To the Graduate Council:

I am submitting herewith a dissertation written by Laura Lee Butler entitled "Food Quality Control Methods Used in Nursing Homes and Hospitals of 100 Beds or Less in Kentucky and Tennessee." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Home Economics.

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FOOD QUALITY CONTROL METHODS USED IN NURSING HOMES AND HOSPITALS OF 100 BEDS OR LESS IN KENTUCKY AND TENNESSEE

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ABSTRACT

In 1981 nursing homes and hospitals with less than 100 beds in Kentucky and Tennessee represented approximately 50% of the total number of these facilities. Little attention has been given in the professional literature to health care facilities of this size. Many small facilities have not employed persons with specialized education and training to manage the foodservice; thus food quality control methods may not be used. Research is needed to identify existing areas of quality control in order for needed improvements and changes to be made. The purposes of this study were to identify and compare current quality control measures employed in dietary departments of small hospitals and nursing homes and to develop a feasible evaluation form that would facilitate the time spent by a consultant dietitian in these facilities.

Chi-square and t-tests performed on the responses of hospitals and nursing homes indicated few significant differences in food quality control methods. Differences were indicated between hospitals and nursing homes for group purchasing practices, the use of issue and requisition forms, qualifications of persons responsible for planning menus and for several of the types of employee and guest foodservices. All of the responding hospitals reported that they employed a dietitian while only 83% of the nursing homes did so. A difference ($p<0.01$) occurred between facilities for the employment status, full-time, part-time or consultant, of the dietitian. Patients

from a random sample of the facilities rated the food and service "Fair" to "Good." No differences in patient opinions occurred between types of facilities.

Nutrient means obtained by analysis of one day's menu from the facilities met or exceeded the Recommended Dietary Allowances (RDA) for adult males and females, ages 23-50, and 51+. An exception to this was the iron RDA for females and calories for men, ages 23-50.

To facilitate the continuous control process, a check sheet was developed to evaluate small health care foodservices. The form was critiqued by 20 practicing dietitians and appropriate revisions made in the form.

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CHAPTER I

INTRODUCTION

Many small hospitals and nursing homes employ a dietitian only on a part-time or consultant basis. In Tennessee and Kentucky it is only required that the Foodservice Director have a minimum of 90 hours in foodservice training; it also is desirable that they qualify for The Hospital, Institution, and Educational Food Service Society (HIEFFS) membership, which requires some additional hours. Therefore, many small foodservice departments are managed by persons with little or no formal training in the foodservice area. Because health care foodservices are both labor and menu-item intensive, they require close supervision by trained personnel (Matthews, 1982).

The United States has approximately 7000 hospitals, 286 (4%) of which are found in the states of Tennessee and Kentucky (Anonymous, 1981a). The 1978 census of nursing homes in the United States listed 18,722 homes (Anonymous, 1981b), with approximately 563 of these in Tennessee and Kentucky. In these two states approximately 52% of the 286 hospitals and 58% (327) of the 563 nursing homes have less than a 100 bed capacity (Anonymous, 1981a,c,d). Few reports were found of research relating to foodservices in small facilities with less than 100 beds. Due to the large percentage of small health care facilities in Tennessee and Kentucky and the minimum education requirement for foodservice personnel in facilities that have less than 100 beds in these states, it seems pertinent that an evaluation

of food quality control measures utilized should be of concern to foodservice directors, dietitians and dietetic consultants. A study could provide information to identify the existing qualities, as well as areas that need improvements and, then, provide the opportunity to suggest changes that would improve department efficiency and effectiveness (Anonymous, 1966). Research is needed to characterize quality control procedures in hospital foodservice and identify needed improvements and changes (Matthews, 1982).

Purposes of Study

The purposes of this research were to identify and compare quality control measures presently used in dietary departments of small hospitals and nursing homes of 100 beds or less in Kentucky and Tennessee and to identify appropriate quality areas where controls may be needed. A quality control evaluation procedure was developed that could be utilized in such facilities.

Objectives

The objectives of this research are the following:

1. To identify quality control measures used in hospitals and nursing homes with less than 100 beds in Tennessee and Kentucky.

2. To compare quality control measures used in these facilities.

3. To compare patient opinions of food and quality control measures utilized by the facility.

4. To develop a food quality control evaluation check sheet for use by the dietitian in a small facility.

CHAPTER II

REVIEW OF LITERATURE

The review of literature includes discussion of several aspects of quality control in foodservices, quality control of foodservice in small health care facilities, patient surveys, nutrient analysis and quality control audits. Literature for each area will be discussed in separate sections.

Quality Control in Foodservice

Quality is a value that must be consistently maintained in a food product to meet the aesthetic expectations of the consumer. To maintain consistent quality in foodservice, standards must be established and control systems designed to monitor and compare the quality of the foodservice with the established standards. Routine evaluation may identify areas that do not meet the established standards.

It is the responsibility of management personnel to establish and maintain standards. Quality control in foodservice areas is difficult to establish and maintain because there is much variability in production and highly perishable products are involved (Kotschevar, 1966). The purpose of quality control is to maintain established standards for a product during all stages of storage, processing, preparation and service with continual corrective action (Thorner and Manning, 1976; Buchanan, 1976; Kirsch, 1980). Quality is controlled when the actual quality of the product is compared with the

established standards and changes are made to correct any deficiency (Hitchcock, 1980). Maximum benefits can be derived when a total quality control program is established at all levels in the operation. Quality alteration can occur in food products due to improper handling procedures and shifts in environmental temperatures (Thorner and Manning, 1976; Nicholanco and Matthews, 1978).

Quality assessment of institutional foodservice systems generally occurs during inspection at the point of service. Inspection at the point of service is retrospective in nature and does not provide opportunity for corrective action (Bobeng and David, 1978a). Control should be applied at points where loss of control would result in an unacceptable product. Hazard Analysis Critical Control Point (HACCP) Models were developed by Bobeng and David (1978a,b) for entrees produced in hospital foodservice systems. In these models, control points were established for three types of systems--conventional, cook/chill and cook/freeze. Conventional systems differ from cook/chill and cook/freeze systems in that the food is prepared and held hot throughout service. In cook/chill systems the food is prepared on the day prior to service, refrigerated overnight, then portioned and reheated by microwave. The cook/freeze system is similar to the cook/chill system, but it involves a frozen thermal break between production and re-heating. The four critical control points identified were ingredient control and storage, equipment sanitation, personnel sanitation and time-temperature control of food. For acceptable ingredient control and storage, foods must be

obtained from approved sources and then should be maintained in the facility in a manner that protects the microbiologic and sensory qualities of the food. Equipment sanitation is also a critical control point for potential contamination of food which may occur at any point where equipment and food come together. A third critical control point, personnel sanitation, is critical at all stages where food is handled. The relationship between time and temperature is the fourth critical control point. The time and temperature relationship is also an important factor in the ingredient and storage critical control point. Quality control standards and monitoring of quality control points must be established by each facility based on resources and constraints. Significant differences among the three systems were found for sensory quality in the research study. For example, while there was no significant difference between cook/chill and cook/freeze systems, there was a significant difference ($p<0.05$) between the two systems and the conventional system (Bobeng and David, 1978a,b).

Buchanan (1976) listed several types of standards to be established in a foodservice system. These standards included written food specifications for purchasing and receiving of products, standardized recipes and pre-meal evaluation standards. Establishing and adhering to evaluation standards such as these will provide the level of quality that meets the expectations of the consumer.

Food specifications provide a basis for ordering and receiving the desired quality of a product. When the delivered goods do not meet the specifications, the foods should not be accepted.

Standardized recipes, if followed, provide control for consistent quality, nutritional value and cost. Not only must the ingredient list of the recipe be followed, but the correct pan size and portion of the prepared product as stated on the standardized recipe must also be used to obtain a uniform quality product that meets the cost standards for the item.

The pre-meal evaluation is a tool used by the manager to motivate the cooks to produce and serve a quality product. Quality standards for each product must be established and each item tested and compared to the standards prior to service. Critical evaluation of the seasonings, texture, temperature and color should be made. The most effective way to teach quality standards to the employees is by comparing a prepared product to the standard (Buchanan, 1976).

A number of factors have been shown to affect the microbiological, nutritional and sensory aspects of food quality. The ingredients, recipes and holding at high temperature affects the sensory quality, which influences consumer acceptance of products (Unklesbay and Balsley, 1979). Temperature is a factor which influences all three aspects--sensory, microbial and nutritional--of food quality (Bobeng and David, 1978a; Nicholanco and Matthews, 1978). Temperature affects the moisture retention of a food product, thus possibly lowering the sensory quality (Dahl and Matthews, 1979).

Bryan (1978) presented data collected from 1973 to 1976 indicating factors that frequently contributed to foodborne illness outbreaks. The most frequent cause involved time and temperature

relationships where the food was mishandled in foodservice establishments.

Nicholanco and Matthews (1978) conducted a study to "design practical methods for evaluating food quality and to test these methods under actual operational conditions in a hospital chill foodservice system." The menu item used in the study was beef stew. The movement of ingredients for the preparation of beef stew was observed and charted at all handling stages from storage through patient service. A time and temperature study was done to identify critical handling stages. The critical handling stages identified were preparation, production, chilled storage and assembly-distribution. Sensory, microbial and nutritional qualities of the beef stew were evaluated at these critical stages of handling. Sensory evaluation was done by the foodservice employees. A mean score of 3.0 or above on a 5-point scale, with 5 as extremely desirable and 1 as very undesirable, was given for all attributes examined except for flavor which received a 2.8 score. A difference in the sensory quality of the beef stew was found among three days of preparation by analysis of variance. The same recipe was used for each day but a different cook prepared the stew each day. The variation also could be due in part to the inexperience of the panelists.

Very little microbial growth occurred in the beef stew with the highest counts occurring during chilled storage when the temperature was between 45°F and 140°F. Nutritional quality of the beef stew was determined by testing the retention of thiamin at the four

stages of handling. Loss of thiamin occurred during the cooking phase but no further loss occurred during microwave reheating. The authors stated that the methods used to document, survey and evaluate the beef stew could be used as a basis for a good quality assurance program in an alternate foodservice system.

A research study on quality assessment of food and service in 14 Wisconsin nursing homes was conducted (Arlington, Matthews, and Johnson, 1981). Food preparation, food service and sanitation and safety were three major categories under which 10 characteristics of quality meals were evaluated. They identified temperature as one of the most critical problems found. Delay in the delivery of meal carts was also discovered to be a problem area. The study's recommendations included the establishment of quality standards and routine assessment to determine if quality standards were achieved.

Quality Control of Foodservice in Small Health Care Facilities

According to Thorner and Manning (1976), small and medium sized facilities have been reluctant to implement quality control programs because management personnel did not feel adequate in directing and executing the required tasks. Quality control does not require additional costs, but it can be achieved by establishing standards and using basic evaluation tools such as thermometers and scales (Balsley, 1980).

Several studies on quality control in small alternate foodservice systems were found in the professional literature; however, few authors reported on quality control research in small foodservice facilities with a conventional foodservice system. Lofquist et al. (1960) studied various aspects of the dietary department in small hospitals up to 135 beds to identify the present status in general hospitals and areas where skills and knowledge need improvement. The researchers found that persons without professional education in dietetics were responsible for planning menus and that little or no advance menu planning was done. They also found that hospitals with less than 30 beds purchased most of their food in local retail markets. The authors felt that more complete foodservice management was provided in hospitals that employed dietitians than in those that did not employ a dietitian.

In 1975 a joint effort between the American Hospital Association and the Texas Hospital Association produced a guide to assist management of small hospitals in implementing a program to improve foodservice work methods (Anonymous, 1975). Morrison and Vaden (1978) collected data on the purchasing practices in small hospitals with emphasis on usage of convenience foods. A stratified random sample was used to select 300 hospitals with 100 beds or less in the West North Central Region of the United States. Several identified factors that frequently prohibited the purchase of convenience foods included lack of freezer space, high cost, lack of adequate kitchen staff and unacceptable product quality. Also, a lack of proper equipment was given as one of the limitations by 21.5% of the respondents.

Control of food quality in critical areas must be consistently maintained to provide a safe food product that meets the aesthetic expectations of the consumer. A frequently used method to evaluate the quality of the food and service is to obtain the opinion of the consumer.

Patient Surveys

Quality control systems should, and generally do, include surveys of patients' perceptions of the food served. Surveys can be a valuable tool when they are used to improve the menu, food preparation and service quality of the system (Berkman, 1980). On the most practical level, increasing patient acceptance of the food will reduce the food waste. Rejection of food items may be associated with such factors as unfamiliar foods, menu monotony and personal preferences of the consumer.

A survey of five U. S. Army Medical facilities in Texas, Georgia, California and South Carolina was conducted to obtain opinions of the 1597 hospital patients and staff regarding hospital food and service (Maller et al., 1980). A questionnaire was used to assess demographic information, acceptability of past meals and mood-related variables. Each person was surveyed for one meal, either breakfast, lunch or dinner. Age was the major demographic factor found to affect people's opinions of the food. Other important factors were education and occupation. The researchers felt that age was an underlying factor to education and occupation as older persons had better jobs and more education. Younger patients and staff were more

critical, possibly due to a preference for fast food rather than the hospitals' conventional foods. Ward patients tended to rate the food higher than did the staff or the ambulatory patients eating in the dining room.

A sampling of patients and employees in a large hospital participated in a study to record their reactions to a food product (Zellmer, 1970). Two or three items per meal were rated over a three-week period. The relationship of sex, age, educational level, mood, health, appetite and familiarity to the item were studied. The study supported the hypothesis that the acceptance of a food item decreases with frequency of servings when the food appears in the same form with the same menu combinations. Acceptance of a food item may increase with more frequent servings if the food is offered with different menu combinations.

An Illinois hospital used a standard survey form to obtain patient satisfaction with foodservices from discharged patients (Carey and Posavac, 1982). A 55-60% return rate was achieved from the surveys sent to a random sample of patients. The data were analyzed by computer. Services evaluated in the survey were admissions, food service, housekeeping and nursing. Patient responses were divided into two categories: satisfied and less than satisfied. Excellent responses were considered in the satisfied category while any responses less than excellent were considered to be less than satisfied. Gender, age, length of stay, pain and anxiety were patient characteristics related to satisfaction or dissatisfaction.

