein, vitamins and minerals in proportion to its calories (Lease, 1963). Work capacity, efficiency of performance, absenteeism and the morale of employees are directly related to industrial feeding (U.S.D.A. Marketing Research, 1959).

Advances in the science of nutrition have revealed that good food served under attractive conditions increases productivity in places, office, and shop. Thus the employees cafeteria makes a vital contribution to better working condition and greater co-operation and team work between management and all members of the working force (Tuttle, 1960).

A good industrial luch does not mean eating so much that one feels uncomfortable but that supplement what the employee

eats at home to balance his diet for the day and the year (Lease, 1963).

C. Present situation of industrial canteens:

Industrial feeding is regarded as an integral part of the facilities of the factory even though the provision of food to workers is frequently not required by law (FAO., WHO, 1965).

Industrial catering is now such an established feature in industry that the canteen has become almost a part of the modern factory or office as the workshop or sales office (New, 1957). A canteen which can produce a well cooked meal at a reasonable price, in pleasant surroundings, has some influence on attracting and holding labour - a point being regarded by many firms as being of great importance (Lubarg, 1973). The use of canteen services varies in the different countries but is often disappointingly small.

Because of rapid urbanisation and consequent large shifts in population an industrial feeding programme becomes important not only to the health and productive capacity of the worker but also to the improved distribution and use of food supply (Lillicarp, 1971). At the moment canteens tend to provide meals that please the worker, with little consideration for their nutritive value, or for the correction of known

inadequacies in the local diet (William, 1963). There is little or no attempt in any country to use the canteen for nutrition teaching in an effort to improve the food habits of workers. Some reports on industrial feeding stress the educational value of canteen meals in promoting the consumption of more adequate diets. Further more because of its lower price, the canteen meal may be regarded by the worker merely as a fringe benefit and not as an achievement to be emulated with the family (FAO, 1963). The psychological reactions by which the frustrations of the working day may sometimes be rationalised. This effect emphasizes the need for the attractive price taken of meals if they are to serve as a model for meals if they are to serve as a model for meals eaten at home (Chartrand, 1968).

D. Organisational and management aspects:

Organisation and management are the two aspects of the problem of integrating industrial enterprise. From the point of view of the members of the enterprise, the organisation is the pattern of relationships established among them and the management is the use to which this pattern is put in integrating their activities (Willers, 1961).

Organisation is the foundation upon which the whole structure of management is built that enables living things to work effectively by identifying and grouping the work to be

performed, defining and delegating responsibility and authority and establishing relationships for the purpose of enabling people to work most effectively together in accomplishing objectives (Allen, 1958).

Management is not a purpose in itself, it is an instrumentality. It can be defined as purposive and effective use of resources. Effectiveness and purposiveness must be judged through the dual optics of national economy and a particular firm within it (Hawrylyshyn, 1978).

The functions of management in all organisation are commonly classified as planning, organising, delegating, actuating, forecasting and controlling. Deviating from the traditional approach, change in management is a must in the rapidly changing food service industry (West et al, 1977, Donaldson, 1971).

1. Menu planning:

Good food assumes importance in institutions where meals are the major events of the day and influence the resident's and employee's health and morale (Wifquist, 1952 and Hartman, 1958).

The menu determines the foods to be purchased, the equipment, and personnel needed, the work schedules, the supervision required and is the basis for precosting food to be

served. The well planned menu reflects careful thought and represents three points of view, the customer or guest who desires and expects variety and ample amounts to satisfy his appetite and bring him pleasure; the employees and the management (West et al, 1966).

The attractive service of well prepared satisfying and nutritionally adequate food at a fair cost should be the objective of every food service operation. The first duty of the catering manager is therefore to serve within the limits of economy, the foods which he knows will be appreciated by his customers (Wood, 1966 and New, 1957).

The development of the menu for the food facility should be done carefully because it is the foundation upon which the layout and other design functions are based. The menu serves as the source of information for the various food items that are to be prepared and consequently the processes required for their preparation (Edward, 1975). Strictly speaking all menus should be composed, and it is the duty of the management, in close consultation with the chief to undertake this important duty (Winslet, 1955).

Advance planning permits checking menus for nutritional adequacy as well as the variety. It helps in planning the purchase needs and certainly it helps the cook to plan the

work more efficiently. Menu planning is not just a question of providing palatable and sustaining dishes. Meals should be planned also to provide as much nourishment as possible (Lessman, 1967 and New, 1957).

The aim in planning meals in canteens should be to provide one meal during the day a substantial proportion of all the essential nutrients required by the body. Menus should be suitable for the age, type of worker, nature of the industry and working conditions involved. Variety and choice in a canteen meals are psychologically the best means of promoting appetite and of putting over a healthy diet (New, 1957).

2. Purchasing and storage:

The procurement of food has been a challenging process since primitive times when man depended on the resources of nature and his ingenuity for survival. Current changes in food service operation are making the professional's responsibility for food procurement increasingly more important (West et al 1966; and Anderson et al, 1977).

Food buying should be in the hands of a capable and conscientious person of the highest integrity upon which depends to a great extent, the economical running of the canteen, the variety of the menu, and on the ultimate standard and cost of feeding (New, 1957).

Buying of food is a management function and as such the food service administration will have policies and procedures to guide him in setting up a course of buying action (West et al, 1977). Food purchases should be planned and made sufficiently in advance of needs and by establishing well defined purchasing patterns, the food service director can give more time to other administrative duties (Wifquist, 1952, and Elman, 1961).

The golden rule for storing food is to keep it clean, cool and covered. The proper storage of food in a catering establishment calls for systematic and unremitting care on the part of both management and staff (Dept of Health, 1963).

Waste due to unsatisfactory storage is often overlooked and sometimes tolerated because of insufficient space to improve or extend existing store rooms. Good storage will pay for itself in savings of food money and time (New, 1957 and Moore et al, 1977).

5. Portion control:

Portion control means the size or the quantity of food to be served to each customer, which is determined by the management by reference to number of factors; type of customers or establishments, quality of food, portion size adjusted to the price charged and the amount of profit required (Jayachandra, 1976).

In every case the size of the portion should be standard for standardised portions are as necessary as standard recipes (New, 1957). Weight and portion control are synonymous and better business practices in today's food service operations which is achieved through simple procedures such as teaching kitchen employees to read and use a scale efficiently and correctly. A regular procedure of check weighing on the receiving scales is vital, and is care of the scale to keep at accurate standandised recipes are also important (Sanders, 1961).

