FOOD PRODUCTION TRAINING NEEDS OF FOODSERVICE PERSONNEL IN OKLAHOMA'S NUTRITION PROGRAM FOR OLDER AMERICANS

By

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CHAPTER I

INTRODUCTION

In recent years, the United States has experienced increased demands for public programs in aging services such as the Nutrition Program for Older Americans (NPOA). The demand for NPOA and other public programs could be directly related to changes occurring in the world's population (Cantor, 1985).

Demographic estimates and projections revealed that the elderly are the fastest growing population group. In 1950, the U. S. population 60 years old and above reached 18.5 million and by 1980, the same age group had nearly doubled to 35.8 million (U. S. Department of Commerce, Bureau of the Census, 1984). In 1983, the U. S. Census Bureau revealed that this population group had reached an estimated 38.1 million, which accounted for 16 percent of the American population. The current projected number was expected to double in the next 30 years; from 39.5 million in 1985 to 78.3 million by the year 2025 (U. S. Department of Commerce, Bureau of the Census, 1983).

With an increasing aging population in America, there was also an increasing concern for this group's health and nutritional needs. When discussing the nutritional needs of the elderly, the greatest interest has focused on the impact and value of feeding programs and nutrition services. One of the first legislative acts which authorized public food assistance to the low income population was the Potato Control Act

of 1935, signed into law as Public Law 72-320 (U. S. Senate, 1935). Food assistance programs could also be traced around the time of the Social Security Act of 1935, when foods were distributed to meet the food needs of welfare recipients and the elderly beginning in 1936 (MacDonald, 1977). From this program, the Food Stamp Act of 1964 utilized the nation's food surpluses and promoted the nutritional well-being of low income persons (Food Stamp Act, 1964).

In 1965, President Johnson signed into law the Older Americans Act of 1965 (Public Law 89-73). As a result of the White House Conference from the Panel on Aging in 1969, evolved the Nutrition Program for Older Americans Title VII in 1972 of the Older Americans Act of 1965 (Older Americans Act, 1972). Through the Administration on Aging, the NPOA currently operates under Title III-C of the Older Americans Act. With state, federal, and local government efforts, the popularity and demand for participation has increased dramatically.

The NPOA has been the highlight of several research projects. A national study measured the magnitude of nutrition services offered to program participants and the program's financial efficiency (U. S. Department of Health, 1979, 1981, 1983). Numerous state and local studies focused on nutrition services or on the nutritional status of program participants. An effort to improve staffing of supportive services was prioritized so that the NPOA would have competent personnel working at every meal site guaranteeing services to program participants. In efforts to reach this objective, the NPOA implemented the Nutrient Standard Method of Menu Planning and Monitoring systems developed by Harper, Jansen, Shigetomi, and Frey (1976). In conjunction with the menu monitoring system, the NPOA adopted the 1974 Recommended Dietary

Allowance (RDA), now revised, and utilized the 1980 RDAs of the Food and Nutrition Board (Food and Nutrition, 1980). The NPOA is authorized to provide one-third RDAs for each participant.

To provide extensive nutrition services, on-going personnel training was imperative in meeting the elderlys' nutritional needs. In a study conducted for the Administration on Aging, nutrition service providers identified the need for foodservice personnel training in food safety, sanitation, and equipment (McCool and Posner, 1982). In the same study, the authors anticipated a future need for research in efforts to train foodservice personnel in food safety, and incorporating technologies and management techniques.

No research, however, was found by the researcher concerning training needs of foodservice personnel in the Nutrition Program for Older Americans in Oklahoma, or in the United States. The researcher anticipated that information gained from this research could be used by project directors, consulting dietitians, and site managers when assessing training needs of foodservice personnel in the NPOA. Results of this study could be used at local, state, and national levels when addressing public policy issues and assessing the training needs of foodservice personnel.

Problem Statement

Since 1965, the Older Americans Act had provided community, social, and nutrition services to America's needy elderly. The Nutrition Program for Older Americans and its selected participants involved have been the topic of numerous research studies. Although these studies indicated the program's usefulness and effectiveness, the area of foodservice training has never been addressed.

Foodservice personnel and site managers provide the most useful nutrition service to the elderly today via the NPOA. A quality program constitutes ways to sustain and improve program effectiveness. With adequate training, nutrition services can provide for intended program effectiveness in meeting the needs of the elderly.

Purpose and Objectives

The purpose in this research was to assess the training needs of foodservice personnel in Oklahoma's Nutrition Program for Older Americans. Specific objectives were:

1. Describe the personal characteristics of site managers and the program characteristics of NPOA in Oklahoma.
2. Identify existing food production procedures included in foodservice personnel training programs.
3. Determine how often foodservice personnel follow on-the-job procedures included in training programs.
4. Determine food production training techniques and methods to measure and evaluate training outcomes of foodservice personnel.
5. Assess and make recommendations based on the training needs of foodservice personnel.

Hypotheses

The researcher postulated four null hypotheses in this study:

H_1: There will be no significant difference in the food production scores included on-the-job and in a training program based on the site manager's 1) length of employment, 2) previous program employment, 3) employment status, and 4) highest degree attained.

H_2: There will be no significant difference in the food production scores included on-the-job and in a training program based on the 1) meal site district, 2) total meals served, 3) meal site facility location, 4) type of foodservice system, 5) number of staff, 6) hours spent in training, 7) the trainer, 8) training techniques, and 9) methods to measure and evaluate training.

H_3: There will be no significant difference in the training needs scores based on the same variables in H_1 and H_2.

H_4: There will be no significant difference in the food production scores in a training program based on the frequency of employees to follow on-the-job procedures.

Limitations

The following limitations were acknowledged by the researcher in developing this study.

1. The 198 site managers constituted the survey population from the Nutrition Program for Older Americans in Oklahoma.

2. Site managers' responses were limited by their personal characteristics, program characteristics, and their foodservice subordinates in the Nutrition Program for Older Americans in Oklahoma.

Assumptions

The following assumptions were made by the researcher in developing this study.

1. All nutrition sites had a site manager and at least one other foodservice worker.

2. Site managers objectively answered the questionnaire regarding the training needs of foodservice personnel.

Definitions

The following definitions were important in this study:

1. Administration on Aging (AoA): A division of the Office of Human Development Services within the Department of Health and Human Services, responsible for developing and coordinating national plans, regulations, and guidelines to benefit older Americans (Gelfand and Olsen, 1980).

2. Aging: The irreversible deceleration of biological and physiological processes in humans over their life span (Shock, 1977).

3. Area Agency on Aging (AAA): A local organization authorized by AoA to determine and plan services for elderly in their geographic area (Posner, 1979).

4. Consultant Dietitian: A person who consults, advises, and assists personnel in public and private establishments such as food-service systems, health care and related facilities, schools and in the nutritional care of clients; evaluates and monitors foodservice operations making recommendations for conformance level to provide nutritionally adequate, quality foods; plans, organizes, and administers orientation, in-service training and educational programs for foodservice personnel; formulates and implements menu patterns; discusses equipment and facility layout and design with builders, designers, and facility managers (U. S. Department of Labor, 1977).

5. Nutrition Service Provider: The agency, organization or supervisory staff that provides nutrition services to the elderly (U. S. Department of Health, 1981b).

6. Older Americans Act (OAA): Federal legislation enacted in 1965 to provide services to needy elderly via designated AoA and

state Units on Aging (SUA) (U. S. Department of Health, 1981b).

7. Site Manager: Person responsible for coordinating and implementing meal site activities and monitoring nutrition services of the operation (U. S. Department of Health, 1981b).

8. Training: The process of acquiring and developing competencies, skills, knowledge, and attitudes through instructional activities that meet a specific need (Forrest, 1983).

CHAPTER II

REVIEW OF LITERATURE

This chapter was an attempt to explore the historical perspective of the Older Americans Act of 1965, and the Nutrition Program for Older Americans. In addition, this chapter will provide a discussion on managerial responsibilities and training of foodservice personnel.

Historical Perspective of the Older Americans Act of 1965

The Older Americans Act of 1965 developed from influences of public awareness and demands from previous food assistance programs and major national research studies. As early as 1935, food assistance programs existed providing government commodities to low income populations and later to schools and church organizations. The purpose of these programs was to primarily meet the needs of these population groups. The actual underlying intent was to exhaust surplus commodities to support farm prices, hence strengthening agricultural economy.

Public dissatisfaction with the commodity program helped to foster the first organized food stamp program in 1939 (MacDonald, 1977). The existence of this program operated for four years, when during this time, program effectiveness decreased. Food assistance recipients received foods, yet, commodities were only distributed monthly, according to available supplies. Thus, recipients receiving commodities encountered

food shortages and food spoilages in that one month period. Their unmet nutritional needs enhanced nutritional deficiencies, malnutrition, and starvation.

During the 1940s, 1950s, and 1960s, the food stamp program withstood many public positions in serving those needing assistance. In 1961, President John F. Kennedy launched eight pilot food stamp projects in seven states which eventually expanded to 43 states (MacDonald, 1977). Despite congressional reluctance to support such a program, the Food Stamp Act of 1964 (Public Law 8-525) resulted from Kennedy's previous efforts in meeting the needs of low income populations including the elderly. Even though the program was the first to intervene in the nutritional status of the elderly, it was inadequate in meeting specific needs of elderly groups such as the socially isolated, the chronically disabled, and the very poor.

In efforts to expand services to the elderly, the Older Americans Act was passed in the 89th Congress and was signed into law on July 14, 1965, by President Lyndon Johnson (Public Law 89-73). The act created the Administration on Aging (AoA) within the U. S. Department of Health, Education, and Welfare (USDHEW) which currently operates under the U. S. Department of Health and Human Services (USDHHS).

The purpose of the AoA was to provide grants for research and development projects on aging, grants for training personnel working in the field of aging, and funds to State Units on Aging (SUA) to develop state operating plans for Area Agencies on Aging (AAA) (Wells, 1973; Watkin, 1977). Services and activities for the act were initiated in fiscal year 1966 (U. S. Department of Health, 1982).

The Act was first amended in 1967 (Older Americans Act, 1967). In 1968, Congress extended the Act for two fiscal years, authorizing $2 million annually to AoA under Title IV of the Older Americans Act of 1965 for a three-year nutrition services research project. Programs started operating in Florida and Texas. The act was again amended in 1969 to extend the program for three years (Older Americans Act, 1969). At this time, the 1969 White House Conference on Food, Nutrition and Health was in session and recommendations for aging services was highlighted by the Panel on Aging (Watkin, 1977). Emphasis was placed on meal delivery services for congregate and home delivered meals. The AoA workshop in 1970 suggested to incorporate the recommended dietary allowances (RDAs) of the Food and Nutrition Board, National Research Council-National Academy of Sciences. These recommendations were carried out through 1971 based on research reports indicating that congregate meals were a feasible, community-based mechanism for delivering services to the elderly (Bechill, 1971). The program's effectiveness was cited when a large number of the elderlys' problems decreased, such as nutritional deficiencies, poor health, social isolation, and limited nutritional knowledge.

The recommendations of the Panel on Aging, the AoA workshop, and public concern helped to establish the amended Title VII Nutrition Program for Older Americans (NPOA) of the Older Americans Act. On March 22, 1972, President Richard Nixon signed the Amendment into law (Older Americans Act, 1972), but because of the war in Cambodia, funding did not continue until after the war in 1973. The Act was amended for the fourth time in 1973 designating AAA to develop and administer state plans (Older Americans Comprehensive Services, 1973). States were

required to rapidly implement their programs, and provide feasible evidence of operation. All 50 U. S. states and six U. S. Territories were included in the Act.

In 1974, the Act was again amended (Older Americans Act, 1974), however, for the first time services included Indian Tribes and the Older American Service Employment Program. The Act was amended in 1975 under Public Law 94-135 (Older Americans Act, 1975) and again in 1977 under Public Law 95-65 (Older Americans Act, 1977). In the 1978 amendments, Congress consolidated previous Titles under Title III-C. In the 1981 amendments, appropriations were extended for three years (Older Americans Act, 1981). On March 20, 1984, the Act was reauthorized on a $1 billion operating budget.

Since 1965, the Act has been amended ten times and currently delivers social and nutrition services under Title III-C. The Act holds state agencies responsible for developing and implementing state plans and establishing services for the elderly, 60 years and older. Each SUA has planning and service areas (PSA) under the direction of AAA. The AAA is responsible for assessing needs and priorities, and developing and implementing services and resources in the PSA's where social, nutrition, and training services are provided to local projects. The local nutrition project's responsibilities are to administer AAA plans, and services mandated by Title III-C nutrition program. Senator John Glenn stated at a joint hearing before the 89th Congress that the Act has supported the growth of organized programs in "57 state units on aging, 662 area agencies on aging, and 25,000 local nutrition and supportive service providers". (Committee on Labor and Human Resources, 1984, p. 124).

Managerial Responsibilities

Management can best be defined as creating and maintaining an organization's internal environment where individuals who collaborate in groups, perform efficiently and effectively toward attaining group goals (Koontz and O'Donnel, 1972). In managing human resources, the manager's responsibility is to help employees work together toward desired goals by preestablished organizational objectives. Even though the goals and objectives differ for each organization, they need to be clearly defined in order to provide direction and purpose to group members and society.

The vehicle to achieve organizational goals is through effective human resource planning. According to Sikula and McKenna (1984), human resource planning is a process by which managers determine human resource needs and the means to meet those needs to achieve organizational objectives. This plan involved thinking in terms of the required number of people and types of skills needed to perform the job. While considering employees needs, human resource planning can be developed and implemented by a planning process.

The planning process involves organizational change to best meet employees' needs while achieving organizational goals. Craft (1979) has divided the planning process into four chronological steps:

1) Review organizational plans, goals and objectives for specified planning periods;
2) Forecast human resource needs and the supply of talent and skills to meet those needs. This helps to determine shortfalls and surpluses in employment level and skills;
3) Take previous data to determine staffing and scheduling requirements; and
4) Monitor and assess activities of change in terms of effectiveness and efficiency in meeting desired objectives (p. 77).

Human resource planning plays an important role when considering utilizing and developing employees and their needs. To an extent, managers can plan for change and assess the change in terms of meeting desired objectives.

Objectives are used by management to plan, organize, direct, and control for innovation, decision making, and problem solving purposes (Keiser, 1979). These management functions are known as a system called management by objectives (MBO). It is a method used to set goals and measure achievements against those goals when managing an organization (Miller and Porter, 1985). The purpose was directed at results and achieving goals with participation at all management levels.

Another method used by managers was performance-based objectives (PBO). These objectives are set up to define a task unit of work and describe how the task should be achieved. The objective should state three things: the employees' task; how the task should be completed; and, performance standards for completing the task. Miller and Porter (1985) emphasized that the standard of performance defined the objectives to the extent of the goal to be reached and maintained. Performance-based objectives have several functions in measuring performance. The first was that PBOs help to evaluate and improve on-the-job employee performance. A PBO system could also reduce the chance for employee turnover and low productivity. PBOs were used in recruiting and hiring and functioned as a supplement to a job description when hiring the right people for the job. PBOs were also helpful in training and coaching as employees would know standards expected of them.

Employee Needs

Managers could motivate employees in helping them to achieve organizational goals and objectives by satisfying their personal needs. There are two major types of needs, innate and learned. Innate or basic needs include such things as food, water, and oxygen. Learned needs include social and higher-order needs and are acquired from observing and interacting with other individuals. Much attention has focused on Abraham Maslow and his theory of motivating individuals by a need hierarchy. This theory essentially included a hierarchy of needs in that the lower level needs are met before higher level of needs for self-actualization (Burke, 1982). Theoretically, satisfying human needs at whatever level will produce a happier and more productive employee (Keiser, 1979). Likewise, Craft (1979) stressed that employee needs should be satisfied to achieve effective performance. He suggested four ways a manager can integrate employee needs in achieving organizational goals:

1) Assess subordinates' needs through observation, surveys, one-to-one counseling and interviews, and personally knowing employee;
2) Integrate desired outcomes to consistent behaviors common to organizational objectives;
3) Establish an organization that fosters a creative climate of mutual respect and personal security; and
4) Expect high, yet, realistic performance standards from employees (pp. 82-85).

Assessing and measuring employees' needs was based on daily tasks performed on the job that meet organizational goals and objectives. It was therefore, the manager's responsibility to create an environment facilitating employee competence. The organization could provide opportunities at work enabling employees to define and provide a path to meet his/her immediate goal (Argyris, 1964).

Training Foodservice Personnel

A large proportion of foodservice employees were classified as unskilled labor. On the average, a majority of these employees had a high school education. While advancements in science and technology were decreasing the number of unskilled labor force, the need for semi-professionals and manpower development was becoming greater.

Several federal legislative acts were enacted to provide education and training in specific areas for the skilled and unskilled employees. These impacts have generated many education and training programs. In 1917, under the Smith-Hughes Act, federal support for vocational and technical education was integrated into high school programs (Sikula and McKenna, 1984). Government funds provided courses in agriculture, the trades, and home economics. The George-Barden Act of 1946 provided the same courses as the Smith-Hughes Act of 1917, yet, it generated additional allocations and provided more flexibility for state programs nationwide (Ausperger, 1965). More training programs, however, were needed after World War II, to support the unskilled labor force entering the job market.

The Area Development Act of 1961 was not limited to certain occupations for education and training. Thus, it provided weekly financial support to trainees in various occupations up to 16 weeks (Ausperger, 1965). In the early 1960s, two acts were amended to train and retrain underemployed and unemployed people for skilled jobs: The Manpower Development and Training Act of 1962; and, the Vocational Education Act of 1963. The former Act was administered jointly by the Department of Health, Education and Welfare and the Department of Labor (Mallory, 1966). The Department of Labor had the responsibility of identifying

needed labor skill in the economy at that time, and the DHEW provided funds for instructional training through each states' vocational education agency (Mallory, 1966; Sikula and McKenna, 1984).

Both Acts provided training, research, and/or pilot programs for foodservice workers and later for foodservice supervisors. Under the Manpower Development and Training Act of 1962, training was administered for service occupations in home economics related areas: The American Dietetic Association contributed in developing training materials for these programs. In 1965, pilot programs and research were funded through the Vocational Educational Act based on the population's needs. Trainers and teachers were on college campuses nationwide to participate in developing occupational and vocational education materials in foodservice and other home economics related topics, and to prepare them to train other individuals. Some of the state universities that participated in these pilot programs were Iowa State University, Michigan State University, Oklahoma State University, and Pennsylvania State University (Ausperger, 1965; Mallory, 1966).

