

Quality Control Procedures Adopted  
in  
Selected Food Service Institutions.

by  
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**TO MY GOD PARENTS**  
**SRI. RANGANATHAN AND**  
**SMT. KAMALA RANGANATHAN**

## ***Acknowledgement***

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## ***Introduction***

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## INTRODUCTION

The food and beverage service industry consists of every establishment that sells food and beverage to people outside their own homes. On a global scale, it is a multi-billion dollar enterprise which employs millions of people and is of vital world wide economic importance.

The industry has expanded rapidly in the past half-century, especially the last two decades. It is broad in scope and varies from systems such as highly competitive restaurants and hotels to a multiplicity of fast and less costly food outlets with conservative budgets. The growth in the heavy patronage of such food services may be attributed in part to changes in the socio economic trends of the times and an awakened interest in the health and well-being of the people.

In any food service establishment, be it commercial or non commercial the goal should be the maintenance of acceptable standards of food preparation that will result in a wholesome product of high quality served in the best condition and manner possible.

Although profit making may be the most important goal of commercial establishments, there should be sufficient emphasis on providing food and service of good quality. Food quality varies widely in the food services industry. It may be attributable to the standards the food service manager has, concerning the products and services offered and cost fixed. Almost every component of the dining-out experience, including menu variety, prompt services and food preparation techniques is an indicator of quality. To provide quality the food service manager must establish standards of personnel, equipment, sanitation, raw materials, food preparation, presentation and service.

Quality from the consumer's point of view is the extent to which a product fulfills his or her needs and wants, states MC Nutt (1988) Diners walking into a commercial facility for the first time bring with them a number of expectations. They expect good, safe food, clean surroundings and pleasant service.

In the words of Minor and Cichy (1986) "Quality is fitness for use, plus reliability, delivered at a marketable price". The development of quality products can enhance an establishment's market standing. Quality is never the result of the efforts of the quality control department alone.

Rather, quality is the one factor that the entire organisation must support. It is a valued organisational goal and outcome. It is the management's responsibility to establish quality as an attitude that permeates the entire organisation.

According to Merricks and Jones, (1986) quality control has been defined as the operational techniques and activities that sustain the quality of a product or service that will satisfy given needs.

To understand the development of quality control in the foodservice industry, it is necessary to trace the origin of quality control in the manufacturing industry.

In the early days the manufacturing industry offered no assurance of quality to the consumer. The only hope for purchasing high quality commodities was in examining the products before purchasing. The workers divided the manufactured goods as saleable, seconds and disposable. It was during the industrial revolution in England that a need for manufacturing products of good quality was felt.

During the earlier half of the twentieth century, some standards for quality were established and supervisors were hired to see that these standards were maintained in production. It was during the second world war that there was a real upsurge in quality assurance. More conscious efforts

were taken by manufacturers to improve product quality. The advances in science and technology have contributed greatly to improvement in quality.

The origin of quality control practices in the food service industry is very similar to that of the manufacturing industry. The development of science and technology and various means of transport also increased the number of hotels and this gave rise to competition among the hoteliers. After the second world war, individual entrepreneurs who found themselves crushed in the hotel business merged themselves with international operators. Thus international chain operations were set up. Phrases like "High Quality" and "Best Quality" were used by them in advertising in order to boost their images and to attract clientele.

As times progressed and knowledge in nutrition became advanced, people became more conscious about health, hygiene and sanitation and expected these factors to be present in the hotels they patronised. The managers of hotels became obliged to conform to the minimum standards of quality in order to satisfy the customers. Thus developed the system of quality control in the food service industry. As food technology advanced, more rigorous efforts were taken to establish and maintain quality standards.

The modern day concept of total quality control involves evaluation at various points of operation of the food service institution starting from purchasing till service emphasising on sanitation while handling foods at various stages.

Roger Manley (1990) points out that the consumer's best hope for safety and quality in food lies in the development and maintenance of an adequate quality control programme. The food service industry should not overlook the growing army of consumers with money to spend on foods with good quality and healthful attributes.

It is now recognised by many food service establishments that quality control is vital and in many instances represents the very life blood necessary to compete successfully in today's competitive markets. On the other hand, some establishments still view quality control programmes as an expense with no direct profit.

As a large section of the population today patronises commercial food services, the investigator has chosen to assess quality control procedures in selected food service establishments in the interest of the public.

The objectives of the study are:

- A. To survey the quality control procedures adopted in the selected four commercial food service establishments in

their various stages of operation.

- B. Determine the existing sanitary conditions and personnel hygiene and
- C. Study the consumer's concept of quality.

## ***Review of Literature***

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## II REVIEW OF LITERATURE

The literature pertaining to the study on quality control in selected food service institutions is reviewed under the following headings.

- A. SCOPE OF QUALITY CONTROL IN FOOD SERVICE
- B. QUALITY CONTROL IN THE OPERATION CYCLE OF A FOOD SERVICE
- C. CONSUMER'S PERCEPTION OF QUALITY
- D. SANITATION AND PERSONNEL HYGIENE
- E. THE HAZARD ANALYSIS CRITICAL CONTROL POINT SYSTEM

### A. Scope of Quality Control in Food Service

Quality is the ultimate criterion of the desirability of any food product, remarks Manay & Sadaksharan (1987). Quality control, in the words of Herschdoerfer (1984) is an activity, procedure, method or programme that will ensure the maintenance and continuity of specifications and standards of a product within prescribed tolerances during all stages of handling, processing, preparation and packaging and will further ensure that all the original and desirable characteristics are sustained during storage, processing or preparation and will remain unaltered until consumed. Thorner and Manning (1976) state that quality control can achieve its maximum benefits only if it is instituted on all levels and sublevels of a food service operation.

Quality control programmes have rarely been expanded to embrace all the activities within the confines of a food service facility. They are usually developed for a small segment of the overall operation, example the inspection of incoming products. To be meaningful, quality control must be applied to all steps, areas and equipment that come in contact with food and beverages. Once a programme is developed covering edible products and their contact point, problems contributing to unsavoury and unpalatable foods and drinks will be drastically reduced or completely eliminated. Moreover a strong, thorough programme will increase profits and result in greater customer satisfaction.

According to Kramer and Twigg (1979), total quality control involves evaluations in all steps of product flow, from inspection of incoming raw materials through surveillance of the finished products. Any food service institution, regardless of its size and type, can be thought of as a system of inter-related functions. These functions, called Basic Operational Activities have been outlined by Minor and Cichy (1986), as follows:

1. Purchasing of raw materials
2. Receiving of raw materials
3. Storage of the received materials
4. Preparation of products

5. Service of the prepared products
6. Clearing up and waste disposal.

The work flow of a food service establishment, as outlined by Jacob (1989) is outlined in figure 1.

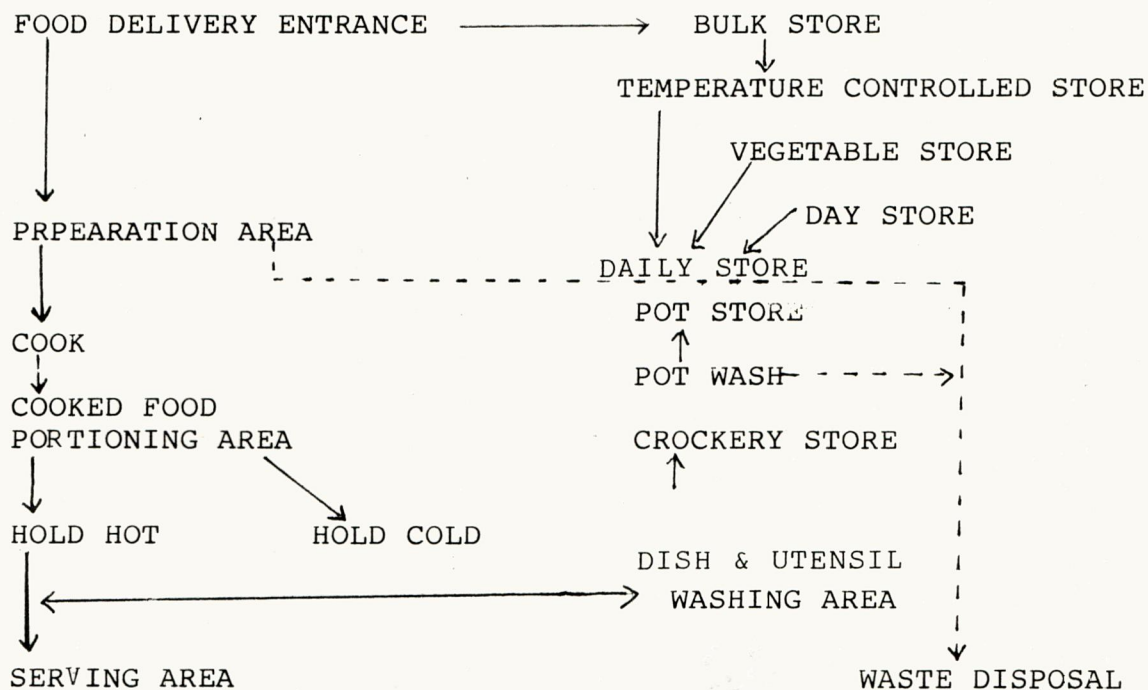


figure 1 WORK FLOW DIAGRAM OF A FOOD SERVICE ESTABLISHMENT

= JACOB (1989)

KEY

- Movement of food
- Movement of waste

Quality control procedures should be adopted at each and every point of the basic operating activities

in order to ensure food safety and quality and customer satisfaction. (Irving and Hoover (1975)).

B. Quality control in the operation cycle of a food service

1. Food Purchasing:

Controlled food purchasing represents a very important function in any type important function in any of food service. The quality of food served depends directly on the quality of the raw ingredients. Mahmood Khan (1984) states that "one can produce a low - quality food from high-quality ingredients whereas it is impossible to get a high-quality food from low - quality ingredients". A manager should therefore give prime importance to food purchasing.

