HOSPITAL FOODSERVICE PERFORMANCE MEASUREMENTS UTILIZED BY ADMINISTRATIVE DIETITIANS

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INTRODUCTION

Productivity enhancement is becoming an extremely important issue in the health care market, which encompasses hospitals, nursing homes, and specialized care facilities (Frumkin, 1988). Super (1987) reports that foodservices are "eating away" at health care's revenues with increased labor and operating expenses, and experts estimate that foodservice operations justify for 5% to 7% of health care facilities' total operating costs. Erickson (1987) explains that "The face of health care foodservice is changing. With patient admission down, and no relief in sight, the industry trend toward developing alternate sources of revenue will continue" (p. 90). Also, according to the Restaurant Growth Index figures, the U.S. health care market displayed negligent sales growth; total foodservice sales for 1987 increased only by 3.1%-the lowest rate of advancement among all segments of industry (Frumkin, 1988).

Because of increasing medical costs, limitation caps on government reimbursements, private sector competition, and alternative delivery systems (HMOs and PPOs), all health care facilities are being forced to

reduce costs by eliminating services. Foodservice administrators and dietitians are beginning to recognize that labor cost controls, service cutbacks, and spiraling competition are the essential forces that challenge the existence of all health care foodservice facilities. Although they are aware of the competitive changes occurring in their environment, many have not adopted correct methods of measurement for attacking the productivity problems in their facilities (Morris, 1985).

This slow establishment of performance measurements by foodservice administrators and dietitians is due to their limited knowledge and understanding of productivity and the other performance criteria. This situation has been identical in most research involving productivity and performance assessments specific to the foodservice industry initiated at Oklahoma State University's Department of Food, Nutrition, and Institution Administration. All studies revealed that most foodservice operators and dietitians encountered some problems in defining performance ratios. Foodservice administrators and dietitians were using other criteria to measure what they thought was productivity; while in fact, they were really measuring quality, quality of worklife, effectiveness, efficiency, etc. These performance studies include: Robertson, 1982; Shaw, 1983; Lamb, 1984; Pickerel, 1984; Putz, 1985; Nazareih, 1986; Lischke, 1987; and Czajkowski, 1988.

The study performed by Czajkowski (1988) surveyed foodservice directors selected from the 1985 edition of the American Hospital Association Guide to the Health Care Field (American Hospital Association, 1985) and attempted to isolate and measure three of the most basic, and believed to be readily used, ratios of performance measurement in foodservice. Again, the results revealed that foodservice directors were still unfamiliar with standard performance ratios. These low response rates to all the previous Oklahoma State University's Department of Food, Nutrition, and Institution Administration performance surveys may possibly indicate that performance measurements and ratios are perceived as threatening and too time consuming. Tuttle and Sink (1985) reveal that productivity measurements may be threatening and may generate fear among managers and employees. The perceived threats plus the lack of knowledge may be the reasons why foodservice administrators and dietitians resist measuring performance. Tuttle and Sink (1985) explain that this resistance or fear may be due to the following: 1) misunderstanding or misuse of measures; 2) exposure or inadequate performance; 3) additional time and reporting demands; 4) reduction in staff; 5) distortion of performance; and 6) reduction of autonomy (p. 25).

Another possible cause of decreased measurement of performance by managers may be due to lack of education in the area of productivity and performance measurements.

Increased education may be the answer to allow foodservice administrators and dietitians to implement and measure performance in their own facilities.

Whatever the cause may be, foodservice administrators and dietitians appear to have difficulties defining and measuring performance in their facilities. Challenges that health care foodservice organizations are facing today cannot be successfully met or achieved without improved design and implementation of measurement and evaluation systems. For measures and measurement systems to be effective, they must capture and reflect what constitutes system performance. Managers and dietitians in the health care foodservice industry must take the initiative to measure and improve performance, otherwise groups not familiar with these variables may try to force inappropriate measures upon this industry.

Purpose

Drucker (1954) emphasizes that "most of today's lively discussion of management by objectives is concerned with the search for one right objective. This search is not only likely to be unproductive as the quest for the philosopher's stone; it is certain to do harm and to misindirect" (p. 62). To be an effective manager, one must balance various needs and goals and establish multiple objectives. Drucker (1954) continues by stating, "Objectives are needed in every area where performance and

results directly and vitally affect the survival and prosperity of the business" (p. 63). Drucker (1954) identifies eight areas in which objectives of performance and results have to be set. These areas include: market standing, innovation, productivity, physical and financial resources, profitability, manager performance and development, worker performance and attitude, and public responsibility. Sink (1985) further condensed this list to seven performance criteria by which an organization can be controlled and evaluated. These criteria include: effectiveness, efficiency, innovation, productivity, profitability, quality, and quality of worklife. It is very important, therefore, for every manager to determine which criteria are appropriate for his/her facility.