The National School Lunch Act and the Child Nutrition Act of 1966 have also identified and provided vocational training for foodservice personnel including workers, supervisors and managers (Public Laws 91-295 and 95-166) (Child Nutrition Act, 1970; National School Lunch Act, 1977). These programs sought to increase personnel competence and skill in foodservice in the day to day operation of these federal programs (Martin, 1965; Martin, 1978). Foodservice personnel in these programs were also identified as needing group workshops, in-service training, and continuing education instruction to improve their knowledge, skills, image, and educational concepts (DeZeeuw, 1978; Kende, 1978).

The aforementioned acts provided for programs to determine and develop skills, competence, and knowledge regarding training and educating foodservice personnel. Much emphasis was sought to prepare unskilled workers and the unemployed. Many occupational and training manuals and guides have been developed to prepare workers for available jobs and to increase their skills based on the industry's needs and the capabilities required for optimal performance.

Training is a performance-based learning process primarily to improve employee performance (Forrest, 1983). The process was directed to achieve organizational goals and could be achieved through improved employee performance. Craft (1979) believed that training and development activities should provide employees for opportunities for increased performance:

> If certain behaviors, skills, knowledge, or attitudes are necessary for meeting requirements for job advancement and movement along a career path, employees should be given the opportunity to develop them. The organization must provide adequate training programs to prepare employees to meet expected challenges and to prepare them for better and future performance (p. 110).

Successful on-the-job performance required appropriate training. On-the-job training was conducted most often by the subordinates' supervisor and/or manager. According to Forrest (1983) the line manager, who was responsible for training efforts must be able to identify the need for improved performance, know if training would increase performance, understand the role in the training process, and identify techniques and methods that may improve performance. Training programs should not respond to a problem, but to the training need. When evaluating training needs, an assessment was usually conducted. Personnel needs were determined by organization and unit needs. There

were many questions asked when training foodservice personnel, but the most common one was how to train for increased work performance.

Basically, there were three types of training programs: 1) orientation; 2) in-service; and 3) on-the-job. All three types aimed at reducing labor turnover, absenteeism, accidents, production costs increasing job performance, morale, and job satisfaction. Orientation was the first day's introduction with the employee's work environment, tasks, and responsibilities. In an employee orientation program, training in specific departmental tasks was usually not conducted. Instead, employees usually received policy handbooks, job descriptions, department tours, and other materials explaining department functions and tasks required for the job. Puls (1974) studied the effects of an orientation program on new foodservice personnel in a hospital dietetics department. The author discovered that employees who participated in orientation to the new job received more job satisfaction and job stability than those who did not have an orientation program.

In-service training was often conducted with several employees or the entire department of foodservice personnel. This type of training was also referred to as group training or group meetings. Baden (1967) stated that group training helped employees to understand their jobs more clearly because group members participated in planning discussions and provided feedback to each other. Employee participation helped to clarify job roles and employees may gain greater self-satisfaction when performing their work. Trainers need to be motivated enough to teach relevant skills in developing employee needs rather than mastering immediate skills for on-the-job performance (West, Wood, Harger, and Shugart, 1977).

Most of employee training was conducted on-the-job. Fisher and Gaurnier (1970) found that among 18 foodservice organizations, most employees were receiving more on-the-job training than other types of training. Grieser (1970) discovered that employers preferred on-the-job training because each establishment has different standards. On-the-job training usually took less time to train and less time to prepare materials for training. In conjunction with other training programs, on-the-job training could be effective if planned in a progressive schedule teaching concepts requiring lower skills first and then to longer periods of training requiring higher skills for the job (Welch, 1966). On-the-job instruction was essentially one-to-one communication between the trainer and the learner. This type of interchange enabled the trainer to check the trainee's progress, insure understanding, formulate concepts, encourage responses, and eliminate any doubt about the task being learned. The most importance process in on-the-job training was coaching.

Coaching was the constant reinforcement by the employee's manager or trainer who encouraged employeed to perform specific standards specified in the training. According to Kirkpatrick (1985), on-the-job coaching helped to correct mistakes and clarified performance standards by giving the employee positive reinforcement. Coaching included monitoring and diagnosing trouble areas, and motivating and reviewing procedures with employees. When studying the positive impact from a training program, Reed (1982) concluded that employee monitoring was essential to develop positive employee skills that reflected a safe, responsible, and productive worker. Training and coaching was the line manager's function. Thus, these two techniques could be used

simultaneously and with other techniques and methods to acquire and develop skills essential to improve performance.

Training Techniques and Methods

Using a variety of techniques and methods could help to make training programs interesting and relevant in motivating employees to perform according to standards. Visual aids were commonly used to train within foodservice establishments. West, Wood, Harger, and Shugart (1977, p. 426) stated that "slide-tape programs for individual instruction in work methods and procedures have proven to be satisfactory." Other types of visual aids used were audiocassetts, videos, television, charts, and posters. Utgaard and Dawis (1970) found that the most common training techniques and methods used in industrial firms were 1) conference or discussion, 2) television, 3) films, 4) simulation, 5) lecture, 6) role playing, and 7) laboratory. Furstenau (1978) reported that Wisconsin restaurateurs used lecture and discussion techniques and one-to-one discussion methods to train sanitation procedures to employees. Other techniques such as slides, tapes, and laboratory and methods such as take-home study materials were also used, but not as frequently. Mier (1981) realized the difficulty in motivating foodservice personnel to attend, participate, and learn new material. She listed and described many innovative techniques and methods to train under four categories: 1) presentations, 2) discussions, 3) games, and 4) other methods such as role playing and field trips.

In the past, home-study courses and continuing education modules have been proven successful in teaching food principles to foodservice

personnel. Personnel learned better by step-by-step instructions, visuals, study guides, and the applicable "hands on" experience. Food-service personnel were found to learn and retain knowledge based on food principles by programmed texts and oral exams (Sumbingco, Middleton, and Konz, 1969). Others have devised many home study programs for training. Successful efforts in teaching personnel have been attributed to short, concise materials that provided and encouraged positive feedback (Jernigan, 1970). Similar studies have focused on developing effective training manuals, nutrition education modules and their effects in teaching employees by using a variety of techniques and methods. With the many techniques and methods available to train personnel, management had the responsibility of selecting appropriate materials in planning for a training program that received successful outcomes in the training efforts.

Training Process

Training foodservice personnel is a continual process in keeping abreast of everchanging demands and technologies introduced within foodservice operations. It is, therefore, management's responsibility to plan for and manage changes inherent to the organization and its members.

Some managers have realized the time constraints of training or that training was not a priority of the operation. Often managers resisted training employees knowing that employees did not master skills by training, or if they did, employees skills exceeded the manager's skills. Managers with negative attitudes about training are unlikely to be effective trainers unless their attitudes change about themselves

and their employees (Forrest, 1983). Management's responsibility was to be an effective leader and communicator when considering the needs of each individual worker (Miller and Porter, 1985). Perhaps training endeavors could be more effective in training for improved work performance if managers planned for and provided for opportunities that fostered learning and the growth of individuals.

When planning for a training program, five common steps were usually followed: 1) identified group and individual needs, 2) set goals and objectives, 3) designed the program, 4) prepared employees, and 5) evaluated results. Gines and Schweitzer (1979) suggested that when assessing foodservice personnel's needs, the manager must satisfy administration, foodservice recipients, foodservice personnel for their personal growth, and outside agencies. Training needs could be assessed by several methods such a questionnaire, observation, conversation, and have employees rank order priority of needs. A more technical approach for a needs assessment is identified by Azarnoff and Seliger (1982). These authors suggested that training need areas should be determined by the attitudes, skills, and knowledge needed by the worker minus the attitudes, skills, and knowledge already acquired by the worker. They also suggested that tasks could be identified by this method to determine needs. Job tasks are usually related to job lists which were specific and more detailed than a job description. Forrest (1983) also stated that job task identification helped managers to define foodservice personnel's training needs and helped to distinguish which task should be prioritized according to the organization's immediate goals.

The second step in training was establishing objectives and goals for tasks and procedures to be learned. Objectives should be observable

and measurable that lead to desired performance (Gines and Schweitzer, 1979). Goals were also relative to job tasks in that tasks were narrowed specifying what work should be performed and how it should be performed.

The next step in planning a training program was to design the program. One method that had been used was a Performance Based Objective system (PBO). This method assisted in providing a systematic plan for training and more specifically for each job unit and task. According to each job unit, specific objectives were established, procedures for each task were broken down, techniques and methods were implemented, and an evaluation was conducted (Miller and Porter, 1985). Another method that had been used was the PERT chart (program evaluation and review technique) (Donaldson, 1970). This method could be used when planning for change in an organization. It represented a model that determined activities, tasks, and events to be completed, dates of completion, who completed the activity, and who monitored the activity. Designing the training so that desired skills will be developed considered appropriate materials and methods to be used, the time allocated for training, and the person to be trained.

The fourth step in training was preparing employees for basic concepts to be learned. In order to learn new concepts, trainees must be motivated. Craft (1979, p. 114) stated that "a motivated trainee learns more quickly and retains what has been learned better than one who is not motivated." Trainees also learned better when they were provided with instant feedback and reinforcement when trying their skill on-the-job or following written or verbal tests. Longree and Blaker (1982) suggested that making the trainee feel at ease, creating

a desire for the trainee to learn by thoroughly explaining the job, and emphasizing critical operational procedures. Training must integrate concepts of knowledge, skills, and attitudes of each employee in the context to the standards and goals of the operation when developing competencies (Forrest, 1983).

After preparing the trainee, the trainer evaluated the effectiveness of the program. This phase of the process evaluated employee performance and their retained knowledge about content matter taught. At this point, trainers could also question if the techniques and methods were appropriate and if objectives were met. The outcome of training was usually a basis for justifying resources utilized for future training programs.

Summary

Research related to training foodservice personnel was supported by the need for a competent, well-trained foodservice staff working in the Nutrition Program for Older Americans. But, there was limited research related to specific training programs and standardized materials for foodservice personnel in the NPOA. In general, many programs, manuals, techniques, and methods have been found useful and effective when training foodservice personnel. As new technology introduces new foods, equipment, packaging systems, and demands for skilled labor within foodservice operations increase, managers will be forced to train foodservice personnel.

Researchers have developed materials and methods in the context of the organization's goals and objectives. Various training programs were made available to foodservice personnel and management that

developed skills for the job in which they were employed or about to be employed. The three most common types of training programs were 1) orientation, 2) in-service, and 3) on-the-job. Planning a training program required time, appropriate teaching materials, and knowledge of each individual's need for learning. Evaluating the training results provided employees with feedback and helped to reinforce and develop their skills, provided knowledge, and modified their attitudes when performing their job. Evaluation also assisted the trainer in developing and implementing future plans for training foodservice personnel.

CHAPTER III

METHOD

The purpose in this study was to assess the training needs of foodservice personnel in Oklahoma's Nutrition Program for Older Americans, and to formulate recommendations for training programs at the state and local levels. The research design, sample/population, and data collection which included the development of the survey, the revised research instrument, survey procedures, and data analysis were included in this chapter.

Research Design

The descriptive status survey research design was used in this study. Descriptive status survey was intended to describe a specific set of phenomena in and of themselves (Fox, 1969). According to Best (1981), descriptive research was concerned with hypothesis formulation and testing, comparison and contrast of relationships between non-manipulated variables in a natural setting, development of generalizations or theories through the use of inductive-deductive reasoning. Descriptive survey was used for this research to gather information about a specific group of site managers and their foodservice subordinates who worked in various types of meal sites in Oklahoma's Nutrition Program for Older Americans.

Sample/Population

In this survey, criteria for participants were employment as site managers in Oklahoma's NPOA. Meal site managers and/or meal site addresses were generated from two mailing lists. One mailing list was provided by Oklahoma's Special Unit on Aging. The second mailing list was collected from the nutrition program's project directors representing their Area Agency on Aging. From the two lists, 198 site managers and their addresses served as the approximate total population. All 198 site managers were sent a questionnaire and were asked to participate in this study. Survey results can only be generalized to this group.

Data Collection

Development of Survey Instrument

A six-page questionnaire was developed based on the review of listerature, (Furstenau, 1978; Bosselman, 1985), and five foodservice education and training manuals utilized in the nutrition program: (U. S. Department of Health and Human Services publications No. (OHDS) 81-70672, 1981 and No. (OHDS) 82-20674, 1982; Barker, 1981a; Barker, 1981b; and Food, Nutrition and Institution Administration, 1976). The five food-service procedures studied were 1) quantity and quality food production, 2) sanitation, 3) equipment and safety, 4) nutrition, and 5) personal health and hygiene. The preliminary questionnaire included four questions on personal characteristics, 11 questions on geographic data and program characteristics, 41 questions on food production procedures and five rank order questions on the importance of the five foodservice

training needs. A cover letter accompanied the questionnaire (Appendix A). On April 20, 1985, the preliminary research instrument was hand-delivered and explained to four site managers who represented one Oklahoma county. Suggestions from the pilot study participants and the researcher's graduate faculty committee were then incorporated into a revised research questionnaire.

The Revised Research Instrument

A newly revised instrument consisted of a five-page questionnaire. Three main sections comprised the questionnaire: 1) "General Information" of the site manager's personal characteristics, 2) "Program Characteristics" including geographic data, and 3) "Food Preparation/ Production Procedures" in five areas of foodservice. At the end of the questionnaire, participants were asked to rank order the importance of the overall training needs of foodservice personnel at their site. The researcher's graduate faculty committee from the Food, Nutrition and Institution Administration and the Statistics Departments at Oklahoma State University reviewed the instrument for clarity, content validity, and format.

The new research instrument consisted of multiple choice questions, open-ended questions, check lists, and a rank order of importance of the training needs (Appendix B and Appendix C). Participants were asked to specify their answer when the choice "other" was checked. This type of answer was tabulated by hand. A five point Likert-type scale was used on the procedure section and ranged in values from 5 (always) to 1 (not applicable) if the procedure did not apply to the site. This scale was used to evaluate on-the-job food production procedures.

Checklist questions parallel to the Likert-type scale questions on the questionnaire asked survey participants whether these procedures were "included" or "not included" in a training program. At the end of the survey instrument, participants were asked to rank order the importance of training needs of their foodservice personnel.

The five page instrument was printed on three sheets of gold paper accompanied with an attached cover letter (Appendix C). The cover letter invited site managers to participate in the study by responding to the questionnaire (Appendix B). Likewise, the cover letter expressed the study's importance in the training needs of foodservice personnel. It was also stated that overall results would be shared with site managers without revealing individual identification or meal site.

Survey Procedure

On May 8, 1985, the researcher mailed 198 questionnaires to site managers in Oklahoma's NPOA. Questionnaires were mailed first class in hand stamped envelopes accompanied with a self-addressed stamped envelope. On June 3, 1985, the researcher had received a 43 percent (N=86) return from the 198 questionnaires mailed. A follow-up postcard was sent on June 7, 1985 encouraging site managers to offer their input to the study and to return the questionnaire within one week from the mailing date (Appendix D). By June 20, 1985, the return rate had increased to 55 percent (N=109). The cost to mail each questionnaire on the first mailing was $.44 per person while the cost to mail each follow-up card was $.14 for 112 participants.

Data Analysis

Data collected from the survey were transcribed onto Fortran coding papers then entered onto the IBM System 3081 at Oklahoma State University with the Time Sharing Option (TSO). Statistical data was analyzed by Statistical Analysis System (SAS) (Barr and Goodnight, 1972). The frequencies generated revealed personal characteristics and program characteristics. Chi-square was used to determine if relationships existed between the independent variables and food production scores. A one-way analysis of variance (ANOVA) and t tests were used to determine differences among mean scores of personal and program characteristics of food production procedures and the rank order of training needs (McCall, 1975). When determining if two or more groups were significantly different, the Duncan's multiple range test determined multiple comparisons between groups (Huck, Cormier, and Bounds, 1974). Spearman's rho correlation coefficient was used for nonparametric data to determine correlations between dependent variables and rank order of training needs (Huck, Cormier, and Bounds, 1974).

CHAPTER IV

RESULTS AND DISCUSSION

This study assessed the five area of food production procedures followed by foodservice personnel in the Nutrition Program for Older Americans in Oklahoma. The assessment also determined foodservice personnel's training needs in these procedures as perceived by their site manager. A five-page questionnaire examined personal and program characteristics and 12 relevant questions on training, training techniques, and methods to measure training. Other information included a rank order of training needs and 48 questions highlighting five areas of food procedures imperative to the NPOA and general foodservice establishments.

The site managers represented the sample group employed in the NPOA who supervised one or more foodservice subordinates. A research instrument with cover letter was mailed to 198 site managers in Oklahoma and 109 (55%) responded.

Characteristics of Respondents

Length of Employment, Previous Employment, Work Status, and Highest Degree

The majority of survey respondents, 45.9 percent (N=50), were employed between one to five years in the nutrition program and 36.7 percent (N=40) were employed more than five years. Nearly 83 percent

(N=90) of the respondents had no previous program employment. Over one-half (55%, N=60) of the respondents indicated that they worked 20 hours but less than 35 hours per week. Eighty-nine percent (N=97) of the respondents listed a high school diploma as the highest level of education obtained and 6.4 percent (N=7) of the respondents had a bachelor of science degree (Table I).

Program Characteristics

Geographic Location

Oklahoma is comprised of 77 counties. These counties were divided into 11 planning and service area districts in 1978 under the Older Americans Act (Figure 1). These districts support between 5 to 27 functioning meal sites. All meal sites responded from districts SWODA (100%, N=10) and OEDA (100%, N=5). Nearly 75 percent (N=11) of the meal sites in district KEDDO responded. Over one-half of the meal sites responded from districts SODA (55%, N=11), INCOG (59%, N=16), and ASCOG (56%, N=15). Almost 40 percent of the total respondents answered from districts INCOG (14.7%, N=16), ASCOG (13.6%, N=15), and EODD (11%, N=12) (Figure 2). Even though all meal site managers responded (N=10) from SWODA, they only represented about five percent of the 109 total respondents.