Age also was associated with foodservice ratings. Older patients and females rated foodservice more favorably than did younger patients and males. Only 34.8% of the respondents felt the food temperatures were acceptable and 43.7% thought the food was flavorful. The patient satisfaction survey was only one aspect of the overall evaluation of hospital performance used by administrative personnel.

A questionnaire form was designed to measure patient acceptance of cycle menu entrees in one Ohio hospital (Kincaid, 1975). Patients on regular diets were asked to complete a questionnaire at the noon meal to assess individual entrees. A question was included to determine whether or not the entree was eaten. Additional questions were included for the patients to indicate why they did not finish the entree. Based on the results, changes were made in the frequency with which entrees were offered in the menu cycle. The responses were dichotomous, that is, yes or no, with space allowed for additional comments. Popularity of certain entrees and combinations of entrees was assessed by computing the number of times each entree or combination was chosen. Evaluation of a menu entree was made by the percentage of choices for each item in relation to the other entree offered at the same meal.

A study to determine the effect of unfamiliar food terms on item selection by patients was conducted in a California hospital (Rucker et al., 1973). Two salad and two dessert items were chosen from each week of a five-week menu. Descriptions of these items were typed on half of the regular patient menus. The remaining menus contained only the names of the items. Consumption data on

the items studied were gathered as the trays were returned to the kitchen. The researchers found that patients receiving the descriptive menus were more likely to choose an item with an unusual name than were patients receiving a non-descriptive menu. It was found that unfamiliar menu item names may reduce the acceptance of a food item and including a description of menu items with unusual names might increase choices and reduce plate waste.

To compare the degree of patient satisfaction of the food served in a frozen/chilled foodservice with the food served in a conventional foodservice, Armstrong and Reeve (1978) developed a questionnaire with response categories ranging from "always" to "never." The emphasis of the article was on the development of the questionnaire. The questionnaire was given to the patient during the hospital stay and again one week after discharge. Computer analysis between the two completed questionnaires indicated no significant difference in responses before and after discharge. The authors recommended that the questionnaire only be administered during the hospital stay since there was no difference in responses and, in addition, the home survey required additional expenses for labor and supplies. After analysis of the data was completed, the original questionnaire was evaluated and redesigned. The final questionnaire was refined to 24 significant questions of the original 38 questions. For this study the data were coded and analyzed by computer, but the authors felt the questionnaire also was appropriate for manual tabulation in a small facility.

In yet another study, a hospital in Indianapolis, Indiana established a system to identify and eliminate possible causes of patient and employee dissatisfaction (McLaren, 1973). Food items were evaluated by foodservice employees for appearance, taste and texture. Established temperature standards were used to evaluate the temperature of food items prior to tray assembly. A five-point questionnaire was given to patients to rate food and service items. Poor and very poor ratings were referred to a dietitian for follow-up visits to the patient. In addition to producing better quality control, the program provided data that justified equipment purchases.

Nutrient Analysis

Patients in a health care facility are dependent upon the facility to provide a nutritious diet; therefore, providing nutritious food to acute and long term care patients is an important part of the treatment and continued health of the individual. The nutritional quality of the menu is an indication of the overall quality of the food available. The development of a quality control program must start with the menu that will be offered (Kirsch, 1980). Hospitals and nursing homes use dietary data to assess the nutritional adequacy of the menus (Sawichi and Endres, 1983). The Joint Commission on Accreditation of Hospitals (JCAH) recommends the evaluation of all menus for nutritional adequacy as a quality control tool (Miller and Balsley, 1980).

The Recommended Dietary Allowances (RDA) were developed by the Committee on Dietary Allowances Food and Nutrition Board of the National Research Council (Food and Nutrition Board, 1980). The RDA are recommendations of levels of nutrients that healthy population groups should consume in average daily amounts. The RDA cannot be applied to specific individuals, only to targeted population groups. Menus should be written using the RDA as a standard to provide a variety of foods that would meet the RDA for all age and sex groups.

Sempos et al. (1982) reported a study of 14 Wisconsin nursing homes in which menus and diets were analyzed for energy and specific nutrients to determine which nutrients were low in the food provided and consumed. A computer program was used to analyze the menus. Nutrient values were expressed as percentages of the 1974 RDA. The mean nutrient content of the menu items and the nutrient density per 1500 kilocalories were obtained. None of the menus met the RDA for both sexes for all nutrients. Little variation between menus in the different institutions was noted. Comparisons were made between the nutritional content of menus for this study and previous studies. Nursing home menus did not meet the nutrient needs of the majority of the residents. Nutrient density, based on 1500 kilocalories, indicated that an individual needed at least 2000 kilocalories per day to meet the RDA for all the nutrients analyzed. However, 30% of the residents consumed less than 1200 kilocalories on the day studied (Sempos et al. 1982).

Recently the nutrient density of diets was recommended as a measure for assessment of the actual nutrient quality of the

individual diet. The available food and food intake must meet not only the individual's energy requirements, but the various nutrient requirements as well. Persons needing to reduce weight, thus lowering calorie intake below energy requirements, would need to select foods that have a high nutrient density. The Index of Nutritional Quality (INQ) is a ratio of the amount of nutrient in a 1000 kilocalorie portion of a food divided by the suggested allowance of the nutrient per 1000 kilocalories and is independent of a serving size. The suggested allowance was obtained by dividing the RDA by the average calorie allowance for an individual and multiplying it by 1000. The INQ can be used as a guideline in developing menus, or it can be used to provide useful information for product labeling (Hansen and Wyse, 1980).

A study of the nutrient density of diets from the USDA Nationwide Food Consumption Survey (1977-1978) used the INQ method for determining the density of the diets (Windham et al., 1983a,b). The researchers found that different demographic and socioeconomic groups had similar food consumption. Calcium density of the diets was generally below standard in all regions, but the South had the lowest value. Vitamin C intake averaged above recommended standards for all regions with the Northeast region averaging the highest in Vitamin C. Calcium, iron, magnesium and vitamin B-6 averaged below the standards. The authors recommended that the public be educated to plan and consume adequate diets based on the nutrient density standards.

The increased technology in computer systems has provided more available utilization of computerized nutritional analysis.

Computer nutrient bases are used for such things as evaluation of menus, cost-optimizing menu planning, analysis of food intake and research. However, small health care facilities generally do not have access to the computer systems that larger institutions may have. Therefore the development of the micro computers and the variety of nutrient calculation programs available for different micro computers have made it possible for the smaller institution to develop procedures to analyze menus and individual patient's diets. The use of computers to calculate nutrient data for food items has increased speed and accuracy and has decreased the cost of the calculation (Sawichi and Endres, 1983). However, decisions involving multiple items in mixed foods and the coding mechanism for most programs may lessen the time saved by the computer.

Witschi et al. (1981) developed a simplified computer based nutrient value table and an interactive retrieval system. Access to the program did not require coding and was done directly into the terminal during an interview. Food items were located by the full name, first few identifying letters, item number or the subtable name. The simplified program eliminated the amount of time spent coding and in selection decision-making.

Quality Control Audits

The development of newer technologies and inflation of labor, food and energy costs often necessitates changes in the operation of a foodservice system. To control expensive resources, administrators

must establish good standards and provide control systems to ensure the standards are met.

The first formalized standards used to evaluate the effectiveness of a hospital dietary service were presented in check sheet form in 1956 by the American Dietetic Association. This eight-page evaluation tool was developed to appraise the existing conditions of the dietary department and to reflect changes that would improve or enhance efficiency. Such a standardized form is a useful tool to provide consistent assessment (Osborn, 1981; Sichterman, 1979).

Schiller and Bartlett (1979) identified an audit as a process designed to solve problems and identify substandard performance. Past and present performance of employees and products is evaluated to determine if standards are met. Differences between an audit and an evaluation were described. These differences included the criteria, process and personnel involved in completing an audit or an evaluation. A number of audit topics were suggested by the authors among which are inventory control, portion control, personal hygiene, tray assembly, nourishments, food delivery, equipment repair and maintenance. Proposed solutions to problems identified by an audit or evaluation process should be implemented as soon as possible.

The American Society of Hospital Food Service Administrators of the American Hospital Association published a 70-page handbook entitled "Hospital Foodservice Management Review" (Anonymous, 1980). The review was developed for use by Foodservice Administrators in

identifying deficiencies in operational practices. Statements are written for evaluation of all areas of foodservice management. Responses are indicated by placing a check mark in columns headed by "yes," "no" and "not applicable (N/A)." The foodservice audit is a comprehensive review of the foodservice management practices and is too comprehensive for a monthly review, but it is a very effective tool for a yearly audit (Anonymous, 1980).

Standardized evaluation forms are valuable tools for the consultant dietitian who visits a facility only once or twice a month. Criteria that have been established should be included on the form for evaluation against set standards. The evaluation form would then serve as an assessment tool for consulting dietitians in health care facilities. The records provided on the form allowed continuity between visits to the facility by the consultant (Sichterman, 1979). The form can also be used as a periodic report to the supervisor and administrator of a facility. Past reports should be reviewed and used to establish future goals and objectives (Osborn, 1981; Sichterman, 1979). Matthews (1982) indicated in a review of research conducted on foodservices in health care facilities that "there is a need to research the way things are done in hospital foodservices to identify where improvements and changes can be made." Quality control of foodservices in health care facilities needs research to identify more appropriate procedures.

CHAPTER III

PROCEDURES

As the desired goal of any foodservice is the acceptance of food by the consumer, it is essential that a quality product be produced and maintained until the consumer receives the item. Acceptability of the food depends upon such quality characteristics of food as sensory, microbiological and nutritional values (Nicholanco and Matthews, 1978). Quality control of food items is essential at all stages of procurement, storage, processing, holding and service (Bobeng and David, 1978a; Hitchcock, 1980). Foodservices in small nursing homes and hospitals may have fewer areas in their foodservice to control than do larger health care institutions, but, still, they require control of food quality in all areas.

Selected nursing homes and hospitals in two states, Tennessee and Kentucky, were surveyed to identify how they control the quality of food in five critical areas. This research was done to identify patterns of control in two types of health care facilities and differences that were present between the type and size of facilities. Foodservices in nursing homes and hospitals, both small and large, have similar areas of receiving, storing, processing, holding and servicing. Therefore, types of control for food quality should be similar.

Questionnaire Development and Pilot Test

A 53-question survey form was developed to obtain information from small hospitals and nursing homes concerning their food quality control practices in the five critical control areas of procurement, storage, processing, holding and service (see Appendix A). Items in the instrument were developed from the experiences of the researcher and also from ideas found in published literature. The American Hospital Association's Hospital Food Service Management Review (Anonymous, 1980) was used as a reference to check for major areas of omission in questions on food quality control. The majority of the surveys were completed by a dietitian, consultant dietitian, or the foodservice supervisor. The foodservice director or facility administrator completed the survey in some instances.

As has been previously stated, the acceptability of the food in a health care facility is an important factor used to assess the quality of the food served. To obtain some insight in this area of quality control, a five-point Likert scale survey form was developed and included with the questionnaire to survey patients in the facility for their opinions of the food and foodservice.

A pilot study was conducted using four facilities, two nursing homes and two hospitals, to test for the clarity of the survey form. Because the population of hospitals with less than 100 beds was surveyed in Kentucky and Tennessee, dietitians in two hospitals from the neighboring state of Mississippi were chosen to pilot test the questionnaire packet; only one of the two responded. One nursing

home from Tennessee and one from Kentucky were selected after the sample selection process was completed to eliminate the possibility that the pilot facilities would occur in the survey sample. The dietitians from both nursing homes in the pilot test responded to the questionnaire. Based on comments by participants in the pilot survey, changes were made in the questionnaire and in the patient survey form before submitting the final survey packets (see Appendix B).

Sample Selection

The population of hospitals with less than 100 beds in Kentucky and Tennessee was 146 and the population of nursing homes with less than 100 beds in both these states was 327. A nursing home was identified for the purposes of this study as one which is classified by the State Licensure Board as offering skilled, intermediate or personal care.

Selection of hospitals with less than 100 beds was made from the listing of hospitals in the American Hospital Association Guide to the Health Care Field (Anonymous, 1981a) for each state. All hospitals with less than 100 beds in Tennessee and Kentucky listed in the American Hospital Association Guide were surveyed. Since there were more than twice as many nursing homes as hospitals meeting the criteria for the research project, approximately one-half of the nursing homes were selected in order to assure equal representation of each type of facility. A listing of personal care, intermediate

and skilled care nursing homes with less than 100 beds was obtained from the Division of Licensing and Regulation Directories (Anonymous, 1981b,c) for each state. A table of random numbers was used to start the selection. Every other facility in Tennessee and Kentucky on the list was selected thereafter until the desired number of facilities was obtained. The use of the random start process allows each facility the same probability of being selected as any of the other facilities. Survey forms were sent to 145 hospitals and 157 nursing homes in the two states. A second random start process was used and every fifth facility was selected to receive the acceptability survey forms to be completed by ten patients on regular diets, soft diets or high-calorie diets. Patient survey forms were sent to 32 hospitals and 34 nursing homes. Soft and high-calorie diets, in addition to regular diets, were included to generate a larger number of nursing home patients available to answer the survey. It was felt that the soft and high-calorie diet modifications would not bias the respondents' answers about the food and service due to the influence of the diet.

Data Collection

The questionnaire packets were mailed to the hospitals and nursing homes addressed to the attention of the dietitian. Copies of the cover letter, questionnaires and follow-up post card are included in Appendix A. Each facility was assigned a number corresponding to the number on the front of the questionnaire to identify

those responding. As each responded, the facility was checked off the mailing list. This was done to identify nonrespondents who were to receive a follow-up reminder. Approximately three weeks were allowed for receipt of the replies before mailing a follow-up post card to non-respondents. A second questionnaire was mailed upon request as suggested by Babbie (1973) and Dillman (1978). In addition to the survey and questionnaire, a regular patient menu for the Wednesday following the receipt of the questionnaire was requested from each facility.

Analyses of Data

A percentage of replies was calculated by comparing the total number of returned surveys to the total sent. Incomplete surveys or those not meeting the criteria for the research were subtracted from the total returned before calculating the percentage.