Previous performance studies conducted by researchers at Oklahoma State University's Department of Food, Nutrition, and Institution Administration have attempted to determine the various types of performance measures presently being utilized in all areas of foodservice. To work toward the overall goal of standardized performance measures, it has become necessary to determine if these ratios are in fact the most effective means of performance measurements.

This study will attempt to isolate three of the most basic ratios of performance measurement in foodservice. The ratios were found to be the most frequently chosen ratios by foodservice operators and dietitians in the

previous performance studies. Results of this study could be a progressive step toward standardizing formal performance measures that can be implemented by foodservice managers and dietitians in their facilities.

This project is part of a companion study. Czajkowski (1988) focused on methods of measurement used by a sample of participants selected from the 1985 edition of the American Hospital Association Guide to the Health Care Field (American Hospital Association, 1985). This research will focus on methods of measurement used by a sample of members in the ADA practice group "ADA Members With Management Responsibilities in Health Care Delivery Systems."

Objectives

The objectives for this research are:

1. To isolate and measure three very basic performance measures over a two-quarter period of time.
2. To determine if these three performance measures are in fact the most widely used measurements utilized by foodservice managers and dietitians with management responsibilities.
3. To allow for an increased expansion of knowledge between productivity and the other performance criteria: effectiveness, efficiency, innovation, profitability, quality, and quality of worklife.

4. To relate demographics and institutional variables of the operation to the performance measures.
5. To discover if these performance measures accurately reflect organizational performance.
6. To make suggestions as to how these performance measures can be used by foodservice managers and dietitians in health care delivery systems.

Hypotheses

The hypotheses postulated for this study are:

H_1: There will be no significant association between the utilization of performance ratios (survey part II, sections A and B) and selected personal variables:

a. age
b. educational background
c. R.D. registration status
d. route to ADA membership
e. position title
f. salary
g. number of years in foodservice management.

H_2: There will be no significant association between the utilization of performance ratios and selected institutional variables:

a. hospital affiliation
b. type of medical service provided
c. type of facility

d. size of facility

e. facility location

f. type of foodservice management.

H_3: There will be no significant association between the utilization of performance ratios and training received in productivity measurement.

H_4: There will be no significant association between the utilization of performance ratios and the type of hospital control.

H_5: There will be no significant association between the frequency and type of performance measures (survey III) sections A,B, and C) and selected personal variables stated in H_1 and H_3.

H_6: There will be no significant association between the frequency and type of performance measures and selected institutional variables stated in H_2 and H_4.

Assumptions and Limitations of this Study

The underlying assumptions for this study include:

1. Health care foodservice administrators and dietitians will have sufficient knowledge of performance measures to accurately respond to and complete the questionnaire.
2. The respondents will provide honest responses based upon factual knowledge, rather than the perceived ideal responses.

3. The respondents will generate enough interest and cooperation toward the subject matter to complete and return the questionnaire.
4. Membership in the American Dietetic Association and the practice group (ADA Members With Management Responsibilities in Health Care Delivery Systems) are not mutually exclusive.
5. The respondents will have access to the information requested and the necessary time to properly complete the questionnaire.

A limitation of this study indicates that the sample surveyed may or may not be representative of the entire population.

Definitions

AHA: American Hospital Association

Effectiveness: the extent to which the outputs produced enable the organization to achieve its goals and objectives (Tuttle & Romanowski, 1985).

Efficiency: the ratio of resources expected to be consumed on the right things to resources actually consumed (Tuttle & Romanowski, 1985).

Innovation: the creative process of adaptation of product, service, process, structure, etc., in response to internal as well as external pressures, demands, charges, needs, etc. (Sink, 1985).

Input: any controllable factor or resource that may be acquired in various quantities, types, and/or qualities (e.g., energy, people, materials, and data) (Sink, 1985).

HMO: Health Maintenance Organization

JCAH: Joint Commission on Accreditation of Healthcare (title prior to 1987)

JCAHO: Joint Commission on Accreditation of Healthcare Organizations

Output: any controllable factor or resource that results from a transformation of the input variable (e.g., energy, people, services, and data/information) (Sink, 1985).

PPO: Preferred Provider Organization

Productivity: relationship between quantities of outputs from a system and quantities of inputs in that same system (Sink, 1985).

Profitability: a measure or set of measures that assess attributes of financial resource utilization (Sink, Tuttle, & DeVries, 1984).

Quality: the attribute for customer evaluation of products and services (Shettey, 1987).