4. Quality control:

Quality control or quality assurance is an activity, method or programme that will ensure the maintenence and continuity of specifications and standards of products during all stages of handling, processing and preparation, and will further ensure that all original and desirable characteristics are sustained during storage, processing or preparation and will remain unaltered until consumed (Thorner et al, 1976).

Quality control in food service is the standard to which all steps of operation must of necessity conform in order to ensure that changes in a food's characteristic do not take place (Manning et al, 1976).

In quantity production of food, more attention must be placed on quality control. The planning and execution of purchasing, production and serving govern the extent of loss of final product quality (Livingston and Lane, 1968).

Factors responsible for poor quality food can be traced to poor sanitation, faulty handling, malfunctioning equipment, incorrect preparation and carelessness (Minor, 1977). With the advent of and phenomenal growth of food service units, handling convenience foods and quality control assumes an added role which is different from that in a conventional facility which converts its products from the raw to the finished state (Thorner et al, 1976).

5. Cost control:

Cost control has been defined as the guidance and regulation of costs of operating an undertaking. Food cost control is cost control as applied to hotels, restaurants, canteens and similar establishments, (Kotas et al, 1978). A well controlled food cost means that 'Waste' has been reduced to a minimum and maintained at that level because of close co-operation between competent employees and efficient management (Emery, 1960). No matter how efficient and modern the lay out, any food service operation is doomed to failure without adequate control of costs (Rosenblatt, 1958).

The main objectives of food cost control is analysis of income and expenditure, pricing of food and quotations, prevention of waste and inefficiencies, and data for management reports (Kotas et al, 1973).

It is only by planning in advance against an estimated per serving price on each menu that the manager can control the basic ordering and cut or add to the menu so that per serving costs are kept within a previously ascertained range. The purpose of cost control is to assist in obtaining the highest possible gross profit consistent with the operating policies of the organisation (Lawton, 1957 and West et al, 1966).

6. Sanitation and safety:

Food sanitation pertains to both cleanliness and wholesomeness of food. Practising sanitation means applying sanitary measures at every stage of the operation purchasing, receiving, storing, preparing and serving for the sake of cleanliness and for the sake of protecting the health of the public served (Longree, 1971). Food sanitation means food hygiene by which food can be kept safe and wholesome (Health Education Council, 1957).

Caterers have large known that in their industry cleanliness is of the first importance. Food must not only be clean but safe (Dept of Health, 1963). Inspite of certain

regulations it is well known that thousands of people become sick or die every year after consumption of contaminated food particularly after eating out from some food service establishments. The improper handling of food creates significant sufferings both to the consumer and to the food service operations to some extent (Whealn, 1975 and Chakravarthy, 1978).

Sanitation and safety are closely related to environmental factors in planning and operation of a food service. Provision for and maintenance of high standards in both are strategic to the health and well being of the community population (West et al, 1977). The safety and sanitation hazards and need for protection is multiplied in relation to the number of food handlers and food consumers involved daily in public food service (Ketschevar et al, 1977).

The canteen may be one of the most common foci from which disease may spread which may become a danger to the health of the worker and nullify the benefits of the canteen programme (FAO., WHO, 1965).

7. Personnel:

The productivity, efficiency and quality of the service of any food service establishment can be judged by assessing the employees in the establishments to a greater extent (Chakravarthey, 1978).

The efficient running of an industrial canteen cannot be completely achieved by any one person but depends on the co-operation of the employer, employees, the catering manager and his staff (New, 1957). There was in 1969 a total of about 177,000 people engaged in industrial catering in private and nationalised industry (Dept of Employment, 1972).

The managers and the workers of a canteen should be well trained and managing a canteen successfully is a job that calls for exceptional qualities, and the choice of the right person perhaps is the most important single factor for success (FAO, 1963).

E. Need for expert nutritionists in food service industry:

The importance of educational and vocational guidance is increasingly being recognised by the professionals and the lay public. Occupational information, atleast in the forms of the opportunities available for the persons trained in particular field of academic study is essential for wise educational and vocational career decisions (Saraswathy, 1978).

A nutritionist is one who had college training in the science of nutrition and is engaged in interpreting the principles of nutrition to individual or groups, and a translator of science of nutrition into the skill of furnishing optimal nourishment to people (Peak, 1974 and Mathewson, 1973).

It was recognised that the need for well qualified institutional nutritionist will continue for food services and cafeterias for the public and for industrial workers (Beasely and Huenemann, 1968).

If nutrition services are to be incorporatated in legislation, upto date methods and procedures in financial management and in personnel management must be adopted and new types of equipment and methods in handling and presenting food must be used (Fischer, 1974).

The work of a nutritionist in food service management requires a large amount of creative and analytic thinking, judgement, initiative, confidence and vision for the proper utilisation, regeneration and conservation of food and fuel resources, improving dietary practices and devising low cost and indigenously available foods (Gleiser, 1960 and Saraswathy, 1978). The nutritionist can enhance her contribution to the food service industry if she is both an expert in nutrition and a capable administrator (Blaker, 1974).

III. METHODOLOGY

In most countries today, the canteen is considered as an integral part of the plant organisation and the management takes pride in providing attractive and adequate facilities (FAO, 1963) Hence; the methodology of the study comprise:

A. Selection of the venue for the study

B. Selection of method

C. Comparison of the organisational and management aspects of the canteen

D. 1. Purchasing and storage

2. Cost control

3. Portion and quality control

4. Sanitation

5. Nutritive value of the food

6. Personnel

A. <u>Selection of the venue for the study:</u>

Industrial feeding services adaptation to changing working hours, needs and habits of workers are precipitating changes in these services and their organisation leading to the reassessment of present methods of operation of canteens (FAO, 1963).

For conducting the study the venue selected was the Coimbatore district itself, since many industrial plant organisations in this area were maintaining canteens for providing meals for their workers.

Of the two canteens selected, one was run by contract caterers, and the other by the management itself. These samples were selected to compare the functioning with regard to all the aspects in organisation and management and to find out which of these two canteens are promoting the welfare of the workers by providing nutritious food to the maximum.