The Statistical Analysis System (SAS, 1982) program was used to analyze the data. The University of Tennessee Computer Center facilities were used to help process data. The program cross-tabulated responses for questions 26 and 27 with responses from all other survey questions. This divided the data by type and size of facility. Responses were tabulated by frequencies and percentages for Question 1 through Question 53. Frequency of responses were calculated for each of the questions on the questionnaire. Response means were calculated for the size of the facility (Q27), part time and full time employees (Q30-1, Q30-2), total number of employee hours (Q31), length of the menu cycle (Q37), the number of dietitians

employed by the facility (Q41) and the number of hours per week the supervisor spends as cook and supervisor (Q48-1, Q48-2). Percentages and frequency of responses and response means also were calculated for each of the questions on the patient survey forms.

To test for differences between hospitals and nursing homes a t-test was performed on the data from the following variables: frequency of physical inventory (Q5), length of holding time for hot food (Q10), length of time for tray assembly (Q14), size of the facility (Q27), the number of part-time and full-time dietary employees (Q30-1, Q30-2), the total number of weekly employee hours (Q31), the average daily census (Q32), length of the menu cycle (Q37), the number of employed dietitians (Q41) and the number of weekly hours the supervisor spent as cook (Q48-1) and as supervisor (Q48-2). Chi Square analysis was used to test the significance of the relationship between types of facilities for all other variables on the questionnaire. Chi Square was used to test the significance of patient responses between the two types of facilities. The response categories for the patient survey form ranged from very good (5) to very poor (1). For one Chi Square analysis the categories were condensed into two groups. Fair, poor and very poor were condensed into one group and good and very good were condensed into another group.

The menu sent by each facility was coded and an analysis for nutrient content was completed through a nutrient analysis program based on the USDA Home and Garden Bulletin Number 72 (1981) at The

University of Tennessee Computer Center. Comparison of nutrient content with the RDA was made for reference adult females and males ages of 23-50 and 51+. The nutrient content per 1000 calories and the Index of Nutritional Quality also were obtained.

To test the difference between the means of each nutrient for the menus from hospitals and nursing homes, a t-test was conducted. The "t" value for unequal variances was used because the sample sizes for hospitals and nursing homes were different. The t-test on the menus was based on a reference female age of 23-50.

Development of Food Quality Audit

A number of different methods are used by dietitians to assess the foodservice in a health care facility. Assessment should be done periodically, usually monthly, to evaluate goals and objectives, to observe if correct procedures are being followed and to plan additional goals and objectives for the facility. A check sheet or form is one method that may be used that will allow consistent evaluation of the foodservice and provide written communication to the foodservice supervisor and administrator regarding the status of the foodservice system.

The consultant dietitians generally are in the facility for a very limited time; therefore, a form is needed for evaluation that is thorough, yet easy to complete without unnecessary writing. No one audit form can fit the individual needs of every health care facility, but a standardized form can be adapted to the specific needs of the facility.

Following the collection and analysis of data from the facilities, a format was developed to be used as an audit procedure for food quality by consultant dietitians to small nursing homes and hospitals in Kentucky and Tennessee. Areas that were considered potential problems for the control of quality were included on the evaluation form. Other categories that were not included in the survey, but which were felt to be essential to complete the evaluation format included equipment, physical facilities and miscellaneous items.

Interested dietitians with experience in small facilities in Kentucky and Tennessee were asked to complete the evaluation form and respond with comments concerning changes that should or could be made to facilitate the use of the form. Forms were sent to 20 dietitians. Changes were made in the form based on the comments and suggestions received (Appendix C).

CHAPTER IV

RESULTS

A survey was conducted in hospitals and nursing homes with less than 100 beds to identify the methods used to control quality standards. Foodservice areas included in the questionnaire were purchasing, storage, processing, holding and service.

Surveys were sent to 145 hospitals and 157 nursing homes in the states of Kentucky and Tennessee. The facilities were divided into two size categories, $\leq$60 beds and >61 beds, as differences could exist between the size categories of small facilities.

Of the 302 surveys sent to hospitals and nursing homes in Kentucky and Tennessee, 124 were returned from 73 hospitals and 51 nursing homes, resulting in a 50% return rate for hospitals and 32% return rate for nursing homes. Six hospital and two nursing home responses were considered unusable for the following reasons: an increase in the number of beds exceeding the survey limits, one survey for both an acute care and extended care facility with a combined bed size exceeding the survey limits and one nursing home out of business. The final response rate was 46% for hospitals and 31% for nursing homes. Responses from several facilities that reported more than 100 beds were considered usable because the average occupancy rate was less than 100 beds. The operation of the foodservice, including purchasing and staffing, most likely would be based on the average census and not on the number of beds available.

Background Information

Most (34) of the nursing homes had >60 beds. For hospitals, 37 had ≤60 beds. An almost equal percentage of responses for each type of facility was returned by both states. The average number of beds in the 67 hospitals was 61. The 49 nursing homes averaged somewhat larger with 70 beds. The average occupancy rate for hospitals was 41, while nursing homes averaged a 68 daily census. Hospitals maintained, on the average, a 67% bed capacity while nursing homes maintained a 96% bed capacity. A difference ($t=-6.41$, $p<0.01$) was indicated for the average occupancy rate between the types of facilities.

Sixty-seven percent of the hospitals gave "nonprofit" as the type of ownership. Profit making nursing homes, on the other hand, made up the majority of such facilities (55%) (Table 1). The type of ownership was different ($\chi^2=5.73$, $p<0.05$) between hospitals and nursing homes.

The majority of hospital respondents had the title of Dietitian (45%). Other respondents included the Foodservice Manager-Non-Dietitian (23%), Supervisor (20%) or Foodservice Manager-Dietitian (11%) (Table 2). In nursing homes the title of the person answering the questionnaire most frequently was Supervisor (47%). Other responses included the Dietitian (23%), Foodservice Manager-Non-Dietitian (15%), Administrator (9%), Foodservice Manager-Dietitian (4%) and Assistant Administrator (2%) (Table 2). The

Table 1--Report of hospitals and nursing homes by bed size and ownership

	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	----------%----------			
Size facility[a]	55	45	30	70
Type ownership[b]				
For profit	18	15	17	38
Not for profit	37	30	15	30

[a]N=69 hospitals, 49 nursing homes.

[b]N=67 hospitals, 47 nursing homes.

Table 2--Title of person completing questionnaire by facility type and bed size

Title	Hospitals N=64		Nursing homes N=47	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	----------%----------			
Dietitian	23	22	11	13
Supervisor	17	3	6	40
Food Service Manager-Non-Dietitian	11	13	4	11
Food Service Manager-Dietitian	5	6	2	2
Administrator	-	-	7	2
Assistant Administrator	-	-	2	-

person most frequently answering the questionnaire in hospitals was a dietititan; whereas, in the nursing homes the most frequent respondent was a person other than a dietitian, such as the supervisor, foodservice manager-non-dietitian, or the administrator. A difference (χ^2=18.94, $p<0.01$) for the title of the person completing the questionnaire occurred between facility types.

A dietititan who met the requirements for membership in The American Dietetic Association was employed in all 67 hospitals. Nursing home responses indicated that 83% employed a dietitian. A difference (χ^2=12.0, $p<0.01$) for the employment of a dietitian was found between the types of facilities. This could account in part for the greater percentage of dietitians answering the questionnaire from hospitals than from nursing homes. Respondents from the nursing homes with $\leq$60 beds (3 responses) indicated they did not employ a dietitian.

In response to the number of dietitians employed, 97% of hospital respondents reported employing one dietitian. One hospital employed two dietitians and one hospital employed three dietitians. The employment status of the dietitian in a hospital $\leq$60 beds was very likely to be a consultant as 20 out of 37 employed consultants. Eighteen of the 30 hospitals with >60 beds employed one full-time dietitian. One facility reported employing one full-time and one part-time dietitian. Forty-two percent of the hospitals employed a full-time dietitian and 40% employed a consultant. This compares

with 10% and 81% respectively in nursing homes. Four nursing home facilities employed a part-time dietitian and four employed a full-time dietitian (Table 3). A difference (χ^2=18.30, p<0.01) for dietitians' employment status occurred between hospitals and nursing homes. The data for employment status of the dietitian was condensed into two groups. One group combined part-time and full-time dietitians and the second group contained only consultants. A difference (χ^2=26.60, p<0.01) occurred for the two groups between nursing homes and hospitals. There was no difference for employment status between the sizes of facilities for either nursing homes or hospitals.

The amount of time spent by a qualified person, such as a dietitian, in a facility could directly influence the quality control program in a foodservice department. Fifty-nine percent of the nursing homes and 27% of the hospitals employed a dietitian less than five hours per week. The second most frequently reported number of hours of employment for the dietitian in a nursing home (23%) was 6-10 hours per week. Fifteen percent of the hospital respondents also reported 6-10 hours per week. Three percent of the hospital respondents reported the dietitians worked in excess of 40 hours per week, while 39% worked between 31 and 40 hours per week (Table 3). These data indicated that a dietitian was actually in a facility 10 hours or less in 82% of the nursing homes and 42% of the hospitals. A t-test indicated a difference (t=4.56, p<0.01) in the number of hours worked by dietitians in the two types of facilities.

Table 3--Dietitians employment status and number of hours worked by facility type and bed size

	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	%			
Employment status[a]				
Full-time	15	27	2	7
Part-time	10	6	-	10
Consultant	30	10	24	57
One full-time and one part-time	-	2	-	-
Number of hours[b]				
≤5	24	3	18	41
6-10	8	8	3	20
11-15	3	3	-	5
16-20	4	-	-	3
21-30	2	3	-	-
31-40	15	24	3	8
>40	-	3	-	-

[a]N=67 hospitals, 42 nursing homes.

[b]N=66 hospitals, 39 nursing homes.

Dietetic technicians complete two years of education and training in the foodservice area; thus they are better qualified through both education and experience for the management position of a small facility than the general foodservice supervisor. A dietetic technician was employed in five nursing homes (11%) and 13 hospitals (20%) (Table 4). Foodservice supervisors were employed in 85% of the hospitals and 90% of the nursing homes. Nursing home and hospital supervisors, 64% and 43% respectively, qualified for the position through the 90-hour course for foodservice supervisors. Three hospital (5%) supervisors and one nursing home (2%) supervisor had a Bachelor of Science degree in dietetics. Other qualifications included two supervisors with military foodservice experience, one with five years experience as a foodservice supervisor for a correctional institution, one with an associate degree in foodservice management, one with a Bachelor of Science degree in Nutrition, eight with Bachelor of Science degrees in Home Economics and one with a Master's degree in Adult Community Education.

In many small facilities it is not economically feasible to employ a full-time supervisor. In these instances one person may be hired to cook part-time and fulfill a limited number of duties that a supervisor would perform, such as purchase food and prepare the employee time sheet.

In hospitals, 19% (11) of the supervisors reported that they also worked as a cook. Ten of the 11 responses were from hospitals

Table 4--Dietetic technician employed by facility type and bed size

	Hospitals N=66		Nursing homes N=46	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	%			
Yes	11	9	4	7
No	45	35	26	63

with ≤60 beds. Thirty-four percent of the nursing home supervisors from both size facilities reported that they spent part of their time cooking and part performing the duties of a supervisor. The mean number of hours the supervisors in hospitals spent cooking was six hours per week and in nursing homes the mean number of hours was seven per week. A t-test did not indicate any significant differences between nursing homes and hospitals in the number of hours the supervisor spent as cook or in a supervisory capacity.

The foodservice supervisor also served as the director of the dietary department in 51% of the hospitals and in 89% of the nursing homes. In facilities where the foodservice supervisor also served as director of the dietary department, 60% were from nursing home facilities with >60 beds as compared with only 14% of the same size hospitals. There was a difference (χ^2=16.79, $p<0.01$) between hospital and nursing home supervisors serving as the dietary director. These data indicate that the larger hospitals were

more likely than nursing homes to have a person other than the supervisor serve as director.

The operation of a foodservice is based on the planned menus. The person most frequently responsible for planning menus in hospitals was the dietitian (68%) while in nursing homes there was an equal number responding that the dietitian (31%) and both the dietitian and supervisor (31%) planned the menus. In four nursing homes the administrator was responsible for planning the menus and writing the modified diets, and in one the supervisor and head cook planned the menus (Table 5). A difference was indicated between nursing homes and hospitals for planning menus (χ^2=19.27, $p<0.01$) and writing modified diets (χ^2=8.88, $p<0.05$).

Lofquist et al. (1960) found that persons who were not specialists with professional education in dietetics were responsible for planning menus in three-fourths of the hospitals in their study. Titles of persons specifically mentioned were cooks, kitchen supervisors, housekeepers and administrators.

Fifty percent of the nursing homes and 71% of the hospitals in this study stated that modified diets were written by the dietitian. However, the supervisor wrote the modified diets in 21% of the nursing homes and in 15% of the hospitals. Responses to questions concerning correct food preparation methods and whether or not food preparation methods were changed for modified diets showed differences (χ^2=5.73, $p<0.05$; χ^2=5.61, $p<0.05$) between

Table 5--Person responsible for various department activities by facility type and bed size

	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	%			
Plan Menus[a]				
Dietitian	36	32	6	25
Supervisor	12	4	10	18
Dietitian and supervisor	8	8	6	25
Administrator	-	-	6	2
Supervisor and head cook	-	-	2	-
Schedule Dietary Employees[b]				
Dietitian	16	13	2	2
Supervisor	36	28	19	56
Dietitian and supervisor	2	-	-	2
Assistant food service manager	-	-	-	2
Administrator	2	-	8	6
Supervisor and head cook	-	-	-	-
Food service manager	-	2	-	2
Patient Diet Instruction[c]				
Dietitian	27	33	6	15
Supervisor	15	5	17	40
Dietitian and supervisor	14	6	-	13
Administrator	-	-	6	2
Supervisor and head cook	-	-	-	-
Nurse	-	-	-	2

Table 5--Continued

	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	%			
Assign Cleaning Duties[d]				
Dietitian	12	9	-	2
Supervisor	37	29	22	63
Dietitian and supervisor	2	2	-	-
Administrator	-	-	6	2
Supervisor and head cook	3	2	2	-
Head cook	2	-	-	-
Food service manager	-	2	-	2
Visit Patients for Food Preference[e]				
Dietitian	16	28	2	9
Supervisor	18	12	19	48
Dietitian and supervisor	19	5	4	13
Administrator	-	-	2	2
Head cook	2	-	-	-
Supervisor and head cook	-	-	-	-
Write Modified Diets[f]				
Dietitian	38	33	10	40
Supervisor	11	5	6	15
Dietitian and supervisor	7	8	8	13
Administrator	-	-	6	2
Supervisor and head cook	-	-	-	-

Table 5--Continued

	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	----------%----------			
Purchase Food Items[g]				
Dietitian	13	7	2	4
Supervisor	39	30	20	61
Dietitian and supervisor	3	2	2	-
Head cook	-	-	2	-
Administrator	-	-	6	2
Food service manager	-	6	-	-
Supervisor and head cook	-	-	-	-
Assistant food service manager	-	-	-	2

[a]N=66 hospitals, 49 nursing homes.