Quality of Work Life: a state of mind, a state of consciousness affected by a composite of factors on the job- factors that related to work itself, to the work environment, and to the employee personally (Bennett, 1983).

CHAPTER II

REVIEW OF LITERATURE

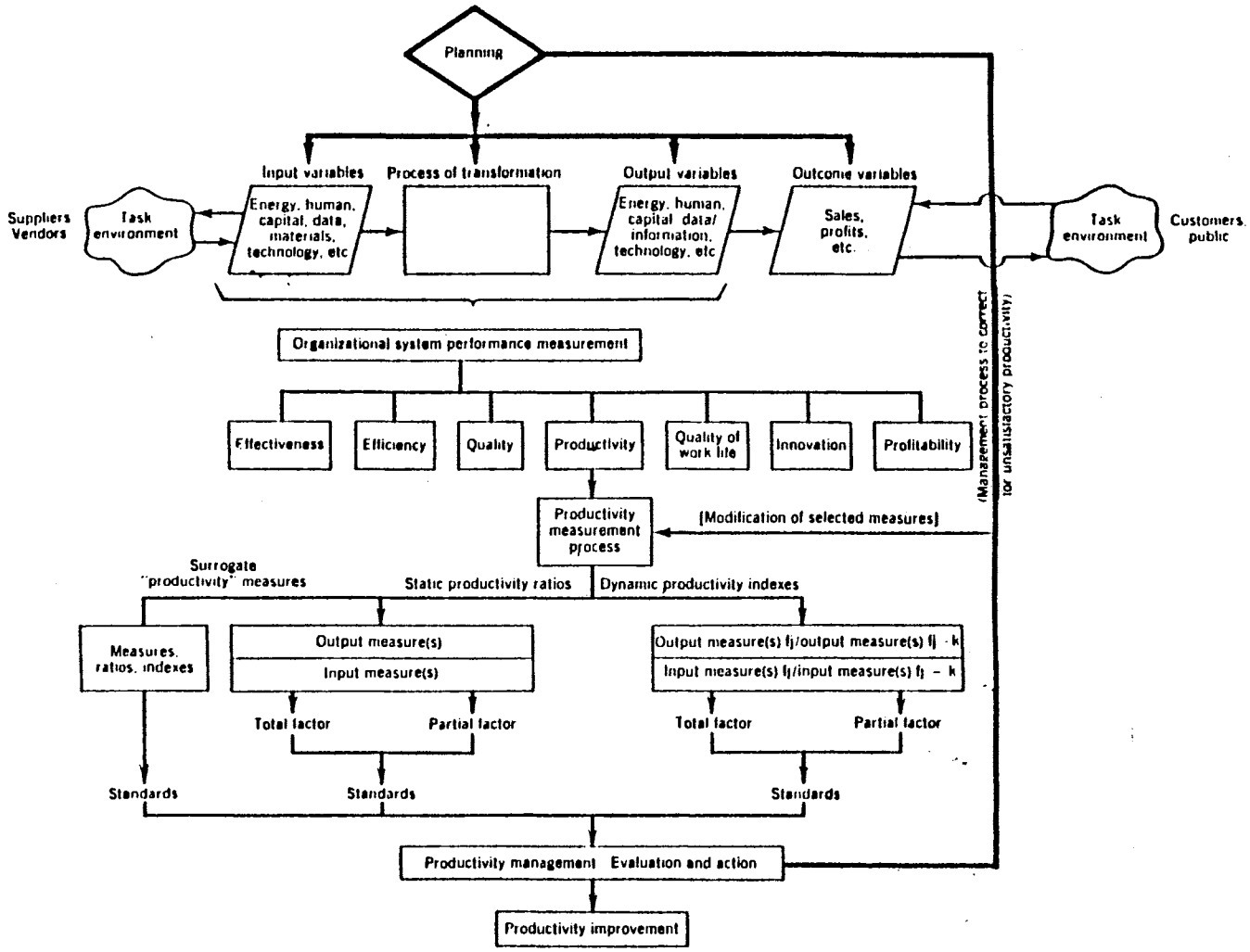
With the current economic state rapidly changing to a predominantly service and information based economy, the idea of monitoring performance and producing quality products and services presents a serious challenge to our management strategies and our traditional approaches to productivity measurements (Tuttle & Romanowski, 1985). According to Sink (1985), a critical job of every manager is to design, develop, and implement performance measurements and evaluation systems. In simpler terms, performance measurements are trying to answer this question: "Are we doing the things we are supposed to be doing and how well are we doing them?" (Fernandes, 1987, p. 17).