Population Size of Community

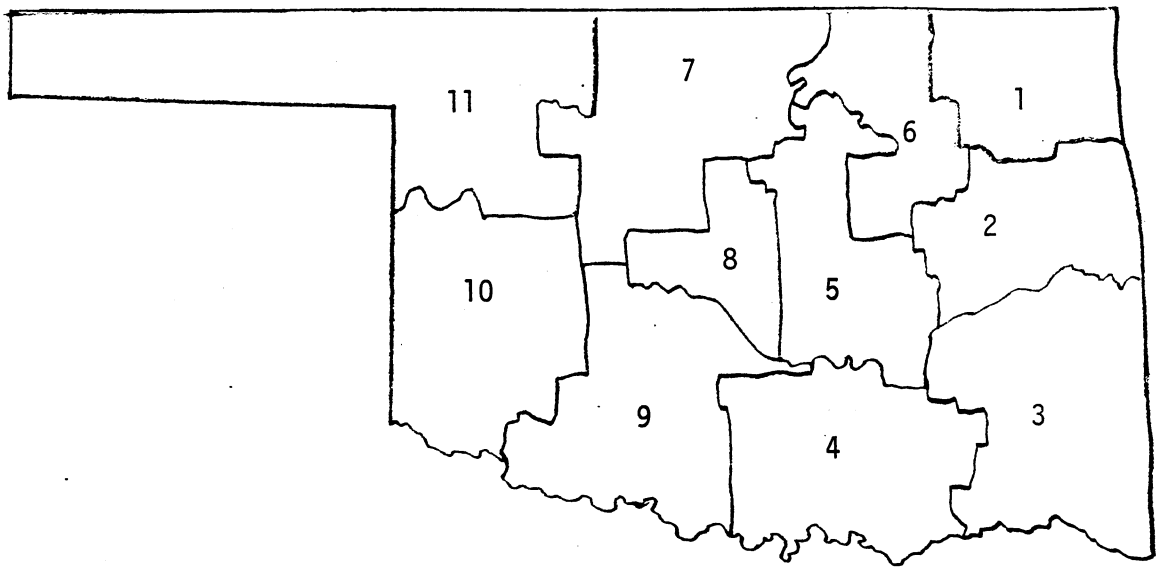
Meal site facilities were predominately located in rural areas of less than 2500 people according to 45.9 percent (N=50) of the respondents. Nearly 38 percent (N=41) operated in a small city (2500-24,999), and 9.2 percent (N=10) in a medium city (25,000-149,999).

TABLE I

FREQUENCY DISTRIBUTION OF PERSONAL CHARACTERISTICS

Variable		Response N	Response %
Length of Employment			
<1 year		19	17.4
1-5 years		50	45.9
>5 years		40	36.7
	Total	109	100.0
Previous Employment			
Yes		19	17.4
No		90	82.6
	Total	109	100.0
Current Work Status			
Full-time (35 hours or more per week)		23	21.1
Full-time (more than 20 hours but less than 35)		60	55.0
Part-time (20 hours or less per week)		26	23.9
	Total	109	100.0
Degree Attained*			
High school diploma		97	89.0
B.S.		7	6.4
M.S.		2	1.8
Other		2	1.8
	Total	108	99.0

*1 person did not respond



(1) NECO - Northern Economic Counties of Oklahoma (N=12)
(2) EODD - Eastern Oklahoma Development District (N=24)
(3) KEDDO - Kiamichi Economic Development District of Oklahoma (N=15)
(4) SODA - Southern Oklahoma Development Association (N=20)
(5) COEDD - Central Oklahoma Economic Development District (N=24)
(6) INCOG - Indian Nations Council of Government (N=27)
(7) NODA - Northern Oklahoma Development Association (N=13)
(8) ACOG - Association of Central Oklahoma Government (N=21)
(9) ASCOG - Association of South Central Oklahoma Government (N=27)
(10) SWODA - South Western Oklahoma Development Association (N=10)
(11) OEDA - Oklahoma Economic Development Association (N=5)

Figure 1. Planning and Service Area Districts for Oklahoma's Nutrition Program for Older Americans

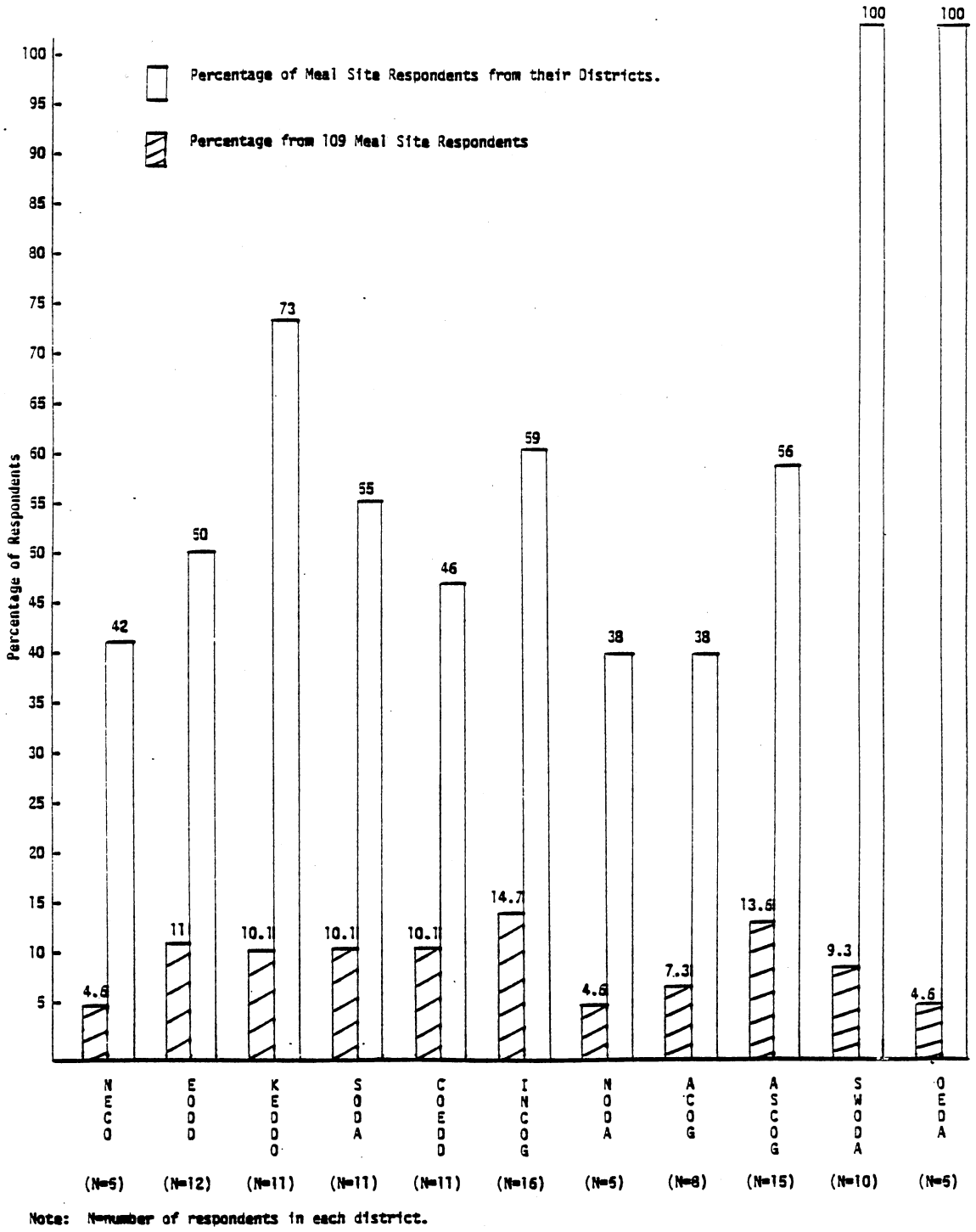


Figure 2. Meal Site Respondents

In contrast, only 7.3 percent (N=8) of meal sites operated in a large city of 150,000 or more individuals (Table II).

Meal Site Facility Location

The meal sites basically operated from six designated facilities. About 35 percent (N=38) reported operating from a community civic center, 7.3 percent (N=8) from a religious institution, and 3.7 percent (N=4) from a school (Table III). The majority of respondents (41.3%, N=45), however, indicated utilizing "other" types of facilities as meal sites. The most commonly used facility was the Nutrition/Senior Center among these "other" facilities (Table IV).

Meals Served

Most meal sites (62%, N=66) served between 200 to 499 meals per week while 20 percent (N=22) of the meal sites served between 500-999 meals per week. The total meals reported (41,559) comprised congregate and home delivered meals. The majority of meals served in a congregate setting ranged from 200 to 499 (55%, N=60) meals for a total of 33,039 congregate meals served per week. In contrast, 72 respondents (66%) reported that their site delivered between 1 to 99 meals to home-bound participants totaling 7,912 home delivered meals (Table V).

Contract Foodservice and Foodservice System

When respondents were asked whether they contract with a food-service management company or government agency, 59.6 percent (N=65) answered "no" and 40.4 percent (N=44) answered "yes." Among those who

TABLE II

FREQUENCY DISTRIBUTION OF COMMUNITY POPULATION SIZE OF MEAL SITE LOCATION

Population Size	Response N	Response %
≥150,000	8	7.3
25,000 - 149,999	10	9.2
2,500 - 24,999	41	37.6
<2,500	50	45.9
Total	109	100.0

TABLE III

FREQUENCY DISTRIBUTION OF MEAL SITE FACILITY LOCATION

Meal Site Facility	Response N	Response %
Community Civic Center	38	34.9
Religious Institution	8	7.3
School	4	3.7
Low Income Housing	13	11.9
Restaurant	1	0.9
Other	45	41.3
Total	109	100.0

TABLE IV

FREQUENCY DISTRIBUTION OF "OTHER" MEAL SITE FACILITY

"Other" Meal Site Facility	Response N	Response %
Nutrition/Senior Center	20	44.4
American Legion	7	15.6
Park Recreation Building	3	6.8
Renovated School Building	3	6.8
Kiwanis Building	2	4.4
V.F.W. Building	2	4.4
Library	1	2.2
Fairgrounds Building	1	2.2
Salvation Army Building	1	2.2
Renovated Hospital	1	2.2
Masonic Lodge	1	2.2
Social Service Building	1	2.2
Eastern Star Building	1	2.2
Municipal Auditorium	1	2.2
Total	45	100.0

TABLE V

FREQUENCY DISTRIBUTION OF SITES SERVING AVERAGE NUMBER OF MEALS PER WEEK

Average Meals Served Per Week		Total Average per Week	Response N	Response %
Total				
No response		0	0	0
1-199		2,053	19	17.4
200-499		21,355	66	61.6
500-999		15,076	22	20.2
>1000		3,075	2	1.8
	Totals	41,559	109	100.0
Congregate Meals				
No response		0	2	1.9
1-199		3,539	31	28.4
200-499		18,591	60	55.0
500-999		9,259	15	13.8
>1000		1,650	1	0.9
	Totals	33,039*	109	100.0
Home Delivered Meals				
No response		0	7	6.5
1-49		960	36	33.0
50-99		2,432	36	33.0
100-149		2,060	18	16.5
>150		2,460	12	11.0
	Totals	7,912*	109	100.0

*Missing data

answered "yes", 45 percent (N=2) contracted with Morrison's Foodservice Company and 95.4 percent (N=42) were funded by the government.

Almost all (97.2%, N=106) of the survey respondents managed conventional foodservice systems. Only 2.89 percent (N=3) managed other systems such as assembly/serve, cook/chill, or cook/freeze.

Foodservice Personnel

Table VI summarized the frequencies reported for foodservice personnel working in the nutrition program. Site managers indicated a total of 75 full-time paid employees were hired by 101 facilities, and 194 part-time foodservice personnel were hired by 100 meal sites. One hundred and one respondents indicated that they a total of 402 volunteer personnel working at their sites.

Hours Spent Training New Foodservice Personnel and Person Responsible for Training

About two-fifths of the respondents (38.5%, N=40) indicated that two to six hours were spent training new foodservice personnel. Approximately 17 percent (N=18) of the respondents indicated that new foodservice personnel were trained zero to one hour in food production procedures. In contrast, 10 or more hours were spent training new foodservice personnel as indicated by 30.8 percent (N=32) of the survey respondents (Figure 3).

Three and one-half percent (N=5) of the respondents reported that no training was conducted presently. Consulting dietitians trained most often as indicated by 48.3 percent (N=69) of the respondents; with

TABLE VI

FREQUENCY DISTRIBUTION OF FOODSERVICE PERSONNEL WORKING IN THE NUTRITION PROGRAM

Number of Personnel	Response N	Full-time[a] Personnel	Response N	Part-time[b] Personnel	Response N	Volunteer[c] Personnel
0	69	0	23	0	44	0
1	14	14	13	13	9	9
2	9	18	31	62	19	38
3	7	21	18	54	3	9
4	3	12	11	44	3	12
5	2	10	3	15	4	20
6	0	0	1	6	3	18
7	0	0	0	0	3	21
10	0	0	0	0	4	40
15	0	0	0	0	4	60
22	0	0	0	0	1	22
23	0	0	0	0	1	23
35	0	0	0	0	1	35
40	0	0	0	0	1	40
55	0	0	0	0	1	55
Totals	104	75	100	194	101	402

[a]Full-time paid (35 hours or more per week)

[b]Part-time paid (less than 35 hours per week)

[c]Volunteer (full-or part-time and no pay)

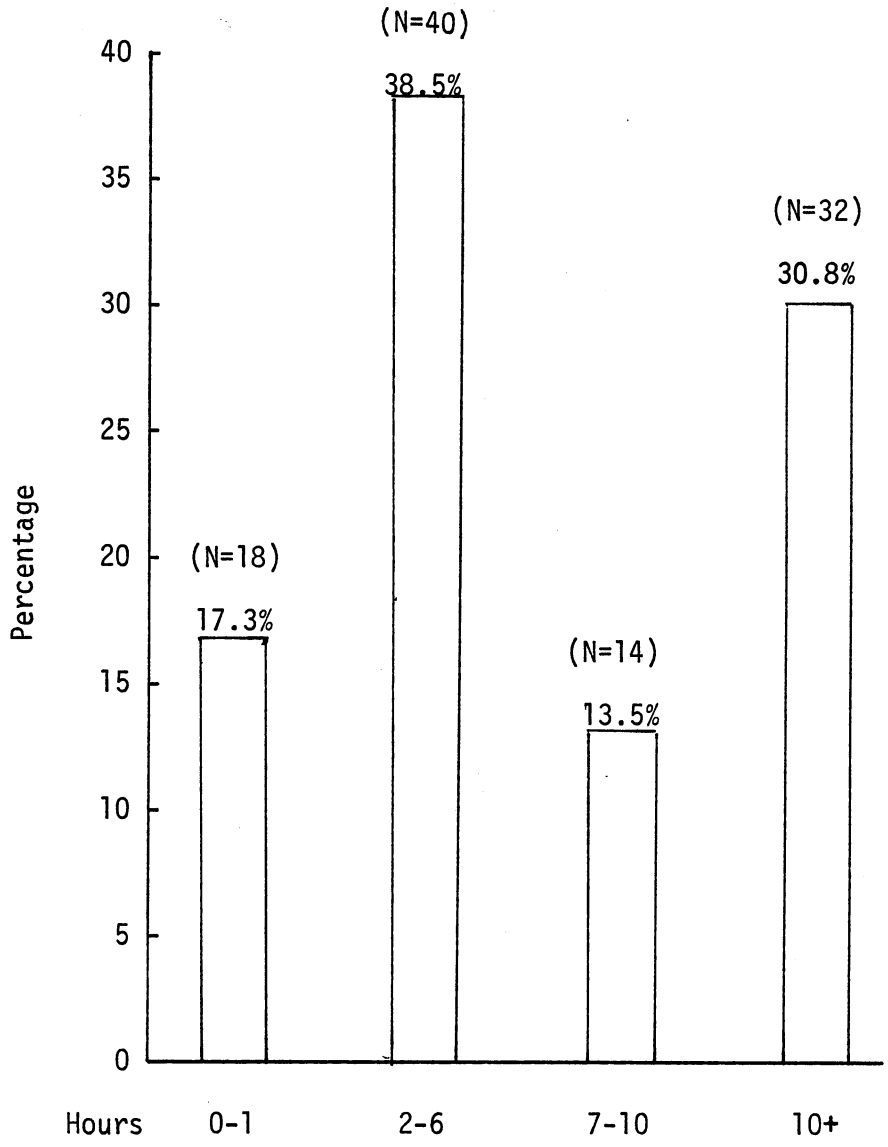


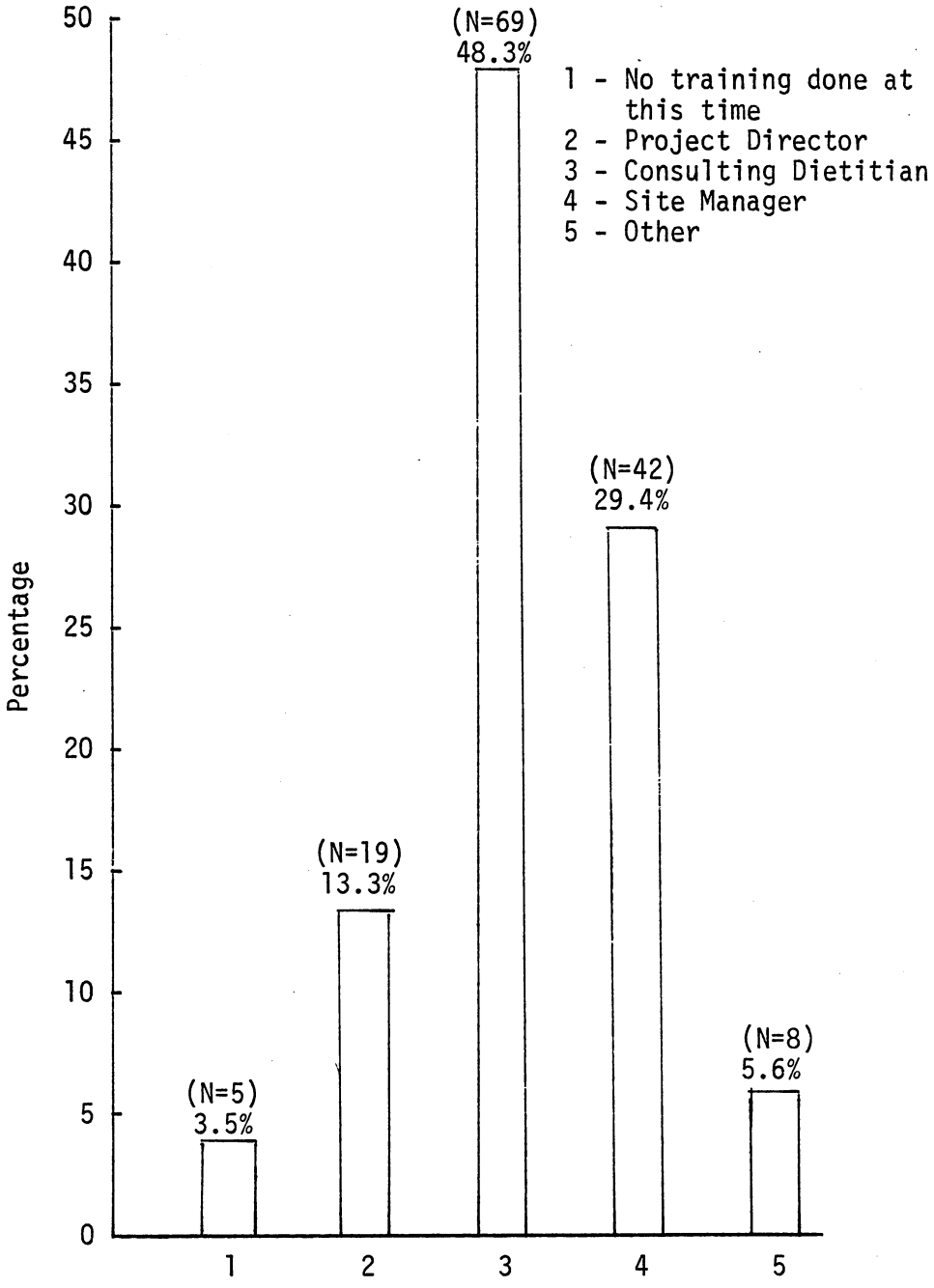
Figure 3. Hours Spent Training New Foodservice Personnel

site managers training next to the highest as indicated by 29.4 percent (N=42) of the respondents. Those 5.6 percent (N=8) of respondents who checked "other" category indicated that vocational education instructors and public health department instructors also trained foodservice personnel (Figure 4).