B. Selection of the method:

Interview method was followed as it is a systematic method by which a person enters more or less imaginatively into the inner life of a comparitive stranger (Rangaswamy, 1976). The investigator had interviewed the managers of the two selected canteens in order to get the necessary information regarding the study. This was supplemented by observation.

C. Comparison of the organisational and management aspects of the canteen:

Since the two samples selected were under different control, one by contractors and one by management, the investigator had compared the various aspects of organisation and management. The managerial aspects were compared.

1. Purchasing and storage

Buying of food is a management function and as such the food service administration will have policies and procedures to guide him in setting up a course of buying action (West et al, 1977). The investigator had compared the purchasing and storage policies of the selected canteens to

find out whether there is any significant difference in the cost control by their different methods of purchasing and storage.

2. Cost control

Food is the largest controllable item of expenditure and the one subject to greatest fluctuation in the food service budget. If adequate control of food cost is to be effective, efficient methods must be employed in planning the menu, purchasing, storing, preparing and serving the food (West et al, 1977). So the cost control methods of the selected canteens were compared to find out what methods are being adopted by them to control their food cost.

3. Portion and quality control

While controlling the food cost, portion and quality control should also be maintained to provide an economical and high quality food to the customers. So these aspects were also compared as part of the study.

4. Sanitation

The canteen may be one of the most common foci from which disease may spread and unless safeguards are taken to make the food safe to eat, it may endanger the health of the workers (FAO, 1965).

A sanitation checklist was prepared to check the sanitational aspects of the selected canteens.

5. Nutritive value of the food

The menu is the pivotal point of the whole food service operation (Ohene, 1960). To find out the nutritional adequacy of the food provided for the workers, the nutritive value of the menu of the selected samples were calculated and compared.

6. Personnel

Good human relations within the organisation play a major role in the success of any enterprise. The personnel management and the efficiency of personnel were also recorded and compared inorder to find out how these aspects promote the welfare of the organisations as well as the staff.

The data obtained by conducting the study was analysed and discussed.

IV RESULTS AND DISCUSSION

The results of the study, 'Comparision of the functioning of Two Industrial Canteens' are discussed under the following headings:

A. Organisation and management of the two selected canteens

B. Managerial aspects

1. Purchasing and storage

2. Cost control

3. Portion control and quality control

C. Nutritionnal quality of the food

D. Sanitation

A. Organisation and management of the two selected canteens:

Of the two canteens selected for the study one was run by contract caterers and the other by the management itself. The two canteens are designated as canteen A and B respectively.

Canteen A worked in lease with caterer as the management wanted to be relieved of a considerable responsibility from the day to day operation of the catering services. Catering contracters could also improve cost control by interunit comparison, bring down overheads of an individual operation as a centralised organisation and control and spread planning, administration, training and proportion of management costs over a number of canteens.

The contractor accepted the full responsibility of running the canteen, while enabling it to retain its control, on the authority on matters of policy and principle in the establishment. Having accepted agreed terms it was the responsibility of the contractor to make profit or loss.

In this case the contractor was a person who had thorough knowledge of the importance of good nutrition and had been properly trained in the field of nutrition.

Canteen B was managed by the company itself. Here the organisation retained entire control and did the job itself which is considered to be the best method, as the fullest consideration could be given to the welfare angle and the agreed policy of the company which is to see that the employees get the maximum services. This Canteen A catered to 450 industrial workers. There were 20 workers employed here, whereas canteen B catered to 400 workers employing 12 workers in the canteen. The company appointed the supervisor and the rest of the staff. The workers of canteens A and B are depicted in Table I.

TABLE I

WORKERS OF CANTEEN A AND B

Type of workers	Number of workers	
	Canteen A	Canteen B
Manager or Supervisor	1	1
Cooks	3	2
Assistant cooks	1	1
Waiters	12	6
Helpers	3	-
Washing people	-	2
Total	20	12

In canteen A the contractor himself was the manager and supervisor. Of the three lady helpers, two were employed for cleaning the vessels and one for cleaning rice. The manager gives instructions for the workers to do their daily work. There were no part time workers and all the workers were given free accomodation and clothing.

The customers got the food when they produced coupons issued by the company. The manager had to collect the coupons and present them to the administrative officer of the company before he gets the actual cost of the meals provided at the canteen.

The catering contractor will only make himself responsible for the cost of food, wages, insurance, replacement of light, equipment and utensils. Other costs such as fuel replacement of equipment, maintanence and capital depreciation of plant have to be borne by the company.

The person who is appointed to manage this type of catering must obviously be able to satisfy in a dual capacity, first his employers, by making their required profit each week and secondly by trying to give full value and service to customers.

In canteen B the supervisor who is in charge of the whole canteen is responsible for controlling the cost and quality of the food and keeping the canteen clean and neat and he has got complete authority over the employees.

In this canteen the workers had to produce the tokens issued by the company at the counter before they took the food. This canteen functions for six days in a week unlike canteen A which functions for five days. Here also the employees were given free accomodation, food, clothing but the wages were paid by the company itself. Both the canteens provide meals for breakfast, lunch, tea and dinner.

On comparison the management of canteen B was more difficult than canteen A because each and every aspect of its administration should be taken to the administrative office of the company whereas in the latter, part of the responsibility was taken up by the contractors. But this does not affect the proper functioning of the canteen. Moreover direct management assures good will of the canteen.

Personnel:

The management of the personnel is the full responsibility of the manager or supervisor who is in charge of the canteen. The proper smooth functioning of the canteen depends upon the efficient management of the personnel and their efficiency in carrying out the work assigned to them. When compared it was found that personnel management was much better in canteen B than in the other. In the former the workers get bonus of 20 per cent per annum in addition to free lodging, food and clothing and thus they get an incentive to work satisfactorily whereas the workers in canteen A did not get any bonus or any other wages except the meagre salary and free accomodation, clothing and food. Infact there was no smooth relationship between the contractor and the workers whereas in the canteen B the workers were more happy and content. So that they work without making troubles and complaints.

Moreover in Canteen B music was provided during meal time, So that the customers as well as the staff could feel at home and relieve their tensions. But in canteen A no music was provided.

In both the canteens the selection of the personnel was not done carefully nor did they get proper training after selection.