Performance and productivity, while often used interchangeably, represent distinctively separate concepts. Productivity is a component of performance, not a "synonym" for it (Sink, Tuttle, & DeVries, 1984, p. 265.) Performance, the most comprehensive of the two, takes into account the many criteria that affects an industry's operations and means of measuring the success of those operations. Productivity represents a

major component of the organizational performance equation, and managers must confront the task of designing and implementing measurement, evaluation, control, and improvement systems for this performance criteria (Sink, Tuttle, & DeVries, 1984).

Performance of an organizational system is comprised of seven criteria (indicators). These indicators are defined as "tools for telling whether and to what extent key results are being achieved" (Somers, Locke, & Tuttle, 1985-86, p. 137). These performance criteria include: effectiveness, efficiency, quality, quality of work life, innovation, profitability, and productivity.

Sink, Tuttle, and DeVries (1984) emphasize that all seven performance criteria are not independent of one another; in fact, they are interrelated. Although the criteria are measured and analyzed separately, each criterion affects the other by direct or indirect means and must be combined in order to assess the total, dynamic picture. Figure 1 accurately depicts the interrelationship between the seven basic performance criteria. Sink (1986) also projects that all performance criteria are not equally important in all organizational situations and that each criterion must be measured separately in order to accurately determine the performance levels in each area of the organization. Separate measures are necessary for three important



Scott, D. (1985). Productivity Management: Planning, Measurement and Evaluation, Control and Improvement. New York: John Wiley & Sons.

Figure 1. Productivity Management

reasons: first, to determine where a business stands in relation to its standard and to establish a baseline to measure progress; second, to identify specific problem areas; and third, to justify improvement actions (Sink, 1986).

According to Sink (1986), productivity, profitability, and efficiency are considered to be the primary performance measures, effecting the monetary goals of the organization. Productivity examines the relationship between inputs and outputs. Productivity is defined as "a ratio relationship of quantities of output from an organizational system to quantities of input from the same organizational system for some period of time " (Chew, 1988, p. 111). The central mission of productivity is to reach the highest levels of performance with the lowest possible expenditures of resources (Layton & Johnson, 1987).

Efficiency is closely related to productivity in that it focuses on inputs. Efficiency is defined by Drucker (1974a) as "doing things right" (p. 45). It can be computed in this manner:

$$\text{Efficiency \%} = \frac{\text{actual (standard) hours}}{\text{actual (worked) hours}}$$

(Rose, 1984, p. 272).

Profitability is, of course, the bottom line. Sink, Tuttle, and DeVries (1984) define profitability as "a measure or set of measures that assess attributes of financial resource utilization" (p. 268); in the public

sector, it is referred to as budgetability. Miller (1984) delineates profitability as "equaling productivity + price recovery, where price recovery represents the net effect on profits of changes in sales prices and inputs prices over a period of time" (p. 146).

The secondary measures of performance are effectiveness, quality, quality of work life, and innovation. These criteria are affected by employee performance. Of these, effectiveness is viewed as the most important due to its emphasis on outputs, or ideal vs. actual results. Effectiveness measures provide an evaluation of the service from the user's point of view (Fernandes, 1987). It is defined by Sink, Tuttle, and DeVries (1984) as "doing the right things on time, and in the right manner, in terms of goals, objectives, activities, goods, products, services, etc." (p. 267).

Quality is also very important to consider because it emphasizes prevention rather than correction (King, 1984). Quality, defined as "the attribute for customer evaluation of products and services" (Shettey, 1987, p. 46), has a significant impact on productivity. Shettey (1986) reveals that "improved quality decreases productivity costs" and "successful organizations are learning that commitment to quality products, combined with thorough understanding of how quality can be improved, can substantially improve productivity and profitability" (p. 171).

Quality of work life (QWL) has become a major priority for the organization and its administrators. Like productivity, it is a very pervasive performance criterion in that "it has the potential to influence performance against the other criteria" (Sink, Tuttle, & DeVries, 1984, p. 268). QWL is defined by DuBrin (1988) as "the extent to which workers are able to satisfy important needs through their job and other experiences within the organization" (p. 510). Employees are directing their needs toward self actualization; this change may be a crucial factor in increasing productivity (Sinetar, 1987).

Innovation is the performance criterion burdened with broad and conflicting definitions and encompassed by many aspects of creativity. Masaaki Imai defines innovation as "leaping breakthroughs--discontinuous, radical departures from the way things have been done in the past" (Miller & Pearce, 1987-88, p. 35). Innovation is an on-going process, directly linked with productivity and quality enhancement . The link is due to the fact that innovation "increases the quality solutions to organizational problems; revitalizes motivation; upgrades personal skills; and catalyzes effective team performance" (Raudsepp, 1987, p. 50).