Perceived Rank Order of Importance of Training Needs

Food production procedures discussed previously were divided into five major groups. There were six to thirteen items with each group totaling 48 procedures of activities (Appendix C).

A rank order was used to determine in what major areas foodservice personnel needed training. A score of 1 was considered the most important areas, 2 next important to 5 which was considered the least important area for training. Ninety-two (84.4%) of the 109 total respondents answered this secion. Sanitation was the most important need area for training with quantity and quality food production and nutrition being the second and third respectively most important need area. Personal health and hygiene, and equipment and safety procedures were ranked similarly and considered the fourth and fifth respectively next most important need areas (Table VII). Since equipment and safety were ranked least important by the majority of respondents, foodservice personnel perhaps are receiving this in training, and therefore, following these procedures on-the-job more often than other procedures. Personal health and hygiene may be considered a major component of sanitation. It is inferred, however, that personal health and hygiene and sanitation were separate procedures and in which foodservice personnel need more training.



Note: More than one category was answered
Total Possible = 143

Figure 4. Person Responsible for Training

TABLE VII

RANK ORDER OF PERCEIVED IMPORTANCE OF TRAINING NEEDS[a]

Major Group	Sum[b]	Standard Deviation	Composite Mean Level of Importance[c]
1 - Equipment and Safety	361	1.12	3.92
2 - Personal Health and Hygiene	311	1.35	3.38
3 - Nutrition	243	1.23	2.64
4 - Quantity and Quality Food Production	242	1.35	2.63
5 - Sanitation	216	1.08	2.35

[a]Only 92 out of 109 responded

[b]Total possible = 460

[c]Score 1 - most important area for training needs, 5 - least important area for training needs

Testing the Hypotheses

H_1: There will be no significant difference in the food production scores included on-the-job and in a training program based on the site manager's 1) length of employment, 2) previous program employment, 3) employment status, and 4) highest degree attained.

The t-test, one-way analysis of variance (ANOVA), and Duncan's multiple range were used to determine the effects of selected independent variables on food production scores. Significant differences were not revealed when the t test procedure was utilized. The Duncan's multiple range test was used to determine multiple comparisons and differences between group means. Food production scores were generated by totaling columns in the two sections: on-the-job and in-training. Each response was given a score - always (5) to not applicable (1). Differences were considered significant at $p \leq 0.05$.

Length of Employment and Highest Degree

Eight differences were found by ANOVA and Duncan's multiple range tests. When testing for on-the-job quantity and quality food production, those 16 respondents employed less than one year indicated employees followed procedures more often than those respondents (N=39, N=29) who had one or more years of experience ($p \leq 0.01$). A second difference was found for the same procedures against highest degree ($p \leq 0.05$). The difference tween group means were perhaps attributed to the one respondent in the "other" category who indicated employees always followed procedures. Interestingly, those 74 high school graduates had employees who followed procedures less than those six respondents

with a bachelor of science degree, yet the means were not grouped differently (Table VIII).

When testing on-the-job and in-training sanitation scores, three differences were discovered. Employees followed procedures more as indicated by 17 respondents employed less than one year ($p \leq 0.01$). Those two who had "other" degrees listed employees followed procedures more than the six respondents with a bachelor of science degree and 71 with a high school diploma (Table IX).

One respondent with a master of science degree answered that all sanitation procedures were included in a training program. The difference between group means, however, was among the "other" degree category ($p \leq 0.05$), who did not always include procedures in a training program (Table X).

Other differences were found among independent variables when compared with on-the-job equipment and safety scores. Managers with less than one year of experience again scored higher than other groups ($p \leq 0.01$). Six respondents with a bachelor of science degree had employees who followed procedures more than those with a high school education (N=78) and master of science degree (N=2) ($p \leq 0.01$). The scores between the last two groups, however, were not considered different (Table XI).

For on-the-job nutrition procedures, two respondents with "other" degrees said that employees followed procedures more than those with a bachelor of science degree (N=5), high school diploma (N=74) and master of science degree (N=2) ($p \leq 0.05$). Those two with "other" degrees saw that foodservice personnel followed procedures sometimes to always on-the-job. Those with a bachelor of science degree and master of science

TABLE VIII

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB QUANTITY AND QUALITY FOOD PRODUCTION SCORES: LENGTH OF EMPLOYMENT

	ANOVA			
Source	df	SS	MS	F Value
Length of Employment	2	1572.23	786.12	5.21*
Error	81	12231.91	151.01	
Total	83	13804.14		
Highest Degree	3	1258.52	419.51	2.64**
Error	79	12535.17	158.67	
Total	82	13793.69		

	Duncan's Multiple Range		
Source	N	Mean	Grouping
Length of Employment			
≤1 year	16	37.94	A
1-5 years	39	28.03	B
>5 years	29	26.00	B
Highest Degree			
Other	1	60.00	A
Bachelor of Science	6	34.67	B
High School	74	28.60	B
Master of Science	2	22.00	B

*$p \leq 0.01$

**$p \leq 0.05$

TABLE IX

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB SANITATION SCORES: LENGTH OF EMPLOYMENT

	ANOVA			
Source	df	SS	MS	F Value
Length of Employment	2	1017.33	508.67	7.83*
Error	79	5131.95	64.96	
Total	81	6149.28		
Highest Degree	3	1455.44	485.15	7.96*
Error	77	4693.70	60.96	
Total	80	6149.14		

	Duncan's Multiple Range			
Source	N	Mean	Grouping	
Length of Employment				
<1 year	17	33.24	A	
1-5 years	36	24.92	B	
>5 years	29	24.17	B	
Highest Degree				
Other	2	48.50	A	
Bachelor of Science	6	33.83	B	
High School	71	25.28	B	C
Master of Science	2	21.00		C

*$p \leq 0.01$

TABLE X

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR IN-TRAINING SANITATION SCORES: HIGHEST DEGREE

ANOVA

Source	DF	SS	MS	F Value
Highest Degree	3	12.23	4.21	2.89*
Error	70	101.86	1.46	
Total	73	114.49		

Duncan's Multiple Range

Source	N	Mean	Grouping
Highest Degree			
Master of Science	1	13.00	A
High School	67	12.54	A
Bachelor of Science	5	12.40	A
Other	1	9.00	B

*$p \leq 0.05$

TABLE XI

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB EQUIPMENT AND SAFETY SCORES: LENGTH OF EMPLOYMENT

	ANOVA			
Source	DF	SS	MS	F Value
Length of Employment	2	323.92	161.96	4.67*
Error	86	2982.98	34.69	
Total	88	3306.90		
Highest Degree	3	412.87	137.62	4.00*
Error	84	2892.95	34.44	
Total	87	3305.82		

	Duncan's Multiple Range			
Source	N	Mean	Grouping	
Length of Employment				
<1 year	17	20.94	A	
1-5 years	42	16.29		B
>5 years	30	15.87		B
Highest Degree				
Other	2	28.00	A	
Bachelor of Science	6	21.50	A	B
High School	78	16.53		B
Master of Science	2	13.00		B

*$p \leq 0.01$

degree indicated employees followed procedures rarely to seldom (Table XII).

Based on the eight differences found between food production scores on-the-job and in a training program and independent variables, the researcher rejected Hypothesis (H_1). There were no differences discovered between previous employment and procedure scores. The less experience managers had the less likely employees followed procedures. Perhaps less experienced managers had less responsibilities and could observe employees more often than managers employed longer than one year. Also those who had "other" degrees and bachelor of science degrees saw that employees followed procedures more, possibly, because these managers concentrated in management and/or foods related majors.

H_2: There will be no significant difference in the food production scores included on-the-job and in a training program based on the 1) meal site district, 2) total meals served, 3) meal site facility location, 4) type of foodservice system, 5) number of staff, 6) hours spent in training, 7) the trainer, 8) training techniques, and 9) methods to measure and evaluate training.

The t test, one-way analysis of variance (ANOVA), Duncan's multiple range, and chi-square were used to determine the differences between selected independent variables on food production scores. Differences at $p \leq 0.05$ were considered significantly different. Twenty-three differences were discovered with the t-test procedure, 14 with ANOVA and Duncan's multiple range, and 12 with chi-square. (Refer to Appendix E for complete chi-square tables.)

TABLE XII

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB NUTRITION SCORES: HIGHEST DEGREE

ANOVA

Source	df	SS	MS	F Value
Highest Degree	3	395.67	131.89	3.64*
Error	79	2862.29	36.23	
Total	82	3257.95		

Duncan's Multiple Range

Source	N	Mean	Grouping	
Highest Degree				
Other	2	25.00	A	
Bachelor of Science	5	19.80	A	B
High School	74	14.49		B
Master of Science	2	10.50		B

*$p \leq 0.05$

Type of Foodservice System and the Trainer

Those respondents who operated from conventional foodservice systems rank ordered nutrition procedures as the second to third most training need area. The two respondents who operated from cook chill/ cook freeze systems ranked personal health and hygiene procedures almost the second training need area. For those respondents who operated from assembly serve systems, these respondents indicated that personal health and hygiene procedures were again almost the second training need area. These differences, however, may be a result of the number of respondents for each group, rather than the variables under consideration (Table XIII).

Five respondents indicated that no training was conducted presently in equipment and safety procedures. Perhaps these differences again are a result of the number of respondents for each group (Table XIV).

Training Techniques and Methods to Measure and Evaluate Training

Those sites who used discussion, charts, film, slides or tapes, paper and pencil tests, observing personnel on-the-job and a rating scale to evaluate performance had employees who followed quantity and quality procedures less often than those who did not use these techniques and methods ($p \leq 0.04$) (Table XV). Chi-square values determined a similar association between procedure scores and paper and pencil tests ($p=0.0154$, $X^2=38.671$, $df=22$). Sixty-seven percent (N=56) of the respondents who did not use paper and pencil tests indicated employees

TABLE XIII

t-TEST PROCEDURE FOR RANK ORDER OF IMPORTANCE OF TRAINING NEEDS: TYPE OF FOODSERVICE SYSTEM

Variable	N	Mean	Standard Deviation	t	Observed Significance Level
Nutrition:					
Conventional					
Yes	89	2.58	1.20	2.49	0.01
No	3	4.33	0.58		
Personal Health and Hygiene:					
Cook Chill/Cook Freeze					
Yes	2	1.50	0.70	2.01	0.04
No	90	3.42	1.34		
Personal Health and Hygiene:					
Assembly Service					
Yes	4	1.75	0.96	2.53	0.01
No	88	3.45	1.33		

TABLE XIV

t-TEST PROCEDURE FOR EQUIPMENT AND SAFETY SCORES: THE TRAINER

Variable	N	Mean	Standard Deviation	t	Observed Significance Level
In Training:					
No training done at this time					
Yes	5	7.80	0.45	-2.53	0.02
No	73	7.03	1.97		

followed procedures more often than the 33 percent (N=28) of respondents who did use this method to evaluate training.

In a training program, demonstration was included less often than paper and pencil tests and evaluating by a rating scale ($p \leq 0.05$) (Table XV). Chi-square values determined two other associations for in-training scores. Ninety-five percent (N=71) of the respondents indicated that observing personnel was used to evaluate training ($p=0.0224$, $X^2=20.824$, $df=10$). There was also a positive association ($p=0.0388$, $X^2=19.120$, $df=10$) between evaluation measures and in-training scores. Thirty-five percent (N=26) who used a rating scale and 65 percent (N=49) who did not included quantity and quality procedures in their training program. These results may indicate that paper and pencil tests and rating scale were not adequate methods to evaluate and measure learning and performance for quantity and quality procedures.

For sanitation procedures, when other techniques were used employees tended not to follow procedures on-the-job. The difference may be between the groups' size instead of the variables under consideration. In a training program, paper and pencil tests were used more often than evaluating performance on-the-job ($p=0.04$) (Table XVI).

For equipment and safety procedures, employees tended not to follow them when discussion was used in group meetings. This may indicate that equipment and safety training required actual contact with equipment and materials for learning tasks to perform skills on-the-job. Evaluating by a rating scale was used, however, to measure performance (Table XVII).

Chi-square values showed a positive association ($p=0.0236$, $X^2=29.047$, $df=16$) between equipment and safety scores and training

TABLE XV

t-TEST PROCEDURE FOR QUANTITY AND QUALITY FOOD PRODUCTION SCORES: TRAINING TECHNIQUES AND METHODS TO MEASURE AND EVALUATE TRAINING

Variable	N	Mean	Standard Deviation	t	Observed Significance Level
On the Job:					
Discussion					
Yes	71	27.54	11.73	2.91	0.004
No	13	38.38	15.47		
Charts, Film, Slides, or Tape					
Yes	57	26.68	10.15	2.31	0.02
No	27	34.56	16.29		
Paper and Pencil Tests					
Yes	28	25.93	7.37	2.05	0.04
No	56	30.86	14.70		
Observing Personnel					
Yes	77	28.27	12.33	2.27	0.03
No	7	39.57	15.39		
Evaluating by Rating Scale					
Yes	26	24.92	11.27	2.08	0.04
No	58	31.14	13.20		

TABLE XV (Continued)

Variable	N	Mean	Standard Deviation	t	Observed Significance Level
In Training:					
Demonstration					
Yes	52	9.69	3.28	1.99	0.05
No	23	10.91	1.98		
Paper and Pencil Test					
Yes	27	11.03	1.93	-2.49	0.01
No	48	9.52	3.33		
Evaluate by Rating Scale					
Yes	26	11.00	2.51	-2.01	0.05
No	49	9.57	3.11		

TABLE XVI

t-TEST PROCEDURE FOR SANITATION SCORES: TRAINING TECHNIQUES AND METHODS TO MEASURE AND EVALUATE TRAINING

Variable	N	Mean	Standard Deviation	t	Observed Significance Level
On the Job:					
Other Techniques					
Yes	2	13.5	0.71	2.16	0.03
No	80	26.7	8.57		
In Training:					
Paper and Pencil Tests					
Yes	27	12.81	0.48	-2.14	0.04
No	48	12.31	1.49		
Evaluate Performance on-the-Job					
Yes	67	12.45	1.30	2.11	0.04
No	8	12.88	0.35		

TABLE XVII

t-TEST PROCEDURE FOR EQUIPMENT AND SAFETY SCORES: TRAINING TECHNIQUES AND METHODS TO MEASURE AND EVALUATE TRAINING

Variable	N	Mean	Standard Deviation	t	Observed Significance Level
On the Job:					
Discussion					
Yes	74	15.83	4.40	2.83	0.01
No	15	22.93	9.50		
In Training:					
Evaluate by Rating Scale					
Yes	26	7.62	1.06	-2.38	0.02
No	54	6.72	2.29		

techniques. Those 83 percent (N=74) who indicated using charts, film, slides, or tapes saw that employees were less likely to follow procedures. Observing personnel on-the-job used as a measure, was positively affected by how often employees followed procedures with a significant association ($p=0.0046$, $X^2=34.519$, $df=16$). Eighty-five percent (N=68) of the respondents who indicated discussion was used revealed that equipment and safety procedures were included in training ($p=0.0428$, $X^2=15.967$, $df=8$). Employees followed procedures more when techniques and methods were not used to train. Perhaps the training techniques and methods used were not adequate to train and to measure for equipment and safety procedures.

When discussing nutrition procedures, they were not followed by employees as often when discussion and charts, film, slides, or tapes were used to train ($p\leq0.01$). Discussion, although, was used to train employees ($p=0.04$) (Table XVIII). Those 2.4 percent (N=2) who used "other" training techniques scored employees lower in following procedures than those 97.6 percent (N=82) who did not use "other" training techniques ($p=0.0001$, $X^2=47.122$, $df=15$). The positive association, however, may be the result of differences in group size rather than the variable under consideration. Similarly, a positive association ($p=0.0005$, $X^2=39.890$, $df=15$) was found between employees following on-the-job sanitation procedures and observing personnel on-the-job. The findings on observing personnel may be significant for the same reasons discussed previously.

In a training program, chi-square values determined significant associations for two techniques used for group training: lecture ($p=0.0302$, $X^2=13.949$, $df=6$) used by 81.3 percent (N=61) and not used by

TABLE XVIII

t-TEST PROCEDURE FOR NUTRITION SCORES: TRAINING TECHNIQUES AND METHODS TO MEASURE AND EVALUATE TRAINING

Variable	N	Mean	Standard Deviation	t	Observed Significance Level
On the Job:					
Discussion					
Yes	69	14.04	5.78	2.94	0.004
No	15	19.07	6.98		
Charts, Film, Slides or Tape					
Yes	58	13.63	5.24	2.61	0.01
No	26	17.85	7.44		
In Training:					
Discussion					
Yes	64	5.20	1.63	-2.03	0.04
No	11	4.09	1.97		

18.7 percent (N=14) of the respondents; and discussion (p=0.0336, X^2=13.665, df=6) used by 85.3 percent (N=64) and not used by 14.7 percent (N=11) of respondents. Those "other" methods used to evaluate training had a significant association (p=0.0063, X^2=17.990, df=6) primarily because of differences between those who answered "yes" (N=1) and those who answered "no" (N=75).