[b]N=67 hospitals, 48 nursing homes.

[c]N=66 hospitals, 48 nursing homes.

[d]N=66 hospitals, 48 nursing homes.

[e]N=67 hospitals, 46 nursing homes.

[f]N=66 hospitals, 48 nursing homes.

[g]N=67 hospitals, 49 nursing homes.

hospitals and nursing homes. There was a statistical difference between hospitals and nursing homes in who was responsible for performing certain foodservice duties. These duties included scheduling dietary employees (χ^2=18.55, $p<0.01$), giving diet instructions to patients (χ^2=28.34, $p<0.01$), assigning cleaning duties in the dietary area (χ^2=18.50, $p<0.01$), purchasing food items (χ^2=18.18, $p<0.01$) and visiting patients for food preferences (χ^2=22.78, $p<0.01$).

A t-test conducted on the number of full-time personnel employed in the dietary department indicated a difference ($t=3.41$, $p<0.01$) between nursing homes and hospitals. Hospitals averaged nine and nursing homes averaged six full-time employees. There was no significant difference in the number of part-time employees between the facilities. Table 6 provides information concerning the number of part-time and full-time employees for both hospitals and nursing homes.

Limited equipment, personnel and space restrict the number of food items that may be prepared to offer the patients a choice. It is important to offer a variety of foods to prevent monotony in meals, particularly for long-term hospital patients and residents of nursing homes. One way to increase the variety of foods offered is to lengthen the cycle of the menu. Facilities that offer selective menus can reduce the length of the cycle.

Table 6--Number of dietary employees in each type facility by bed size

Number of Employees	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
Part Time:				
0	8	3	2	3
1-3	21	8	6	17
4-6	7	11	5	9
7-9	0	3	1	3
10-12	0	4	0	2
13-18	0	1	1	0
20+	0	0	1	0
Total	36	30	15	34
Full Time:				
0	0	0	0	1
1-3	3	2	10	4
4-6	11	5	2	13
7-9	17	7	0	14
10-12	5	6	1	1
13-15	1	5	0	0
16-19	0	5	1	0
27+	0	0	0	1
Total	37	30	14	34

A non-selective menu was offered to patients in 98% of the nursing homes and in 70% of the hospitals. Thirty percent of the hospitals, 23% of which had >60 beds, offered a selective menu to patients. None of the nursing homes with ≤60 beds provided a selective menu (Table 7). A difference (χ^2=14.73, $p<0.01$) occurred in the type of menu offered in nursing homes and hospitals. The average length of the menu cycle reported was 18 days in hospitals and 20 days in nursing homes. One nursing home and three hospital respondents reported that a menu cycle was not used. A 21-day cycle menu had the highest frequency occurrence.

Table 7--Type of patient menu by facility type and bed size

	Hospitals N=52		Nursing homes N=48	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	----------	----------	% ----------	----------
Selective	8	23	-	2
Non-selective	48	21	31	67

Survey results of hospitals in New York City were reported by Franzese (1980). The author found that the majority of hospitals offered a 21-day menu cycle, and selective menus were used by 86%

of the respondents as compared with 30% of the hospitals in this study. The smallest hospital in the Franzese study was a 59-bed facility.

The conventional type of foodservice system where the food is produced, held heated or chilled then served to the consumer, is one of the most frequently used systems in the United States (Matthews, 1982). The conventional system was found in 96% of the hospitals and 94% of the nursing homes. One nursing home and one hospital had a ready-prepared foodservice system and two hospitals ($\leq$60 beds) had a commissary type service. Two nursing homes (>60 beds) also had a commissary type service and two reported an assembly/serve system.

Providing meals for another facility or other groups would increase the total number of meals served and would possibly increase the amount of labor, equipment and space needed depending on the number of extra meals served. Four hospitals and four nursing homes provided meals for other types of facilities. The four hospitals provided meals for another hospital, a nursing home, a senior meals program and for a day care center. The nursing homes sent meals to another nursing home, two senior meals programs and to a retirement home.

The smaller nursing homes and hospitals may not have the facilities to provide meal service to employees and guests. Lofquist et al. (1960) found that 38% of the surveyed hospitals reported the employees "helped themselves" to food in the kitchen, and in 30% of the hospitals the employees came to the kitchen, but were served by

the kitchen personnel. This survey included questions about foodservice facilities for both employees and guests. Restaurant or cafeteria service was provided for employees by 77% of the hospitals and 24% of the nursing homes and for guests by 67% of the hospitals and 27% of the nursing homes. Employees were served in the kitchen/dining area by kitchen employees according to 52% of the hospital and 81% of the nursing home respondents. Employees served themselves in the kitchen in four hospitals and in six nursing homes. Vending machines were available in hospitals to employees (93%) and guests (95%). In nursing homes vending machines were available to guests (74%) and to employees (65%). Other types of foodservice provided for employees may be found in Table 8. A difference occurred in foodservice facilities available to guests: for restaurant/cafeteria (χ^2=13.25, $p<0.01$), room guest trays (χ^2=13.86, $p<0.01$), served in the dining area by kitchen employees (χ^2=14.37, $p<0.01$) and vending machines (χ^2=8.98, $p<0.01$). A difference was indicated for the following employee services: cafeteria (χ^2=25.07, $p<0.01$), served in kitchen/dining area by kitchen employees (χ^2=9.18, $p<0.01$) and vending machines (χ^2=12.25, $p<0.01$). A higher percentage of hospitals provided cafeteria or restaurant services for employees or guests than did nursing homes.

One method for providing educational information to non-professional foodservice personnel is through regular inservice training programs. Approximately 96% of the hospitals and 90% of the nursing homes reported they provided inservice education to

Table 8--Other types of employee foodservice[a]

Types	Number of Responses	
	Hospitals	Nursing homes
1. Coffee shop--one hot meal and short order grill	1	-
2. Employees may purchase food if left over after patient trays served	1	-
3. Employees come to kitchen door and are given tray by kitchen employee	-	1
4. Sandwiches and patient tray available at night	1	-
5. Employees have cooking facilities in lounge	1	-
6. Doctor's dining room	1	-
7. Employees eat out	-	1
8. Salad bar	-	1
9. Bring own food	-	3
10. 2 A. M.-4 A. M. meal in cafeteria	-	1

[a]What are the available foodservice facilities for employees?

foodservice employees. To determine if a variety of topics was offered, the respondents were asked to indicate the frequency with which inservice training was given. Quarterly inservice training was the most frequent response given by nursing homes for all categories except disaster and fire procedures. Annual inservice training on disaster and fire procedures was reported by 68% of the hospitals. One hospital and two nursing homes reported that they never provided inservice training on modified diets. Inservice training on portion control was never given by three hospitals and two nursing homes (Table 9). The inservice training on food preparation procedures was reported as presented quarterly to dietary employees by 60% of the nursing homes, but only by 30% of the hospitals. A difference (χ^2=12.16, $p<0.01$) for inservice training on food preparation procedures was found to occur between hospitals and nursing homes.

Direct Food Quality Control

Direct food quality control was defined for the purpose of this study as control procedures that are used directly to regulate the quality of a food product.

Purchasing and Receiving

Written specifications for food items are controls for purchasing and receiving a quality food product which is appropriate to the institution. Written food specifications were available for

Table 9--Frequency of employee inservice training topics by facility type and bed size

	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	%			
Employee Safety and Sanitation[a]				
Quarterly	19	11	9	31
Bi-annual	14	15	9	24
Annual	23	18	11	13
Never	-	-	2	-
Food Safety and Sanitation[b]				
Quarterly	26	9	16	31
Bi-annual	12	18	4	25
Annual	18	17	9	13
Never	-	-	2	-
Modified Diets[c]				
Quarterly	26	18	20	30
Bi-annual	11	8	2	25
Annual	17	18	7	11
Never	2	-	2	2
Disaster and Fire Procedures[a]				
Quarterly	10	8	9	15
Bi-annual	8	6	-	18
Annual	38	30	20	36
Never	-	-	2	-
Food Preparation and Procedures[a]				
Quarterly	18	12	22	38
Bi-annual	17	18	-	22
Annual	21	14	7	9
Never	-	-	2	-

Table 9--(Continued)

	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	----------%----------			
Portion Control[a]				
Quarterly	14	8	11	34
Bi-annual	12	12	7	13
Annual	27	23	11	20
Never	3	1	2	2

[a]N=66 hospitals, 45 nursing homes.

[b]N=66 hospitals, 44 nursing homes.

[c]N=65 hospitals, 44 nursing homes.

58% of the nursing homes and for 62% of the hospitals. However, only 51% and 60%, respectively, indicated that they actually used the specifications for purchasing. Fifty-eight percent of the nursing home respondents reported they had written specifications and 51% used them for purchasing (Table 10). Fifty percent of the nursing homes and 44% of the hospitals indicated that they actually used the specifications to compare items against when they were received. There was no difference between any of the responses from nursing homes or hospitals on food specifications.

Food items are frequently put out on bid to obtain the best price for the quality product desired. Only 33% of the nursing homes and 39% of the hospitals used a bid system for purchasing. Small institutions also can reduce their food and supply cost through group purchasing. However, 67% of the nursing homes and 45% of the hospitals were not members of a group purchasing organization. The responses indicate that the hospitals were more likely ($\chi^2=5.82$, $p<0.05$) to belong to a purchasing group than were the nursing homes. The percentage of hospitals in this area participating in group purchasing was greater than the 25% found in a 1978 study by Morrison and Vaden.

Two nursing homes and four hospitals responded that they used a computerized purchasing system. However, 96% of the nursing homes and 94% of the hospitals did not have computerized purchasing. This is consistent with the findings of Morrison and Vaden (1978) who reported only two hospitals surveyed used computerized purchasing.

Table 10--Written specifications used for purchasing by facility type and bed size

	Hospitals N=65		Nursing homes N=49	
	≤60 beds	>60 beds	≤60 beds	>60 beds
Yes	29	31	14	37
No	26	14	16	33

A common method for controlling qualitative and quantitative standards in the receiving area is the use of scales to weigh foods, particularly meats. In 67% of the nursing homes and 80% of the hospitals, scales were not used when foods were received. A written return policy to return and receive credit for damaged or inferior goods is another quality control check. Written return policies were available for 50% of the nursing homes and 71% of the hospitals (Table 11). A difference occurred between nursing homes and hospitals ($\chi^2=5.05$, $p<0.05$) for available written return policies.

Storage

The majority of nursing homes and hospitals, 86% and 96% respectively, had a storeroom available for dietary use only. This percentage was greater than the approximately 50% found in a study of 152 hospitals in Minnesota by Lofquist et al. (1960). Physical control of the inventory of a foodservice is essential to the economic well being of the facility. To protect the quality of foods prior to

Table 11--Written return policy for food deliveries by facility type and bed size

	Hospitals N=65		Nursing homes N=49	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	----------	----------	% ----------	----------
Yes	39	32	19	31
No	15	14	12	38

preparation and service the stored items must be held at appropriate temperature and humidity. Forty-one percent of hospitals and 47% of nursing homes reported that the storeroom used by dietary was neither temperature nor humidity controlled. Storerooms in some nursing homes (38%) and hospitals (29%) were temperature controlled only.

A standard stored goods receiving system of First-In-First-Out (FIFO) where older stock is rotated to the front and new stock placed behind was used by 94% of the nursing homes and 97% of the hospitals. Records of received goods were kept by all the nursing homes and by 96% of the hospitals. Very few (19% or nine facilities) of the nursing homes and 43% of the hospitals used issue or requisition forms for the stored items. A difference occurred ($\chi^2=7.42$, $p<0.01$) between hospitals and nursing homes using issue or requisition forms.

Two hospitals and three nursing homes used an ingredient room to control the amount of food used. Physical inventory was the

type of inventory control procedure used most frequently by nursing homes (63%) and hospitals (69%). Monthly physical inventory received the highest percentages of responses from both nursing homes (49%) and hospitals (39%) as their method of physical inventory. A yearly physical inventory was the second most frequently reported response for hospitals (23 responses, or 36%). Other responses reported for the facilities are listed in Table 12. A difference ($\chi^2=7.01$, $p<0.05$) occurred between hospitals and nursing homes for the type of inventory procedure used. A difference ($\chi^2=17.05$, $p<0.05$) also occurred for the inventory frequency period between hospitals and nursing homes.

Holding and Service of Food

Each facility was asked to indicate the method used to hold hot prepared food until served and the average length of time food generally is held prior to and during the meal service. Several methods were used by foodservices to hold hot food until it was served. A steam table was the most frequent method given as a response by both nursing homes (88%) and hospitals (89%). A Hot Box was the next most frequent response given by hospitals (35%). Other methods used to keep food hot listed by seven hospitals and six nursing homes were food warmers, hot plates, range tops, and the oven.

Covering hot food during the holding period serves to prevent heat loss and prevent contamination. Hospital and nursing home respondents answered this question in the affirmative by 94% and 98% respectively.