Because health care foodservices are being drastically reshaped by government regulations and organizational restructuring, foodservice administrators

and dietitians are becoming more concerned about standards of performance, cost and quality of services, and performance improvements within their facilities. In order for performance improvements to be measured effectively in foodservices, administrators and dietitians need to understand all aspects of productivity and the other performance criteria. A more detailed discussion of the seven performance criteria is presented in order to expand upon the recent development in the area of performance measurement.

Effectiveness

Effectiveness is viewed by Sink, Tuttle, and DeVries (1984) as the most important performance criterion. Effectiveness is a component on the output side of the performance system and focuses upon what should and what does come out of the organizational system. Sink, Tuttle, and DeVries(1984) define their most favorable performance criterion as "doing the right things on time, and in the right manner, in terms of goals, objectives, activities, goods, products, services, etc." (p. 267).

Tuttle and Romanowski (1985) refer to effectiveness as "the extent to which the outputs produced enable the organization to achieve its goods and objectives" (p. 95). Fernandes (1987) agrees by stating that "Effectiveness, indicating the extent to which goals and objectives of the

program are being met, provides an evaluation of the service from the point of view of the user" (p. 19).

Drucker (1974b) expresses that "effectiveness focuses on opportunities to produce revenue, to create markets, and to change the economic characteristics of existing products and markets" (p. 45). The definition of effectiveness and efficiency are often interchangeable between experts, but Drucker (1974b) distinguishes between the two by defining effectiveness as "doing the right things" (p. 45), and efficiency as "doing things right" (p. 45). Drucker (1974) further expands on this distinction by explaining that effectiveness is that foundation of success, and efficiency is a minimum condition for survival after success has been accomplished.

Sink (1985) further indicates that there are at least three criteria needed to evaluate the degree of effectiveness. These include: 1) quality; 2) quantity; and 3) timeliness (p. 42). This planning process decides what must be accomplished, when it is to be accomplished, and what kinds of quality standard to adapt.

Measures of effectiveness are measures of achievement against present goals. The basic model for this kind of measure is: projected/actual (Kinlaw, 1986-87, p. 32). In direct outcome, effectiveness is concerned with the extent to which quantity and cost targets are met. Another example of an effectiveness measure is:

$$\frac{\text{actual success rate}}{\text{success rate goal}}$$ (Tuttle & Romanowski, 1987, p. 99).

Efficiency

George Russel (1987) of Time Magazine explains that "U.S. industries are launched on a dramatic drive for efficiency" (p. 44). Because of unpredictable global competition and financial turbulence, various industries are being forced to cut back costs and eliminate unnecessary layers of management in order to refocus their attention on ways to improve efficiency and effectiveness. U. S. Deputy Treasury Secretary, Richard Darman, emphasizes that "We have to make ourselves more efficient in the service sector...and the efficiency problem is a white-collar problem even more than a blue-collar problem" (Russel, 1987, p. 44). Newly cost-conscious managers and directors are on a persistent examination of the efficiency and effectiveness of all organizational operations. These industries' overall goal is "to produce streamlined, combative concerns that can withstand the frantic, competitive pace of the late 80's" (Russel, 1987, p. 44). In other words, U. S. industries are ridding themselves of all bureaucratic, inefficient management practices and making dramatic and durable improvements in long-term profitability, productivity, efficiency, and effectiveness.

Various definitions of efficiency presently exist in management literary journals and documented books. According to Sink, Tuttle, and DeVries (1984), efficiency is "the ratio of resources expected to be consumed on the right things, to resources actually consumed" (p. 267). Sink, Tuttle, and DeVries (1984) points out that efficiency is a component on the input side of the performance equation. Also, efficiency focuses upon resource consumption (the relationship between what should have been consumed and what actually was consumed). Shepherd, Turk and Silberston (1983) defines efficiency as "the relationship of work out to work in" (p. 30). This exact meaning of efficiency involves maximizing an output for a given input of resource or minimizing an input for a given output. Stern (1983) presents a general principle that guides definitions of efficiency. This principle states that "a situation, organization, or plan may be described efficient if it is impossible to have more of one thing without having less of something else" (Shepherd, Turk, & Silberston, 1983, p. 78). In simpler terms, Drucker (1974) states that efficiency is "doing things right" (p. 45).

The similar relationship between efficiency and effectiveness has been well noted in literature. Understanding the relationship between the two terms is crucial for successful managerial planning and decision making. Both efficiency and effectiveness must be

measured and monitored in order to improve goal correspondence and overall organizational performance (Sudit, 1984).