For personal health and hygiene procedures, chi-square values determined a positive association (p=0.0022, X^2=14.584, df=3) in a training program. Almost 82 percent (N=68) who used lecture procedures were included in a training program. Employees, in general, were less likely to follow procedures on-the-job when various techniques and methods were used to train or evaluate the effects of training. Perhaps these techniques were ineffective to train employees or employees' performance was altered when managers observed and evaluated their performance on-the-job.

For the rank order of importance of training needs, three differences were discovered ($p \leq 0.04$). Those respondents N=30) who used paper and pencil tests rank ordered quantity and quality procedures as third most training need area. Those respondents (N=30) who used the same method rank ordered personal health and hygiene procedures as the second to the third most training need area. Equipment and safety procedures were ranked as second to the third most training need area by those respondents (N=83) who observed personnel on-the-job (Table XIX).

TABLE XIX

t-TEST PROCEDURE FOR RANK ORDER OF IMPORTANCE OF TRAINING NEEDS: TRAINING TECHNIQUES AND METHODS TO MEASURE AND EVALUATE TRAINING

Variable	N	Mean	Standard Deviation	t	Observed Significance Level
Quantity and Quality:					
Paper and Pencil Test					
Yes	30	3.07	1.25	-2.12	0.04
No	60	2.43	1.37		
Personal Health and Hygiene:					
Paper and Pencil Test					
Yes	30	2.83	1.28	2.79	0.006
No	60	3.65	1.31		
Equipment and Safety:					
Observing Personnel On-the-Job					
Yes	83	2.55	1.20	2.14	0.04
No	7	3.57	1.27		

Person Responsible for Training Personnel, Training Techniques and Methods to Measure and Evaluate Training

Other differences were found for food production scores based on who trains, and the training techniques and methods to measure and evaluate training. When site managers observed personnel performance on-the-job, personnel followed procedures more often than when consulting dietitians observed personnel ($p \leq 0.05$) (Table XX). This is perhaps related to site managers being on the premises daily and having line authority whereas a consulting dietitian, being a staff person, only visits sites at least eight hours per month and only makes suggestions and does not tend to enforce daily procedures.

Demonstration was performed by site managers more often than other trainers, and both site managers and consulting dietitians demonstrated procedures more than "other" trainers ($p \leq 0.05$). Consulting dietitians included charts, film, slides, or tapes more than when dietitians and managers together trained employees ($p \leq 0.05$) (Table XXI).

Site managers who observed personnel on-the-job indicated employees followed procedures more often than when others observed ($p \leq 0.01$). Again this may indicate that site managers are on the premises more than other trainers (Table XXII). In a training program both site managers and consulting dietitians demonstrated procedures more than consulting dietitians or "others" along ($p \leq 0.05$). Consulting dietitians used charts and media more and site managers indicated using these techniques almost as often ($p \leq 0.01$) (Table XXIII). These findings may again be related to similar reasons stated earlier

TABLE XX

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB QUANTITY AND QUALITY FOOD PRODUCTION SCORES: OBSERVING PERSONNEL

ANOVA

Source	df	SS	MS	F Value
Observing Personnel				
On-the-Job	3	1535.02	511.67	3.30*
Error	79	12265.89	155.26	
Total	82	13800.92		

Duncan's Multiple Range

Source	N	Mean	Grouping	
Observing Personnel				
On-the-Job				
Site Managers	7	39.57	A	
Consulting Dietitian	18	32.11	A	B
Other	40	28.70		B
Both	18	23.33		B

*$p \leq 0.05$

TABLE XXI

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR IN-TRAINING QUANTITY AND QUALITY FOOD PRODUCTION SCORES: TRAINING TECHNIQUES

ANOVA				
Source	df	SS	MS	F Value
Demonstration	3	86.93	28.98	3.57*
Error	70	567.95	8.11	
Total	73	654.88		
Charts, Film, Slides, or Tapes	3	68.17	22.72	2.71*
Error	70	586.71	8.38	
Total	73	654.88		

Duncan's Multiple Range			
Source	N	Mean	Grouping
Demonstration			
Site Manager	24	10.88	A
Both	29	10.59	A B
Other	14	8.43	B C
Consulting Dietitian	7	8.14	C
Charts, Film, Slides or Tapes			
Consulting Dietitian	45	10.69	A
Both	5	9.40	A B
Site Manager	22	9.22	A B
Other	2	6.00	B

*$p \leq 0.05$

TABLE XXII

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB SANITATION SCORES: OBSERVING PERSONNEL

	ANOVA			
Source	df	SS	MS	F Value
Observing Personnel				
On-the-Job	3	1220.59	406.86	6.36*
Error	77	4928.55	64.01	
Total	80	6149.14		

	Duncan's Multiple Range		
Source	N	Mean	Grouping
Observing Personnel			
On-the-Job			
Site Manager	8	37.50	A
Consulting Dietitian	18	27.28	B
Other	38	24.84	B
Both	17	23.65	B

*$p \leq 0.01$

TABLE XXIII

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR IN-TRAINING SANITATION FOOD PRODUCTION SCORES: TRAINING TECHNIQUES

ANOVA				
Source	df	SS	MS	F Value
Demonstration	3	12.11	4.04	2.76*
Error	70	102.38	1.46	
Total	73	114.49		
Charts, Film, Slides, or Tapes	3	19.90	6.63	4.91**
Error	70	94.58	1.35	
Total	73	114.49		

Duncan's Multiple Range			
Source	N	Mean	Grouping
Demonstration			
Site Manager	26	12.69	A
Both	29	12.69	A
Consulting Dietitian	7	12.43	A B
Other	12	11.58	B
Charts, Film, Slides, or Tapes			
Consulting Dietitian	44	12.75	A
Site Manager	24	12.42	A B
Both	4	11.00	B C
Other	2	10.50	C

*$p \leq 0.05$

**$p \leq 0.01$

for quantity and quality procedures; the site managers demonstrated procedures, whereas dietitians used other visual media to train sanitation procedures.

For on-the-job equipment and safety scores, when site managers observed performance, employees followed procedures more than when others observed ($p \leq 0.01$) (Table XXIV). The differences here may again be related to site managers who are on the premises more often, observed employee performance more than other trainers.

For nutrition procedures, site managers who observed personnel on-the-job viewed personnel followed procedures more often than other trainers ($p \leq 0.01$). When dietitians observed personnel, they viewed that employees rarely followed procedures (Table XXV). A possible reason for this may be that dietitians were more familiar with nutrition procedures and identified neglected personnel performances more than site managers and/or other trainers.

Demonstration was used most often by both dietitians and site managers ($p \leq 0.05$). Site managers who trained alone tended not to include nutrition procedures in a training program ($p=0.03$) (Table XXVI). The findings may indicate that dietitians and site managers trained and observed nutrition practices and procedures more than other trainers.

Site Location

When testing procedures against site location, five differences were found significant at $p \leq 0.05$. All five differences were discovered by the ANOVA procedure. For on-the-job quantity and quality food procedures, differences were found between site locations ($p \leq 0.01$).

TABLE XXIV

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB EQUIPMENT AND SAFETY SCORES: OBSERVING PERSONNEL

	ANOVA			
Source	df	SS	MS	F Value
Observing Personnel				
On-the-Job	3	480.33	160.12	4.76*
Error	84	2825.49	33.64	
Total	87	3305.82		

	Duncan's Multiple Range		
Source	N	Mean	Grouping
Observing Personnel			
On-the-Job			
Site Manager	9	23.78	A
Other	41	16.63	B
Consulting Dietitian	19	16.53	B
Both	19	15.26	B

*$p \leq 0.01$

TABLE XXV

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB NUTRITION SCORES: OBSERVING PERSONNEL

ANOVA

Source	df	SS	MS	F Value
Observing Personnel On-the-Job	3	827.26	275.75	8.96*
Error	79	2430.69	30.77	
Total	82	3257.95		

Source	N	Mean	Grouping
Observing Personnel On-the-Job			
Site Manager	9	22.00	A
Consulting Dietitian	18	17.28	B
Other	37	14.03	B C
Both	19	11.32	C

*$P \leq 0.05$

TABLE XXVI

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR IN-TRAINING NUTRITION SCORES: DEMONSTRATION

ANOVA				
Source	df	SS	MS	F Value
Demonstration	3	27.64	9.21	3.43*
Error	70	188.30	2.69	
Total	73	215.95		

Duncan's Multiple Range				
Source	N	Mean	Grouping	
Demonstration				
Both	29	5.59	A	
Consulting Dietitian	24	5.13	A	
Other	14	4.36	A	B
Site Manager	7	3.71		B

*$p \leq 0.05$

Those four who responded operating from religious institutions indicated employees followed procedures sometimes to always; and those 10 who operated from low income housing facilities reported employees followed procedures rarely to seldom. Other respondents indicated that procedures did not apply or that employees rarely followed them on-the-job (Table XXVII).

Similar differences were discovered for on-the-job sanitation procedures. Those employees who worked in religious institutions and low income housing facilities followed procedures more often than in other facilities ($p \leq 0.01$) (Table XXVIII). In contrast, sanitation procedures were reported to be not included as often in a training program in low income housing facilities and religious institutions ($p \leq 0.05$) (Table XXIX). Perhaps employees received more training on-the-job than instruction in a training program in these facilities.

For on-the-job nutrition procedures, likewise, employees followed procedures more in religious institutions and low income housing facilities than in other site locations ($p \leq 0.05$). The one restaurant who indicated that these procedures rarely applied to their facility was perhaps a satellite facility (Table XXX).

In much the same way, employees followed personal health and hygiene procedures more often in religious institutions ($p \leq 0.05$), yet, they were doing it seldom. The one restaurant did not view personal health and hygiene procedures applicable to their establishment (Table XXXI).

Based on the 49 differences discovered among on-the-job and in-training food production scores and on selected independent variables, the researcher rejected Hypothesis (H_2). In general, the training

TABLE XXVII

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB QUANTITY AND QUALITY FOOD PRODUCTION SCORES: SITE LOCATION

ANOVA

Source	df	SS	MS	F Value
Site Location	5	2707.10	541.42	3.81*
Error	78	11097.04	142.27	
Total	83	13804.14	142.27	

Duncan's Multiple Range

Source	N	Mean	Grouping
Site Location			
Religious Institution	4	51.75	A
Low Income Housing	12	32.30	B
Civic Center	29	28.90	B C
Other	36	27.25	B C
School	4	23.25	B C
Restaurant	1	12.00	C

*$p \leq 0.01$

TABLE XXVIII

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB SANITATION SCORES: SITE LOCATION

ANOVA				
Source	df	SS	MS	F Value
Site Location	5	1459.19	291.84	4.73*
Error	76	4690.09	61.71	
Total	81	6149.28		

Duncan's Multiple Range			
Source	N	Mean	Grouping
Site Location			
Religious Institution	4	42.48	A
Low Income Housing	11	29.27	B
Other	34	25.32	B C
Civic Center	28	25.04	B C
School	4	23.75	B C
Restaurant	1	13.00	C

*$p \leq 0.01$

TABLE XXIX

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR IN-TRAINING SANITATION SCORES: SITE LOCATION

ANOVA				
Source	df	SS	MS	F Value
Site Location	4	16.97	4.24	3.04*
Error	70	97.78	1.39	
Total	74	114.75		

Duncan's Multiple Range				
Source	N	Mean	Grouping	
Site Location				
School	4	12.75	A	
Civic Center	25	12.72	A	
Other	34	12.65	A	
Low Income Housing	9	11.78	A	B
Religious Institution	3	10.67		B

*$p \leq 0.05$

TABLE XXX

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB NUTRITION SCORES: SITE LOCATION

ANOVA				
Source	df	SS	MS	F Value
Site Location	5	498.88	98.98	2.79*
Error	78	2771.82	35.54	
Total	83	3266.70		

Duncan's Multiple Range				
Source	N	Mean	Grouping	
Site Location				
Religious Institution	5	22.80	A	
Low Income Housing	11	17.46	A	B
Civic Center	29	14.76	A	B
Other	34	13.59	A	B
School	4	12.25		B
Restaurant	1	10.00		B

*$p \leq 0.05$

TABLE XXXI

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR ON-THE-JOB PERSONAL HEALTH AND HYGIENE SCORES: SITE LOCATION

ANOVA

Source	df	SS	MS	F Value
Site Location	5	387.74	77.55	2.41*
Error	85	2731.80	32.14	
Total	90	3119.54		

Duncan's Multiple Range

Source	N	Mean	Grouping	
Site Location				
Religious Institution	6	24.00	A	
Other	37	17.84	A	B
Civic Center	31	17.39	A	B
School	4	15.76	A	B
Low Income Housing	12	15.33	A	B
Restaurant	1	9.00		B

*$p \leq 0.05$

techniques used most often in group meetings were 1) demonstration, 2) charts, film, slides, or tapes, and 3) discussion. Lecture was said to be used in group meetings but not as frequently as other techniques. It was also evident that when these techniques were used, employees were less likely to follow procedures on-the-job than when they were not used. The researcher did not expect these differences. It would seem that if these techniques were used to train, then employees would tend to follow procedures.

The most common evaluation methods used to follow up training were 1) paper and pencil tests, 2) observing personnel on-the-job, and 3) evaluate performance on-the-job. Even though these methods were used in-training and on-the-job, employees tended not to follow procedures.

Differences also revealed that demonstration was included in training programs, yet not as much as other techniques. Perhaps trainers saw that demonstration was ineffective to train in quantity and quality procedures, sanitation procedures, equipment and safety procedures, and personal health and hygiene procedures. Even though these techniques and methods were predominantly used in nutrition training, employees followed procedures more when they were not used. The researcher summarized that perhaps more on-the-job training and coaching was taking place in nutrition programs.

Site managers observing performance indicated employees followed procedures more often than when others observed personnel. Perhaps dietitians were not observing as much as site managers or dietitians identified problem areas more readily. Dietitians were more likely to use charts, film, slides, or tapes in quantity and quality and

sanitation training. Demonstration was used by both site managers and consulting dietitians in group meetings.

The tendency for religious institutions to indicate employees followed procedures more than other facilities perhaps may reveal that procedures were receiving more attention after training. Employees in low income housing facilities followed procedures in each area except for sanitation practices. There may be a need for more training in all five areas for all facilities since employees' scores were low. Also, satellite sites need not be considered as a separate entity for training. Satellites need to know and follow all five major food production areas since food handling (including sanitation, personal health and hygiene) and nutrition are essential to help foodservices operate efficiently and effectively.

H_3: There will be no significant difference in the training needs scores based on the same variables in H_1 and H_2.

Analysis of variance (ANOVA), Duncan's multiple range and chi-square values were used to test differences between training needs scores and selected independent variables through group mean calculation. (See Appendix E for complete chi-square tables.) Four differences were found through ANOVA and Duncan's multiple range and five differences were found when chi-square values were determined. Survey respondents rank ordered their perceived importance of training needs for the five food production areas (see Research Instrument, Appendix C).

One difference was found for the importance of sanitation training and site district ($p \leq 0.05$). Those four respondents from district NODA indicated less of a need for sanitation training than what other

districts indicated. Those five respondents from district OEDA needed training in sanitation procedures. Other districts indicated they moderately needed sanitation training (Table XXXII).

Those 75 respondents (83.33%) who evaluated job performance needed sanitation training ($p=0.0069$, $X^2= 14.134$, $df=4$). Twenty-four (32%) of those who used this method ranked sanitation training needs most important. Nine out of the 15 respondents who did not evaluate performance indicated sanitation training was the second most important training need area.

For equipment and safety training, three differences were found. The first difference was noticed between site locations ($p\leq 0.05$). Those respondents from religious institutions had an average rank order of equipment and safety training being the second most important area for training. This finding compared to the results in Hypothesis (H_2). This facility indicated that employees followed procedures seldom to sometimes on-the-job. This did not necessarily indicate that employees working in religious institutions need more sanitation training than other sites. Perhaps significance associations were only revealed for this meal site facility (Table XXXIII).

The second difference was revealed between the use of paper and pencil tests ($p\leq 0.01$). Those site managers and consulting dietitians who used paper and pencil tests to evaluate training outcomes, viewed equipment and safety training less important for their facilities (Table XXXIII).

A third difference revealed that one respondent (1.1%) who used other methods to measure training ranked equipment and safety training second most important ($p=0.0068$, $X^2=14.157$, $df=4$). Of the 89 (98.9%)

TABLE XXXII

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR RANK ORDER OF TRAINING NEEDS IN SANITATION PROCEDURES: DISTRICT

ANOVA

Source	df	SS	MS	F Value
District	10	23.65	2.37	2.25*
Error	79	82.97	1.05	
Total	89	106.62		

Duncan's Multiple Range

Source	N	Mean	Grouping
District			
NODA	4	3.50	A
KEDDO	9	3.00	A B
ACOG	7	2.71	A B
SWODA	8	2.63	A B
INCOG	11	2.45	A B
SODA	10	2.40	A B
NECO	3	2.33	A B
COEDD	9	2.22	A B
ASCOG	4	2.14	B C
EODD	10	1.80	B C
OEDA	5	1.00	C

*$p \leq 0.05$

TABLE XXXIII

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR RANK ORDER OF TRAINING NEEDS IN EQUIPMENT AND SAFETY PROCEDURES: SITE LOCATION AND PAPER AND PENCIL TEST

ANOVA				
Source	df	SS	MS	F Value
Site Location	4	13.63	3.41	2.94*
Error	87	100.86	1.16	
Total	91	114.47		
Paper and Pencil Tests	2	12.37	6.18	5.30**
Error	84	98.07	1.16	
Total	86	110.47		

Duncan's Multiple Range			
Source	N	Mean	Grouping
Site Location			
School	4	4.25	A
Other	42	4.09	A
Low Income Housing	12	4.08	A
Civic Center	30	3.80	A
Religious Institutions	4	2.25	B
Paper and Pencil Tests			
Site Managers	23	4.09	A
Consulting Dietitian	62	3.94	A
Both	2	1.50	B

*$p \leq 0.05$

**$p \leq 0.01$

respondents who did not use these methods, 35 (39%) ranked these procedures least important. The differences, however, may be a result of groups' size rather than the variables under consideration.

For nutrition training needs, one other difference was discovered. Eighty-three of the respondents (92.2%) who demonstrated nutrition procedures in group meetings revealed a need for nutrition training ($p=0.0335$, $X^2=10.452$, $df=4$). Almost one-half of the respondents ($N=40$) rank ordered a need for nutrition training either as most important or second most important area. Those four out of seven who did not use demonstration, ranked nutrition training as the fourth most important needed area for training. Perhaps nutrition training needs can be identified when trainers demonstrated procedures in group meetings.