B. Managerial aspects:

The managerial aspects are discussed below under:

1. Purchasing and storage
2. Cost control

and 3. Portion control and quality control

1. Purchasing and storage:

The purchasing of food materials was done from Chinthamani Co-operative stores at Coimbatore in both the canteens. Milk was bought from Milk Co-operatives in both the canteens. But in canteen A some of the food materials such as cereals, pulses and oil were bought from wholesale merchants in order to reduce the costs.

Purchasing was done monthly except for the vegetables. In canteen A vegetables were bought weekly thrice whereas in canteen B it was done weekly thrice. Vegetables were also

changed according to the seasonal variations, so that whatever vegetables which were available at a cheaper rate were bought in both the canteens.

The food articles were stored in a big and neat store room in canteen B while a small and dark room was used as a store room in canteen A. In the former there were number of racks and shelves to store the food materials with proper ventilation in the room, whereas in the latter the things were arranged in a haphazardous manner and the room was devoid of good ventilation. But the vegetables and other perishable things were stored in a separate place adjacent to the working area.

2. Cost control:

In both the selected canteens the food cost control methods did not differ much. In canteen A the cost was controlled partly by purchasing some of the food materials from whole sale merchants.

The menu of both the canteens differed significantly. The menu is given in Appendix I and II. In canteen A pure vegetarian food was served whereas in canteen B non vegetarian food was also provided on particular days.

These canteens provided meals at a very subsidised rate. But the cost of the food differ in both the canteens. Table II shows the cost of various meals provided for the workers at canteen A and their actual cost.

TABLE II

COST OF THE MEALS PROVIDED IN CANTEEN A AND ACTUAL COST

Items	Amount	Actual Cost		Subsidised rate	
		Rs.	Ps.	Rs.	Ps.
Iddli	2	0	20	0	09
Vadai	2	0	25	0	09
Oothappam	2	0	35	0	12
Pongal	1 plate	0	40	0	12
Meals	1 plate	1	30	0	24
Tea	1 glass	0	30	0	06
Milk	1 glass	0	35	free	

The Table shows that food industrial workers were provided with food from breakfast to dinner at a subsidised rate. Milk was given free and the canteen sent free milk at free cost for 50 - 55 workers four times a day. The contractor get the actual cost from the company when he produces the coupons to the administrative officer.

In canteen B more items were included in the menu. Table III indicates the cost of the food at this canteen.

TABLE III

COST OF MEALS PROVIDED IN CANTEEN B WITH THEIR ACTUAL COST

Items	Amount	Actual Cost		Subsidised cost	
		Rs.	Ps.	Rs.	Ps.
Iddli	2	0	20	0	03
Uppuma	1 plate	0	35	0	03
Chundal	1 plate	0	20	0	03
Dosai	3	0	40	0	06
Biriyani chutney	1 plate	0	35	0	06
Meals	1 plate	1	30	0	21
Poori masala	3	0	40	0	06
Chappathi	3	0	40	0	06
Coffee	1 glass	0	35	0	03

Table III indicates that canteen B is providing the workers with meals at a lower cost than canteen A. Moreover free coffee and tea were given at intervals. Night shift workers were provided everything at free costs. Whereas at canteen A except for the milk nothing was given free. The workers did not have to pay more to take extra food at canteen B while at canteen A anything taken extra was charged.

The wages of the workers were paid by the contractor and the company in canteen A and B respectively. The labour costs of both the canteens are shown in Table IV.

TABLE IV

LABOUR COSTS OF CANTEENS A AND B

Workers	Wages	
	Canteen A	Canteen B
Supervisor	-	900
Head cook	250	400
Tea master	40	100
Vegetable cutting	90	200
Purchasing	100	250
Grinding	65	90
Suppliers	45	75
Rice cleaning	70	100
Vessels cleaning	45	75

Workers in canteen B were given more wages than in canteen A. This may be because the contractor has to pay the wages out of the profit he has made every month. So he controlls the labour cost, whereas in canteen B the company itself has to pay the wages to the workers just like the other workers of the company.

Moreover the fuel used to cook in the canteen was firewood which costs Rs.1900/month while cooking gas was used in canteen B which costs only Rs.1600/month. Taking into consideration the cost trends the canteen A authorities were intending to adopt Kerogas for cooking purposes in the near future.

3. Portion and quality control:

In order to obtain portion and quality control standardised recipes were used in both the canteens and weighed and standard amounts were given for each meal. The standardised amounts of each item given in both the canteens are depicted in Table V.

TABLE V

STANDARDISED AMOUNTS OF FOOD ITEMS GIVEN AT CANTEEN A AND B

Items	Amount	Weight (g)	
		Canteen A	Canteen B
Rice	1 plate	500	700
Iddli	2	100	150
Vadai	2	40	65
Pongal	1 plate	150	-
Oothappam	2	80	-
Tea	1 glass	140ml	-
Coffee	1 glass	-	150ml
Milk	1 glass	140	-
Rasam	1 glass	140	150
Sambar	1 cup	120	150
Poriyal	1 portion	80	75
Buttermilk	1 glass	200	250
Curds	1 cup	60	75
Pickles	1 tsp	5	5
Uppuma	1 plate	-	75
Chundal	1 plate	-	60
Dosai	2	-	50
Chappathi	3	-	65
Poorimasala	3	-	60
Biriyani chutney	1 plate	-	70

In canteen A lesser amounts of food were given whereas in canteen B the amount as well as the items were comparitively more. Compared to the cost of the meals the portion given at canteen B was much more and also more economical. The workers could have as much as they want, while in canteen A they had to pay more for extra helpings.

The quality of the food was also much better in canteen B than the other. There was also wide variety in the menu, so that the workers were quite satisfied with the food. In canteen B fresh vegetables were always used unlike the other canteen where they purchased vegetables only thrice in a week. Moreover the type of cooking also determines the quality. In canteen A since firewood was used for cooking, it took a long time to cook. But in canteen B cooking was done by using cooking gas and hence the time and labour was saved as well as the quality was affected.

It was found that the food at canteen B was of high quality and more economical and quite satisfactory.

Nutritional quality of the food provided at the selected canteens:

In order to find out the nutritional adequacy of the food given at both the selected canteens, the nutritive value of the serving per head per day was calculated and compared. But since the workers were working in two shifts they take either breakfast and lunch or tea ~~or~~ and dinner. So the nutritive value of breakfast

and lunch per head was calculated and compared with R.D.A. for adult man doing moderate work as shown in Table VI.