Two types of efficiency have been identified: static efficiency and dynamic efficiency. Static efficiency means "efficiency in the use of resources in given circumstances," while dynamic efficiency means "efficiency in changing circumstances over time" (Shepherd, Turk, & Silberston, 1983, p. 36). Static efficiency may not necessarily have to be combined with dynamic efficiency. An organization may prosper in certain circumstances, but then begin to decline because of failure to adapt to change. Dynamic efficiency is not something that organizations will be able to achieve continuously and smoothly. This type of efficiency is achieved through an organization's ability to survive crisis and continue to exist and prosper, while rival organizations disappear. Survival of an organization is the sign that long-term efficiency has been achieved (Shepherd, Turk, & Silberston, 1983).

Efficiency can also be referred to as the manner in which resources are used to produce quantities of outputs. In this sense, efficiency and productivity can be used interchangeably; however, efficient production is a means to an end, not an end to itself (Sudit, 1984). Sudit (1984) explains that "purposeful organizations strive to operate efficiently in their pursuit of higher level

objectives...In ideal conditions, if efficiency targets and effectiveness goals are appropriately coordinated, attainment of higher efficiency ought to enhance effectiveness" (p. 40).

The development of performance measurements has become a very expensive exercise. Performance measures provide an indication of the quality and quantity of the provided services. Measurements are utilized to determine the amount of work performed, the efficiency with which work is performed, and the work impact on the users. Efficiency is one of the measurements used to measure output. Efficiency measures provide an indication of how well resources are being utilized (Fernandes, 1987). Examples of efficiency measured as a ratio include:

$$\frac{\text{output}}{\text{input}} = \frac{\text{products delivered (or customer served)}}{\text{associated costs (or person hours)}}$$

$$\frac{\text{actual}}{\text{standard}} = \frac{\text{results (or achievement rate) for the period}}{\text{expected results or rate}}$$

(Somers, Locke, & Tuttle, 1985, p. 138).

$$\frac{\text{earned hr}}{\text{no. of hrs. worked}} = \frac{\text{total hrs. machine is utilized}}{\text{total no. hrs. machine is available}}$$

(Tuttle & Romanowski, 1985, p. 216).

Innovation

In today's society, the American challenge for the present and the future is to formulate enough new and satisfying jobs to employ our enumerating work force and to increase the living standards for all American

citizens. The answer to this challenge may be industrial competitiveness. Although the United States is experiencing extensive economic growth, some American industries have lost their competitive drive. Some suggest that the United States should eliminate those industries that have failed to remain competitive and concentrate on current, fresh industries. Other experts disagree. Others believe that the traditional industries still have potential growth and can improve their competitiveness. In order for these American industries to improve their competitiveness, they must implement strategical changes by operating in new and improved ways. They will have to generate creative products and services and find smarter techniques to enhance worker productivity and product/service quality. In brief, American industries must employ more extensive technology and exhilarating innovation by improving the utilization of manpower. Nevertheless, one important aspect must be emphasized--the creation of innovation cannot be forced. Creativeness and innovativeness are the products of individual vision, ingenuity, and courageousness. Innovation can only survive in an environment that reinforces individual prosperity and growth (U.S. House of Representatives, 1984).

In this competitive environment, status quo is the worst enemy for any organization. In order for an organization to survive, top management must generate an

environment that "stimulates, encourages, and rewards innovation" (Vough & Asbell, 1975). Management innovation is one of the most valuable and profitable forms of innovation. Vough and Asbell (1975) reveal that management innovation provides new, original ways of organizing people; dealing with people; motivating people; respecting people; and giving people the opportunity to convert their experiences and ideas into better ways of getting a job.

According to Drucker (1954), every business encompasses two types of innovation: innovation in product and service; and innovation in the various skills and activities to supply them. Drucker (1954) continues by stating that:

> Innovation is the design and development of something new, as yet unknown and not in existence, which will establish a new economic configuration out of the old known, existing elements. It will give these elements an entirely new economic dimension. (p. 147)

Kozlowski (1987) refers to innovation as simply "the introduction of a technology new to a given organization" (p. 147). Sink, Tuttle, and DeVries (1984) defines innovation as "the creative process of adaptation of product, service, process, structure, etc. in response to internal as well as external pressures, demands, changes, needs, etc." (p. 268). Nayak and Ketterghamm (1986) explain that innovation is "incremental improvement in existing work methods" (p. 82). Finally, Drucker's (1980) knowledge of innovation is formalized in these words:

> Innovation does not necessarily mean research, for research is only one tool of innovation. Innovation means, first, the systematic sloughing off of yesterday. It means, next, the systematic search for innovative opportunities. It means, thirdly, the willingness to organize for entrepreneurship to aim at creating new businesses rather than new products or modification of old products. It means, finally, the willingness to set up the innovative venture separately to organize proper accounting concepts for the economics and control of innovation, and appropriate compensation policies for innovators. (p. 70)

Miller and Pearce (1987-88) identify 4 different innovation styles that allow people to express themselves individually and fully in their work. These styles include: the Modifier Style; the Vision-Driver Style; the Experimenter Style; and the Explorer Style.