Two differences were discovered for personal health and hygiene training. First, those 87 (96.7%) of respondents who did not use and those three (3.3%) who did use "other" group training techniques saw a need for training ($p=0.0090$, $X^2=13.522$, $df=4$). From those who did not use "other" techniques, 19 ranked procedures second most important and the majority, 22, ranked procedures least important. From those three who did use "other" techniques, two rank ordered these procedures as a priority area for training. Again, the differences may reveal a difference in the size of the groups instead of variables under consideration.

The second difference was discovered among paper and pencil tests ($p\leq0.01$). When site managers trained the most and used paper and pencil tests, there was a higher need for training than when dietitians trained alone. Where both trained, however, there was a higher need for

training (Table XXXIV). These differences may indicate that paper and pencil tests may not reveal evidence for training. This may also be indicative of site managers who were on the premises more than consulting dietitians, and observed a need for personal health and hygiene training.

Although not all variables tested were found significant, based on the nine differences found significant, however, the researcher again found appropriate evidence to reject Hypothesis (H_3). Differences found regarding "other" techniques and methods to measure and evaluate training perhaps may be the result of differences in groups' size rather than the variables considered. In general, those who used paper and pencil tests revealed a need for training in sanitation, equipment and safety (by both dietitians and site managers), and personal health and hygiene (by both dietitians and site managers). In contrast, quantity and quality food production training was not perceived important by those who used paper and pencil tests, yet training was more important by those who did not use this method. Perhaps paper and pencil tests were not effective to measure quantity and quality food production procedures. Those who used this method perhaps found this an effective tool to measure knowledge employees learned from training.

When other training techniques and measures were used, such as discussion, demonstration, and evaluating job performance, there was an important need for training in nutrition and sanitation procedures. These techniques and measures may be good management tools to train, evaluate, and measure employee performances in nutrition and sanitation procedures.

TABLE XXXIV

ANALYSIS OF VARIANCE AND DUNCAN'S MULTIPLE RANGE FOR RANK ORDER OF TRAINING NEEDS IN PERSONAL HEALTH AND HYGIENE PROCEDURES: PAPER AND PENCIL TEST

ANOVA

Source	df	SS	MS	F Value
Paper and Pencil Tests	2	17.96	8.98	5.34*
Error	84	141.14	1.68	
Total	86	159.10		

Duncan's Multiple Range

Source	N	Mean	Grouping	
Paper and Pencil Tests				
Consulting Dietitian	2	5.00	A	
Site Manager	62	3.61	A	B
Both	23	2.74		B

*$p \leq 0.01$

Only one respondent from OEDD, indicated that sanitation was the most important area for training and all respondents from EODD indicated sanitation the second most important area. Religious institutions ranked equipment and safety procedures the second most training need area. There was no significant association found, however, indicating if employees followed equipment and safety procedures on-the-job in Hypothesis (H_2). Thus, the three most common training need areas based on the same variables in H_1 and H_2 were in sanitation procedures, quantity and quality food production procedures, and nutrition procedures. Training techniques and methods to measure and evaluate training perhaps are discrete management tools for certain procedures and are effective when properly used to train and evaluate training outcomes.

H_4: There will be no significant difference in the food production scores in a training program based on the frequency of employees to follow on-the-job procedures. The Spearman's rho correlation coefficient was used to determine correlations between dependent variables and the rank order of importance of training needs. Differences were found significant at $p \leq 0.01$ with correlations ranging from -.25 to .81.

All five major food production areas were found to be negatively correlated. No direct relationships were found, however, between in-training procedure scores and its respective on-the-job procedure score.

For quantity and quality food production procedures, there was a high indirect relationship between in-training and on-the-job scores ($r=-.63$). This relationship may indicate that even though procedures were included in training, employees were not following them on-the-job. The negative correlations may also reflect that the more procedures

were followed on-the-job, the less they were included in a training program.

There were also negative correlations between sanitation scores (r=-.52) in a training program and on-the-job. For equipment and safety procedures there was a strong indirect relationship (r=-.58) and also for nutrition procedures (r=-.73). A weak indirect relationship was found for personal health and hygiene procedures (r=-.25) (Table XXXIV).

Based on the five differences found between in-training and on-the-job food production scores, the researcher rejected Hypothesis (H_4). The three procedures with the most negative correlations were also perceived as the three most important training needs by the respondents.

TABLE XXXV

CORRELATIONS AMONG FOOD PRODUCTION SCORES[a]

Variables	In-Training Quantity and Quality Food Production	In-Training Sanitation	In-Training Equipment and Safety	In-Training Nutrition	In-Training Personal Health and Hygiene
On-the-Job Quantity and Quality Food Production	-.63* (71)				
On-the-Job Sanitation		-.52* (71)			
On-the-Job Equipment and Safety			-.58* (76)		
On-the-Job Nutrition				-.73* (70)	
On-the-Job Personal Health and Hygiene					-.25** (79)

[a]Decimals were rounded to the nearest hundreth.

*$p \leq .001$

**$p \leq .01$

CHAPTER V

SUMMARY, RECOMMENDATIONS, AND IMPLICATIONS

Training personnel in the foodservice industry is not new, however, this study was the first in attempting to identify and assess training needs of foodservice personnel and the training practices in Oklahoma's Nutrition Program for Older Americans. In the review of literature, training foodservice personnel has been given attention since the early 1900s. More training was conducted after World War II when unskilled labor entered the work force.

It was also realized that managers and especially the employee's immediate supervisor play a vital role in the employee's performance on-the-job. Recent literature suggests that economic conditions and decreased government funding for aging services are placing more time constraints on the dietitian and to delegate training responsibilities to the supervisor. For this reason, the site manager was selected to serve as the survey population.

This study focused on the food production training needs of food-service personnel in Oklahoma's Nutrition Program for Older Americans with the guide of several objectives: to describe the site manager's personal characteristics and each site's program characteristics; to identify existing food production procedures included in a foodservice personnel training program; to determine how often foodservice personnel follow on-the-job procedures which have been taught in a training

program; to assess food production training techniques and methods to measure and evaluate training; and to formulate recommendations as to how training can be more effective based on foodservice personnel's training needs.

In accomplishing these objectives, a five page questionnaire was developed and adapted from the review of literature, (Furstenau, 1978; Bosselman, 1985), and five foodservice education and training manuals previously utilized in Oklahoma's Nutrition Program for Older Americans (FNIA-OSU, 1976; Barker, 1981a; Barker, 1981b; USDHHS, 1981b; USDHHS, 1982). A cover letter accompanied the questionnaire. Questionnaires were mailed to 198 site managers and 109 usable, returned responses were coded for data analysis.

Program Characteristics

The Oklahoma Nutrition Program for Older Americans is geographically divided into 11 planning and service area districts supporting between 5 to 27 functioning meal sites in each district. All meal sites responded from districts SWODA and OEDA, and nearly three-fourths of the meal sites responded from district KEDDO. Over half of the meal sites responded from districts SODA (55%), INCOG (59%), and ASCOG (56%).

Most of the meal sites operated in rural areas of less than 2,500 population (45.9%, N=50) and nearly 38 percent (N=41) operated from a small city (2,500-24,999). Nearly nine percent (N=10) of the meal sites operated from a medium city (25,000-149,999) and 7.3 percent (N=8) from a large city ($\geq$150,000).

The majority of respondents (41.3%, N=45) operated within "other" designated meal site facilities, mainly nutrition/Senior Centers.

About 35 percent (N=38) operated from community civic centers and 7.3 percent (N=8) from religious institutions.

Nearly 62 percent (N=66) of respondents indicated that the majority of meals served per week range from 200 to 499 meals and 20 percent (N=22) served between 500 to 999 meals per week. The total meals served, both congregate and home-delivered by 109 sites, was 41,559. Fifty-five of 90 sites (N=60) served between 200 to 499 congregate meals per week, while most of the home-delivered meals ranged from 1 to 99 meals per week as indicated by 66 percent (N=72) of the respondents.

Thirty-eight and one-half percent indicated that foodservice personnel were trained two to six hours in orientation to a new job and 30.8 percent said that 10 or more hours were spent training new foodservice personnel. Nearly one-half of the respondents indicated that the consulting dietitians trained foodservice personnel most often. Site managers also trained foodservice personnel as indicated by 29.4 percent of the respondents. Those 5.6 percent who checked the "other" category, indicated that vocational education instructors and the public health departments trained foodservice personnel.

Perceived Rank Order of Importance of Training Needs

Site managers were asked to rank order the most important training need area for their foodservice operation. The procedures were divided into five major areas with six to thirteen procedural tasks constituting each major area. From the 92 respondents who answered this question, sanitation was the most important need area for training. Quantity and quality food production was the second most training need and nutrition was the third most training need area. Personal

health and hygiene and equipment and safety procedures were ranked similarly and were the fourth and fifth, respectively, most needed area for training.

Testing the Hypotheses

In this research, five statistical tests were utilized to test the four null hypotheses. The t test, one-way analysis of variance, and Duncan's multiple range determined the effects of 1) previous program employment, 2) length of employment, 3) employment status, and 4) highest level of education, on the food production scores of procedures included in a training program and if employees followed procedures on-the-job. Eleven significant differences were found at $p \leq 0.05$ when using these statistical tests.

Eight differences were discovered for length of employment and highest degree. Basically, site managers employed less than one year stated that foodservice personnel followed procedures more often than those employed longer for the following major areas: quantity and quality food production, sanitation, and equipment and safety. Employees tended to follow procedures more when taught by trainers who had a bachelor of science degree or "other" degree rather than those with a master of science degree and/or a high school diploma. Based on the eight differences discovered, the researcher rejected Hypothesis (H_1).

Forty-nine differences were noted at $p \leq 0.05$ when utilizing the t-test procedure, one-way analysis of variance, Duncan's multiple range and chi-square for food production scores, in-training and followed on-the-job based on: training techniques, methods to measure and

evaluate training; who trains, and the meal site location. The training techniques commonly used in group meetings were demonstration, charts, film, slides or tapes, and discussion. Lecture was also used, but not as often as the aforementioned techniques. Furstenau (1978) revealed that lecture, demonstration, and discussion were also frequently used group techniques to train foodservice personnel in restaurants. She also found that film, slides, charts, or tapes were the least used training technique in restaurant. Differences also showed that personnel were less likely to follow procedures when these techniques were used in the training program.

The most common methods used to measure and evaluate training results were paper and pencil tests, on-the-job observation, and on-the-job evaluation. Evaluation by a rating scale was used to measure learning, but not as frequently. Employees tended not to follow procedures all the time when these methods were used. Other differences were noted between who trains, and the training techniques and methods to measure training. Site managers commonly included demonstration in a training program and dietitians commonly used charts, film, slides or tapes to train. Site managers also observed personnel more than dietitians or other trainers mainly because site managers are on the site premises daily.

Five differences were found when testing procedures with the meal site location. In general, employees followed all procedures more often in religious institutions than in other site locations. Those in school site locations tended to include sanitation procedures more often than in other site locations. Religious institutions included sanitation procedures least of all site locations. Based on these

aforementioned differences, again the researcher rejected Hypothesis (H_2).

Nine differences were found at $p \leq 0.05$ when testing Hypothesis (H_3). The t test, one-way analysis of variance, Duncan's multiple range, and chi-square values determined differences between training needs scores and training techniques, methods to measure training, who trains, meal site location, and site district. In general, those who used paper and pencil tests found this method effective in measuring a need for training in sanitation, equipment and safety, and personal health and hygiene procedures. Discussion, demonstration, and on-the-job performance evaluation revealed an important need for nutrition and sanitation training. The researcher found appropriate evidence to reject Hypothesis (H_3).

The Spearman's rho correlation coefficient was used to determine that if procedures were included in training, were employees following them on-the-job? There were indirect relationships for each five procedural areas. Even though procedures may have been included in a training program, foodservice personnel were not always following them on-the-job. The researcher rejected Hypothesis (H_4) based on the significant differences mentioned.

Recommendations

Development of the Survey Instrument

Four site managers participated in the preliminary study of this research. Even though the pilot survey was hand delivered and directions were fully explained, respondents left questions unanswered.

It is suggested that a larger number of respondents participate in the pilot survey. If time permits, it is further suggested that a second pilot study be administered along with a revised cover letter to reveal if any major complications arise with posed questions (Warde, 1984).

The Revised Research Instrument

The revised research instrument was examined by three research professionals for clarity, content validity, and format. The present research instrument could perhaps be condensed. A shorter questionnaire may result in more responses. It is further suggested that certain questions be included in the demographic section of the questionnaire. These may include asking questions about satellite sites, management functions and styles of the site manager, rank order importance of training needs for each procedure in each major group, and provide open-ended questions pertaining to perceived problems with foodservice procedures and employees following procedures on-the-job.

It would also be possible to direct the study to consulting dietitians, as well as site managers, and compare differences between the two groups. A study comparing meal sites in different states is also recommended since training needs can be confronted with and met at the state and national levels as well as at the local levels.

Recommendations Based on the Study's Results

Several recommendations were made based on the study's results.

1. Certain training techniques and methods to evaluate training were found to identify the training needs in food production procedures. Based on the training needs for each site, the trainer needs to decide

which techniques and methods best train and evaluate personnel in each food production procedure.

2. Training in food production was generally included in training programs, yet, employees tended not to always follow procedures on-the-job. Trainers need to identify the employees' learning capabilities, and mode and method of learning and mastering knowledge, in order to train employees to learn desired job skills.

3. Most of the respondents were high school educated, and employees tended not to follow foodservice production procedures as often when supervised by this group. Continuing education courses could be offered for site managers with a high school education emphasizing foodservice personnel management courses and related areas. Also, establishing membership into a foodservice or management organization such as Dietary Managers Association (DMA) and/or the American Dietetic Association (ADA) may help to enhance personnel and foodservice management skills. These skills can also assist in identifying personnel's training needs and provide appropriate solutions to problems as they surface, not only in a training program.

4. Training materials and manuals need to be updated and their context standardized for Oklahoma's Nutrition Program. Semi-annual or annual meetings are recommended for project directors, consulting dietitians, site managers, and other trainers for gathering innovative ideas and resources. State universities and other governmental agencies, i.e., Public Health Departments, Vocational Education, and other agencies and organizations could perhaps provide personnel and resource materials essential for regularly programmed meetings.

Implications

Results of this study, previous foodservice training studies, and reports have implications for consulting dietitians, site managers, project directors, and other trainers, when considering training foodservice personnel. Information found in this study and other studies can help management to formulate and implement training programs based on personnel's needs for foodservice training. Likewise, information may be useful to foodservice trainers operating in state and local vocational education programs and public health departments. Information found in this study can also help to update, develop, validate, and standardize foodservice training manuals, workshops, and materials with the cooperation of state and federal agencies, organizations, and associations.

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APPENDIXES

APPENDIX A

PRELIMINARY STUDY QUESTIONNAIRE

OKLAHOMA STATE UNIVERSITY
Department of Food, Nutrition and Institution Administration

ELDERLY NUTRITION PROGRAM FOODSERVICE STUDY

I. General Information:

Directions: Please check (✓) or fill in the appropriate answers. It is important that you answer all the questions.

1. Length of employment in current position:
   _____ (1) leass than one year
   _____ (2) 1-2 years
   _____ (3) 3-5 years
   _____ (4) 6-10 years
   _____ (5) more than 10 years

2. Have you had previous employment in the Elderly Nutrition Program?
   _____ (1) yes (please specify) _____ Title:
   _____ Years Employed:
   _____ (2) no

3. Current position work status:
   _____ (1) full-time (35 hours or more per week)
   _____ (2) part-time (21-35 hours per week)
   _____ (3) part-time (20 hours or less per week)
   _____ (4) other (please specify): _____

4. Degree attained and major:
   _____ (1) High School diploma — Major
   _____ (2) B.S. _____
   _____ (3) M.S. _____
   _____ (4) other (please specify): _____
   _____ (5) not applicable

II. Program Characteristics:

This section of the survey identifies the characteristics of your program. Please check (✓) or fill in the appropriate answers. It is important that you answer all the questions.

1. County of meal site facility location:
   (1) County: _____

2. Population size of community where meal site facility is located:
   _____ (1) large city (more than 150,000)
   _____ (2) medium city (25,000-149,000)
   _____ (3) small city (2,500-24,999)
   _____ (4) rural (less than 2,500)

3. Location of meal site facility:
   _____ (1) community civic center
   _____ (2) religious institution
   _____ (3) school
   _____ (4) low income housing facility
   _____ (5) restaurant
   _____ (6) other (please specify):
   _____
   _____

4. Total average number of meals served per week: _____

5. Next to each type of meal below indicate the average number of meals served per week:

   TYPE OF MEAL — NUMBER PER WEEK

   (1) Congregate _____
   (2) Home-delivered _____

   SPECIAL DIET

   (3) Calorie controlled _____
   (4) Fat controlled _____
   (5) Sodium controlled _____
   (6) Other _____

6. Are your foodservices contracted with a foodservice management company or government sponsored program such as school foodservice?
   _____ (1) yes (please specify): _____
   _____ (2) no

7. Type of foodservice system:
   _____ (1) Conventional - menu items prepared from basic ingredients on day they will be served and held in hot or cold state until served.

   _____ (2) Assembly/Serve - primarily commercially prepared food purchased in ready-to-serve form.

   _____ (3) Cook Chill/or Freeze - menu items prepared one or more days in advance and held in chilled/or frozen state until served.

8. Number of foodservice staff (excluding site manager):
   _____ (1) full-time paid (35 hours or more per week)
   _____ (2) part-time paid (less than 35 hours per week)
   _____ (3) volunteer (full or part-time and no pay)

9. How many hours are spent training new employees in food preparation and production practices?
   _____ (1) 0-1 hours
   _____ (2) 2-6 hours
   _____ (3) 7-10 hours
   _____ (4) 10+ hours

10. Who trains your foodservice staff in food preparation and production most often? (Please check (✓) only one)
    _____ (1) no training done at this time
    _____ (2) project director
    _____ (3) consulting dietitian
    _____ (4) on-site manager
    _____ (5) other (please specify): _____

11. Which of the following techniques are used to conduct foodservice preparation/production training, and WHO conducts the technique? Please indicate with a check mark (✓) on the appropriate columns.