Table 12--Physical inventory periods by facility type and bed size

Inventory period	Hospitals N=64		Nursing homes N=37	
	≤60 beds	>60 beds	≤60 beds	>60 beds
Daily	-	-	-	3
Bi-weekly	-	1	-	3
Weekly	2	3	8	16
Bi-monthly	2	2	-	-
Monthly	23	16	11	38
Every other month	-	1	-	-
Quarterly	-	3	-	3
Bi-yearly	8	1	-	5
Yearly	20	16	5	8
Never	2	-	-	-

Prolonged holding of hot food prior to service is likely to decrease the quality of the end product as time and temperature affects food quality (Unklesbay and Balsley, 1979; Hitchcock, 1980). Fifty-one percent of the nursing homes and 40% of the hospitals stated they held hot food from 30 minutes to 1 hour prior to serving. Two hospitals, one ≤60 beds and one >60 beds, held their food longer than two hours. Approximately 79% of both the nursing homes and hospitals check the temperature of food during the holding period (Table 13). Nine of the 12 nursing homes with ≤60 beds reported checking the temperature of the food at this stage.

The temperature of the food must be maintained during tray set up and delivery. In response to the question concerning the type of heat maintenance delivery systems used, three hospital (8%) and five nursing home respondents (23%) reported that they used a thermal tray system with an open cart. Twenty-five hospitals (56%) and 13 nursing homes (48%) used a temperature controlled cart to deliver the food. Sixteen nursing homes (59%) and 15 hospitals (37%) used a regular tray system with closed, unheated carts. The pellet system was used by 32% of the nursing homes, all >60 beds, and by 49% of all size hospitals. "Other" types of heat maintenance delivery systems used by hospitals and nursing homes elicited a number of responses. These responses are reported in Table 14.

The type of tray assembly service and the length of time involved may be critical to the quality of the food received by the

Table 13--Food temperature check during holding period by facility type and bed size

	Hospitals N=64		Nursing homes N=48	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	----------	----------	% ----------	----------
Yes	41	39	19	60
No	14	6	13	8

Table 14--Other types of heat maintenance delivery systems

Other systems	Number of responses Hospitals	Nursing homes
1. Served from the stove	0	2
2. Plate lowerator	0	1
3. Most patients eat in the dining room	2	1
4. Insulated bowls and cups; lids on plates only	1	0
5. Heated bases under plates on tray	1	1
6. Heated stainless steel cover over regular plate	1	0
7. Tray system-open unheated carts	1	4
8. None	1	0
9. Chill-Rethermalize	1	0
10. Hot box	1	0
11. Plate covers	0	3

patient. Few of the facilities, 12% of the hospitals and 6% of the nursing homes, had an automated conveyor tray line. The most frequent response was the manual straight tray line system for both nursing homes (25 or 52%) and hospitals (31 or 47%). Worktable tray assembly was reported for one-third of both nursing homes and hospitals. Other responses are listed in Table 15.

Table 15--Types of tray assembly by facility type and bed size

	Hospitals N=66		Nursing homes N=48	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	----------%----------			
Automated conveyor line	3	9	4	2
Manual straight line	26	21	10	42
Worktable tray assembly	21	12	13	21
Other types	6	2	4	4

Sixty-four percent (41 responses) of all hospitals assembled their patient trays in < 30 minutes. The remaining hospitals assembled trays in 30 minutes to 1 hour. An equal percentage of nursing homes (49%) took <30 minutes and from 30 minutes to 1 hour to assemble trays. Only one nursing home reported 1-2 hours for tray assembly. To check the quality of the food against the standard the dietitian, foodservice supervisor, or other qualified person should sample food items for flavor and texture and

observe the color of the food prior to service. This was reported by 96% of the nursing homes and 99% of the hospitals. Patient trays need to be evaluated for accuracy, portion sizes and appearance of the tray before delivery. All nursing home and hospital (100%) respondents reported that the trays were checked for accuracy and appearance before delivery to patients. An evaluation of portion sizes served was conducted by 94% of the nursing homes and 92% of the hospitals.

Routine food temperature checks are included in a foodservice quality audit. The frequency of these checks varied from facility to facility. The most frequent response from both nursing homes (50%) and hospitals (33%) for daily routine temperature checks was during preparation and before plating. Nursing home respondents (31%) reported weekly food temperature checks after plating. An equal number of hospital respondents reported they annually (27%) or never (27%) checked the temperature of food after plating. Respondents from both nursing homes (26%) and hospitals (28%) reported monthly food temperature checks during delivery of trays (Table 16).

Most nursing home (61%) and hospital (60%) respondents stated that maintaining an adequate food temperature was not a problem. However, for those responding in the affirmative, nursing homes (62%) indicated that they had inadequate or no temperature holding equipment; 81% said the temperature problems were due to their food delivery systems and 50% thought their holding time was too long. Eighty-three percent of the hospital responses to this question indicated that their food delivery system was a problem in maintaining

Table 16--Percent of hospitals and nursing homes taking routine checks on food temperature by bed size

	Hospitals		Nursing homes	
	≤60 beds	>60 beds	≤60 beds	>60 beds
	%			
During Preparation[a]				
Daily	20	13	18	32
Weekly	13	6	-	20
Monthly	4	6	-	9
Annual	3	4	-	-
Never	20	11	9	12
Before Plating[b]				
Daily	23	26	23	36
Weekly	11	11	-	20
Monthly	8	5	3	8
Annual	3	3	-	-
Never	10	-	5	5
After Plating[c]				
Daily	4	-	6	6
Weekly	15	6	3	28
Monthly	6	16	-	16
Annual	12	15	6	9
Never	18	8	13	13
During Delivery[d]				
Daily	5	1	6	6
Weekly	12	7	3	20
Monthly	14	14	3	22
Annual	12	14	11	9
Never	14	7	9	11

[a]N=54 hospitals, 34 nursing homes.

[b]N=62 hospitals, 39 nursing homes.

[c]N=49 hospitals, 32 nursing homes.

[d]N=58 hospitals, 35 nursing homes.

temperature, while 42% had inadequate or no holding equipment and 63% had an excessive holding time. Other responses to this question are found in Table 17.

Table 17--Problems maintaining food temperature

	Number of responses	
	Hospitals	Nursing homes
1. Tray near heat source is hot--trays further down (are) less hot	1	-
2. No heat control system	1	1
3. Pellets not heated long enough	1	-
4. Temperature too low when put on steam table	1	-

Indirect Food Quality Control

Indirect food quality control was defined for this study as control that does not directly regulate the quality of a food product.

Equipment

In smaller institutions the available equipment could be similar in size to that of a home kitchen. The majority of hospitals, 55%, and nursing homes, 76%, felt that the present equipment was adequate for the preparation and service required in their facility. For those institutions indicating that the equipment was

inadequate, responses from hospitals indicated that the equipment was outmoded and newer up-to-date equipment was needed. A summary of reasons given for inadequate equipment by frequency of responses for nursing homes and hospitals may be found in Table 18.

Table 18--Reasons given for inadequate equipment by type of facility

	Hospitals	Nursing homes
1. Insufficient size	11	4
2. Two few pieces of equipment	18	11
3. Needs repair	18	8
4. Outmoded	26	4

Two nursing homes and three hospitals provided additional reasons that they felt their equipment was inadequate. These were: no method for holding hot food except on top of the range, the need for a better tray assembly method, the size of facility, the need for a steam table and poor quality equipment.

Sanitation

Although sanitation is an indirect aspect of quality control in a foodservice, it is one of the most important. Routine infection control checks generally are included in a foodservice quality control program to ensure sanitation of equipment and prevention of bacterial contamination (Moore, 1981). Several questions were

included in the survey to identify the frequency of the existence of these programs and to identify the areas where the most frequent problems might occur. Routine infection control checks were conducted by 55% (37) of the hospitals and 42% (19) of the nursing homes. Only one nursing home response indicated there was a problem with bacterial growth in any area. Hospital respondents indicated bacterial growth problems in all areas except food samples. All facilities, with the exception of one nursing home, indicated that steps were taken to correct problem areas identified by the routine checks.

A dress code policy was established for dietary employees in all but four nursing homes and two hospitals. Eighty-four percent of the hospital and 92% of the nursing home respondents indicated that the employees wore hair nets or other hair restraints during the preparation and service of the food.

Patient Surveys

Ten patient survey forms were sent to each of 66 facilities (32 hospitals and 34 nursing homes). Eighteen facilities returned surveys; those from 10 hospitals and 7 nursing homes were complete and usable.

The overall mean responses for both hospitals and nursing homes were "Fair" to "Good" for all variables. No response means were in the "Very Poor," "Poor," and "Very Good" categories. The two lowest hospital ratings were for hot food temperatures (3.78) and food likes/dislikes considered (3.77). The highest ratings were

for cleanliness of dishes, utensils and trays (4.36) (Table 19).

The mean rating for nursing homes was slightly higher than that of the hospitals. Only one variable was rated "Fair" and the other 13 were rated "Good." The lowest and highest ratings were similar to those of hospitals. The variables, food likes/dislikes considered, was rated the lowest (3.81) and courteous service (4.46) and cleanliness of dishes, utensils and trays (4.43) were rated the highest. This indicated that the patients' opinions of the food were good in both nursing homes and hospitals (Table 19).

The majority of nursing home (83%) and hospital (65%) respondents rated the facilities "Good" and "Very Good" for hot food temperature. Hot beverage temperature received a "Good" to "Very Good" rating by 89% of the nursing home residents and 74% of the hospital patients. The temperature of cold foods also was rated better with nursing home residents (93%) than hospital respondents (80%). There was no difference between the favorable responses for the temperature of hot (89%) and cold (89%) beverages in nursing homes and there also was little difference in hospital responses, 74% and 78% respectively. The variety of foods served received positive responses, with 81% of the nursing homes and 76% of the hospitals reporting "Good" to "Very Good" ratings. Sixty-three percent of hospital respondents and 70% of the nursing home respondents rated the consideration of patients' food preferences "Good" and "Very Good." Serving sizes were considered adequate ("Good" to "Very Good") by 88% of the nursing home and 76% of the hospital respondents. Fewer

Table 19--Mean variable ratings for the patient surveys from hospitals and nursing homes[a,b]

Variable	Hospitals	Nursing homes
Hot food temperature	3.79	4.23
Cold food temperature	4.01	4.29
Hot beverage temperature	4.06	4.34
Cold beverage temperature	4.03	4.36
Food freshness	4.14	4.37
Meat tenderness	3.99	4.07
Selection and variety of food	3.92	4.06
Food likes/dislikes considered	3.77	3.81
Appropriateness of food servings	4.03	4.27
Availability of food between meals	3.80	4.12
Attractiveness of tray	4.12	4.28
Courteous service	4.28	4.46
Cleanliness of dishes, utensils and trays	4.36	4.43
Assistance with meals available if required	4.17	4.36

[a]Scale 1-5:
1 = Very Poor
2 = Poor
3 = Fair
4 = Good
5 = Very good.

[b]N=144.

respondents in hospitals than nursing homes, 73% and 82% respectively, rated availability of food between meals as "Good" to "Very Good."

Ratings on the appearance of the trays were similar for nursing homes and hospitals, 93% and 90% respectively, in the "Good" to "Very Good" range. Better than 90% of the nursing home respondents rated service, cleanliness of dishes and utensils and meal assistance as "Good" and "Very Good." Hospitals rated service and assistance with meals slightly lower than did nursing homes (Table 20).

The results of the patient survey seem to indicate that the majority of the respondents were more than satisfied with the quality of the food and service they were receiving from the foodservice department. However, dissatisfaction by any one patient should be investigated by the department to determine if changes are needed or if they are feasible to make. The temperature of hot food and beverage was rated "Good" to "Very Good" by 65% and 74% of hospital patients and 83% and 89% of nursing home residents. Still 35% of the hospital and 17% of the nursing home patients felt hot food rated only "Fair," "Poor" or "Very Poor." Approximately 25% of the hospital respondents and 20% of the nursing home respondents felt that the variety of food served was "Fair" to "Very Poor," and approximately 30%-35% of the nursing home and hospital respondents respectively, thought their food preferences were poorly considered.

The Chi Square procedure to test for significant differences between types of facilities for each variable was conducted on the patient responses. No difference was found between the types of

Table 20--Percent of hospital and nursing home patient food opinion responses.

	Hospitals			Nursing homes		
	N	Good %	Poor %	N	Good %	Poor %
A. Hot food temperature	84	66	34	60	83	17
B. Cold food temperature	82	81	19	59	93	7
C. Hot beverage temperature	81	74	26	55	89	11
D. Cold beverage temperature	80	78	22	57	90	10
E. Freshness of the food	84	83	17	59	93	7
F. Tenderness of meat	82	77	23	56	80	20
G. Selection and variety of food	82	76	24	59	81	19
H. Food likes/dislikes considered	75	63	37	60	70	30
I. Appropriateness of food servings	83	76	24	60	88	12
J. Availability of food between meals	78	73	27	56	82	18
K. Attractiveness of tray	82	90	10	60	93	7
L. Courteous service	84	88	12	60	90	10
M. Cleanliness of dishes, utensils and trays	83	93	7	60	97	3
N. Assistance with meals available if required	73	82	18	59	93	7

facilities for any of the 14 variables. Since the response rate was low for the patient surveys, the ratings then were condensed into two groups, good and poor responses, to increase the cell size. "Fair," "Poor" and "Very Poor" responses would indicate that a follow-up visit from the dietitian would be necessary to obtain the reason for the low rating. Therefore these three responses were collapsed into a negative category. The "Good" and "Very Good" responses were collapsed into a positive grouping. A Chi Square test was conducted to determine differences between hospitals and nursing homes. Collapsing the ratings into the two groups still produced no significant differences between responses from nursing homes and hospitals.

Analysis of Menus

A total of 78 menus, 49 (73%) from hospitals and 29 (62%) from nursing homes, were provided for computer analysis. Each facility was requested to send the menu to be used in their facility on the Wednesday following the receipt of the questionnaire. Eighteen hospitals and 18 nursing homes did not supply a menu. One respondent indicated that it was against facility policy to give out a menu copy.

The menus represented the types and quantities of food that were provided to patients by the facility, but did not indicate the actual consumption of food. The menu also did not include substitutes that may have been made by the dietary department, or substitutes made to meet patients' preferences.

The average nutrient contents of the menus were compared to the Recommended Dietary Allowances for reference adult females and males aged 23-50 and 51+ (Table 21). The nutrient contents based on 1000 kilocalories and the Index of Nutritional Quality were calculated.