People characterized by the Modifier Style attempt to meet the needs of the group by maximizing accessible resources and finding functional ways to get immediate success. They may obstruct innovation by not allowing themselves to recognize far reaching opportunities.

People characterized by the Vision-Driver Style focus in one direction and develop long-term goals. They may limit innovation by taking steps forward without knowing the possible risks ahead.

People characterized by the Experimenter Style provide methods for taking risks in stages and collectively involve others in the decision making process. They have a difficult time working with people who are not risk-takers, and they limit innovation by losing sight of long-term goals.

People characterized by the Explorer Style defy the accepted way of reality and seek out unique approaches to problems. They can burden innovation by not having clear goals in sight (p. 37).

Pearson (1988) believes that there are five key activities that can be taken to make an organization more dynamic and innovative. She emphasizes that consistent change is the key to an organization's survival. The five activities include:

1) Create and sustain a corporate environment that values better performance above everything else.
2) Structure the organization to permit innovative ideas to rise above the demands of running the business.
3) Clearly define a strategic focus that lets the company channel its innovative efforts realistically, in ways that will pay off in the market.
4) Know where to look for good ideas and how to leverage them once they are found.
5) Go after ideas at full speed, with all their organization's resources brought to bear. (p. 99)

Ray (1987) summarizes that organizational innovation can be best established by identifying these five qualities: intuition, will, joy, strength, and compassion (p. 191). He concludes that:

> The essence vision of creative innovation is far wider and deeper than mastery of problem solving techniques. We look within to find our own individual and universal source...The very purpose of human creativity is to get acquainted with your own essential qualities and express them in your daily activities. (p. 192)

Quality

Quality. Do you remember it? Do you remember during the glory days of the 1950's and 60's when "Made in the U.S.A." proudly represented the best that an industry could produce. Those glory days have since faded from the national picture, and the superior prince of quality has turned indigent. For the U. S. industries, the message is obviously clear: "Get better or get beaten" (Port, 1987, p. 131).

Dr. W. Edwards Deming, generally known as the father of modern quality assurance, views quality as simply "the state of being in which a product is considered to be acceptable. No more, no less" (Wilson, 1987, p. 47). He believes that quality can be achieved by the use of statistics, control charts, and a minimal number of suppliers. Deming has incorporated 14 directories which are to be practiced by management in order to achieve quality. The directories are:

1) Plan products using a long-range perspective in terms of company needs.
2) Learn the new philosophy.
3) Use statistical controls to assure the quality of goods.
4) Use a minimal number of supplies.
5) Realize quality problems: faulty systems and inadequate performance by workers.
6) Improve and modernize job training.
7) Provide a higher caliber of supervision.
8) Drive out fear.
9) Maintain two-way, open communication between all departments.
10) Get rid of numerical goals and slogans.
11) Examine and evaluate the value of work standards in a realistic way.

12) Remove the barriers that stand between the worker and his/her right to take pride in his/her workmanship.
13) Institute a vigorous training program in new skills.
14) Create a quality implementation structure in top management. (Wilson, 1987, p. 47)

Shettey (1986) defines quality as "conformity to customer requirements" (p. 166). She explains that by directing more attention toward the quality of products and services, industries can reduce waste and defects and further improve productivity. Leonard and Sasser (1982) supportively reveal that "efforts to raise quality almost always results in heightened productivity...and efforts to raise productivity usually pay off in better quality" (p. 168). For this reason, Shettey (1987) indicates that quality encompasses three related components: 1) the customer's perception; 2) the product itself plus the service package; and 3) the product's relationship to the competitor's product (p. 167). Quality, therefore, is a major attribute for customer evaluation of products.

According to Crosby (1979), quality is "conformance to requirements; it is precisely measurable; error is not required to fulfill the laws of nature; and people work just as hard now as they ever did" (p. 17). He believes that top management must be committed to quality, and that quality must be built into a product, instead of added to a product. Crosby (1979) supports his views on quality by stating that "Conformance to requirements is achieved by

doing it right the first time...The error that does not exist cannot be missed" (p. 48).