Quality control can be adopted by setting out accurate specifications for each food. Stefanelli (1981) suggests that for this, foods can be conveniently grouped under the following headings - milk and its products, meat, poultry and fish, vegetables, fruits, cereals and products, Pulses and legumes, sugar and sweets, fats and oils and beverages.

After the foods have been conveniently grouped, specifications have to be prepared for each group. A specification, as defined by Sullivan (1990) is a written

statement in clear, concise terminology that states what is desired by the buyer. For food products, specification refers to the quality, size and other factors needed to obtain the right item. It communicates to the supplier the exact sizes, weights and numbers required, along with the desired quality characteristics. Malhan & Sethi (1987) state that to control quality in purchasing, every manager must adopt government established standards like Agmark, ISI and FPO for various products and formulates his own standards for those which do not have any.

Wise food procurement decisions should result in minimum food waste and the promotion of adequate nutritional care, remarks unklesbay (1977).

## 2. Receiving :

Efficient food purchasing methods demand good receiving procedures. Statistics gathered by Keiser (1989) reveal that poor receiving procedures have the following results: Pilferage, accepting underweight merchandise, contamination and waste. These factors individually or in combination have contributed to severe losses and even business failures.

Regardless of the size or scope of an establishment, receiving requires quick handling, exacting quality

control procedures and trained personnel possessing good judgement and experience, state Kotas and Davis (1981).

Manning (1976), Keister (1977) and Sullivan (1990) have suggested the following guidelines to control quality in receiving :

- a) The receiving personnel should have the necessary storage space ready.
- b) When the goods arrive a proper invoice or delivery sheet should be used for verification.
- c) All merchandise should be carefully checked for quality by checking against specifications besides considering aspects like governmental standards. In the case of fresh fruits and vegetables, the colour, freshness and freedom from damage should be checked. Dairy products can be checked for fat content.
- d) All items received and checked should be immediately sent to their respective storage areas.

### 3. Storage

The proper storage of food immediately after it has been received and checked is an important factor in the prevention and control of loss or waste, pilferage, deterioration or infestation. When food is left unguarded in the receiving area, its safe keeping and quality are jeopardized.

Food storage facilities should provide for the satisfactory preservation of foods in dry storage and refrigeration. Controlled storage of all food purchased is essential to protect stocks against unauthorised usage: (west et al 1977).

#### 4. Preparation

This includes pre-cooking and cooking processes, pre-cooking involves all food handling procedures, performed prior to heating which includes collecting the ingredients, weighing and measuring them according to the recipes and preparing the different foods to make them ready for cooking (Mario, 1982).

The preparation of nutritious and appealing food is an asset to any institution, since quality food is not only satisfying to clients but also enhances an institution's image. Although menu planning, purchasing and related procedures are of major importance, the foremost concern should be the development of perfect products-the best in quality, styling and satisfaction -(Rutherford, 1990).

Fulter (1986) emphasizes the use of standardized recipes in food preparation as they are valuable aids for the control of quality and quantity. Khan (1984)

defines standardized recipes as those which are tested for quality, quantity, procedures, time, temperature, equipment and yield and found consistently to give the same results.

Armbuster and Longree (1987), Adams and Cockett (1988) and Stewart and Hunwick (1988) have outlined the following guidelines for controlling quality in preparation :

- a) Thorough washing of all raw food materials in lukewarm running water to remove dirt, mud, soil and chemical residues.
- b) Using the correct amount of water for cooking vegetables.
- c) Using standardised recipes.
- d) Using correct cooking temperature, time and methods.

#### 5. Holding :

Thorner and Manning (1976) opine that product holding is critical because of the potential for product quality deterioration and contamination. Holding food in bain maries for extended periods of time will downgrade its quality by altering factors such as textures, flavours, shrinkage and nutrient content. In addition, microbial spoilage may become a problem. Juran and Bryna (1980) suggest that product quality deterioration can be reduced

if products are held for minimal amount of time and by preparation of foods in small batches.

Thorner and Manning, (1976) Smith and Giglio (1979) state that the following measures would help in controlling quality during holding :

- a) Holding hot foods at 60 degree C.
- b) Exposing all parts of the food to a safe holding temperature by frequent stirring.
- c) Covering containers.
- d) Using proper utensils for portioning.
- e) Minimising handling and exposure of food during holding.
- f) Maintaining refrigeration temperature at or below 10 degree C and freezer temperature at or less than 0 degree C.
- g) Holding hot foods for not more than four hours and cold foods for not than one day.

#### Utilisation of left-overs

If products held are not sold, they become left-overs. Jones (1983) points out that left-over foods are handled often and are thus subjected to contamination. He suggests that left-overs stored in the refrigerator should be covered tightly, labelled and dated and that vegetable product left-overs should be used within 24 hours of preparation.

Khan (1984) states that the left-overs should be rapidly cooled to a temperature of 7 degree C or less. Hot left-overs can be chilled rapidly by using low-temperature coolants like cold water or ice. When larger quantities are divided into smaller quantities, the left-overs chill more rapidly. He points out that the best method for eliminating unnecessary left-overs is to gear food production to anticipated sales.

#### 6. Service

Before the food reaches the consumer several aspects should be checked, one of which is portion control. Pizam and Lewis (1981) state that portion control is extremely important from the economical and psychological point of view because consumers feel that they are cheated if unequal portions are served.

Evans (1979) has given the following directions to ensure adequate portion control.

- a) The use of standardised recipes
- b) The use of standard sized ladles, cups, spoons, scoops and portions scales.
- c) Usage of meat, and bread and egg slicers to yield consistent sliced portions.

- d) Usage of individually weighed, measured and packed items such as sand wiches.
- e) Pasting charts stating the weight and volume of each item to be served in the portioning area.
- f) Periodic evaluation<sup>^</sup> of recipes by experienced personnel to assess whether they conform to quality standards and making changes where necessary.

The service of food is an art which can make or break the reputation of a food service establishment. Well prepared food, conforming to high standards of quality can be rejected if the service is slow, slipshod or if the server is unkempt in appearance, impolite or careless. Customers can refrain from visiting food services if the environment does not provide the emotional satisfaction expected by them. Apart from food quality, therefore, good service is vital for success in catering. In a 1985 poll conducted in Miami, USA, it was found that 83% of restaurant customers would not go back to a restaurant if they had received bad service (Gallup, 1985). Martin (1986) states that food serving is a basic operating activity in which the control is transferred from the production to the service department.

C. Customers' Perception of Quality:

Hospitality customers are no different from

customers of other goods and services. With most of the goods some attributes can be checked before purchasing. These attributes are called "search qualities". They include such things as colour, fit, feel & so on - that is they are largely tangible qualities. Attributes that can only be evaluated after purchase or during consumption are called "experience qualities". These include such things as taste & wearability, but some of these can be sampled. In hospitality services, however, there is no opportunity for sampling & the customer is almost totally dependent on experience qualities-Lewis & chambers (1989).

#### Evaluating Quality:

In the case of goods, consumers have many tangible clues for evaluating quality before purchase. In the case of hospitality services, customers have few if any real clues before purchase. They have to rely on either their own experience or the experience of others to evaluate quality. In this sense, quality is perceived as the outcome of experiences, i.e., the result desired by the customer. Hence quality is defined as PERCEIVED service matching EXPECTED service. This definition clearly places the criteria of quality on the consumer, not management.

Perceived Risk:

Hospitality consumers assume greater risk when buying hospitality products. Services are not standardized. A service order that takes a long time is nonredeemable. An overcooked food may be replaced but only at the sacrifice of one's time. A surly waiter can ruin one's day without redemption.

Carter (1989) remarks that Brand loyalty has small reward in hospitality. Consumers may prefer one chain's hotel in one city and another chain's hotel in another city. Research has shown that a good reputation is more important to the customer.

According to McNutt (1988), Quality from the consumer's point of view is the extent to which a product fulfils his or her needs & wants. They also include "getting what you're paying for" in their definition of quality.

Measuring Customer Satisfaction

(King 1989) states that customer satisfaction should be monitored periodically. Comment cards can be issued to customers to get their opinion on the various items and their satisfaction or dissatisfaction with the quality of service. Complaints should be dealt with smoothly &

efficiently. Studies by the American Management Association (1988) suggest that the satisfied customer tells three friends or acquaintances about his or her good experience, while dissatisfied customers moan about it to eleven people. There should be swift & efficient response from the management in dealing with complaints.

According to Hartesvelt & Lane, (1983) the following are the guidelines for quality in service:

RELIABILITY involves consistency of performance and dependability.

RESPONSIVENESS indicates the willingness or readiness of employees to provide service.

COMPETENCE means possession of the required skills and knowledge to perform the service.

ACCESS involves approachability & ease of contact. It means that waiting time to receive service is not extensive.

COURTESY involves politeness, respect, consideration and friendliness of personnel.

COMMUNICATION means keeping customers informed in a language they can understand and listening to customers.

CREDIBILITY involves trust worthiness, believability and honesty.

UNDERSTANDING THE CUSTOMER involves making the effort to understand the customer's needs.

TANGIBLES include the physical evidence of the service like physical facilities, appearance of personnel and equipment used to provide the service.

D Sanitation and Personnel Hygiene:

The food service manager's responsibility is to see that the food served to the customers is safe and wholesome. Managing a sanitary food service is as important to the success of an operation as controlling costs and advertising.

A report of the National Restaurant Association (1986) states that the over all goal of a sanitation programme is to control the handling of food from purchase to service to ensure its safety. The manager has a number of factors within his or her control that can ensure a sanitary operation and safe food.

Blaker and longree (1988) state that the total environment in which food is delivered, prepared and served **shou**ld be free from the potential of infestation by insects, rats and flies. The water supply and sewage lines should not run too close to each other because in the event of leakage, the water supply can get contaminated.

Venison (1984) states that adequate space for suitable storage of the types of foods selected should be provided in locations convenient to receiving and preparation areas. Storage areas must be kept clean and orderly, with temperature and humidity controls and provision for circulation of air.