TABLE VI

COMPARISON OF NUTRITIVE VALUE OF BREAKFAST AND LUNCH PER HEAD IN THE CANTEENS A AND B WITH R.D.A.

Canteens	Calories	Protein	Calcium	Iron	Carotene	Thiamine	Riboflavin	Vit C
	K cals	g	g	mg	µg	mg	mg	mg
Canteen A	1481	37.1	0.4	28	3954	0.9	0.6	68
Canteen B	1412	37.2	0.3	16.4	1371	0.9	0.5	15.9
R.D.A. for adult man (moderate work)	2800	55	0.4-0.5	20	3000	1.4	1.5	50

P.S: R.D.A: Recommended Daily Allowances

The above Table denotes the comparison of the nutritive value of breakfast and lunch per head in both the canteens with the Recommended Daily Allowances of the adult man doing moderate work.

It was found that in canteen A the food was nutritionally adequate except for riboflavin - which was lacking to a slight extent but not deficient enough to produce any disease. But in canteen B all the nutrients were adequately present except for vitamin A, riboflavin and vitamin C - which were found to be lacking to a considerable degree.

So on comparison the food management of canteen A was found to be much better although the menu items were limited and of comparitively poor quality. This may be due to the efficient management of the contract caterers - who - had thorough knowledge of the importance of nutrition and its impact on human health and - working efficiency. Hence from the nutritional point of view canteen A was found to be better, thus promoting the health of the customers.

The - calculations of the nutritive values are given in Appendices III and IV.

D. Sanitation:

The maintenance of high standards of sanitation is of utmost importance in all operations within the food service industry. A sound basis of understanding and co-operative effort and interest on the part of management personnel and control officials is necessary to carry out an effective programme in food sanitation.

A simple sanitation check list was prepared and using that as a guide the investigator had checked the sanitation and hygienic conditions of the selected two canteens. The criteria of the checklist are discussed as follows.

a. Floor, Walls and Ceiling:

The floor of the canteen A was in a poor state. It was full of trash and not mopped clean while the condition of the floor of canteen B was comparitively good. It was dusted properly.

The walls of the canteen A was dusted but were full of spoiled spots and marks whereas that of canteen B was dusted, white washed and were free of spots and marks although it was not perfectly clean.

The ceiling of canteen A was not dusted properly whereas that of canteen B was not altogether bad.

b. Work table, Sink and Cooking Area:

The top of the work table in canteen A was not clean and in poor hygienic conditions and was not placed in order while that of canteen B was kept in good condition and fairly clean. The condition of shelves and drawers of the table were same in both the canteens.

The sink in canteen A was not in a good condition. The outside and inside of the sink were very untidy in both the canteens. The drains were blocked due to the carelessness of the workers in both the canteens.

The cooking area was not kept clean and tidy while preparing food. All the articles were lying in a haphazardous manner throughout the area.

c. Grinders, Range and Cooking Utensils:

The grinders were kept in rather good condition with their body , base and attachment clean and in order. But in canteen A the workers were using the grinders carelessly spilling the contents all over and around the place.

The gas stove used in canteen B was kept clean and in order with the top ovens and burners clean whereas in canteen A the fire place was not clean and tidy.

The cooking utensils were washed and stored properly in good order and condition. The utensils were washed with soap and water before storing in both the canteens.

d. Personnel:

Taking into consideration the hygienic conditions of the personnel employed in the canteen, the appearance, uniform and hair were more neat and clean in canteen B than in canteen A. But in both the canteens the workers were free from colds or other infections. Handling of the food was not in a proper hygienic way in both the canteens. They touch the food with their hands thus paving way to food borne illnesses.

e. Serving Unit:

i) Serving table and floor:

The serving table in both the canteens were kept clean and free from soiled or grease spots and the floor was dusted and mopped clean and free from any soiled particles. Of all the places the serving unit was the place which was kept clean and tidy always in both the canteens.

ii) Serving Counter:

The serving counter was also kept clean and neat always and free from soiled spots. After each meal time it was washed with soap and water in both the canteens.

f. Store area:

In canteen A the store area was not kept in order. All the things were placed in a careless manner and the area was not dusted properly. Infact the store room was in a neglected condition.

On the contrary the store room of canteen B was kept in good condition with all the shelves, floor, wall clean and tidy and all the things placed in order with proper ventilation.

In both the canteens daily therough cleaning was done after lunch and dinner using soap powder and water. In canteen

canteen A once in a week mass cleaning was done using phenoil or dettol whereas in canteen B it was done thrice in a week. Sterilisation of the vessels was done weekly once using boiled water in both the canteens.

So it was found that with regard to sanitation and hygiene canteen B was comparitively much better than canteen A. The sanitation check list is given in Appendix V.

The result of the study showed that canteen B was better than canteen A in all the aspects regarding the functioning except the nutritional quality of the food where a few vitamins were found to be lacking to a slight extent. Except for this draw back canteen B provided high quality food at a subsidised economical rate to the industrial workers who work hard to ~~care~~ earn their daily bread and butter.

V SUMMARY AND CONCLUSION

Industrial canteens have assumed a special place and have become an integral part of many industrial organisations. The importance of industrial canteens in improving nutritional status, general health and well being and through these the productivity of industrial workers have been well known. Two such industrial canteens in coimbatore designated as canteen A, run by contract caterers, and canteen B run by the management have been observed and the managerial aspects studied.

Organisation and management of the two selected canteens were studied. The purchasing and storage, cost control, portion and quality control, sanitation and personnel were also observed. The nutritional adequacy of the food provided at the selected canteens was assessed.

On comparison it was found that the organisation and management of canteen A was less difficult since part of the responsibility was taken up by contract caterers who had been properly trained in the field of nutrition whereas canteen B was directly managed by the management authorities. The purchasing and storage methods did not differ significantly in both the canteens except that in canteen B storing was done in a planned manner.

The cost was controlled in canteen A partly by buying certain items from whole-sale merchants and the other cost control methods were similar in both the canteens.

In canteen B the amount of food given was greater when compared to canteen A and the quality was also better. Regarding sanitational aspects, it was found that canteen B was more clean and neat whereas in canteen A the sanitational and hygienic aspects were of poor quality. In both the canteens personnel selection was not done carefully nor they were properly trained.