TECHNIQUE	Method Used	On-Site Manager	Consulting Dietitian	Both	Other
A. Group Meetings:					
(1) lecture	___	___	___	___	___
(2) demonstration	___	___	___	___	___
(3) discussion	___	___	___	___	___
(4) film	___	___	___	___	___
(5) slides or tape	___	___	___	___	___
(6) other (please specify): _____	___	___	___	___	___
B. On the Job Supervision and Instruction:					
(1) observation	___	___	___	___	___
(2) checklists/evaluation	___	___	___	___	___
(3) demonstration	___	___	___	___	___
(4) training by other staff	___	___	___	___	___
(5) other (please specify): _____	___	___	___	___	___

III. Food Preparation/Production:

This section contains foodservice preparation/production procedures important toward maintaining healthful and hygenic sanitary conditions, microbiological safety, quality and quantity controls, and personal safety.

Directions: To the right of the procedures given below are two sets of columns, Column A and B.
1) In Column A, indicate by a check (✓) mark if each of these procedures are included or not included in your in-service training program.
2) In Column B, indicate by a check (✓) mark whether each procedure is Very Difficult, Difficult or Not Difficult for the foodservice staff to follow. Please answer all questions.

Food Preparation/Production Procedures	Column A		Column B		
	Included	Not Included	Very Difficult	Difficult	Not Difficult
A. Quantity and Quality Food Production					
(1) Following standardized quantity recipes	—	—	—	—	—
(2) Adjusting recipes to yield needed quantities	—	—	—	—	—
(3) Recognizing common weights and measurements of different can sizes	—	—	—	—	—
(4) Recognizing purchase units, number per units and gross weights	—	—	—	—	—
(5) Preassembling all ingredients	—	—	—	—	—
(6) Weighing and measuring all ingredients	—	—	—	—	—
(7) Deboning, slicing, grinding and breading wholesale cuts of meat, fish, and poultry	—	—	—	—	—
(8) Weighing and measuring foods for modified diets	—	—	—	—	—
(9) Calculating, weighing, measuring, and inspecting portions	—	—	—	—	—
(10) Knowing scoops and ladles serving yields	—	—	—	—	—
(11) Discussing menu changes with on-site manager	—	—	—	—	—
(12) Monitoring and recording over and under production of foods	—	—	—	—	—
B. Sanitation					
(1) Knowing types of bacteria and conditions affecting the growth of bacteria	—	—	—	—	—
(2) Disposing of wastes properly and keeping lid on trash receptacle when not in use	—	—	—	—	—
(3) Cleaning and sanitizing work area after each use	—	—	—	—	—
(4) Refrigerating foods at 42°F or below	—	—	—	—	—
(5) Freezing foods at 0°F or below	—	—	—	—	—
(6) Checking internal temperatures of cooked foods at every meal	—	—	—	—	—
(7) Storing all leftover foods in a shallow, non-porous, covered container	—	—	—	—	—
(8) Checking holding temperatures of steam table foods at every meal	—	—	—	—	—
(9) Defrosting meal, poultry, and fish 24 hours in refrigerator, and cover allowing air to circulate	—	—	—	—	—
(10) Cleaning and sanitizing all equipment, dishes, and utensils after each use	—	—	—	—	—

	Column A		Column B		
	Included	Not Included	Very Difficult	Difficult	Not Difficult
B. Sanitation (Continued)					
(11) Following all health rules and regulations when handling foods	___	___	___	___	___
(12) Keeping all disinfectants and germicides away from food area	___	___	___	___	___
(13) Recognizing clean and detergent-free utensils, counter surfaces, etc. that come in contact with food	___	___	___	___	___
C. Equipment/Safety					
(1) Knowing operation of gas, electric, and steam generated equipment	___	___	___	___	___
(2) Assembling and operating all foodservice equipment	___	___	___	___	___
(3) Detecting for damaged equipment	___	___	___	___	___
(4) Using simpler motions when handling foods and equipment	___	___	___	___	___
(5) Knowing correct detergent usages for equipment, utensils, dishes, and counter surfaces	___	___	___	___	___
(6) Using and storing knives properly and safely	___	___	___	___	___
(7) Checking freezer, refrigerator, and dishwasher temperatures daily	___	___	___	___	___
(8) Checking pot and pan wash water temperatures	___	___	___	___	___
D. Nutrition					
(1) Implementing knowledge of nutrient needs of the elderly by serving appropriate food and serving sizes	___	___	___	___	___
(2) Knowing all food groups and food exchanges	___	___	___	___	___
(3) Ensuring optimal nutrient value of fruits and vegetables when storing, preparing, and cooking	___	___	___	___	___
(4) Comparing and contrasting nutritional value of foods	___	___	___	___	___
(5) Substituting foods with approximate nutrient values	___	___	___	___	___
(6) Recognizing the elderly's likes and dislikes and eating impairments (dentures, swallowing difficulties, etc.)	___	___	___	___	___
E. Personal Health and Hygiene					
(1) Taking daily bath and wearing clean uniform daily	___	___	___	___	___
(2) Avoiding wearing jewelry and fingernail polish when handling food	___	___	___	___	___
(3) Washing hands after coughing, sneezing, and blowing nose	___	___	___	___	___
(4) Avoiding handling place settings or food after wiping tables or handling soiled dishes without handwashing	___	___	___	___	___
(5) Washing hands thoroughly after restroom visits, after handling unclean objects or after smoking	___	___	___	___	___
(6) Using clean spoons in testing food prior to service	___	___	___	___	___

	Column A		Column B		
E. Personal Health and Hygiene (Continued)	Included	Not Included	Very Difficult	Difficult	Not Difficult
(7) Keep hair under a hair net	___	___	___	___	___
(8) Clean, disinfect, and bandage sores immediately	___	___	___	___	___
(9) Refrain from working in food area when ill	___	___	___	___	___

IV. Training Needs

What do you see as the most important area(s) of training in your foodservice operation in the next six months? Please rank order your answers according to degree of importance with 1 being most important, 2 next in importance, etc.

_____(1) Quantity and Quality Food Production

_____(2) Sanitation

_____(3) Equipment/Safety

_____(4) Nutrition

_____(5) Personal Health and Hygiene

Please make sure you have answered all questions. Thank you for your time to complete this questionnaire.

APPENDIX B

CORRESPONDENCE

Oklahoma State University

Department of Food, Nutrition and Institution Administration

425 HOME ECONOMICS WEST
STILLWATER, OKLAHOMA 74078
(405) 624-5039

May 8, 1985

Dear Nutrition Service Provider:

As a site manager in the Nutrition Program for Older Americans, you are managing a foodservice team providing the most useful nutrition service to the elderly. To a major extent however, nutrition services are optimal only when appropriate procedures are maintained and when foodservice training activities are on-going. Training in food preparation/production is important to maximize the safety and the nutritional value of foods.

This study examines five areas of sound foodservice procedures (quantity and quality food production, sanitation, equipment and safety, nutrition, and personal health and hygiene). We would like to know all on-site managers perceptions of their foodservice personnel in following these procedures at work. Perhaps, this will help us to identify the training needs of foodservice personnel working in the Nutrition Program for Older Americans. The results of this study will be shared with on-site managers.

Please find time in your regular schedule to complete this questionnaire. The information you provide will be held confidential and will not identify you or the facility you serve. The number code on the questionnaire is to help us make follow inquiries. After completing the questionnaire, please fold and return in the envelope provided by May 30, 1985.

Thank you for your participation and cooperation.

Sincerely,

Teresa Sanert
Teresa Sanert
Graduate Assistant

Lea L. Ebro
Lea L. Ebro, Ph.D., R.D.
Professor

CENTENNIAL DECADE
1980 • 1990

APPENDIX C

RESEARCH INSTRUMENT

OKLAHOMA STATE UNIVERSITY
Department of Food, Nutrition and Institution Administration

ELDERLY NUTRITION PROGRAM FOODSERVICE STUDY

I. General Information:

Directions: Please check (✓) or fill in the appropriate answers. It is important that you answer all the questions.

1. Length of employment in current position:
   _____ 1) less than one year
   _____ 2) 1-2 years
   _____ 3) 3-5 years
   _____ 4) 6-10 years
   _____ 5) more than 10 years

2. Have you had previous employment in the Elderly Nutrition Program?
   _____ 1) yes (please specify) _____ Title:
   _____ Years Employed:
   _____ 2) no

3. Current position work status:
   _____ 1) full-time (35 hours or more per week)
   _____ 2) part-time (more than 20 but less than 35 hours per week)
   _____ 3) part-time (20 hours or less per week)
   _____ 4) other (please specify): _____

4. Degree attained and major:
   _____ 1) High School diploma
   _____ 2) B.S. Major _____
   _____ 3) M.S. _____
   _____ 4) other (please specify): _____

II. Program Characteristics:

This section of the survey identifies the characteristics of your program. Please check (✓) or fill in the appropriate answers. It is important that you answer all questions.

1. County of meal site facility location: _____

2. Population size of community where meal site facility is located:
   _____ 1) large city (150,000 or more)
   _____ 2) medium city (25,000-149,999)
   _____ 3) small city (2,500-24,999)
   _____ 4) rural (less than 2,500)

3. Location of meal site facility:
   _____ 1) community civic center
   _____ 2) religious institution
   _____ 3) school
   _____ 4) low income housing facility
   _____ 5) restaurant
   _____ 6) other (please specify):
   _____
   _____

4. Total average number of meals served per week: _____

5. Next to each type of meal below indicate the average number of meals served per week:

TYPE OF MEAL	NUMBER PER WEEK	TYPE OF MEAL	NUMBER PER WEEK
1) Congregate	_____	SPECIAL DIET	
2) Home-delivered	_____	3) Calorie controlled	_____
		4) Fat controlled	_____
		5) Sodium controlled	_____
		6) Other _____	_____

6. Are your foodservices contracted with a foodservice management company or government sponsored program such as school foodservice?
   _____ 1) yes (please specify): _____
   _____ 2) no

7. Type of foodservice system:
   _____ 1) Conventional - menu items prepared from basic ingredients on day they will will be served and held in hot or cold state until served.
   _____ 2) Assembly/Serve - primarily commercially prepared food purchased in ready-to-serve form.
   _____ 3) Cook Chill/or Freeze - menu items prepared one or more days in advance and held in chilled/or frozen state until served.

8. Number of foodservice staff (excluding site manager):
   _____ 1) full-time paid (35 hours or more per week)
   _____ 2) part-time paid (less than 35 hours per week)
   _____ 3) volunteer (full or part-time and no pay)

9. How many hours are spent training new employees in food preparation and production practices:
   _____ 1) 0-1 hours _____ 2) 2-6 hours _____ 3) 7-10 hours _____ 4) 10+ hours

10. Who trains your foodservice staff in food preparation and production most often? (Please check (✓) only one)
    _____ 1) no training done at this time _____ 2) project director
    _____ 3) consulting dietitian _____ 4) on-site manager
    _____ 5) other (please specify): _____

11. Evaluations
    Directions:
    A) Which of the following techniques are used in group meetings to conduct foodservice preparation/production training, and WHO conducts the technique?
    B) Which of the following methods are used to measure training by on the job supervision and instruction, and WHO conducts the method?

    Please indicate all responses with a check (✓) mark on the appropriate columns.

A) TRAINING TECHNIQUES	Are these methods used with the foodservice personnel?	Who conducts these techniques?			
	Method Used	On-Site Manager	Consulting Dietitian	Both	Other
Group Meetings:					
1) lecture	____	____	____	____	____
2) demonstration	____	____	____	____	____
3) discussion	____	____	____	____	____
4) charts, film, slides or tape	____	____	____	____	____
5) other (please specify): _____	____	____	____	____	____
B) METHODS TO MEASURE TRAINING EVALUATIONS AS A FOLLOW-UP TO TRAINING					
1) administering a paper and pencil test	____	____	____	____	____
2) observing personnel on the job	____	____	____	____	____
3) evaluating performance on the job	____	____	____	____	____
4) evaluating performance using a rating scale	____	____	____	____	____
5) other (please specify): _____	____	____	____	____	____

III. Food Preparation/Production:
This section contains foodservice preparation/production procedures important toward maintaining healthful and hygenic sanitary conditions, microbiological safety, quality and quantity controls, and personal safety.

Directions: To the right of the procedures given below are two sets of columns, Column A and B. Indicate your answers with a check mark (✓) in the appropriate column. Please make sure there are two check marks for each procedure.
1) In Column A, indicate whether foodservice personnel follow each of the following procedures, Sometimes, Seldom or Rarely. Check (✓) not applicable if the procedure does not apply to operation.
2) In Column B, indicate which procedures are Included or Not Included in your in-service training program.

Food Preparation/Production Procedures	On the Job Column A				In Training Column B	
	Sometimes	Seldom	Rarely	Not Applicable	Included	Not Included
A. Quantity and Quality Food Production:						
1) Following standardized quantity recipes						
2) Adjusting recipes to yield needed quantities						
3) Recognizing common weights and measurements of different can sizes						
4) Recognizing purchase units, number per unit and gross weights						
5) Preassembling all ingredients						
6) Weighing and measuring all ingredients						
7) Deboning, slicing, grinding and breading wholesale cuts of meat, fish, and poultry						
8) Weighing and measuring foods for modified diets						
9) Calculating, weighing, measuring, and inspecting portions						
10) Knowing scoops and ladles serving yields						
11) Discussing menu changes with on-site manager						
12) Monitoring and recording over and under production of foods						
B. Sanitation:						
1) Knowing types of bacteria and conditions affecting the growth of bacteria						
2) Disposing of wastes properly and keeping lid on trash receptacle when not in use						
3) Cleaning and sanitizing work area after each use						
4) Refrigerating foods at 42°F or below						
5) Freezing foods at 0°F or below						

	On the Job Column A				In Training Column B	
	Sometimes	Seldom	Rarely	Not Applicable	Included	Not Included
B. Sanitation (Continued)						
6) Checking internal temperatures of cooked foods at every meal	___	___	___	___	___	___
7) Storing all leftover foods in a shallow, non-porous, covered container	___	___	___	___	___	___
8) Checking holding temperatures of steam table foods at every meal	___	___	___	___	___	___
9) Defrosting meat, poultry, and fish 24 hours in refrigerator, and cover allowing air to circulate	___	___	___	___	___	___
10) Cleaning and sanitizing all equipment, dishes, and utensils after each use	___	___	___	___	___	___
11) Following all health rules and regulations when handling foods	___	___	___	___	___	___
12) Keeping all disinfectants and germicides away from food area	___	___	___	___	___	___
13) Recognizing clean and detergent-free utensils, counter surfaces, etc. that come in contact with food	___	___	___	___	___	___
C. Equipment/Safety:						
1) Knowing operation of gas, electric, and steam generated equipment	___	___	___	___	___	___
2) Assembling and operating all foodservice equipment	___	___	___	___	___	___
3) Detecting for damaged equipment	___	___	___	___	___	___
4) Using simpler motions when handling foods and equipment	___	___	___	___	___	___
5) Knowing correct detergent usages for equipment, utensils, dishes, and counter surfaces	___	___	___	___	___	___
6) Using and storing knives properly and safely	___	___	___	___	___	___
7) Checking freezer, refrigerator, and dishwasher temperatures daily	___	___	___	___	___	___
8) Checking pot and pan wash water temperatures	___	___	___	___	___	___
D. Nutrition:						
1) Implementing knowledge of nutrient needs of the elderly by serving appropriate food and serving sizes	___	___	___	___	___	___
2) Knowing all food groups and food exchanges	___	___	___	___	___	___

	On the Job Column A				In Training Column B	
D. Nutrition (Continued)	Sometimes	Seldom	Rarely	Not Applicable	Included	Not Included
3) Ensuring optimal nutrient value of fruits and vegetables when storing, preparing, and cooking	___	___	___	___	___	___
4) Comparing and contrasting nutritional value of foods	___	___	___	___	___	___
5) Substituting foods with approximate nutrient values	___	___	___	___	___	___
6) Recognizing the elderly's likes and dislikes and eating impairments (dentures, swallowing difficulties, etc.)	___	___	___	___	___	___
E. Personal Health and Hygiene:						
1) Taking daily bath and wearing clean uniform daily	___	___	___	___	___	___
2) Avoiding wearing jewelry and fingernail polish when handling food	___	___	___	___	___	___
3) Washing hands after coughing, sneezing, and blowing nose	___	___	___	___	___	___
4) Avoiding handling place settings or food after wiping tables or handling soiled dishes without handwashing	___	___	___	___	___	___
5) Washing hands thoroughly after restroom visits, after handling unclean objects or after smoking	___	___	___	___	___	___
6) Using clean spoons in testing food prior to service	___	___	___	___	___	___
7) Keeping hair under a hair net	___	___	___	___	___	___
8) Cleaning, disinfecting, and bandaging sores immediately	___	___	___	___	___	___
9) Refraining from working in food area when ill	___	___	___	___	___	___

IV. Training Needs

What do you see as the most important area(s) of training in your foodservice operation? Please rank order your answers according to degree of importance with 1 being most important, 2 next in importance, etc.

_____ Quantity and Quality Food Production

_____ Sanitation

_____ Equipment/Safety

_____ Nutrition

_____ Personal Health and Hygiene

Please make sure you have answered all questions. Thank you for your time to complete this questionnaire.

APPENDIX D

FOLLOW-UP RESPONSE

6-7-85

Dear Nutrition Service Provider:

If you have not yet filled out the gold questionnaire concerning foodservice procedures and training needs of foodservice personnel, please disregard the due date. Kindly return the completed questionnaire in one week. Your input is very important to this study. Thank you for your time and cooperation.

Sincerely,
Teresa Sanert,
Graduate Assistant

APPENDIX E

CHI-SQUARE TABLES

See research instrument in Appendix C for specific techniques and methods listed numerically in each category.