Jones (1979) opines that the arrangement of food items in storage affects the efficiency with which foods can be stocked, issued and re-ordered. He adds that any system adopted should aim at establishing a flow of material in and out of the stores in a manner that will preserve the quality of foods to the maximum.

Cleanliness and orderliness go hand in hand, and the importance and benefits of both can never be overemphasized. No trash or spilled food should be left on the shelves or floor to harbour vermin or soil. A regular cleaning schedule will need to be designed. Cracks and crevices in the floor or walls should be filled in so that they cannot harbour dirt or allow the entry of rodents (Reid, 1989). Stretch and Southgate (1986) assert that leaking overhead sewer lines are a highly dangerous source of contamination of any food.

The Educational foundation of the National Restaurant Association (1985) reports that positive storage control procedures will tend to eliminate the problems of spillage, wastage, deterioration and contamination.

Insect infestation in the food premises can be prevented by protecting the building against entry, eliminating breeding places, protecting food and destroying the insects.

Regarding equipment sanitation, the International committee on Micro biological Specifications for Foods (1986) states that food preparation equipment should be kept in good condition, and be frequently cleaned and disinfected. Slicers and mincers should be thoroughly cleaned after each use. At the end of working periods, all equipment should be cleaned in accordance with the manufacturer's instructions.

A report of the WHO (1986) states that a major risk of food contamination lies with the food handler. Food handlers infected with pathogens may contaminate food, thus transmitting food borne illnesses. To minimise this risk, education and training of food handlers in personnel hygiene and safe food handling techniques should be initiated-Jacob (1989). It has been concluded that routine medical and laboratory screening of food handlers is of no value, as

such examinations only reveal the health status of the worker at the time of examination and cannot take into account subsequent bouts of infectious conditions--(WHO, 1989). Food handlers should, however, be encouraged to report immediately if they are ill. All food handlers should agree to report to their employers any infections or circumstances that might lead to food contamination. An agreement, to this effect, can be drawn up for food handlers.

Food handlers should be encouraged to adopt a code of personal hygiene that could be outlined in a leaflet or booklet to be given to the staff, when they take up employment, using the following guidelines as suggested by Longree and Armbuster (1987) and Blaker (1988)

Wash your hands frequently, particularly after visiting the toilet, immediately before and after handling the food, after handling refuse and when the hands look dirty.

Keep your clothes and overalls clean, and wear the protective clothing provided.

Always keep your hair covered so that stray hair or dandruff cannot get into food. Do not comb or tidy your hair in the food preparation area.

Avoid wearing rings & bracelets when handling food.

Cover all cuts & grazes completely with waterproof dressings.

Try not to smoke. If you must, always leave the food preparation area, and wash your hands before returning. If you have one of the following conditions report it to the management immediately—Jaundice, Diarrhoea, Vomiting, Fever, Sorethroat, Skin rash or boils & cuts, discharge from eye, ear or nose.

If you are handling food that is ready to eat, use tongs and not your fingers.

Do not cough or sneeze over uncovered food.

Pick up knives & forks by their handles, glasses by their stems & plates by their edges.

Wipe up any spills promptly.

Avoid touching your hair, ears, nose or mouth while handling food.

Do not lean or sit on the work table.

Do not wipe work surfaces with your overalls. Use separate cloths for wiping work surfaces.

Change into your uniforms and overalls before you enter the kitchen.

Use disposable plastic gloves if food has to be handled by hand. Dispose of used gloves .

#### F The Hazard Analysis Critical Control Point System

Traditional approaches to assure food safety and quality have significant limitations. Training courses for food workers, for example, are usually of short duration. Regarding microbical testing, it is usually not practical to collect and test enough samples to have a high degree of assurance that contaminants are found if present. According to the National Research Council (1985) the limitations to the use of microbiological testing are:

(i) The problem of sampling and examining a sufficient number of sample units to obtain meaningful information on the microbiological status of a batch of food (Kilsby & Pugh, 1981).

(ii) The constraints of time and cost to obtain results (International Commission on Microbiological Specifications for Foods, 1986).

For example, it is impractical to hold perishable products pending the results of microbiological analyses and with stable products warehousing is necessary. Microbiological testing of products only identifies effects & usually neither identifies not controls causes. Furthermore, microbiological testing is expensive.

Inspections are usually of short duration and only a portion of a process is evaluated. Certain items in regulations are not specific and judgement must be made by inspectors, these may be quite divergent when made by different inspectors.

The Hazard Analysis Critical Control Point System is emerging as the primary means by which the food industry can ensure the safety and quality of its products. It is of great use in food service establishments in developing and developed countries, and consists of the following elements.

1. Hazard analysis. The identification of hazards followed by assessment of the severity of these hazards, and the risks that they pose. A hazard is the unacceptable contamination, growth or survival in food of bacteria that may affect food safety or quality and or the unacceptable production or persistence in foods or product & of substances such as toxins, enzymes or products

2. Determination of critical control points required to prevent or control the identified hazards.

of microbial metabolism.

Severity is the magnitude of the hazard or the seriousness of the consequences that can result when a hazard exists. A risk is an estimate of the probability of a hazard occurring
3. Establishment of effective critical control point.

A critical control point is an operation (practise, procedure or process), or a step in an operation, in which a preventive or control measure could be exercised to eliminate prevent or minimise a hazard.
4. Monitoring of each critical control point to evaluate whether it is under control.

Monitoring is checking that the processing or handling procedure at each critical control point meets the established criteria. It involves systematic observation, measure-

ment, and or recording of the significant factors for prevention and control of the hazard. The monitoring procedures chosen must enable action to be taken to rectify an out-of-control situation or to bring the product back into acceptable limits, either before or during an operation.

## ***Methodology***

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### III METHODOLOGY

The procedure adopted to elicit the necessary information for the study of quality control procedures in selected food service institutions involved the following steps:

- A. Selection of Institutions
- B. Selection of sample
- C. Development of tools in conducting the survey
- D. Conducting the survey
- E. Analysis and presentation of data

#### A. SELECTION OF INSTITUTIONS

Two cities namely Coimbatore and Madras were selected, the former due to convenience and the latter with the aim of extending the study. From each city two hotels were chosen by quota sampling method. In this method the investigator decides in advance the number of sample units she is to investigate from the strata assigned. The sampling quota was fixed according to certain specified characteristics as three star status and accessibility of the hotels. The choice of the particular units for investigation was made on the criteria of facilities for conducting an indepth study and willingness and co-operation of the hotel managers. The quota sampling method also permits the investigator to

to select some fresh units in case of non-response from some of the selected sample units.

Based on the above Criteria, one three star hotel and one restaurant were selected each in Coimbatore and Madras. These have been coded as Hotel and Restaurant A in Coimbatore and Hotel B and Restaurant B in Madras for the purpose of maintaining confidence and discretion. Restaurants A and B were parts of well known chains.

#### B. SELECTION OF SAMPLE

Twenty Five Customers from both the sexes and belonging to different age groups were selected from each of the four institutions on the basis of their willingness to provide information on their concept of quality. For the purpose of collecting information on personnel hygiene all the food service personnel working in one shift were selected from each of the four institutions.

#### C. DEVELOPMENT OF TOOLS IN CONDUCTING THE SURVEY

The information needed for the study was obtained by using the following tools:

##### 1. QUESTIONNAIRE:

Gupta (1986) states that a questionnaire is a list of

questions relating to the field of enquiry and providing space for the answers to be filled by the respondents. The investigator used questionnaires to elicit information from the customers of the selected hotels regarding their concept of quality. The format used is given in appendix I.

## 2. OBSERVATION

Adiseshiah (1976) defines observation as the careful and systematic watching of facts as they occur in the course of nature. It is a reliable source of data collection as it is likely to give direct information and the investigator can relate the data to her personal observations. The investigator drafted an observation schedule (given in appendix II) to observe the various quality control procedures adopted in the selected hotels.

## 3. INTERVIEW

An interview, as stated by Gupta (1981) is a systematic method in which the investigator collects the data personally by making enquiries and soliciting information from the respondents.

The investigator conducted personal interviews with the managers of the selected hotels to find out their opinion of quality and the various quality control procedures adopted

by them. Interviews with the help of a schedule (given in Appendix III) were also conducted with the food production and service personnel regarding their consciousness about personal hygiene and sanitation.

#### 4. CHECK LIST

Rudrappa (1984) defines a checklist as "A set of written specifications which the investigator uses to verify the presence or absence of certain desirable or undesirable characteristics". The investigator used a checklist (which is given in appendix IV) to check the sanitary conditions in the selected hotels. Checklists were also used to assess the personnel hygiene in each hotel, as given in appendix V.

#### D. CONDUCTING THE SURVEY

The quality control procedures adopted in the selected hotels were studied by the investigator by conducting informal interviews with the managers, store-keepers, cooks, waiters and cleaners and by observing the operational processes. Personal visits were made to the selected institutions and observations were made on all the aspects of food quality control. With the help of questionnaires, the consumer's concept of quality in each of the chosen institutions was obtained. Sanitary procedures adopted by the institutions and the personnel hygiene practices were entered in the checklist by the investigator by intricate observation.

#### E. ANALYSIS AND PRESENTATION OF DATA

The data so collected was consolidated, analysed and discussed and is presented in the next chapter.

## ***Results and Discussion***

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#### IV RESULTS AND DISCUSSION

The data gathered in the present study on quality control procedures in selected food service institutions were grouped and discussed as follows:

- A. Quality control measures adopted at various stages of operation.
- B. The present position of sanitary conditions and personnel hygiene.
- C. Quality as perceived by the customer

##### 1. Quality control in purchasing:

###### Hotel A:

The first step towards assuring quality in hotel A was purchase of raw materials from dealers reputed for offering good quality food materials. Sethi and Malhan (1987) state that the suppliers could be selected on the basis of their reputation, samples, prices, delivery schedule and other services offered. Another measure is that they have established their own standards for rice and dhals and the person responsible for purchasing has been trained to assess these items in terms of appearance, keeping quality and yielding desirable quality in the cooked products. The sampling method was followed in purchasing these items. Samples of these items were sent by the suppliers to the hotel which accepted the items if they conformed to the afore

mentioned standards.