From the nutritional point of view, canteen A was found to be providing good nutritious foods although riboflavin was lacking to a slight extent and the foods were of cheaper quality whereas in canteen B the food was found to be nutritionally deficient in vitamins such as vitamin A, riboflavin and vitamin C although high quality food was provided.

So it was found that although the organisation and management aspects of canteen B was better than canteen A, the crucial part of any food service operation - the food management was planned and done carefully in canteen A, so as to provide good nutritious meals using cheaper foods.

This was obviously due to the expert guidance of a good nutritionist, who was quite capable of utilising the resources to the maximum to promote the health of the workers and thus helping them to achieve good economy.

Hence it is recommended that in any food service establishment, the presence of a good expert nutritionist will be necessary to ensure customer satisfaction as well as their good health and well being.

B I B L I O G R A P H Y

Agarwal, N.P., 1978. "Designing a Survey of Cost Control and Reduction", Indian Management. 17. pp.15-16.

Allen, L.A., 1958. Management and Organisation. Tokyo, London, Singapore, Sydney. MC Graw Hill Kogakusha Ltd., p.7.

Anderson, A.L., Moore, A.N., 1977. "Importance of Food Procurement", Journal of American Dietetic Association. 71, 2. pp.20-25.

Badami, G.N., 1976. "How to Manage Managers who Manage the Employees", Indian Management. 15. p.21.

Berge, D.J., Nejelski, N., 1969. "Administration of Food Service Systems", The Cornell Hotel and Restaurant Administration Quaterly. 10. p. 32.

Bond, L.E., 1968. "Factors to consider in using Convenience Foods", The Cornell Hotel and Restaurant Administration Quarterly. 9. p. 9.

Bosley, B., Huenemann, R.L., 1968. "Preparing Nutritionists for integrated Health Service", Journal of American Dietetic Association. 53,2. p.116.

Blaker, G., Day, M.L., 1974. "Management attributes and Personality Characteristics of Dieticians", Journal of American Dietetic Association. 65,4. p. 403.

Brewer, W.D., 1961. "World View of Nutrition", Journal of Home Economics. 53. p.45

Chakravarthy, B.K., 1978. "Improved Food Service for Better Nutrition", The Indian Journal of Nutrition and Dietetics. 15. pp. 317-318.

Cordell, V.E., 1966. "How the Food Industry looks at the Sanitarian", Journal of Environmental Health. 28. p.379.

Cronan, M.L., Alwood, J.C., 1965. Foods in Home Making. Peoria, Chas Bennet Co., p.11.

Davis, A.S., 1977. "A New Era in Food Service Sanitation", Food Technology. pp. 30-31.

Davey, P.L.H., Lowenstein, F.W., Denhartog, A.P., 1968. "Industrial Canteens in Ghana", News Bulletin of joint FAO/WHO/OAU-STRC. pp. 2-3.

Dardarian, L., 1957. "Ten ways To Cut Your Labour Costs", Restaurant Management. 80. p. 43.

Devadas, R.P., 1968. A Manual of Basic Principles of Foods and Nutrition. p. 2-3.

Devadas, R.P., 1978. "Science and Technology for Tamil Nadu in Relation to Nutrition and Homescience" Proceedings of Tamil Nadu Academy of Sciences. 1. pp. 1-2.

Department of Employment, 1972. "Man Power Catering Studies. London. Her Majestie's Stationery Office. pp. 8-21.

Donaldson, B., 1970. "Managing change in Food Service Operations", Journal of American Dietetic Association. 57. pp. 335-337.

Elman, K., 1961. "Shaping Food Purchasing Patterns" Hospitals. 35. pp. 68-69.

Emery, J.H., 1959. "A Job that Never Ends", American Restaurant. 43. p. 663.

Fairbrook, P., 1964. "What Do You Know About Labour Costs", Food Service Magazine. 26. p. 31.

Fischer, F.E., Peck, E.B., 1974. "The Dietitian in the Legislative Arena", Journal of American Dietetic Association. 64, 6. pp. 622-642.

Food and Agricultural Organisation; World Health Organisation. 1965. — Industrial Feeding in the Near East. Alexandria, United Arab Republic. pp. 5, 17, 30-38.

Food and Agricultural Organisation. 1963. — Report of the Joint Symposium on Industrial Feeding and Canteen Management in Europe. Rome, Italy, pp. 2-7, 19, 30-33.

Freshwater, J.F., 1969. — "Future of Food Service Systems", The Cornell Hotel and Restaurant Administration Quaterly. 10. p. 28-

Friese, J.C., 1970. — "Professional Purchasing Techniques", School and College Food Management. 6. p. 16.

Greet, T., 1959. — "Inventory and Storage Factors in-Cost Control", American Restaurant. 43. p. 109.

Greenaway, D., 1962. — "Food Service Management", Journal of American Dietetic Association. 41, 6. p. 15.

Greet, T., 1960. — "Spot light on Cost Controls", American Restaurant. 44. p. 29.

Hall, C.G., 1976. — "Why New Sanitation Regulations are a Challenge to your Business", Food Service Marketing. 38. pp. 16-17.

Hawrylyshyn, B., 1978. — The Making of Managers in Asian Countries", Indian Management. 17. p. 10.

Haszonics, J.J., 1962. — "Cost Balancing the menu", Restaurant Management. 90. p. 38-39.

Health Education Council of Western Australia. 1963. — Food in Our Hands. pp. 7, 21.

Hogg, B., 1963. "The Windjammer - Efficient Sanitation, Volume Feeding Management.

Hunt, S.M., 1978. "Nutrition - The Foundation for fitness", School Food Service Research Review. 2. pp. 15-16.

Hysen, P., 1974. "Guide to Successful Planning", Hospitals, 48, 132. p. 52.

Kotschevar, L.H., Terrel, M.E., 1977. Food Service Planning, Layout and Equipment, New York, London, Torronto: John Wiley and Sons. pp. 2-4, 27, 35.

Kotas, R., Davis, B., 1973. "Food Cost Control". London. Billings and Sons Ltd., pp. 3-5.

Kotschevar, L.H., Williams, M., 1969. Understanding Food, New York, London. John Wiley and Sons. Inc., pp. 1-2.

Lane, M.M., 1968. "Quality Control in Foods", Nursing Homes, 17. p. 25.

Lawson, C.H., 1970. "For Contract Food Service Management", Hospitals, 44. p. 105.