OJQQ = On-the-job quantity and quality food production

ITQQ = In-training quantity and quality food production

OJES = On-the-job equipment and safety

ITES = In-training equipment and safety

OJNUT = On-the-job nutrition

ITNUT = In-training nutrition

ITPHH = In-training personal health and hygiene

R1 = Rank order quantity and quality food production

R2 = Rank order sanitation

R3 = Rank order equipment and safety

R4 = Rank order nutrition

R5 = Rank order personal health and hygiene

MMT = Methods to measure training

GM = Group meetings

TABLE OF OJQQ BY MMT1

OJQQ / FREQUENCY / PERCENT	MMT1 .	0	1	TOTAL
.	4 .	13 .	8 .	. .
12	0 .	6 7.14	2 2.38	8 9.52
13	0 .	2 2.38	0 0.00	2 2.38
16	0 .	4 4.76	0 0.00	4 4.76
18	0 .	0 0.00	1 1.19	1 1.19
24	0 .	5 5.95	14 16.67	19 22.62
25	0 .	0 0.00	1 1.19	1 1.19
26	0 .	2 2.38	2 2.38	4 4.76
27	0 .	9 10.71	3 3.57	12 14.29
28	0 .	1 1.19	0 0.00	1 1.19
29	0 .	1 1.19	0 0.00	1 1.19
30	0 .	8 9.52	1 1.19	9 10.71
TOTAL	. .	56 66.67	28 33.33	84 100.00

TABLE OF OJQQ BY MMT1

OJQQ FREQUENCY PERCENT	MMT1 .	0	1	TOTAL
31	0 .	3 3.57	1 1.19	4 4.76
32	0 .	2 2.38	0 0.00	2 2.38
34	0 .	1 1.19	0 0.00	1 1.19
38	0 .	1 1.19	0 0.00	1 1.19
39	0 .	0 0.00	1 1.19	1 1.19
41	0 .	1 1.19	0 0.00	1 1.19
42	0 .	0 0.00	1 1.19	1 1.19
48	0 .	0 0.00	1 1.19	1 1.19
54	0 .	1 1.19	0 0.00	1 1.19
56	0 .	1 1.19	0 0.00	1 1.19
57	0 .	2 2.38	0 0.00	2 2.38
60	0 .	6 7.14	0 0.00	6 7.14
TOTAL	. .	56 66.67	28 33.33	84 100.00

CHI-SQUARE	38.671	DF= 2[illegible]	PROB=0.0154
PHI	0.679		
CONTINGENCY COEFFICIENT	0.561		
CRAMER'S V	0.679		
LIKELIHOOD RATIO CHISQUARE	46.217	DF= 2[illegible]	PROB=0.0018

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF ITQQ BY MMT2

ITQQ / MMT2	.	0	1	TOTAL
.	4 .	7 .	23 .	. .
0	0 .	0 0.00	1 1.33	1 1.33
1	0 .	0 0.00	2 2.67	2 2.67
2	0 .	0 0.00	1 1.33	1 1.33
4	0 .	0 0.00	3 4.00	3 4.00
5	0 .	1 1.33	0 0.00	1 1.33
6	0 .	0 0.00	2 2.67	2 2.67
8	0 .	0 0.00	4 5.33	4 5.33
9	0 .	0 0.00	2 2.67	2 2.67
10	0 .	0 0.00	11 14.67	11 14.67
11	0 .	0 0.00	14 18.67	14 18.67
12	0 .	3 4.00	31 41.33	34 45.33
TOTAL	. .	4 5.33	71 94.67	75 100.00

CHI-SQUARE	20.824	DF= 10	PROB=0.0224
PHI	0.527		
CONTINGENCY COEFFICIENT	0.466		
CRAMER'S V	0.527		
LIKELIHOOD RATIO CHISQUARE	10.939	DF= 10	PROB=0.3623

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF ITQQ BY MMT4

ITQQ / MMT4 FREQUENCY PERCENT	.	0	1	TOTAL
.	4 .	27 .	3 .	. .
0	0 .	1 1.33	0 0.00	1 1.33
1	0 .	2 2.67	0 0.00	2 2.67
2	0 .	0 0.00	1 1.33	1 1.33
4	0 .	2 2.67	1 1.33	3 4.00
5	0 .	1 1.33	0 0.00	1 1.33
6	0 .	2 2.67	0 0.00	2 2.67
8	0 .	3 4.00	1 1.33	4 5.33
9	0 .	2 2.67	0 0.00	2 2.67
10	0 .	11 14.67	0 0.00	11 14.67
11	0 .	10 13.33	4 5.33	14 18.67
12	0 .	15 20.00	19 25.33	34 45.33
TOTAL	. .	49 65.33	26 34.67	75 100.00

CHI-SQUARE	19.120	DF=	10	PROB=0.0388
PHI	0.505			
CONTINGENCY COEFFICIENT	0.451			
CRAMER'S V	0.505			
LIKELIHOOD RATIO CHISQUARE	25.072	DF=	10	PROB=0.0052

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF OJES BY GM3

OJES GM3

FREQUENCY PERCENT	.	0	1	TOTAL
.	4 .	5 .	11 .	. .
8	0 .	0 0.00	9 10.11	9 10.11
10	0 .	0 0.00	2 2.25	2 2.25
11	0 .	0 0.00	1 1.12	1 1.12
12	0 .	0 0.00	3 3.37	3 3.37
14	0 .	0 0.00	1 1.12	1 1.12
16	0 .	7 7.87	39 43.82	46 51.69
17	0 .	0 0.00	3 3.37	3 3.37
18	0 .	1 1.12	1 1.12	2 2.25
TOTAL	. .	15 16.85	74 83.15	89 100.00

TABLE OF OJES BY GM3

OJES	GM3			
FREQUENCY PERCENT	.	0	1	TOTAL
19	0 .	1 1.12	4 4.49	5 5.62
20	0 .	0 0.00	2 2.25	2 2.25
21	0 .	1 1.12	2 2.25	3 3.37
22	0 .	0 0.00	5 5.62	5 5.62
24	0 .	1 1.12	1 1.12	2 2.25
33	0 .	1 1.12	0 0.00	1 1.12
34	0 .	0 0.00	1 1.12	1 1.12
37	0 .	1 1.12	0 0.00	1 1.12
40	0 .	2 2.25	0 0.00	2 2.25
TOTAL	. .	15 16.85	74 83.15	89 100.00

CHI-SQUARE	29.047	DF= 16	PROB=0.0236
PHI	0.571		
CONTINGENCY COEFFICIENT	0.496		
CRAMER'S V	0.571		
LIKELIHOOD RATIO CHISQUARE	27.131	DF= 16	PROB=0.0400

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF OJES BY MMT2

OJES / MMT2	.	0	1	TOTAL
.	4 .	2 .	14 .	. .
8	0 .	0 0.00	9 10.11	9 10.11
10	0 .	0 0.00	2 2.25	2 2.25
11	0 .	0 0.00	1 1.12	1 1.12
12	0 .	0 0.00	3 3.37	3 3.37
14	0 .	0 0.00	1 1.12	1 1.12
16	0 .	4 4.49	42 47.19	46 51.69
17	0 .	0 0.00	3 3.37	3 3.37
18	0 .	1 1.12	1 1.12	2 2.25
TOTAL	. .	9 10.11	80 89.89	89 100.00

TABLE OF OJES BY MMT2

OJES / FREQUENCY / PERCENT	MMT2 .	0	1	TOTAL
19	0 .	1 1.12	4 4.49	5 5.62
20	0 .	0 0.00	2 2.25	2 2.25
21	0 .	0 0.00	3 3.37	3 3.37
22	0 .	0 0.00	5 5.62	5 5.62
24	0 .	0 0.00	2 2.25	2 2.25
33	0 .	1 1.12	0 0.00	1 1.12
34	0 .	0 0.00	1 1.12	1 1.12
37	0 .	0 0.00	1 1.12	1 1.12
40	0 .	2 2.25	0 0.00	2 2.25
TOTAL	. .	9 10.11	80 89.89	89 100.00

CHI-SQUARE	34.519	DF=	16	PROB=0.0046
PHI	0.623			
CONTINGENCY COEFFICIENT	0.529			
CRAMER'S V	0.623			
LIKELIHOOD RATIO CHISQUARE	23.346	DF=	16	PROB=0.1048

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF ITES BY GM3

ITES GM3

FREQUENCY PERCENT	.	0	1	TOTAL
.	3 .	8 .	17 .	. .
0	0 .	1 1.25	1 1.25	2 2.50
1	0 .	2 2.50	0 0.00	2 2.50
2	0 .	0 0.00	1 1.25	1 1.25
3	0 .	0 0.00	2 2.50	2 2.50
4	0 .	0 0.00	2 2.50	2 2.50
5	0 .	0 0.00	4 5.00	4 5.00
6	0 .	1 1.25	2 2.50	3 3.75
7	0 .	1 1.25	6 7.50	7 8.75
8	1 .	7 8.75	50 62.50	57 71.25
TOTAL	. .	12 15.00	68 85.00	80 100.00

CHI-SQUARE	15.967	DF= 8	PROB=0.0428
PHI	0.447		
CONTINGENCY COEFFICIENT	0.408		
CRAMER'S V	0.447		

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF OJNUT BY GM5

OJNUT	GM5			
FREQUENCY PERCENT	.	0	1	TOTAL
.	4 .	18 .	3 .	. .
6	0 .	6 7.14	1 1.19	7 8.33
7	0 .	1 1.19	0 0.00	1 1.19
9	0 .	0 0.00	1 1.19	1 1.19
10	0 .	2 2.38	0 0.00	2 2.38
11	0 .	2 2.38	0 0.00	2 2.38
12	0 .	33 39.29	0 0.00	33 39.29
13	0 .	6 7.14	0 0.00	6 7.14
14	0 .	2 2.38	0 0.00	2 2.38
TOTAL	. .	82 97.62	2 2.38	84 100.00

TABLE OF OJNUT BY GM5

OJNUT / FREQUENCY / PERCENT	GM5 .	0	1	TOTAL
15	0 .	5 5.95	0 0.00	5 5.95
16	0 .	4 4.76	0 0.00	4 4.76
18	0 .	3 3.57	0 0.00	3 3.57
21	0 .	2 2.38	0 0.00	2 2.38
22	0 .	1 1.19	0 0.00	1 1.19
24	0 .	7 8.33	0 0.00	7 8.33
27	0 .	4 4.76	0 0.00	4 4.76
30	0 .	4 4.76	0 0.00	4 4.76
TOTAL	. .	82 97.62	2 2.38	84 100.00

CHI-SQUARE	47.122	DF= 15	PROB=0.0001
PHI	0.749		
CONTINGENCY COEFFICIENT	0.599		
CRAMER'S V	0.749		

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF OJNUT BY MMT2

OJNUT / MMT2	.	0	1	TOTAL
.	4	2	19	.
	.	.	.	.
6	0	0	7	7
	.	0.00	8.33	8.33
7	0	0	1	1
	.	0.00	1.19	1.19
9	0	0	1	1
	.	0.00	1.19	1.19
10	0	0	2	2
	.	0.00	2.38	2.38
11	0	0	2	2
	.	0.00	2.38	2.38
12	0	1	32	33
	.	1.19	38.10	39.29
13	0	0	6	6
	.	0.00	7.14	7.14
14	0	1	1	2
	.	1.19	1.19	2.38
TOTAL	.	9	75	84
	.	10.71	89.29	100.00

TABLE OF OJNUT BY MMT2

OJNUT / FREQUENCY / PERCENT	.	0	1	TOTAL
15	0 .	0 0.00	5 5.95	5 5.95
16	0 .	1 1.19	3 3.57	4 4.76
18	0 .	0 0.00	3 3.57	3 3.57
21	0 .	1 1.19	1 1.19	2 2.38
22	0 .	1 1.19	0 0.00	1 1.19
24	0 .	0 0.00	7 8.33	7 8.33
27	0 .	1 1.19	3 3.57	4 4.76
30	0 .	3 3.57	1 1.19	4 4.76
TOTAL	. .	9 10.71	75 89.29	84 100.00

CHI-SQUARE	39.890	DF= 15	PROB=0.0005
PHI	0.689		
CONTINGENCY COEFFICIENT	0.567		
CRAMER'S V	0.689		

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF ITNUT BY GM1

ITNUT / GM1	.	0	1	TOTAL
.	4 .	6 .	24 .	. .
0	0 .	2 2.67	0 0.00	2 2.67
1	0 .	0 0.00	4 5.33	4 5.33
2	0 .	0 0.00	4 5.33	4 5.33
3	0 .	1 1.33	2 2.67	3 4.00
4	0 .	2 2.67	2 2.67	4 5.33
5	0 .	1 1.33	6 8.00	7 9.33
6	0 .	8 10.67	43 57.33	51 68.00
TOTAL	. .	14 18.67	61 81.33	75 100.00

CHI-SQUARE	13.949	DF=	6	PROB=0.0302
PHI	0.431			
CONTINGENCY COEFFICIENT	0.396			
CRAMER'S V	0.431			
LIKELIHOOD RATIO CHISQUARE	12.785	DF=	6	PROB=0.0466

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF ITNUT BY GM3

ITNUT GM3

FREQUENCY / PERCENT	.	0	1	TOTAL
.	4 .	9 .	21 .	.
0	0 .	0 0.00	2 2.67	2 2.67
1	0 .	1 1.33	3 4.00	4 5.33
2	0 .	2 2.67	2 2.67	4 5.33
3	0 .	2 2.67	1 1.33	3 4.00
4	0 .	1 1.33	3 4.00	4 5.33
5	0 .	0 0.00	7 9.33	7 9.33
6	0 .	5 6.67	46 61.33	51 68.00
TOTAL	. .	11 14.67	64 85.33	75 100.00

CHI-SQUARE	13.665	DF=	6	PROB=0.0336
PHI	0.427			
CONTINGENCY COEFFICIENT	0.393			
CRAMER'S V	0.427			
LIKELIHOOD RATIO CHISQUARE	11.454	DF=	6	PROB=0.0753

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF ITNUT BY MMT5

ITNUT / MMT5	.	0	1	TOTAL
.	4 .	30 .	0 .	. .
0	0 .	2 2.67	0 0.00	2 2.67
1	0 .	4 5.33	0 0.00	4 5.33
2	0 .	3 4.00	1 1.33	4 5.33
3	0 .	3 4.00	0 0.00	3 4.00
4	0 .	4 5.33	0 0.00	4 5.33
5	0 .	7 9.33	0 0.00	7 9.33
6	0 .	51 68.00	0 0.00	51 68.00
TOTAL	. .	74 98.67	1 1.33	75 100.00

CHI-SQUARE	17.990	DF=	6	PROB=0.0063
PHI	0.490			
CONTINGENCY COEFFICIENT	0.440			
CRAMER'S V	0.490			
LIKELIHOOD RATIO CHISQUARE	6.123	DF=	6	PROB=0.4096

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF ITPHH BY GM1

ITPHH / GM1	.	0	1	TOTAL
.	4	5	17	
	.	.	.	.
0	0	1	0	1
	.	1.20	0.00	1.20
7	0	2	0	2
	.	2.41	0.00	2.41
8	0	0	3	3
	.	0.00	3.61	3.61
9	0	12	65	77
	.	14.46	78.31	92.77
TOTAL	.	15	68	83
	.	18.07	81.93	100.00

CHI-SQUARE	14.584	DF= 3	PROB=0.0022
PHI	0.419		
CONTINGENCY COEFFICIENT	0.387		
CRAMER'S V	0.419		

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF R1 BY MMT1

R1 MMT1

FREQUENCY / PERCENT	.	0	1	TOTAL
.	2 .	9 .	6 .	. .
1	1 .	22 24.44	5 5.56	27 30.00
2	0 .	9 10.00	4 4.44	13 14.44
3	1 .	17 18.89	8 8.89	25 27.78
4	0 .	5 5.56	10 11.11	15 16.67
5	0 .	7 7.78	3 3.33	10 11.11
TOTAL	. .	60 66.67	30 33.33	90 100.00

CHI-SQUARE	10.275	DF=	4	PROB=0.0360
PHI	0.338			
CONTINGENCY COEFFICIENT	0.320			
CRAMER'S V	0.338			
LIKELIHOOD RATIO CHISQUARE	9.993	DF=	4	PROB=0.0405

TABLE OF R2 BY MMT3

R2	MMT3			
FREQUENCY PERCENT	.	0	1	TOTAL
.	2 .	8 .	7 .	. .
1	1 .	1 1.11	24 26.67	25 27.78
2	0 .	9 10.00	14 15.56	23 25.56
3	1 .	3 3.33	26 28.89	29 32.22
4	0 .	1 1.11	10 11.11	11 12.22
5	0 .	1 1.11	1 1.11	2 2.22
TOTAL	. .	15 16.67	75 83.33	90 100.00

CHI-SQUARE	14.134	DF=	4	PROB=0.0069
PHI	0.396			
CONTINGENCY COEFFICIENT	0.368			
CRAMER'S V	0.396			
LIKELIHOOD RATIO CHISQUARE	13.150	DF=	4	PROB=0.0106

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF R3 BY MMT5

R3	MMT5			
FREQUENCY PERCENT	.	0	1	TOTAL
.	2 .	15 .	0 .	. .
1	0 .	4 4.44	0 0.00	4 4.44
2	0 .	5 5.56	1 1.11	6 6.67
3	0 .	19 21.11	0 0.00	19 21.11
4	1 .	26 28.89	0 0.00	26 28.89
5	1 .	35 38.89	0 0.00	35 38.89
TOTAL	. .	89 98.89	1 1.11	90 100.00

CHI-SQUARE	14.157	DF=	4	PROB=0.0068
PHI	0.397			
CONTINGENCY COEFFICIENT	0.369			
CRAMER'S V	0.397			
LIKELIHOOD RATIO CHISQUARE	5.582	DF=	4	PROB=0.2326

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF R4 BY MMT2

R4 MMT2

FREQUENCY / PERCENT	.	0	1	TOTAL
.	2	4	11	.
	.	.	.	.
1	0	1	20	21
	.	1.11	22.22	23.33
2	1	0	20	20
	.	0.00	22.22	22.22
3	0	1	26	27
	.	1.11	28.89	30.00
4	1	4	11	15
	.	4.44	12.22	16.67
5	0	1	6	7
	.	1.11	6.67	7.78
TOTAL	.	7	83	90
	.	7.78	92.22	100.00

CHI-SQUARE	10.452	DF=	4	PROB=0.0335
PHI	0.341			
CONTINGENCY COEFFICIENT	0.323			
CRAMER'S V	0.341			
LIKELIHOOD RATIO CHISQUARE	9.462	DF=	4	PROB=0.0505

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF R5 BY GM5

R5 GM5

FREQUENCY / PERCENT	.	0	1	TOTAL
.	2 .	13 .	2 .	. .
1	0 .	6 6.67	2 2.22	8 8.89
2	1 .	19 21.11	0 0.00	19 21.11
3	0 .	22 24.44	0 0.00	22 24.44
4	0 .	13 14.44	0 0.00	13 14.44
5	1 .	27 30.00	1 1.11	28 31.11
TOTAL	. .	87 96.67	3 3.33	90 100.00

CHI-SQUARE	13.522	DF=	4	PROB=0.0090
PHI	0.388			
CONTINGENCY COEFFICIENT	0.361			
CRAMER'S V	0.388			
LIKELIHOOD RATIO CHISQUARE	8.680	DF=	4	PROB=0.0696

WARNING: OVER 20% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5.
TABLE IS SO SPARSE THAT CHI-SQUARE MAY NOT BE A VALID TEST.

VITA

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