The short-coming of this sampling method is that it could be adopted only for non-perishables.

Perishables like milk, fruits and vegetables were purchased locally everyday, the latter being purchased by the personnel directly. All the vegetables and fruits were weighed and the quality was checked by a superficial examination. Milk was tested by an electronic milk tester to assess its fat content, the procedure for this is given in Appendix VI. No written specifications of quality were used mainly because purchasing of perishables was done by the personnel themselves, who felt that it would be a waste of time to write them down when they could easily examine every item before purchasing.

However, thorough examination of all items which were bought in bulk was not possible.

#### RESTAURANT A:

Written specifications of quality were not used in Restaurant A but standards like FPO, ISO and Agmark were used as guidelines for quality. Perishables were purchased directly by the store-keeper after examining the quality and non-perishables were supplied by reliable dealers.

#### HOTEL B

Perishables and non-perishables were supplied by dealers to Hotel B. Governmental standards like ISI and Agmark were used in purchase of non-perishables but on examining jam bottles, it was found that FPO mark was absent. Brand names like Aavin butter, SVS brand groundnut oil and VVD coconut oil, Idhayam gingelly oil were used in purchasing. The perishables as well as non-perishables were ordered pertaining to the quantity and they were door delivered to the hotel by the suppliers.

#### RESTAURANT B:

A list of brand names for various products was used as a guide in restaurant B to aid in purchasing. This list, shown in Table I, consists of popular brands in Tamilnadu which are indicative of good quality.

TABLE I  
BRANDS USED IN PURCHASING IN RESTAURANT B

S.No.	ITEM	BRAND USED
1.	Refined oil	SVS
2.	Vanaspathi	MVS
3.	Coconut oil	VVD
4.	Gingelly oil	VVV
5.	Ghee	RKG
6.	Toor dhal	Captain
7.	Green gram	Eagle
8.	Maida	Gopuram
9.	Raw rice	Diamond
10.	Boiled rice	VVM

Government standards like Agmark, ISI and FPO were also used. Purchase of perishables was done by the personnel themselves with no written specifications of quality. The items were weighed and examined superficially before purchasing.

It is interesting to note that none of the establishments used written specifications of quality. In the absence of such specifications stating desirable quality characteristics, it would be very difficult to evaluate the quality of items purchased because different people have different interpretations of quality and it would be impossible to purchase products of standard quality always. However, it is encouraging to know that brand names and Governmental standards were used in purchasing.

## 2. Quality control in receiving:

### Hotel A:

Receiving was done directly in the store. All non perishables were checked for quality and quantity and no compromise was made in either. The receiving function was performed by the storekeeper and his assistants. As purchase of perishables was done by the personnel themselves, these items were checked neither for quantity nor quality in the receiving area.

RESTAURANT A:

The receiving area was adjacent to the storeroom. Purchasing of fruits and vegetables was done by the store-keeper in the local market who examined the items before purchasing. This eliminated the task of checking the items during receiving. Non-perishables were checked for both quality and quantity; quality being judged only by the appearance.

Hotel B:

Checking the weights of both perishables and non-perishables was done in hotel B as all these items were door-delivered by the supplier. Vegetables and fruits were not examined critically for freshness, bruises, cuts and signs of spoilage. Only a superficial examination was done. Vegetables were delivered in sacks and baskets and fruits in wooden crates lined with newspapers. These were clean and free from dirt and grime.

RESTAURANT B:

Receiving in restaurant A was similar to that of Hotel A in that the perishables were not checked for quality and quantity. The reason stated for this was that the personnel checked the items before purchasing - again, non-perishables were checked for quality and quantity, quality being evaluated by appearance, colour, texture and absence of off flavours.

Table II shows the results of the investigator's evaluation of some of the vegetables received in the food service institutions. The investigator selected two root vegetables, two green leafy vegetables one leguminous vegetable and one fruit and evaluated them on the basis of appearance and texture.

TABLE II

EVALUATION OF VEGETABLE QUALITY AS RECEIVED

Vegetable	Hotel A	Restaurant A	Hotel B	Restaurant B
Beans	Fresh, good colour tender	Not tender slightly withered	Fresh, tender, good colour	Fresh and tender, good colour
Beetroot	Slightly muddy, not tender	Fresh, good colour, tender	very muddy not tender	fresh and tender, good colour

Cabbage	Fresh, firm good colour	Fresh, firm good colour	80% fresh but 20% bruised, leaves torn & withered	Fresh, good colour, firm
Carrot	Fresh and tender, good	Not tender, bruised and not fresh	Dull orange colour, not fresh	Mostly fresh and tender but 10% not tender
Green leafy vegetables	Pale green slightly shrivelled and spotted leaves, not fresh.	leaves tender but withered, pale green colour	leaves withered slightly yellow, muddy roots	withered but tender leaves
Tomato	60% unripe but on the whole fresh and firm, light orange colour	Fresh and ripe, firm bright red colour	80% unripe, yellow green colour firm texture	Fresh, bright red colour firm

---

The above table reveals that quality of vegetables varied in all the hotels. Green leafy vegetables were not fresh in any of the hotels because they wither quickly and might have lost their freshness during transportation. To prevent this, they could be transported in baskets covered with wet cloths. Tomatoes were fresh and firm in all the institutions because it is easy to judge the quality of tomatoes by their appearance and colour. Some were deliberately bought unripe because they needed to be stored for a few days.

If the food service institutions developed written specification for each items the quality evaluation of these items would be easier for the receiving clerk. One more suggestion is that even though checking of weight is done personally at the market, it is preferable to check the weight again in the receiving area so that losses due to damage can be assessed.

### 3. Quality Control in Storage:

#### Hotel A

There was a large store room for storing non-perishable items. Rice bags were stacked in a hap-hazard manner on the floor. All the dry items were cleaned before storage. Pulses were stored in steel drums for a period of two or three months. Spices, sugar and other dry ingredients were stored in tins. Miscellaneous items like jam, sauce, tea etc. were stored in cartons on the shelves for about six months. It was stated that the dry store was cleaned only twice a year. Sweeping was done once a week. Adequate lighting and ventilation were provided. No measures were undertaken to control pests and rodents.

The cold storage room used for storing vegetables, fruits and khoa was maintained at 5 degree Celsius. The room was cleaned whenever the stock was less. Invariably it was once a month.

There was rigid control against pilferage-nobody was allowed to take anything out without the gate pass issued and signed by the store keeper.

Restaurant:

There was a common store-room for perishables and non-perishables, the former being stored in deep-freezers at a corner of the store-room. Rice was stored for a period of six months in bags stacked against the wall in an orderly manner. All other dry ingredients were stored in neatly arranged tins for one month. Ventilation and lighting were adequate. Once a month the store was cleaned and mopped thoroughly. Pest control was done by professionals using a mixture of chemicals. The store was swept once in three days. The deep-freezer was cleaned once in three days and defrosted once a week. It was checked everyday. There were no measures to prevent pilferage.

Hotel B:

Dry ingredients were stored in a large room and perishables in a refrigerator and freezer at the corner of the room. Rice was stored for one month in bags stacked haphazardly.

Pulses and all other dry items were stored in wooden drums and aluminium tins. Some of these were not covered-this could be conducive to insect infestation. Butter, cheese and dough were stored in the refrigerator which was cleaned and defrosted once a week and checked everyday. Some of the refrigerated items were uncovered. A few insects were observed inside the refrigerator. The deep freezer used only for storing ice-creams was defrosted and cleaned once a week. Despite using pesticides, Cockroaches and rats presented problems. The store was swept and mopped with white phenyl daily. There was no control against pilferage.

Restaurant B:

There were separate stores for non-perishables and perishables, the former being well maintained. All the ingredients were stored in labelled, air tight containers and cleaned before storage. Adequate lighting and ventilation were provided. Cleaning of floors was

thoroughly done daily by moving the drums and sacks placed on the floor. Pesticides were effectively used to control pests. There was no sign of rats. Perishables like icecreams and khoa, fruit juices etc., were stored in two deep-freezers which were checked daily and cleaned and defrosted once in three days.

Here the management relied on the honesty of the workers to prevent pilferage.

4. Quality control in Preparation and service:

The various quality control measures adopted in the four selected institutions are presented in table III.

TABLE III

QUALITY CONTROL MEASURES IN PREPARATION AND SERVICE

S.No.	Measure	Hotel A	Restaurant A	Hotel B	Restaurant B
1.	Washing Vegetables before cutting	✓	✓	✓	✓
2.	Using correct amount of Water for cooking	X	X	X	X
3.	Incorporating excess water used in cooking vegetables in some other dish	X	✓	X	X

4.	Using correct sized vessels	✓	✓	✓	✓
5.	Using correct cooking temperatures	✓	✓	✓	✓
6.	Using standardized recipes	X	X	X	X
7.	Using accurate portion control methods	X	✓	X	✓
8.	Holding foods at the right temperature	✓	✓	✓	✓
9.	Effective usage of left overs	X	X	X	X
10.	Using labour saving equipment like vegetable slicer, cutter etc.	✓	X	X	X

---

Table III reveals that all the quality control measures were not adopted in all the establishments. However, with the exception of hotel B, the rest had adopted at least half of them.

Standardized receipes, which are valuable aids to control quality and quantity, were not used in any of the institutions while measures like assuring the quality of ingredients, using the right proportion of ingredients, correct cooking temperatures and time were adopted.

PLATE I - WEIGHING OF TOMATOES IN THE RECEIVING AREA OF HOTEL B



PLATE II - WASHING OF VEGETABLES IN RESTAURANT A

Portion control was accurate in both restaurants A and B, the latter being more rigid because it had displayed charts stating the size and weight/volume of each item in the institution. It was only in these two restaurants that the personnel had been given strict instructions on the EXACT quantity to be served for one portion. In the other hotels, it depended on the person incharge of portioning.

Prepared foods were immediately refrigerated or put into bain-maries in all the institutions.