Lawton, R.P., 1957. "Standardisation Leads to Lower Costs", The Modern Hospital. 89. p. 106.

Lease, E.J., Anderson, H.S., Malphrus, R.K., 1963. "Industrial Lunches And Public Health", Journal of American Dietetic Association. 43, 1. p. 62-65.

Lilly, M.M., 1976. "The Problem of Unsafe Food", Food Service Marketing, 38. p. 16.

Livingston, G.E., 1968. "Industrial Feeding", Food Technology. 22. p. 33.

Litman, C.K., 1970. "How to Chart Portions and Costs", Plant and Business Food Management, 6. p. 26.

Lillicarp, D.R., 1971. Food And Beverage Service, London. Edward Arnold Ltd., pp. 141-144.

Livingston, G.E., 1972. "Different Approaches to Total Food Service Systems", Hospitals, 46. p. 135.

Livingston, G.E., 1974. "Changes in Food Service Industry", Cornell Hotel and Restaurant Administration Quarterly. 15, 19. p. 15.

Lyod, A., 1977. "The Quest for Safe Food", Journal of Home Economics. 60, 4. p. 13.

Lowenberg, M.E., Todhunter, N.E., Wilson, E.D., Feeney, M.C., Savage, J.R., 1968. Food and Man. New York, London. John Wiley and Sons, pp. 101-102.

Longree, K., 1972. Quantity Food Sanitation. New York, London. Toronto. Wiley and Inter - Science. p. 209, 302.

Longree, K., Blaker, G.G., 1971. Sanitary Techniques in Food Service. London, Sydney, Toronto. John Wiley and Sons. p. 3-6, 59, 78.

Lubar, S., 1973. "Rescheouling the Inplant Menu", Plant and Business Food Management. 6, 19. p. 26.

Lundberg, D.E., 1964. "Management Responsibilities in Hotels, Restaurants and Clubs", Food Executive. 67. p. 10.

Mathewson, G.H., 1973. "Contributing Information to Patient Care Plans", Journal of American Dietetic Association. 63, 1, p. 45.

Metropolitan Life Insurance Company. 1955. Nutrition for the Family. pp. 5-6.

Minor, L.J., 1977. "Quality as an Economic Force in the Food Industry", Cornell Hotel and Restaurant Administration Quaterly 18. p. 29.

Miller, G.A., Goodenow, M.B., 1962. "Product Standardisation for Quality and Cost-Control", Journal of American Dietetic Association, 41, 1. pp. 25-27.

Moss, A.L., 1969. "Man Power Shortage in Food Service", The Cornell Hotel and Restaurant Administration Quarterly. 10. p. 43.

New, J.G., 1957. "Office and Works Catering", London. Business Publications Ltd., pp. 9, 13, 18, 20-25, 30-50, 89, 98.

Ohene, J., 1960. "The Menu", Volume Feeding Management, 14, 4. pp. 15-17.

Pocock, C.C., 1978. "The Manager in Today's Society", Indian Management. 17. p. 3.

Plewer, M.S., 1967. "Institution Administration", Journal of Home Economics. 59, 8. p. 675.

Rappole, C.L., 1977. "Sanitation in the Food Service Operations", Cornell Hotel and Restaurant Administration Quarterly. 18. p. 31.

Ross, M.A., 1967. "The Growing Demand for Technical Assistance in Feeding the worker", Journal of American Dietetic Association. 50,4. pp. 284-289.

Rosenblatt, R.L., 1958. "Practical Methods of Controlling Food - Costs", Institutions, 43. p. 167.

Saraswathy, L.S., 1978. "Job of Home Scientists", India Journal of Home Science, 12, 2. p. 65.

Sanders, A., 1960. "Portion Control and Profits", Restaurant Management. 87. p. 65.

Scottish Ministry of Home and Health Department 1963. Clean Catering. London. pp. 34, 43.

Thorner, M.E., Manning, P.B., 1976. Quality Control in Food Service. West port, Connecticut. The Avi Publishing Company Inc., pp. 1-6.

Thomson, M., 1960. "Portion Control is Basic Cost Control", Journal of Home Economics. 52, 8. pp. 49-52.

U.S. Department of Health, Education, Welfare. 1961. Food Service Industry Training Programmes and Facilities. Washington, State Government Printing Office. pp. 1-8, 10-4.

U.S. Department of Health Education and Welfare 1962. Food Service Sanitation Manual. pp. 1-5.

Waldvogel, F., 1977. "Time per portion and Volume in Food Service", Journal of American Dietetic Association. 70,2 p.35.

West, B.B., Wood, L., Harger, V.F., 1966. Food Service in Institutions. New York,,London, Sydney. John Wiley and Sons. pp. 15-16, 32,40.

Weaver, L., 1959. "Simple Steps to Control for More Profit", American Restaurant. 43. pp. 29-30.

Welch, J.M., 1969. "Food Service Can Compete", The Cornell Hotel and Restaurant Administration Quarterly. 10, p. 56.

Wilett, H., 1977. "Improving Sanitation in Food Service", Journal of American Dietetic Association. 70, 5. pp. 50-52.

Wilett, R., 1969. "What's Happening in Food Service", Food Engineering. 41. p. 111.

William, A.R., 1962. "Industrial Catering's Dilemma", Canadian Food Journal. 3. p. 38.

Wifquist, R.C., Hartman, J., Food Service in Small Hospitals. pp. 6-10, 12-13.

Zaccarelli, H.E., 1969. "The Future of Institutional Management", Catholic Institutional Management. 21. p. 64.

Zihlman, C.J., 1958. "Operating the Inplant Cafeteria", Inplant Food Management. 4. pp. 23-59.