The average daily total calories provided by hospital and nursing home menus were 2620 and 2453 calories, respectively. Eight menus provided more than 3000 total calories. Six menus fell below 2000 calories for the day's total. The average percentages of protein, fat and carbohydrate content were the same for both hospitals and nursing homes. Protein was calculated as 15% and fat as 41% of the total calories for both facilities. Carbohydrates provided 45% of the total calories.

The quality of the menus as determined by the nutrient content was compared between types of facilities by using a t-test. A difference occurred between the facilities for total protein and the percentage of the RDA provided by protein. These differences are not of concern, however, since both hospital and nursing home menus far exceeded the protein recommended allowance for any age group.

Hospital and nursing home menus met or exceeded the RDA for all nutrients except for females, age group 23-50, and energy content for men, age group 23-50. The hospital menus met 89% of the iron RDA for women, age 23-50 and nursing home menus met 85% of the iron RDA for the same sex and age group. The mean value of the menus exceeded the recommended energy allowance for all sex and age groups except for men age 23-50. Hospital and

Table 21--Average nutrient content of menus presented as percentage of the RDA by sex and age

Nutrient	Hospitals					Nursing homes				
	Nutrient Total	Men 23-50	Men 51+	Women 23-50	Women 51+	Nutrient Total	Men 23-50	Men 51+	Women 23-50	Women 51+
		%					%			
Protein	97 g	173	174	221	221	89 g	160	160	203	203
Vitamin A	13,222 IU	264	264	331	331	17,552 IU	351	351	439	439
Ascorbic acid	126 mg	211	211	211	211	121 mg	202	202	202	202
Thiamin	2 mg	126	147	176	176	2 mg	114	133	160	160
Riboflavin	3 mg	176	201	235	235	3 mg	188	214	250	250
Niacin	22 mg	123	138	170	170	20 mg	112	126	155	155
Calcium	1,256 mg	157	157	157	157	1,274 mg	159	159	159	159
Phosphorus	1,661 mg	208	208	208	208	1,661 mg	208	208	208	208
Iron	15.9 mg	159	159	90	159	15.3 mg	153	153	85	153
Energy	2,620 kcal	97	109	131	146	2,453 kcal	91	102	123	136

nursing home menus met 97% and 91% respectively of the energy Recommended Dietary allowance for this group (Table 21). Vitamin A content was over 400% greater in nursing home menus and over 300% greater in hospital menus than the Recommended Dietary Allowance. The patterns of the menus were very similar. Some common food items such as spaghetti and meat sauce, banana pudding, carrot cake, cornmeal dressing, slaw, mashed potatoes and green beans appeared frequently on nursing home and hospital menus.

The nutrient content of the menus expressed as the amount of a nutrient per 1000 kilocalories would allow easier adjustments in diet calculations to meet individual nutrient requirements for the appropriate energy level. The menu content was established per 1000 kilocalories for the following nutrients: protein, vitamin A, ascorbic acid, thiamin, riboflavin, niacin, calcium, phosphorus and iron. Based on the amount of iron in the nursing home and hospital menus per 1000 kilocalories (6 g), a female age 23-50 would need to consume almost 3000 calories daily to meet the recommended allowance for iron. Other nutrient values calculated would meet the recommended allowance of each nutrient based on the energy level recommended for the female age group 23-50 (Table 21). Windham et al. (1981) computed the data values from the 1977-1978 Nationwide Food Consumption survey to 1000 kilocalories of food consumed. The authors found that the intake per 1000 kilocalories met and exceeded the recommended allowances for all nutrients calculated except calcium, iron, magnesium and vitamin B-6. However, they

reported consumption data for the general population whereas this study was concerned with the nutritive value of the food that was made available to hospital and nursing home patients or residents.

The Index of Nutritional Quality was an additional tool used to measure the quality of the food as it related to the Recommended Dietary Allowance. The method used for determining the Index of Nutritional Quality was to divide the amount of a nutrient per 1000 kilocalories by the Recommended Dietary Allowance per 1000 kilocalories. A value of 1.0 indicates that the Recommended Dietary Allowance would be met if the energy requirement were fulfilled. The quality index was determined for protein, vitamin A, ascorbic acid, thiamin, riboflavin, niacin, calcium, phosphorus and iron. The mean quality index for both nursing homes and hospitals exceeded 1.0 for every nutrient except iron. The quality index for iron in hospital menus was 0.68 and for nursing home menus it was 0.70, indicating that the iron requirement for the reference female would not be met at the recommended energy level. No hospital and only three nursing homes had menus with a nutrient density of iron sufficient to meet the recommendation for a female age 23-50. Since the quality index is determined by the amount of a nutrient per 1000 kilocalories and the nutrient density of iron in the menus is low, the calories required for females of this age group were not high enough to meet the iron needs (Table 22).

Table 22--Average nutrient content of menus per 1000 kilocalories and quality index for nursing homes and hospitals[a]

Nutrient	Hospitals		Nursing homes	
	Average nutrient amount per 1,000 kcal.	Nutrient density (INQ)[b]	Average nutrient amount per 1,000 kcal.	Nutrient density (INQ)
Protein	37 g	1.70	37 g	1.67
Vitamin A	5110 IU	2.55	7262 IU	3.63
Ascorbic acid	48 mg	1.62	50 mg	1.67
Thiamin	0.68 mg	1.36	0.66 mg	1.31
Riboflavin	1.08 mg	1.80	1.24 mg	2.06
Niacin	8.51 mg	1.22	8.39 mg	1.20
Calcium	484 mg	1.21	524 mg	1.31
Phosphorus	637 mg	1.59	681 mg	1.70
Iron	6.16 mg	0.68	6.30 mg	0.70

[a]Based on RDA for females age 23-50.

[b]A nutrient density of 1.0 indicates that the RDA would be met if energy requirements were met.

Evaluation of Food Quality

An audit form was developed for the purpose of evaluating small facilities on a regular basis (Appendix C). A check sheet format was selected to make the form as brief and concise as possible, yet cover the major points of a routine evaluation. The form was designed to be used as a monthly evaluation tool by the consultant dietitian. The form would serve as a communication tool to the facility administrator to provide a written assessment of where potential problems exist and it would also provide recommendations for resolving the problems.

The evaluation form was sent for review and critique to 20 dietitians with experience in small facility dietetics. All 20 responses were returned. Suggestions and comments made by the reviewers (Table 23) were considered by the author and appropriate changes were made in the format (Forms 1 and 2, Appendix C).

Several reviewers felt that more space was needed in the comment section. However, since the space follows the evaluation statement, one or two key words may be all that is needed to identify the problem. Space at the end of the form was used to add an "additional comments" statement. If more lengthy comments or explanations need to be made, a separate sheet could be attached to the form.

The statement, "temperature of prepared food" was not clear to a number of evaluators. The statement was clarified by changing

Table 23--Recommendations for food quality evaluation form from dietitians[a]

(The number in parenthesis following a statement is the number of the same responses for this item. No number indicates single responses.)

1. Need larger comment space (3).
2. Clarify "temperature of prepared food" (6).
3. Include dishwashing temperature, storage and handling of dishes and silverware, food inventory for adequate supply and policy and procedures.
4. Clarify "holding period for prepared foods within suggested time frame."
5. All statements stated in a way that they are easily understood (2).
6. Space for comments and column spaces seem adequate (2).
7. Do not feel any statements could be eliminated (2).
8. "One trained person responsible for checking all incoming food purchases" should be changed to at least two people (2).
9. This audit form seems to be an extremely useful tool for supervisors and dietitians and I feel should be used consistently for control of quality food.
10. Should safety be added?
11. Possibly more specific sanitation checks should be included.
12. Useful form. This is a good way to remind the administrator that you are aware of these problems and that some of your recommendations are still open.
13. The overall effectiveness of the audit is good (2).
14. How often is this designed to be used?
15. Who should conduct the audit? Foodservice director, supervisor, administrator, dietitian?
16. Audit easy to complete.
17. Suggest separate "clean and good repair of appliances" (2).
18. Should something about adequate staffing be included?
19. Response column "sometimes" could be amplified to "times per month/week" etc. (2).
20. Could include security systems to prevent bacterial and viral contamination from outsiders.

Table 23--Continued

21. Difficult to evaluate when items are grouped (2).
22. What is purpose of form and how does it aid a facility or foodservice manager?
23. Covers most points in a small facility.
24. How do (you) plan on evaluating or scoring audit?
25. Should there be a criteria for performance set or shown on form?
26. Good audit form--simple, clearly written, easy to understand.
27. This can and should be a useful tool to develop programs for areas of an individual foodservice that needs updating.

[a]N=20.

to "Temperature of prepared food meets established facility standards."

Several respondents indicated that the phrase "one trained person responsible for checking all incoming food purchases" should be changed to "two trained persons" or "one trained person per shift." This was changed to "trained personnel responsible for checking all incoming purchases." Two respondents indicated that the "sometimes" column heading could have been expanded to a specific time, such as "times per month" or "times per week." The author felt that the specific frequency could be written in the comment column when "sometimes" is checked if this information were necessary (Forms 1 and 2, Appendix C).

A number of positive responses were received, such as "This can and should be a useful tool to develop programs for areas of an individual foodservice that need updating" and "covers most points in a small facility." Good suggestions and recommendations were made by the dietitians, and these were incorporated into the evaluation form wherever feasible.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purposes of this study were to identify methods of quality control utilized in small health care facilities in two states, Kentucky and Tennessee, and to identify differences between small hospitals and nursing homes in the methods of quality control. Patient opinions and nutrient content of the food served were considered as measures of quality control in the facilities studied.

Survey forms were sent to 145 hospitals and 157 nursing homes in Kentucky and Tennessee. The survey included a questionnaire pertaining to quality control procedures, background information, and a request for one day's menu. Sixty-six hospitals and nursing homes, randomly selected from the sample of 302 facilities, were sent one-page patient survey forms to be completed by 10 patients.

The results of the questionnaire indicated that 100% of the responding hospitals employed a dietitian but only 83% of the nursing homes did so. The employment status of the dietitian and number of hours worked varied with the facilities. Only 4 of the 42 nursing homes employed a full-time dietitian. The data for employment status of dietitians in health care facilities were condensed into two groups, one group for consultants and one group for part-time and full-time dietitians. A difference ($\chi^2=26.60$, $p<0.01$) was found between

hospitals and nursing homes. Eighty-two percent of the nursing homes and 42% of the hospitals employed a dietitian ≤10 hours per week. The mean percent occupancy was approximately 67% for hospitals and 96% for nursing homes. The average small hospital operated approximately 30% below capacity.

Supervisors in 51% of the hospitals and 89% of the nursing homes also served as director of the dietary department. Sixty-four percent of the nursing home supervisors and 43% of the hospital supervisors qualified for the position through a 90-hour training course for foodservice supervisors. Fourteen (12%) of all respondents who served as directors of the dietary department reported they held a formal college degree; four held a Bachelor's degree in Dietetics, one had a Bachelor's degree in Nutrition, eight reported a Bachelor's degree in Home Economics and one had a Master's degree in Adult Community Education. These findings indicated that the majority of dietary facilities were managed by persons with very little formal education. The nursing home facilities >60 beds were much more likely (60%) to be managed by the foodservice supervisor than were the >60 bed hospitals (14%).

Both hospitals and nursing homes surveyed generally offered a non-selective menu prepared in a conventional kitchen. A 21-day cycle menu was the most frequently found menu cycle in both types of facilities.

A monthly physical inventory was the type of inventory control method most frequently given as a response by both nursing

homes and hospitals. However, almost one-third of both type facilities indicated that they took an inventory only on an annual basis.

Approximately 40% of both facility types indicated that they did have problems maintaining food temperature, and 80% felt this was due to their delivery systems. Only about 25% checked the temperature of food on even a monthly basis after food was plated and during delivery. Twenty-five percent of both facilities indicated that the temperature was never checked during these periods. Only one-third of the hospitals and one-half of the nursing homes said the temperature was checked during preparation on a daily basis. When the temperature was checked, the supervisor more frequently conducted the actual test than did the dietitian.

Menus were considered an overall indicator of quality within a dietary department since the operation of the department was based on the menu. The purpose of this portion of the project was to evaluate one day's menu using the RDA for different adult age groups as a standard. An assumption was made that the menu was served as written. One day's menu was judged to be adequate for the purpose of this study as a menu planner generally follows the same basic outline when planning menus. This study did not provide consumption data, only the nutrient content of the one-day menu available to the patient or resident. The data analysis discussion is based on the nutrient means for hospitals and nursing homes.

Analysis of the menus returned by the facilities indicated that as a whole they met or exceeded the recommended allowances for

four groups of adults, males and females, in age groups 23-50 and 51+. The exceptions to this were the number of calories for adult men, age 23-50, and the iron requirement for females, age 23-50. However, this energy level would probably be more than sufficient if consideration was given to the reduced needs due to decreased activity levels of hospital patients and the sedentary life of the nursing home residents. In hospitals the energy content of the menus ranged from a high of 3408 calories to a low of 1720 calories. A similar range occurred in nursing homes with a high of 3282 calories and a low of 1737 calories. Individual facilities that returned both a menu and patient surveys provided menus with caloric levels above 2000 and met the recommended allowances for reference females for all nutrients except iron.

The mean content of 2054 calories in menus of 14 nursing homes in Wisconsin was reported by Sempos et al. (1982). They also found that while over 2000 calories per day were available the mean daily intake was 1400 calories for women and 1704 calories for men. The mobility level of the patient would partially affect the actual energy need.

The mean percent fat content of the menus was above the 30%-35% of total calories recommended by The American Heart Association. This percentage was probably consistent with southern cultural habits and represented a typical diet. An effort should be made to reduce the level of total fat in the menus and possibly increase the iron content of the menus. However, only one group,

females ages 23-50, did not meet the RDA for iron. Special consideration for diets of females in the age bracket 23-50 could be given on an individual basis to provide the iron requirement. If the same pattern for food consumption and availability of nutrients occurred in further research for this same population as that reported by Sempos et al. (1982), the actual iron intake for females could be very low. Alternate methods, such as additions or substitutions of iron-rich foods, could be used for patients in this sex and age category.

Control of food quality should be a continuous evaluation process in a foodservice system. Therefore, a food quality audit form was developed for small health care facilities. The form was evaluated by 20 practicing dietitians in health care facilities. Their suggestions and comments were incorporated into the revision of the form.