Effective usage of left-overs was not observed in any of the hotels-they were merely dumped into the garbage cans or distributed to workers at the end of the serving period. Left-overs like sambar, vegetable curries and side dishes were refrigerated at the end of the serving period. Instead, the left-overs could be put into the freezer and incorporated into some other dish the following day. For instance left-over gravy can be used to prepare kurma, soup, sauces or curry the next day. But the left-overs have to be checked thoroughly for off flavours, sour taste and other visible signs of spoilage before being stored for further use.

Labour - saving equipment like vegetable cutter and potato slicer were used in hotel A only (which could also ensure even portion size). Such equipment could be installed in the other establishments also.

These observations reveal that strict quality control was not followed anywhere. This may be attributed to a lack of awareness among the workers rather than neglect or disregard. Therefore it is suggested that the supervisor should act as a liason between management and workers in practising strict quality control in production.

B. PRESENT POSITION OF SANITARY CONDITIONS AND PERSONNEL HYGIENE

1. Sanitary conditions:

This included sanitary practices adopted in storage, preparation, holding and service besides equipment and environment sanitation. The findings have been presented in Table IV.

TABLE IV

SANITARY PRACTICES ADOPTED IN THE SELECTED INSTITUTIONS

S.No.	Practices	Hotel A	Restaurant A	Hotel B	Restaurant A
1.	STORAGE				
	(i) Proper temperature	✓	✓	✓	✓
	(ii) Well ventilated	✓	✓	✓	✓
	(iii) Containers covered	✓	✓	X	✓

(iv) Frequency of cleaning a year	Twice a year	Monthly once	Daily	Daily
(v) Effective pest and rodent control	X	✓	X	✓
(vi) Refrigerator checked everyday	✓	✓	✓	✓

5. ENVIRONMENTAL SANITATION	Hotel A	Restaurant A	Hotel B	Restaurant B
(i) Washing and disinfecting the preparation and service areas daily	✓	✓	✓	✓
(ii) Keeping garbage bins covered	X	X	X	X
(iii) Proper drainage facility	X	✓	✓	✓
(iv) Proper waste disposal	X	X	X	✓
(v) Providing vapour extractor and exhaust fans	✓	✓	✓	✓
(vi) Leakage	X	X	X	X

-----

Table IV reveals that while most of the sanitary practices were followed, some were ignored, mainly because of lack of awareness. These included failure of effective cleaning of equipment. It was observed that in restaurant A, though the food processing equipment was cleaned after each use, cleaning was not effective. Particles of food were found adhering to crevices. In hotel B, with the

exception of grinders, all the other equipment were cleaned only at the end of the serving period. Garbage bins were kept uncovered in all the institutions which may be the reason for the presence of flies in the kitchen.

In hotel A, effective drainage system was not provided. Water tended to stagnate and make the floor slippery.

Vapour extractor hoods and exhaust fans were provided in all institutions to improve air circulation.

The method of disposing wastes could be improved in hotel A and B and restaurant A. In hotel A, wastes from the garbage bins were dumped into a dump outside the hotel, which was removed by municipality workers the next morning. In restaurant A the wastes were dumped into a built in tank very close to the kitchen. The tank was cleaned by scavengers the next day. It was uncovered and full of flies. As the tank is very close to the kitchen, this could facilitate the entry of flies inside and hence contamination.

In hotel B there was a garbage collecting area in the pot and pan washing area itself where the garbage was thrown into bins and taken outside, to be disposed into the rubbish dump away from the hotel. This is shown in plate V.

In restaurant B, though the garbage bins were uncovered, they were immediately dumped into a pit away from the preparation and service areas. This may be the reason for the absence of flies in the kitchen.

It is suggested that garbage could be dumped into a pit away from the kitchen and the service area and incinerated.

Dish washing was done manually using hot water and soap oil in all the institutions. The washed dishes were dried and stacked immediately. Dishwashing in hotel A is shown in plate IV.

Scores have been given to the institutions for adopting the sanitary practices outlined in Table IV. The scores secured by each institutions are presented in Table V.

PLATE III - CUTTING OF VEGETABLES IN RESTAURANT B



PLATE IV - DISHWASHING IN HOTEL A

**TABLE V**  
**SCOREES FOR SANITARY PRACTICES**  
(Maximum Score-25)

---

Institution	Score
Hotel A	18
Restaurant A	19
Hotel B	17
Restaurant B	23

---

Table V reveals that restaurant B scored the highest score. This may be attributed to the strict discipline enforced by the supervisor.

## 2. Personnel Hygiene

The aspects of personnel hygiene in the selected hotels have been dealt with as follows:

### a) Personal Grooming:

Twenty five employees involved with food preparation and service in each of the selected institutions were assessed for personal grooming based on the following criteria-covered hair, short and clean nails, wearing clean clothes, aprons and uniforms.

The results are presented in Table VI

**TABLE VI**  
**ASPECTS OF PERSONAL GROOMING OF WORKERS(N = 25**  
**(in each food service institutions)**

Criteria	Hotel A	Restaurant A	Hotel B	Restaurant B
Covered hair	14	19	-	24
Short and clean nails	23	21	-	24
Wearing apron	16	23	-	22
Wearing uniform	24	23	22	24
Wearing clean clothes	16	18	17	23

Table VI shows that more than three fourth of the employees in restaurant B conformed to high standards of personal grooming and employees in hotel B wore neither aprons nor caps as seen in plate VI. Other aspects of personal grooming were followed by more than half of the number of workers studied in all the institutions.

**b. Food Handling Practices:**

Table VII presents the food handling practices of the employees in the selected institutions.

PLATE V - WASTE DISPOSAL UNIT IN HOTEL B



PLATE VI - FOOD PREPARATION WORKER IN HOTEL B

**TABLE VII**  
**FOOD HANDLING PRACTICES OF WORKERS N = 25**  
**in each food grain institution**

Practices	Hotel A	Restaurant A	Hotel B	Restaurant B
Coughing/sneezing over unscreened food	-	-	-	-
Handling cutlery and crockery correctly	-	-	-	-
Smoking in the kitchen	-	-	-	-
Using spoon to taste the food	25	24	23	24

From Table VII it is clear that except for handling cutlery and crockery correctly (i.e. carrying knives and forks by their handles and glasses by their rims) and a few stray cases of using hands to taste the food, other practices of food handling were followed by all the workers in all the institutions.

c. Personal Hygiene Habits:



Table VIII depicts the personal hygiene habits of the workers in the selected institutions.

**TABLE VIII**  
**PERSONAL HYGIENE HABITS OF WORKERS**

Habits	Hotel A	Restaurant A	Hotel B	Restaurant B
Picking ears/nose while handling food	-	1	2	-
Dipping hands into prepared food	2	1	3	-
Spitting in cooking area	-	-	-	-
Washing hands before cooking	25	21	22	25
Using clean cloth to wipe work surfaces	5	2	4	6
Using towel to wipe hands	17	12	13	15
Washing hands after working	20	21	12	22

Table VIII reveals that the most neglected habits were using clean cloths to wipe work surfaces and towels to wipe hands. Other aspects of personnel hygiene were diligently followed, except for a few cases of picking ears and nose while handling food in restaurant A and Hotel B and dipping hands into prepared food in all the institutions except restaurant B. It is apparent that workers of restaurant B ranked the highest in following good personal hygiene habits.

KEY

-  - BEFORE COOKING
-  - AFTER COOKING

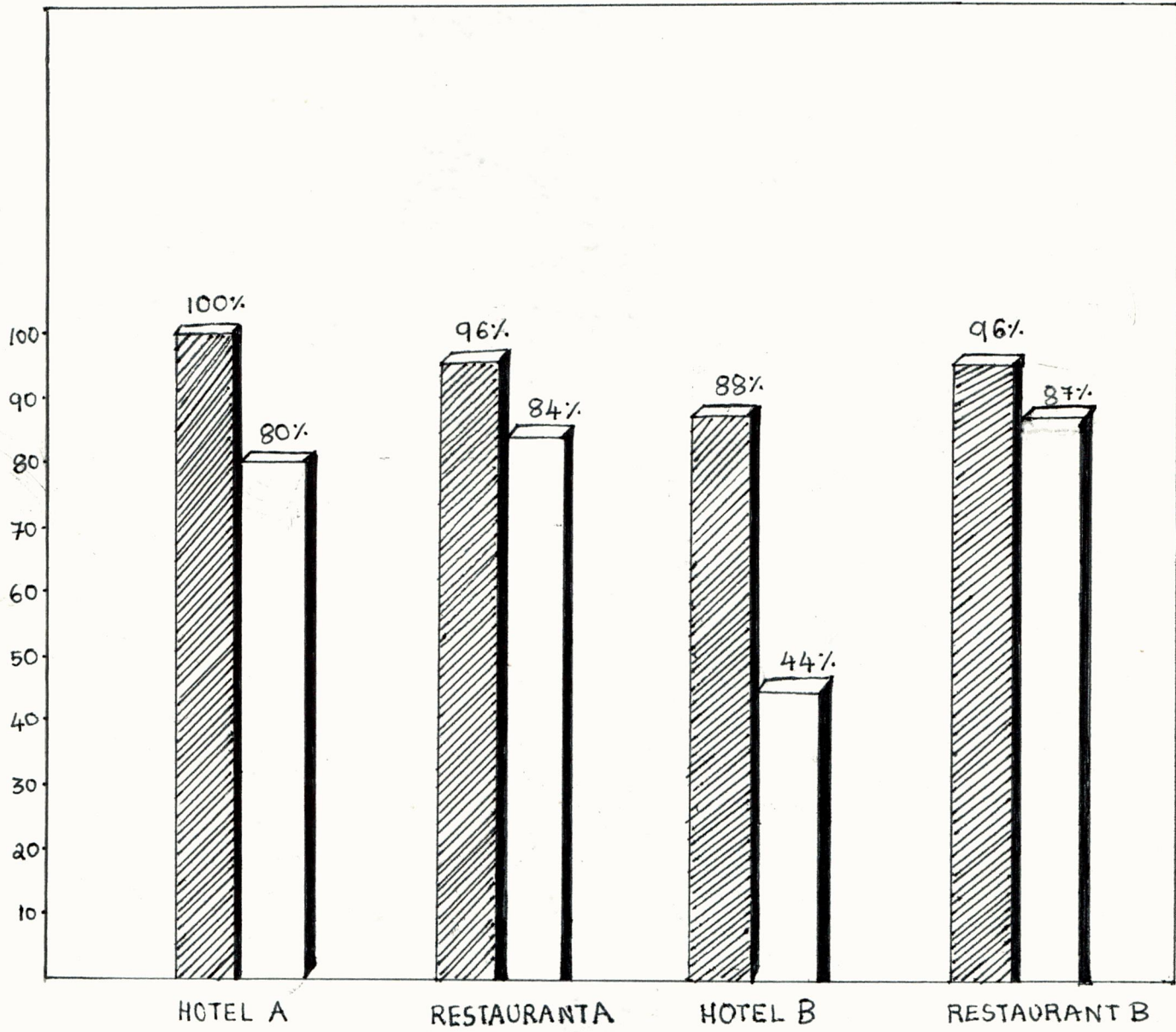


FIGURE II - PERCENTAGE OF EMPLOYEES WHO WASHED THEIR HANDS

Figure 2 shows the percentage of employees who washed their hands before and after cooking.