APPENDICES

APPENDIX I

MENU FOR A WEEK IN CANTEEN A

	Monday	Tuesday	Wednesday	Thursday	Friday
Breakfast	Iddli, Sambar Vadai, Chutney Tea	Iddli, Sambar Oothappam, Chutney Tea	Iddli, Sambar Vadai, Chutney Tea	Iddli, Sambar Pongal, Chutney Tea	Iddli Sambar Vadai, Chutney Tea
Lunch	Rice Sambar Carrot porial Yamkkottu Mango inchi Rasam	Rice Brinjal Sambar Amaranth Kottu Potato porial Curds Lime pickle	Rice Vattal Kolambu Ladies finger porial Cabbage Kottu Mango pickle Rasam	Rice Aviyal or Mor Kolambu Beetroot porial Mint Chutney Curds Rasam	Rice Pumpkin Sambar Yam porial Chou-chou kottu Goosberry pickle Rasam
Evening	Same	as breakfast			
Dinner	Same	as lunch			

APPENDIX II

MENU FOR A WEEK IN CANTEEN B

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Poori Masala	Iddli, Sambar	Dosai, Sambar	Iddli, Chutney	Biriyani Chutney	Chappathi Dhalcurry
Breakfast	Uppuma	Uppuma	Uppuma	Uppuma	Uppuma	Uppuma
	Chundal	Chundal	Chundal	Chundal8	Chundal	Chundal
	Coffee	Coffee	Coffee	Coffee	Coffee	Coffee
Lunch	Rice Sambar Rasam Potato-Porial Pickles Appalam Curds	Rice Sambar Rasam Brinjal-Porial Pickles Appalam Curds Mutton	Rice Sambar Rasam Yam-Porial Pickles Appalam Curds	Rice Sambar Rasam Carrot-Porial Pickles Appalam Curds Mutton	Rice Sambar Rasam Brinjal-Porial Pickles Appalam Curds Payasam	Rice Sambar Rasam Beetroot Porial Pickles Appalam Curds
Evening	Same	as breakfast				
Dinner	Same	as Lunch				

APPENDIX III

NUTRITIVE VALUE OF THE FOOD PER HEAD PER DAY IN CANTEEN A

Ingredients	Raw Weight (g)	Calories (K cals)	Protein (g)	Calcium (g)	Iron (mg)	Carotene (µg)	Thiamine (mg)	Riboflavin (mg)	Vitamin C (mg)
Rice	550	1903	35.2	50.0	22.0	-	1.00	0.27	-
Red Gram dhal	50	168	11.2	36.5	2.9	66	0.22	0.09	-
Black Gram dhal	50	174	12.0	77.0	4.5	19	0.21	0.18	-
Coconut	20	89	0.9	2.0	0.3	-	0.01	0.02	0.2
Milk	170	114	5.4	204.0	00.3	1785	0.09	0.30	3.4
Curds	75	45	2.3	112.0	0.10	918	0.04	0.12	0.8
Tomato	20	4	0.2	10.0	0.08	70	0.02	0.01	5.0
Onion	50	30	0.9	20.0	0.60	8	0.04	0.01	1.0
Green Chillies	5	2	0.2	1.5	0.06	9	-	0.01	5.6
Tamarind	5	14	0.1	9.0	0.90	3	-	-	0.1
Potato	90	87	1.4	9.0	0.60	21	0.09	-	15.3
Brinjal	50	12	0.7	9.0	0.50	37	0.02	0.05	6.0
Amaranthus	90	41	3.6	357.0	23.0	4968	0.02	0.20	89.0
Lime	15	9	0.2	13.5	0.05	3	-	-	9.5
Oil	30	270	-	-	-	-	-	-	-
Total		2962	74.3	0.4	56	7907	1.8	1.3	136
R.D.A. For Adult man (moderate work)		2800	55	0.4-0.5	20	3000	1.4	1.5	50

R.D.A - Recommended Dietary Allowances

APPENDIX IV

NUTRITIVE VALUE OF THE FOOD PER HEAD PER DAY IN CANTEEN B

Ingredients	Raw Weight(g)	Calorie (K cals)	Protein (g)	Calcium (mg)	Iron (mg)	Carotene (µgm)	Thiamine (mg)	Riboflavin (mg)	Vitamin C (mg)
Rice	500	1730	32.0	45.0	20.0	-	1.05	0.25	-
Rava	35	122	3.6	5.6	0.6	-	0.04	0.01	-
Red Gram dhal	40	134	9.0	29.2	2.4	54	0.18	0.08	-
Black Gram dhal	40	139	10.0	62.0	3.7	17	0.17	0.15	-
Bengal Gram (Whole)	20	72	3.4	40.2	2.0	38	0.06	0.05	0.6
Mutton	35	68	6.5	53.0	0.90	-	0.06	0.04	-
Milk	150	101	4.8	180.0	0.30	1572	0.08	0.30	3.0
Curds	75	45	2.3	112.0	0.10	918	0.04	0.12	0.8
Ladies finger	25	9	0.5	17.0	0.50	13	0.02	0.02	3.0
Brinjal	25	6	0.4	5.0	0.30	19	0.01	0.03	3.0
Tomato	20	4	0.2	10.0	0.08	70	0.02	0.01	5.4
Onion	75	44	1.4	30.0	0.90	11	0.06	0.01	1.5
Green Chilies	5	2	0.2	1.5	0.06	9	-	0.01	5.6
Red Chillies	5	12	0.08	8.0	0.01	17	0.04	0.02	2.5
Tamarind	5	14	0.1	9.0	0.90	3	-	-	0.1
Lime	10	6	0.1	9.0	0.01	2	-	-	6.3
Oil	25	315	-	-	-	-	-	-	-
Total		2823	74.4	0.6	32.8	2743	1.8	1.1	31.8
R.D.A. For Adult man (moderate work)		2800	55	0.4-0.5	20	3000	1.4	1.5	50

R.D.A - Recommended Dietary Allowances.

APPENDIX V

SANITATION CHECK LIST

Food Preparation Unit	Scores
Floor	
Free from trash	
Mopped clean	
Walls	
Dusted	
Free from Soiled Spots	
Ceiling	
Dusted	
Work Table	
Top Clean and in order	
Shelf clean and in order	
Drawer clean and in order	
Sink	
Outside clean	
Inside clean	
Drains open	
Faucets tight	
Cooking area	
Clean and in order	
Grinders	
Body and base clean	
Attachments clean and in order	
Range	
Top clean and polished	
Oven clean	
Burners clean	
Cooking utensils	
Clean and free from greasy film	
Stored in good order	
Personnel	
Appearance neat	
Uniform clean	
Hair neat	
Hands clean	
Free from colds or other infections	
Food properly handled	

Serving Unit	Scores
Serving table	
Top clean and free from soiled spots or grease	
Floor	
Dusted	
Mopped clean	
Free from any trash	
Serving counter	
Clean and inorder	
Free from soiled spots	

Store area	Scores
Cupboards dusted properly	
Free from soiled spots	
Floor clean and dusted	