Conclusions

Major control systems for food quality protection appeared to be established in the majority of the foodservices studied. Medicare surveys, which began in the mid-sixties, may have increased the quality control of many of the facilities through the regulations established by the Division of Licensing and Regulation.

Many of the respondents stated they used such controls as written food specifications, but the controls were not always utilized to their fullest advantage. Less than one-half of the nursing homes

and hospitals used a bid system for purchasing. The bid system has been most advantageous for facilities with high volume of business. Small facilities with low volume of business did not have this advantage, but through group purchasing they could obtain the price discounts received by much larger facilities or chains. Group purchasing by small institutions was higher for hospitals in this study (55%) than the 25% found by Morrison and Vaden (1978). Only 33% of the nursing homes in this study belonged to a purchasing group. There is opportunity for growth between purchasing groups and small facilities, particularly for nursing homes.

More than 90% of the respondents from both types of facilities reported a dress code for dietary employees. Approximately 80% of the hospital and 90% of the nursing home respondents reported their employees wore some type of hair restraints. Twelve percent of the respondents from hospitals and 6% from nursing homes indicated that their employees "sometimes" wore hair restraints. It is the responsibility of management personnel to enforce dress codes and other quality control standards regardless of the size of the facility. Standards and controls should be maintained to protect the food from possible contamination.

Responses from the majority of both types of facilities indicated that they had direct control systems in place to protect the quality of the food in most critical areas. One area that could be improved is the tray delivery system. Almost 60% of the nursing homes and 37% of the hospitals used a system where regular trays were delivered in closed, unheated carts. One-third of the respondents

indicated the type of tray assembly used was a workable tray assembly which is generally considered much less efficient than either a manual or automated tray line system. If the tray make-up system was inefficient and the food was placed in delivery systems that were not temperature controlled, then a rapid loss of temperature could occur, thus lowering the quality of the food delivered to patients. Routine temperature checks pinpoint areas where problems may exist.

Roughly 20%-30% of nursing homes and hospital patients indicated that the temperature of hot food and hot beverage was less than "Good." While this is not a majority, viewed along with the fact that most of the facilities did not check the temperature of each meal service and many indicated a problem maintaining an adequate temperature, food temperature is an area that needs further attention and study. Food and service in such areas as food temperature, cleanliness, service, food variety and consideration of food preferences were rated "Fair" to "Good" by the patients. Patient responses indicated that while the majority of hospitals and nursing homes were doing a good job providing quality food, some improvements could be made in the areas of food temperature, increasing the variety of food served and making a greater effort to consider individual preferences in food selections. Selective menus could help alleviate this problem, but management would have to weigh the advantages of patient satisfaction over the possible increases in equipment, food and labor costs.

The response rate for the patient surveys was low. It is possible that facilities receiving negative responses did not return

the survey form. Adequate personnel may not have been available to assist patients in completing the forms, thus influencing the overall response rate from nursing homes.

Recommendations

Both types of facilities appeared to do well in protecting the quality of food through their control systems. The survey provided information concerning certain areas where potential problems could occur that dietitians, particularly consultants, may want to specifically evaluate in the facility. Further research on a broader scale is needed to see if the same results would occur in other geographical areas for facilities of this type and size.

Questionnaire surveys were necessary in this study because large geographical areas were involved and funding was limited. However, if adequate funding could be obtained through professional or private groups, a follow-up survey of the same population using personal interviewers and surveyors with professional background in food systems could document better the data through personal observation and from obtaining actual patient consumption data. Personal visits by the surveyors possibly could increase the response rate. The low return for patient surveys and the consistently good ratings could indicate that patient surveys showing poor ratings were not returned.

Another recommendation would be that the information obtained in the Medicare surveys be compiled, tabulated by size of facility,

and disseminated to the dietitians and foodservice directors. This information would provide data from which individual, area, or state goals and objectives could be established. The data from this survey could be compiled by state and compared to data from a follow-up survey of the same population groups in other states.

A recommendation for further study would be to include financial control in the survey. The responses related to the use of specifications and inventories might indicate that better control in this area may be needed. More indepth study of purchasing, portion control, costing, inventory and budgeting would be needed to assess and make recommendations in the area of financial control.

Other recommendations for future research include obtaining plate waste and consumption data for the same survey population. A larger sample of menus from each facility could be analyzed to validate the results obtained from the one day's menu in this study.

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APPENDICES

APPENDIX A

COVER LETTERS AND QUESTIONNAIRE

October 10, 1982

Dear Dietitian:

As we all know, control systems for quality are an important part of a foodservice operation. As part of a doctoral research project we are conducting a survey of small hospitals and nursing homes in Kentucky and Tennessee to identify methods used to control quality of food.

We are asking your cooperation in taking a few minutes of your time to complete the questionnaire packet. We also request that you send us a copy of your regular menu which was served for all three meals for the Wednesday following the receipt of this questionnaire. Please include the portion sizes for each food item that would be served to an adult female. If you have a selective menu, indicate which items would be served as the house items. The back page of the questionnaire has been provided for any suggestions or comments you may have concerning the questionnaire.

You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so we may check your facility name off the mailing list when your questionaire is returned.

Thank you in advance for your prompt attention and participation in this project.

Sincerely,

/S/ Laura L. Butler, R. D.
Doctoral Candidate in Food Systems Administration

/S/ Mary J. Hitchcock, Ph. D., R. D.
Professor, Food Systems Administration

LLB/MJH:dk 1

Enclosure

Two weeks ago a questionnaire seeking information about food quality control procedures used in small hospitals and nursing homes was mailed to you. Your facility was one of a small number selected to participate in the survey.

If you have already completed and returned it to us, please accept our sincere thanks. If not, please do so today. Because it has been sent to only a small, but representative, sample of facilities it is extremely important that yours be included in the study if the results are to accurately represent small nursing homes and hospitals in our area. Your assistance is greatly appreciated.

If you have misplaced your questionnaire and would like to have another, please write or call collect (615-974-3491).

Sincerely,

Laura L. Butler, R. D.
Co-Director

The following questionnaire will take approximately fifteen to twenty minutes to complete. Please answer each applicable question completely by circling each answer or filling in the blank. If you have any comments, questions or suggestions concerning the survey please feel free to use the space provided on the back page of the questionnaire. Thank you for your assistance.

The following questions have been formulated to develop an understanding of the procurement and storage practices in health care facilities. Please answer them as indicated for each question.

Q-1 Which of the following functions of purchasing and receiving does the facility perform? (please circle your answer for each item)

	CIRCLE ONE	
1. Are written specifications for food items available?	YES	NO
2. Are the written specifications used for purchasing?	YES	NO
3. Are written specifications used to compare food items against when received?	YES	NO
4. Do you maintain a bid system for purchasing?	YES	NO
5. Are you a member of a group purchasing organization?	YES	NO
6. Do you have a computerized purchasing system?	YES	NO
7. Are scales used to weigh items received?	YES	NO
8. Do you have a written return policy for inferior or damaged products?	YES	NO

Q-2 Which of the following apply for your facility? (please circle your answer for each item)

	CIRCLE ONE	
1. Have one central storeroom for entire facility.	YES	NO
2. Have a storeroom for dietary only.	YES	NO
3. First in-First out (FIFO) procedure utilized in the storeroom.	YES	NO
4. Receiving records kept on file.	YES	NO
5. Requisition and issue forms used for food items.	YES	NO
6. Ingredient room used (all food items weighed or measured for each recipe before issued to cooks)	YES	NO

Q-3 Is the dry food storage area temperature and humidity controlled? (circle the number of your answer)

1. Both temperature and humidity controlled
2. Temperature controlled only
3. Humidity controlled only
4. Neither temperature or humidity controlled

Q-4 What type of inventory procedure is used? (circle the number of your answer)

1. PHYSICAL INVENTORY ONLY
2. PERPETUAL INVENTORY WITH PERIODIC PHYSICAL INVENTORY
3. NO INVENTORY PROCEDURE USED

Q-5 How often is a physical inventory taken?_____

The next set of questions pertain to the preparation, holding, and service areas. Please indicate your answer by circling the number adjacent to your answer or as otherwise indicated.

Q-6 Which of the following procedures are followed in the preparation area? (circle your response for each item)

	CIRCLE ONE	
1. Are standardized recipes available?	YES	NO
2. Are standardized recipes used for menu items?	YES	NO
3. Are changes made in food preparation methods for modified diets?	YES	NO
4. Are correct or appropriate pan sizes used per standardized recipe instructions?	YES	NO
5. Are correct serving portions used per standardized recipe instructions?	YES	NO

Q-7 Do you consider your present equipment adequate for preparation and service within your facility? (please circle the number of your answer)

1. YES (if yes, go to Q-9)
2. NO (if no, go to Q-8)

Q-8 Why do you consider your equipment inadequate? (please circle your response for all that apply)

	CIRCLE ONE	
1. Insufficient size	YES	NO
2. Too few pieces of equipment	YES	NO
3. Needs repair	YES	NO
4. Outmoded	YES	NO
5 Other (please specify)_____	YES	NO

Q-9 Which method(s) do you use for holding hot prepared food until served? (please circle your response)

	CIRCLE ONE	
1. Steam Table	YES	NO
2. Bain Marie	YES	NO
3. Hot Boxes	YES	NO
4. Another type of holding equipment available	YES	NO

if yes, please specify_____

Q-10 What is the average length of holding time for hot food prior to and during each meal service? (circle the number of your answer)

1. LESS THAN 30 MINUTES
2. 30 MINUTES TO 1 HOUR
3. 1 TO 2 HOURS
4. GREATER THAN 2 HOURS

Q-11 During the holding period are hot food items covered to prevent contamination and loss of temperature? (circle the number of your answer)

1. YES
2. NO

Q-12 Which type of heat-maintenance delivery system is used? (please circle your response for each item)

	CIRCLE ONE	
1. Thermal trays-open cart	YES	NO
2. Temperature controlled carts	YES	NO
3. Tray system--closed, un-heated carts	YES	NO
4. Pellet system	YES	NO

5. Other (please specify)_____

Q-13 What type of tray assembly service do you use? (circle the number of your answer)

1. AUTOMATED CONVEYOR STRAIGHT TRAY LINE
2. MANUAL STRAIGHT TRAY LINE
3. WORKTABLE TRAY ASSEMBLY
4. OTHER SYSTEM (please specify)_____

Q-14 What is the average length of time for tray assembly? (circle the number of your answer)

1. LESS THAN 30 MINUTES
2. 30 MINUTES TO 1 HOUR
3. 1 TO 2 HOURS

Q-15 Do you maintain any of the following quality control measures to check quality of food before service? (please circle your response for each item)

	CIRCLE ONE	
1. Taste and observation test for color, flavor, texture of prepared items.	YES	NO
2. Temperature check during holding period	YES	NO
3. Correct food preparation methods for modified diets	YES	NO
4. Check patient tray for accuracy	YES	NO
5. Check portion sizes	YES	NO
6. Appearance of tray	YES	NO

7. Other (please specify)_____

Q-16 How routinely are food temperature checks conducted at your facility? (circle the appropriate column adjacent to each category. Write in the title of the person conducting the check in the final column)

	DAILY	WEEKLY	MONTHLY	ANNUAL	NEVER	BY WHOM
1. During preparation	1	2	3	4	5	_____
2. Before plating	1	2	3	4	5	_____
3. After plating	1	2	3	4	5	_____
4. During delivery	1	2	3	4	5	_____

Q-17 Do you have problems maintaining adequate food temperature? (please circle the number of your answer)

1. YES (if yes, go to Q-18)
2. NO (if no, go to Q-19)

Q-18 Are the problems maintaining food temperature due to: (please circle the number of your answer)

	CIRCLE ONE	
1. Inadequate or no holding equipment for food	YES	NO
2. Food delivery systems (food carts, ect.)	YES	NO
3. Too long holding time	YES	NO

4. Other (please specify)_____

Q-19 Does each refrigerator and freezer unit have a thermometer? (please circle the number of your answer)

1. YES
2. NO

Q-20 Is the temperature of the freezers and refrigerators noted and recorded daily? (please circle the number of your answer)

1. YES
2. NO

Q-21 Does the facility maintain a dress code for dietary employees? (circle the number of your answer)

1. YES
2. NO

Q-22 Do all dietary employees wear hair nets or other hair restraints during preparation and service of food? (circle the number of your answer)

1. YES
2. NO
3. PART OF THE TIME

Q-23 Are routine infection control or microbiological checks conducted to determine bacterial count in various areas of the dietary department? (please circle the number of your answer)

1. YES (if yes, go to Q-24)
2. NO (if no, go to Q-26)

Q-24 Is there a problem with bacterial growth in the following areas of the facility? (please circle your response for each item)

	CIRCLE ONE	
1. Food preparation countertop area	YES	NO
2. Mechanical tray line	YES	NO
3. Washed silverware or dishes	YES	NO
4. Food contact surfaces of equipment	YES	NO
5. Workers' hands	YES	NO
6. Food samples	YES	NO

Q-25 Are steps taken to correct problem areas identified by routine infection control checks? (please circle the number of your answer)

1. YES
2. NO

To obtain an understanding of your facility we would like to ask a few background questions. All information is strictly confidential and will never be identified with your name.

Q-26 What type of facility is this? (please circle the number of your answer)

1. HOSPITAL
2. NURSING HOME

Q-27 What is the size of your facility in number of beds?_____

Q-28 What is the type of ownership? (please circle the number of your answer)

1. FOR PROFIT
2. NOT FOR PROFIT

Q-29 Is the foodservice contracted to an outside management company? (please circle the number of your answer)

1. YES
2. NO

Q-30 How many personnel are employed in the dietary department?