d. Recent Illness:

The number of employees who had suffered from cold, sore throat, fever, diarrhea or jaundice in all the four institutions were surveyed and it was found that one or two employees in all the institutions had suffered from either cold or sore throat fever or diarrhea in the past month. They were given leave when they had fever or diarrhea and were not allowed to handle food when they had cold. None of them had suffered from jaundice in the past month.

The features found to be common in all the four institutions were:

i) All the food service institutions had provided facilities for the employees to change into their uniforms.

ii) None of the employees leant or sat on the working tables.

iii) There were separate washrooms and toilets for workers.

iv) None of the workers had undergone training in personal hygiene.

**TABLE IX**  
**SCORES FOR PERSONNEL HYGIENE**  
**MAXIMUM SCORES 25**

Institutions	SCORES
Hotel A	17
Restaurant A	18
Hotel A	16
Restaurant B	19

Table IX reveals that restaurant B gets the highest score of 19. It was observed that in restaurant B, the supervisor acted as a liason between the management and the workers in implementing standards of hygiene and cleanliness among the workers.

C. Quality as perceived by the customer:

The various aspects pertaining to consumer acceptability and preferences are discussed as follows:

1. Reason for selecting the hotels for dining:

With respect to the selection of a particular hotel for dining, reasons like accessibility, availability, of tasty items, prompt service, good reputation and reasonable cost were obtained. Table X gives the reasons for selection along with the number of sample in each institution.

TABLE X

REASONS FOR SELECTION OF HOTELS FOR DINING

Reason	Hotel A n=25	Restaurant A n=25	Hotel B n=25	Restaurant B n=25
Accessibility	14	13	20	14
Availability of tasty items	15	9	15	15
Prompt services	7	3	13	10
Good reputation	12	9	5	15
Reasonable cost	10	-	-	-

Table X reveals that accessibility and availability of tasty items are the main reasons for selecting hotels for dining, followed by good reputation and prompt services. Cost was not a major factor in selection as only a small number of customers stated it as a reason. Figure II illustrates this.

2. Concept of quality:

Customers rated good taste as the most important parameter of quality, along with cleanliness and good service. Table XI gives the concept of quality as perceived by the clientele.

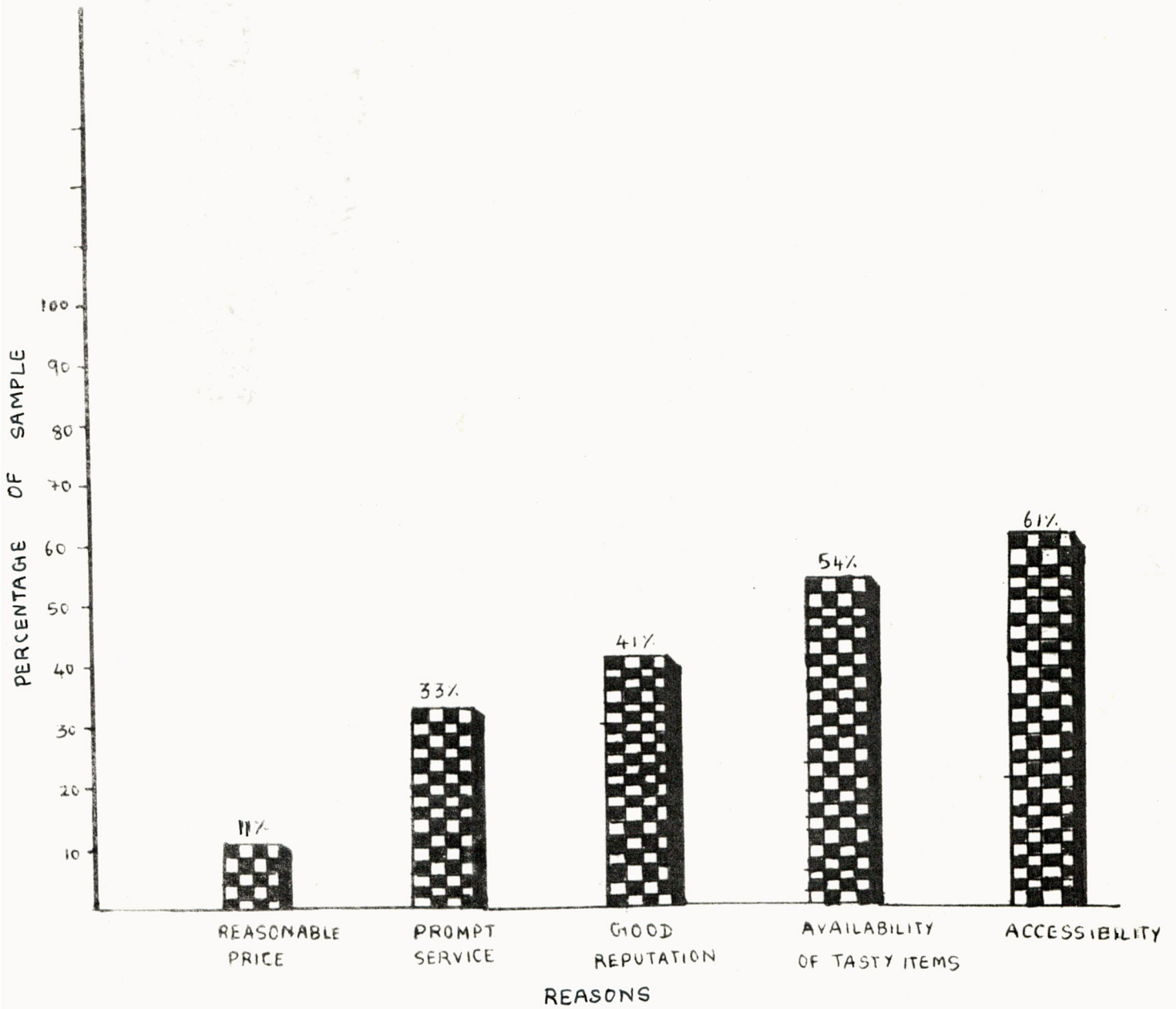


FIGURE IV - REASONS FOR THE SELECTION OF FOOD SERVICE INSTITUTIONS FOR DINING

**TABLE XI**  
**CONCEPT OF QUALITY**

Concept	Hotel A N=25	Restaurant A N=25	Hotel B N=25	Restaurant B N=25
Good taste	20	20	24	25
Cleanliness	20	18	25	25
Good service	12	8	18	14
Reasonable prices	7	4	1	3

Reasonable price was stated as an indicator of quality by only a small number of customers in all the institutions.

5. Opinion about items served:

Table XII gives the customers' opinion about the items served.

**TABLE XII**  
**OPINION ABOUT ITEMS SERVED**

Opinion	Hotel A n=25	Restaurant A n=25	Hotel B n=25	Restaurant B n=25
Excellent	1	3	1	5
Very good	11	10	14	13
Good	10	9	7	7
Fair	2	2	1	-
Poor	-	-	-	-

Table XII reveals that 'very good' was the term used to describe the items by maximum numbers of customers in all the establishments.

6. Opinion about the waiters:

Table XIII gives the customers' opinion about the waiters.

**TABLE XIII**  
**OPINION ABOUT THE WAITERS**

Opinion	Hotel A n=25	Restaurant A n=25	Hotel B n=25	Restaurant B n=25
Attentive	13	22	13	14
Courteous	10	5	8	8
Efficient	14	9	11	15
Inattentive	2	-	--	-
Rude	-	-	-	-
Inefficient	1	-	-	-

That the waiters were attentive was felt by 22 customers in restaurant A as against 13 in Hotels A and B. 14 of the customers felt that the waiters were attentive in restaurant B. Regarding courteousness 10 customers found the waiters

courteous in Hotel A and five in restaurant A and eight each in hotel B and restaurant B. The waiters were judged efficient in hotel A by 14 of the customers followed by nine in restaurant A 11 in hotel B and 15 in restaurant B. Two of the customers describe the waiters as inattentive in hotel A and one in hotel B. The waiters were termed inefficient by one customer in hotel A only.