1. PART TIME_____
2. FULL TIME_____

Q-31 What is the total number of employee hours worked per week by all employees?_____

Q-32 What is your average daily patient census?_____

Q-33 What available foodservice facilities do you have for guests? (please circle your response for each item)

	CIRCLE ONE	
1. Restaurant or cafeteria	YES	NO
2. Snack Bar	YES	NO
3. Room guest trays	YES	NO
4. Served in dining area from kitchen by kitchen employees	YES	NO
5. Vending machines	YES	NO

6. Other (please specify)_____

Q-34 What are the available foodservice facilities for employees? (please circle your response for each item)

	CIRCLE ONE	
1. Cafeteria	YES	NO
2. Served in kitchen/dining area by kitchen employees	YES	NO
3. Employees serve themselves in kitchen	YES	NO
4. Vending Machines	YES	NO
5. Other type of employee foodservice (please specify) _____	YES	NO

Q-35 What type of foodservice system does your facility have? (please circle the number of your answer)

1. CONVENTIONAL--Food procured at various stages of readiness for service, is produced, held heated or chilled, and served to the consumer.
2. COMMISSARY--Food is produced in a central location, stored frozen or chilled, then heated and distributed to consumer.
3. ASSEMBLY/SERVE--Food procured almost or completely prepared; is stored frozen or chilled; then portioned, heated, and served to consumer.
4. READY PREPARED-- Food is produced in facility, is stored frozen or chilled; then heated and served to consumer.

Q-36 Which type of menu is provided to patients? (please circle the number of your answer)

1. SELECTIVE
2. NON-SELECTIVE

Q-37 What is the length of the menu cycle (in days)?_____

Q-38 Do you provide meals for any other facility? (please circle the number of your answer)

1. YES (if yes, go to Q-39)
2. NO (if no, go to Q-40)

Q-39 What other type of facility(s) do you serve? (please specify)_____

Q-40 Does this facility employ a dietitian with a 4 year, B.S. degree that meets requirements for membership in the American Dietetics Association? (please circle the number of your answer)

1. YES (if yes, go to Q-41)
2. NO (if no, go to Q-44)

Q-41 How many dietitians does the facility employ?_____

Q-42 Is the dietitian(s): (please circle the number of your answer)

1. FULL TIME
2. PART TIME
3. CONSULTANT

Q-43 How many hours does the dietitian(s) work per week? (please circle the number of your answer)

1. LESS THAN 5
2. 6 TO 10
3. 11 TO 15
4. 16 TO 20
5. 21 TO 30
6. 31 TO 40

Q-44 Does this facility employ a dietetic technician?* (please circle the number of your answer)

1. YES
2. NO

Q-45 Does this facility employ a foodservice supervisor? (please circle the number of your answer)

1. YES (if yes, go to Q-46)
2. NO (if no, go to Q-50)

Q-46 What type of education or training does the foodservice supervisor have? (please circle the number of your answer)

1. ON THE JOB TRAINING
2. NINETY HOUR FOODSERVICE SUPERVISOR COURSE
3. TWO YEAR DIETETIC TECHNICIAN PROGRAM
4. BACHELORS DEGREE IN DIETETICS
5. OTHER (please specify)_____

Q-47 Does the supervisor also function as a cook? (please circle the number of your answer)

1. YES (if yes, go to Q-48)
2. NO (if no, go to Q-49)

* A technically skilled person who has completed a 2 year associate degree program

Q-48 How many hours per week does the supervisor spend as:

1. COOK_____

2. SUPERVISOR_____

Q-49 Does the foodservice supervisor also serve as director of the dietary department? (please circle the number of your answer)

1. YES

2. NO

Q-50 Who is responsible for performing the following duties: (circle the number of your answer following each statement)

	Dietitian	Supervisor	Head Cook	Nurse	Administrator
1. Scheduling dietary employees	1	2	3	4	5
2. Giving diet instruction to patients	1	2	3	4	5
3. Assigning cleaning duties in dietary area	1	2	3	4	5
4. Visiting patients for food preferences	1	2	3	4	5
5. Planning menus	1	2	3	4	5
6. Writing modified diet menus	1	2	3	4	5
7. Purchasing food items	1	2	3	4	5
8. Receiving and storing food supplies	1	2	3	4	5

Q-51 Do you provide a monthly inservice education program for dietary employees? (please circle the number of your answer)

1. YES (if yes, go to Q-52)

2. NO (if no, go to Q-53)

Q-52 How often are the following topics included in the continuing education program? (please circle the appropriate column beside each topic)

	QUARTERLY	BI-ANNUAL	ANNUAL	NEVER
1. Employee safety and sanitation	1	2	3	4
2. Food safety and sanitation	1	2	3	4
3. Modified diets	1	2	3	4
4. Disaster and fire procedures	1	2	3	4
5. Food preparation procedures	1	2	3	4
6. Portion Control	1	2	3	4

Q-53 Title of person completing this questionnaire:

_____

This page is provided for additional comments or questions you have concerning this questionnaire. Please feel free to write in the space provided.

HAVE YOU:

1. Completed the questionnaire?_____
2. Included a copy of the menu?_____
3. Included the patient acceptability surveys? (if requested)____

PATIENT SURVEY INSTRUCTIONS

You are one of a very small select group that has been chosen to provide additional information for this study. Forms are included in this packet for a survey of patients acceptance of the food served. Please select 10 different patients on regular, high calorie, or soft diets and request that they complete the acceptability survey forms enclosed. Return the completed survey forms along with the questionnaire and menu copy. Thank you.

PATIENT-FOOD SERVICE SURVEY

DATE_____ MEAL_____ Length of Hospital Stay_____

This survey is being conducted to help management provide good food-service. We are interested in your opinion of our food and service. For each topic, check the item that best describes your opinion.

	5 VERY GOOD	4 GOOD	3 FAIR	2 POOR	1 VERY POOR
A. Hot food temperature	___	___	___	___	___
B. Cold food temperature	___	___	___	___	___
C. Hot beverage temperature	___	___	___	___	___
D. Cold beverage temperature	___	___	___	___	___
E. Freshness of the food	___	___	___	___	___
F. Tenderness of meat	___	___	___	___	___
G. Selection and variety of food	___	___	___	___	___
H. Food likes/dislikes considered	___	___	___	___	___
I. Appropriateness of food servings	___	___	___	___	___
J. Availability of food between meals	___	___	___	___	___
K. Attractiveness of tray	___	___	___	___	___
L. Courteous service	___	___	___	___	___
M. Cleanliness of dishes, utensils and trays	___	___	___	___	___
N. Assistance with meals available if required	___	___	___	___	___

APPENDIX B

PILOT TEST RESPONSES

COMMENTS:

1. Others may find it confusing that instructions for survey were on the front of the questionnaire.

2. Liked the booklet form of questionnaire.

3. Easy to understand--short questions--not time consuming to fill in questionnaire.

4. Question N on survey confusing as to what is meant.

5. Only 16 patients on regular diet, none able to fill in forms without assistance.

6. Need to qualify some of the questions (no specifics given).

APPENDIX C

FOOD QUALITY AUDIT FORMS

March 25, 1983

Dear Dietitian:

As part of a Food Quality Research Project, a Food Quality Audit form was developed to be used in small facilities. Please use the enclosed audit sheet for a review of your facility. As you evaluate the facility, place a check in the appropriate column adjacent to the item or activity evaluated. Use the comment section for additional notes you wish to make. Critically analyze the audit form for:

(1) Clarity of statements

(2) Space for comments

(3) Adequacy of response columns (yes, no, sometimes)

(4) Statements that should be eliminated from the audit form

(5) Statements that should be added to the audit form

(5) Usefulness of the audit form.

Please make your comments and suggestions on the enclosed comment sheet and return to me in the enclosed stamped envelope by April 15, 1983. Thank you.

Sincerely,

Laura L. Butler, R. D.

FORM 1--ORIGINAL

FOOD QUALITY AUDIT

DIRECT	YES	NO	SOMETIMES	COMMENTS
I. FOOD PROCUREMENT, PROCESS, HOLDING AND SERVICE				
Specifications written and used for all goods	___	___	___	_____
One trained person responsible for checking all incoming food purchases	___	___	___	_____
First-In-First-Out storage procedure used in stock area	___	___	___	_____
Standardized recipes available	___	___	___	_____
Standardized recipes used	___	___	___	_____
Standard portions established and followed	___	___	___	_____
Temperature of prepared food meets established facility standards	___	___	___	_____
Food temperature checked by thermometer on routine basis	___	___	___	_____
Record of purchase and receiving orders kept	___	___	___	_____
Patients visited at regular intervals	___	___	___	_____
Patient preferences used in planning menus	___	___	___	_____
Patient surveys conducted to evaluate satisfaction on routine basis	___	___	___	_____
Tray service assembled efficiently	___	___	___	_____
Tray service completed on time	___	___	___	_____
Each tray checked for accuracy/appearance at end of assembly	___	___	___	_____
Therapeutic diet modifications followed	___	___	___	_____
Foods covered during holding periods	___	___	___	_____
Holding period for prepared foods within established facility standards	___	___	___	_____
INDIRECT				
II. EQUIPMENT				
Garbage receptacles clean	___	___	___	_____
Tray delivery equipment cleaned after use	___	___	___	_____
Small appliances clean/good repair	___	___	___	_____
Major pieces of equipment clean/good repair	___	___	___	_____
Proper storage of dishes and silverware	___	___	___	_____
Dishwasher temperature maintained at approved standard	___	___	___	_____
Current cleaning schedule made and posted	___	___	___	_____
Refrigerated/freezer equipment clean/good repair	___	___	___	_____
Temperature of refrigerator/freezer within appropriate standard	___	___	___	_____
Present equipment adequate to hold, prepare and serve menu as written	___	___	___	_____

	INDIRECT	YES	NO	SOMETIMES	COMMENTS
III.	PHYSICAL FACILITIES				
	Storage areas maintained at appropriate temperature	___	___	___	_____
	Floors clean/good repair	___	___	___	_____
	Walls clean/good repair	___	___	___	_____
	Light fixtures clean--all bulbs burning	___	___	___	_____
	INDIRECT				
IV.	PERSONNEL				
	Employees follow sanitation procedures during food handling	___	___	___	_____
	Employees adhere to facility dress code policy (personal hygiene, uniforms, hair restraints)	___	___	___	_____
	Employee staffing schedule completed and posted	___	___	___	_____
V.	MISCELLANEOUS				
	Conferences held with administrator	___	___	___	_____
	Conferences held with Director of Nursing	___	___	___	_____
	Inservice given	___	___	___	_____
	Routine infection control report O. K.	___	___	___	_____
	Adequate staffing maintained	___	___	___	_____

ADDITIONAL COMMENTS:

FORM 2--REVISED

FOOD QUALITY AUDIT

	YES	NO	SOMETIMES	COMMENTS
I. FOOD PROCUREMENT, PROCESSING, HOLDING AND SERVICE				
Specifications written and used for all foods	___	___	___	_____
Trained personnel responsible for checking all incoming food purchases	___	___	___	_____
First-In-First-Out storage procedure used in stock area	___	___	___	_____
Standardized recipes available	___	___	___	_____
Standardized recipes used	___	___	___	_____
Standard portions established and followed	___	___	___	_____
Temperature of prepared food meets established facility standards	___	___	___	_____
Food temperature checked by thermometer on routine basis	___	___	___	_____
Record of purchase and receiving orders kept	___	___	___	_____
Patients visited at regular intervals	___	___	___	_____
Patient preferences used in planning menus	___	___	___	_____
Patient surveys conducted to evaluate satisfaction on routine basis	___	___	___	_____
Tray service assembled efficiently	___	___	___	_____
Tray service completed on time	___	___	___	_____
Each tray checked for accuracy/appearance at end of assembly	___	___	___	_____
Therapeutic diet modifications followed	___	___	___	_____
Foods covered during holding periods	___	___	___	_____
Holding period for prepared foods within established facility standards	___	___	___	_____
II. EQUIPMENT				
Garbage receptacles clean	___	___	___	_____
Tray delivery equipment cleaned after use	___	___	___	_____
Small appliances clean/good repair	___	___	___	_____
Major pieces of equipment clean/good repair	___	___	___	_____
Proper storage of dishes and silverware	___	___	___	_____
Dishwasher temperature maintained at approved standard	___	___	___	_____
Current cleaning schedule made and posted	___	___	___	_____
Refrigerated/freezer equipment clean/good repair	___	___	___	_____
Temperature of refrigerator/freezer within appropriate standard	___	___	___	_____
Present equipment adequate to hold, prepare and serve menu as written	___	___	___	_____

III. PHYSICAL FACILITIES	YES	NO	SOMETIMES	COMMENTS
Storage areas maintained at appropriate temperature	___	___	___	_____
Floors clean/good repair	___	___	___	_____
Walls clean/good repair	___	___	___	_____
Light fixtures clean--all bulbs burning	___	___	___	_____
IV. PERSONNEL				
Employees follow sanitation procedures during food handling	___	___	___	_____
Employees adhere to facility dress code policy (personal hygiene, uniforms, hair restraints)	___	___	___	_____
Employee staffing schedule completed and posted	___	___	___	_____
V. MISCELLANEOUS				
Conferences held with administrator	___	___	___	_____
Conferences held with Director of Nursing	___	___	___	_____
Inservice given	___	___	___	_____
Routine infection control report O. K.	___	___	___	_____
Adequate staffing maintained	___	___	___	_____

ADDITIONAL COMMENTS:

VITA

Laura Lee Smith Butler was born in Burkesville, Kentucky on July 12, 1943, the daughter of Winton Simpson Smith and Randolph N. Smith. She attended Burkesville Elementary and High Schools and was graduated in May 1961. She completed a Bachelor of Science degree in 1973 from Western Kentucky University with a major in Dietetics and Institution Administration. She completed a Master of Science degree in Allied Health from Western Kentucky University in 1977 and became a Registered Dietitian in that same year.

Her professional experiences include consultant positions with small hospitals and nursing homes in Kentucky and full-time and part-time faculty positions with the Home Economics Department at Western Kentucky University and the College of Home Economics, The University of Tennessee, Knoxville. She is presently employed as Secretary/Treasurer of Smith Pharmacy Corporation, and consultant dietitian to Cumberland County Hospital in Burkesville, Kentucky.

Current professional association membership includes The American Dietetics Association, the Kentucky Dietetics Association, the National and State Associations for Consultant Dietitians in Health Care Facilities, American Public Health Association, Kentucky Public Health Association, Foodservice Systems Management Education Council (FSMEC) and Alpha Epsilon Chapter of Omicron Nu Honor Society. She is currently serving as a provider member to the Lake Cumberland Area Development District Health Council.

Laura is married to W. Douglas Butler of Burkesville, Kentucky. They have two sons, Randolph Douglas and William Peyton.