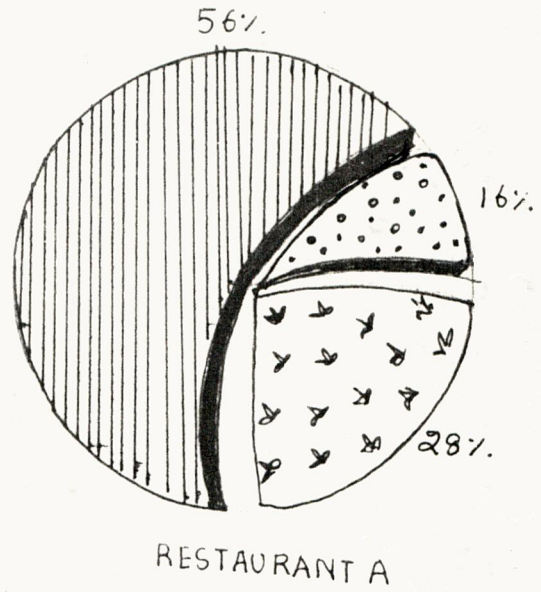
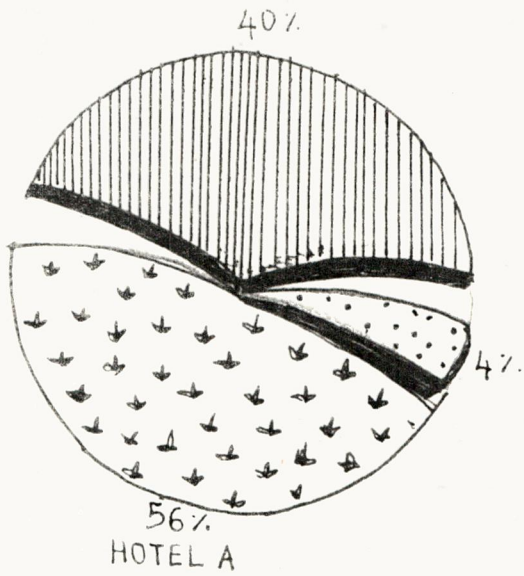
7. Opinion about the cost of items:

Figure 3 indicates the customers' opinion about the cost of the items served.




It is interesting to note that none of the customers in any of the food service institutions found the cost to be low, not even the ones who dine often. This may be attributable to the three star status of the hotel and the economic status of the diners.

8. Satisfaction with the dining experience:

Satisfaction with the dining experience includes four aspects-satisfaction with food quality, service quality, hygiene of the place and hygiene of the workers.



KEY

-  VERY HIGH
-  HIGH
-  REASONABLE

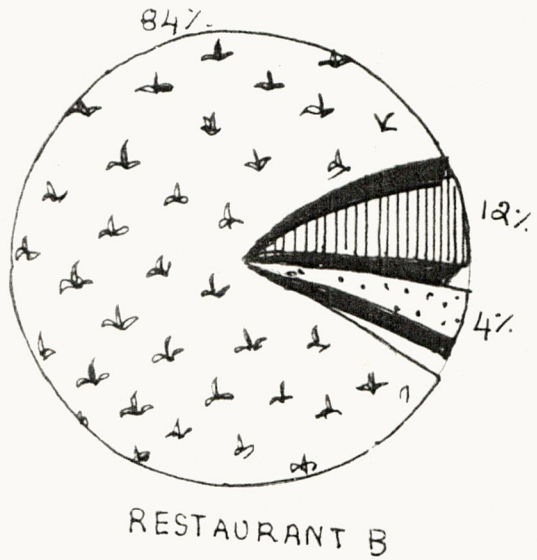
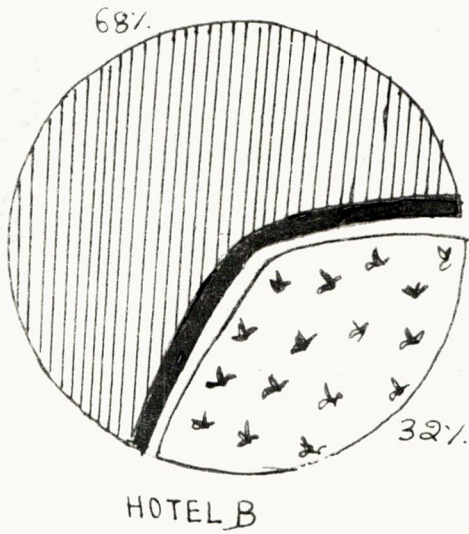


FIGURE IV - CUSTOMERS' OPINION ABOUT THE COST OF ITEMS SERVED

**TABLE XIV**  
**SATISFACTION WITH THE DINING EXPERIENCE**

Satisfied with	Hotel A n=25	Restaurant A n=25	Hotel B n=25	Restaurant B n=25
A. Food quality	25	22	21	23
B. Service quality	23	23	24	25
C. Hygiene of the place	25	25	25	25
D. Hygiene of the workers*	22	24	25	25

\* Includes waiters, cleaners and water boys.

From the table XIV it is evident that in hotel A all the customers were satisfied with quality, 23 with service quality, 25 with hygiene of the place and only 22 with personnel hygiene.

In restaurant A 22 were satisfied with food quality, 23 with service quality, all with hygiene of the place and 24 with personnel hygiene.

From the above data it can be concluded that customers are more fastidious about food quality and they are more critical of food quality than of the other aspects of the dining experience.

## ***Summary and Conclusion***

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## V SUMMARY AND CONCLUSION

Food is a great socializer and is a source of pleasure as much as a biological necessity. To perform these functions it must be prepared and served under the best conditions possible. Quality control in food service aids in sustaining the quality of food stuffs through all the operating activities so as to ensure a pleasant dining experience for the customers and promote repeat business.

The study on "Quality control in selected food service institutions" was undertaken in the interest of the public with the objectives of surveying the quality control procedures adopted at various stages of operations, assessing the existing sanitary conditions and personnel hygiene besides studying the customers' concept of quality.

For this purpose two hotels with three star status and two restaurants were selected each from two cities namely Coimbatore and Madras. With the help of questionnaire, observation and interview schedules and checklists the necessary data were obtained. From each food service institution, twenty five customers were selected based on the criteria of their constant use of the food service institutions and their willingness to furnish the information sought after.

The salient findings of the study are as follows:

1. Adequate quality control in purchasing was not exercised in any of the food service institutions studied. This is because proper written specifications of quality were not used in purchasing. In the purchase of fruits and vegetables, quality was evaluated only by a superficial examination.
2. Items received were not checked for quality and quantity.
3. Use of labour-saving equipment like automatic vegetable slicers and cutters, which help in conserving time and energy, minimizing wastage, assuring even portion size and assuring better sanitation was found only in Hotel A.
4. Measures to preserve nutrients were adopted only in restaurant A where the excess water used for cooking vegetables was used in preparing in stock for soup.
5. Standardized recipes, which are valuable aids to control quality and quantity were not used in any of the food service institutions studied.
6. The cooks in all the four institutions were found to associate product quality with good ingredients, correct cooking temperatures and time.

7. Adequate portion control was exercised only in restaurant B where charts stating the size and weight of a portion of each item to be served were displayed in the portioning area.

8. Effective utilisation of left-overs was not observed in any of the institutions—they were either refrigerated or distributed to workers only at the end of the serving period. Instead, if a quarter or half the quantity of the prepared item is refrigerated immediately after preparation, it could be used when the stock in hand is exhausted. This would help to control and prevent microbial growth and hence wastage.

9. Pests and rodents presented problems in the storerooms of Hotels A and B. Scientific methods like sealing cracks and crevices and effective use of pesticides could be used to control them.

10. The food processing equipment were not cleaned immediately after each use in hotel B. In restaurant A, cleaning was not thorough because food particles were found adhering to crevices even after cleaning. Effective cleaning should be exercised.

11. Measures to prevent pilferage by staff were adopted only in hotel A, which could be enforced in all the other establishments also.

12. Using labelled, air-tight containers for the storage of dry ingredients was observed only in restaurant B while in the other food service institutions the containers were neither labelled nor air-tight.

13. Good personnel hygiene in restaurant B was traced to the discipline enforced by the supervisor.

14. The mode of garbage disposal followed in all the establishments leaves a lot to be desired. Garbage could be kept in covered containers and incinerated at some point away from food preparation and service areas.

15. Customers patronise food service institutions mainly because of accessibility, good reputation and availability of tasty items. Cost was not a major factor in the selection of dining establishments. This fact is of special significance to managers who view quality control as an unnecessary expense with no direct profit.

16. Concept of quality as evident from the answers of hundred customers (twenty five from each of the four food service institutions studied) was found to include good taste, cleanliness and good services.

17. It was found that responsibility for controlling quality was bestowed on the supervisors. All the personnel involved in food production and service were not conscious about quality and measures to assure it.

It can be concluded that quality control was sporadic and inconsistent; it did not permeate the entire organization. Though the managers considered quality as an important aspect of food service they did not enforce it at every stage of operation. Therefore the investigator suggests the implementation of an adequate quality control programme involving all the workers, using the following guidelines.

(a) Preparation of written specifications of quality of each item purchased so that the quality will be the same, irrespective of the person who does the purchasing.

(b) Checking all the items received for quantity and quality by weighing, counting and matching them against the specifications.

(c) Provision of adequate and proper dry and cold storage facilities. The dry store must be well-maintained and cleaned frequently. Adequate lighting and ventilation must be provided.

(d) Undertaking adequate and scientific pest and rodent control measures like setting up of traps, sealing cracks and crevices, and effective use of pesticides.

(e) Using standardized recipes for food preparation. It was observed that sambar and other vegetable dishes were the items left-over in large quantities. Therefore standardization of these recipes would help in minimizing wastage.

(f) Devising adequate portion control methods using standard cups and ladles and instructing the personnel on the correct method of using them.

(g) Efficient and sanitary disposal of wastes by incineration.

(h) Training the personnel on hygiene and sanitation and inculcating in them an awareness of quality and teaching methods to assure it.

Suggestions for further study:

(1) A study could be done on the items commonly wasted in hotels. These items could then be standardized taking into consideration the turn-over per day and predicting the approximate number of portions needed.

(2) A study on the effective and resourceful methods of left-over utilization can be conducted. Instead of being disposed, the left-overs could be refrigerated and incorporated into novel dishes the next day. This would also add variety to the menu.

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XXXXX

APPENDIX I

QUESTIONNAIRE TO ASSESS CUSTOMERS' CONCEPT OF QUALITY

NAME:

DATE:

OCCUPATION:

AGE:

SEX: M [ ] F [ ] Married [ ] Unmarried [ ]

---

1. Why do you choose this hotel to have your meal

Accessibility	[ ]	Good reputation	[ ]
Tasty items	[ ]	Reasonable cost	[ ]
Prompt service	[ ]	Any other	[ ]

(Please specify)

2. Do you dine here often? YES [ ] NO [ ]

If yes please state how often?

3. Do you think quality is an important aspect of food service?

YES [ ] NO [ ]

4. What is your concept of quality?

Good taste	[ ]	Good service	[ ]
Reasonable price	[ ]	Cleanliness	[ ]

5. List two food items commonly consumed by you?

1.

2.

6. Was the quantity served sufficient?

YES [ ] NO [ ]

7. Was it served at the correct temperature?

YES [ ] NO [ ]

8. How would you rate the items consumed?

ITEM I

<u>SCALE</u>	<u>APPEARANCE</u>	<u>FLAVOUR</u>	<u>TEXTURE</u>	<u>TASTE</u>
EXCELLENT	[ ]	[ ]	[ ]	[ ]
VERY GOOD	[ ]	[ ]	[ ]	[ ]
GOOD	[ ]	[ ]	[ ]	[ ]
FAIR	[ ]	[ ]	[ ]	[ ]
POOR	[ ]	[ ]	[ ]	[ ]

ITEM II

	<u>APPEARANCE</u>	<u>FLAVOUR</u>	<u>TEXTURE</u>	<u>TASTE</u>
EXCELLENT	[ ]	[ ]	[ ]	[ ]
VERY GOOD	[ ]	[ ]	[ ]	[ ]
GOOD	[ ]	[ ]	[ ]	[ ]
FAIR	[ ]	[ ]	[ ]	[ ]
POOR	[ ]	[ ]	[ ]	[ ]

9. Do you find the waiters:

Attentive	[ ]	Inattentive	[ ]
Courteous	[ ]	Rude	[ ]
Efficient	[ ]	Inefficient	[ ]

10. What is your opinion about the price of the item?

Very high	[ ]	Reasonable	[ ]
High	[ ]	Low	[ ]

11. Are you satisfied with the quality of:

- i) Food served : YES/NO
- ii) Service : YES/NO

If no Please give reasons

12. Are you satisfied with:

- i) Cleanliness of the place YES/NO
- ii) Hygiene of workers YES/NO

If you think there would be an improvement in any form, please list your suggestions.

- 1.
- 2.
- 3.

-----

## ***Appendices***

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## APPENDIX II

### OBSERVATION SCHEDULE

#### 1. QUALITY CONTROL IN PURCHASING:

- (a) Food standards, grades or brands used
- (b) Frequency of purchasing
- (c) Selection of dealers

#### 2. QUALITY CONTROL IN RECEIVING:

- (a) Location of the receiving area
- (b) Person-in-charge of receiving
- (c) Checks on the quantity of items received
- (d) Checks on the quality of items received
- (e) Sensory evaluation of some items received.

#### 3. QUALITY CONTROL IN STORAGE

- (a) Periods of storage
- (b) Adequacy of lighting and ventilation
- (c) Measures for prevention and control of Pests and rodents
- (d) Measures for prevention of pilferage
- (e) Frequency of cleaning
- (f) Storage of dry items-whether they are cleaned and stored in airtight, labelled containers.

4. QUALITY CONTROL IN PREPARATION AND SERVICE:

- (a) Pre preparation-whether done manually or mechanically
- (b) Usage of standardized recipes
- (c) Measures undertaken to preserve nutrients during cooking
- (d) Cleaning of food processing equipment
- (e) Portion control methods used
- (f) Holding methods used
- (g) Utilization of left overs
- (h) Dish washing-whether manually done and detergents used
- (i) Waste disposal methods.

**APPENDIX III**  
**INTERVIEW SCHEDULE**  
**FOR MANAGERS/COOKS**

1. What is your concept of quality?
2. What are steps taken by you to assure quality?
3. Do you think of quality control programmes as a waste of time and money?
4. Do you use standardized recipes in preparation?
5. Have you had complaints from customers about the quality of food/service?
6. If yes, how did you deal with them?
7. What are the portion control methods used?
8. How do you utilise left - overs?
9. Do you evaluate recipes frequently?
10. Do you take any measures to inculcate quality consciousness among your co-workers or sub-ordinates?

APPENDIX IV

CHECK LIST FOR SANITATION

S.NO.	YES	NO
I. <u>STORAGE</u>		
1. Is there a separate storage area for perishables and non-perishables?		
2. Is proper temperature maintained in the dry store?		
3. What is the temperature in the cold storage area?		
4. Is the dry store well-ventilated?		
5. Are there proper air-tight containers for storing dry ingredients?		
6. Are the ingredients cleaned before storage?		
7. Are the containers labelled?		
8. Are the storage cupboards fitted with wire mesh?		
9. Is the storage area rat/rodent proof?		
10. Is the refrigerator checked everyday?		

YES

NO

II. PREPARATION

1. Is the preparation area cleaned everyday?
2. Are the foods throughly washed before cooking?
3. Is the preparation area rat/rodent proof?
4. Are the work surfaces easily cleanable?
5. Are prepared foods kept covered?

-----  
S.NO.

YES NO  
-----

III. HOLDING & SERVICE

1. How long are cooked foods held?
2. What is the holding temperature?
3. Are left over foods utilised/  
refrigerated immediately?
4. Are there files/insects in the  
service area?
5. Is the service are cleaned every  
day?

EQUIPMENT

YES

NO

1. Are all the equipment functioning?
2. Are the equipment cleaned before each use?
3. Are the equipment cleaned after each use?
4. Is hot water used for cleaning?
5. Is detergent used for cleaning?

ENVIRONMENT

1. Is the floor washed every day?
2. Is the floor disinfected every day?
3. Is clearing up done immediately after service?
4. Is there a separate waste disposing unit?
5. Are the Garbage bins kept covered?
6. Is there proper drainage facility?
7. Is dish washing done manually?
8. Is there proper light and ventilation in the working area?
9. Is there a:
  - (i) Vapour extractor hood?
  - (ii) Exhaust fans?
10. Is there any leakage any where?

XXXX

APPENDIX V

CHECK LIST FOR PERSONNEL HYGIENE

S.No.	1	2	3	4
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1. APPEARANCE

(i) General Appearance

(ii) Hair-whether covered, kept short and away from the face

(iii) Nails-whether clean and short

2. DOES THE WORKER WASH HIS HANDS

(i) Before handling the food ?

(ii) After handling the food ?

3. DOES THE WORKER WEAR APRON WHILE WORKING?

4. DOES HE WEAR CLEAN CLOTHES?

5. DOES HE WEAR UNIFORM?

If yes, are there facilities to change his uniform?

6. Does he have cuts/Lesions/Grazes his skin?

7. If yes, are they covered?

8. Does he cough or sneeze over unscreened food?

9. Does he pickup forks and knives by their handles, glasses by their stems and plates by their edges?

10. Does he smoke in the preparation area?

11. Does he pick his ears or nose while handling food?

12. Does he dip his hands into the food?

13. Does he use spoon to taste the food? YES NO
14. Has he had a recent attack of an infectious disease?
15. If yes, did he report it to the supervisor and what was the disease?
16. Is he given leave while he has an infectious disease?
17. Does he have a regular medical examination?
18. Are there separate toilets and wash rooms for the workers?
19. Does the worker wash his apron every day?
20. If no does he have a spare one?
21. Does he use clean cloths for wiping work surfaces?
22. Does he lean or sit on the work table?
23. Does he wipe his hands with the towel?
24. Does he spit in the cooking area?
25. Has he undergone any training programme for personnel hygiene and cleanliness?

## APPENDIX VI

### ELECTRONIC MILK TESTING PROCEDURE (EMT)

EMT is a simple, economical but accurate milk fat testing instrument. It measures the fat content instantaneously on digital read out. It does not involve the use of corrosive chemicals. It works on light scattering principle with manual homogenization. It operates on AC mains as well as on battery within built battery charges and automatic switch over to battery in case of power failure.

#### PRINCIPLE OF MEASUREMENT:

EMT is based on the photometric measurement of light scattered by the milk sample. The light is scattered by the fat globules, a kind of small prism.

Not only fat globules in the milk contribute to the light scattering, but also the proteins may affect the measurements. To eliminate their influence, it is necessary to dissolve them. EDTA solution is used for this purpose. All the fat globules do not have the same size. The measuring system requires a constant globule size to provide a fixed relation between the amount of light scattered to the fat content. The range of globule size is limited in the milk tested to a very narrow region outside the natural range. This is achieved by homogenizing and bringing the globules size into the range of 0.5 to 1.5 microns.

Light rays from a photo lamp pass through the cuvette and are scattered all to the amount of fat globules in the sample. More the fat present in the cuvette, more is the light scattered and less light passes through the cuvette. The rays that do pass through the cuvette hit a photo cell, producing a current proportional to the light intensity. The current is fed to a digital read out unit which gives direct fat percentage readout.

The cuvette is made of 2 hardened glass discs-one has a ground depression of 0.4 mm the other has 2 small hole to provide inlet and outlet to the cuvette. Diluent is used to dilute the milk sample and dissolve the proteins.

1. EDTA 52.6 g containing EDTA powder = 45 gms  
Sacket & di-naoH = 7.6 g  
(ii) antifoam - 0.5 ml (10 drops)

#### PREPARATION OF MILK SAMPLES:

##### SAMPLING:

The samples measured should be taken from milk in good condition i.e., the milk should not have started<sup>to</sup> curdle or separate and it should be free of dirt. Since milk fat is of lower density than the other milk constituents it tends to rise to the surface. Gently stir the bulk milk just before sampling to make sure that sample is a truly representative of the bulk. Fresh, unpreserved samples must be tested

immediately. Just before testing, turn the sample upside down a few times to mix it properly.

OPERATION:

The instrument should be warmed up before starting measurement by switching it on the half an hour before measurement.

The zero knob should be set properly.