Quality has a different meaning for different people. To some, quality is luxurious features and flashy designs. To others, quality is a fresh and simple look. But basically, quality refers to something that works properly and is durable. Anything else is considered "extra" (Pennar, 1987, p. 136). Quality has become a powerful means of product differentiation. Customers' perceptions of a good value is attained when they have purchased a product or service whose quality is equal to or greater than the valued money spent. Pickworth (1987) refocuses on the issues of quality and introduces the following concepts:

> 1) Quality should be defined in terms of customer expectations
> 2) Quality control should focus on prevention rather than inspection;
> 3) Quality requires commitment from top management;
> 4) Quality shows during the service encounter. (p. 41)

Koelling, Tenjera, and Riel (1987) has defined six quality checkpoints which provides a framework to view the organizational environment. The six quality checkpoints include: 1) upstream systems; 2) inputs; 3) transformation or value adding process; 4) outputs; 5) downstream systems; and 6) quality management process. Sink gives a brief explanation of each checkpoint:

> Q1-Upstream systems checkpoint refers to the selection and management of suppliers, vendors, and customers. This checkpoint focuses upon

communication, clear expectations, specifications, and cooperation.

Q2-Inputs checkpoint refers to incoming quality control. This checkpoint focuses on ensuring that all inputs received are the specified ones that were needed and expected. It emphasizes quality of products and process design.

Q3-Transformation process checkpoint refers to statistical process control. This checkpoint emphasizes continuous improvement of process quality in all departments.

Q4-Outputs checkpoint refers to outgoing quality control. It focuses on ensuring that products and services meet customer specification.

Q5-Downstream systems checkpoint refers to management of customers, end-users, or other people that affect your organization. This checkpoint's absolute commitment is to customer satisfaction. It aims to solve problems before they occur.

Q6-Quality management process checkpoint addresses how the other five checkpoints are managed. It focuses on the tools, tactics, and techniques employed by the organization. This final checkpoint produces a "synergestic" effect over the first five checkpoints. (p. 17)

Kinlaw (1986-87) affirms that quality is "actual performance compared to the stated or hoped-for performance of a process or product" (p. 31). In measuring quality, various measures have been cited. These measures of quality include: 1) measures of system and product reliability; 2) measures of error; and 3) measures of failure. The basic quality ratio model, interpreted by Kinlaw (1986-87), is:

$$\text{Quality} = \frac{\text{Indicators of error or loss}}{\text{Process of product unit}} \quad \text{(p. 31).}$$

Tuttle and Romanowski (1985) report that a quality measurement is an indirect outcome and is concerned with accuracy, timeliness, customer satisfaction, and desired impact of the product or service. Indirectly, accuracy can be assessed in terms of detected error or number of

corrections required, while satisfaction can be indirectly assessed through repeated business or customer complaints.

Today in the foodservice industry, the issue of service quality has taken a giant leap from a buzz word to a real-issue-taken-seriously. Because of this ever-increasing concern for competitiveness nation-wide, quality has become a major issue within the foodservice industry. Berry, Zeithaml, and Parasuraman (1985) conducted a series of interviews in various service sectors and identified ten determinants of quality service. These quality service determinants include: 1) reliability; 2) responsiveness; 3) competence; 4) access; 5) courtesy; 6) effective communication; 7) credibility; 8) security; 9)understanding; and 10) tangibles of the service (p. 45).

One prominent factor that may interfere with service quality in foodservice is the almost inseparable contact between the service producer and the service consumer. Berry, Zeithaml, and Parasuraman (1985) explain that "The involvement of people in the production of service introduces a degree of non-standardization that doesn't exist when machines dominate that production process" (p. 47). It is particularly disturbing when the backgrounds of those workers delivering the services are quite different from the backgrounds of those consumers purchasing the service. With most services, especially foodservice, the problems of service workers' backgrounds

include low wages, insufficient education and talents, non-glamorous jobs, and inadequate training. Likewise, with most services, the workers' language, skills, dress, and odors are "part of the customer's experience" (Berry, Zeithaml, & Parasuraman, 1985, p. 47).

The service quality challenge is to meet and exceed customer expectations. For foodservice, this is a very complex endeavor because there are no formulaic answers to this challenge. Part of the solution is the recognition by top management to sustain high quality; however, the major part of the solution is total commitment. Anything else is not enough.

Quality of Work Life

Quality of work life describes the values that relate to the quality of human experiences in the work place. According to Bennett (1983), quality of work life is "a state of mind, a state of consciousness affected by a composite of factors on the job--factors that relate to the work itself, to the work environment, and the employee personally" (p. 11).

Sink, Tuttle, and DeVries (1984) define quality of work life as "the human beings' effective response or reaction to working and living in organizational systems" (p. 268). Tuttle and Romanowski (1985) indicate that quality of work life is "the extent to which members of the organization perceive that the organization provides

employment security, a working environment that is safe, and communicates respect for employee needs, pay equity, opportunities for personal growth, and an opportunity to influence decisions that affect them on the jobs" (p. 96). Finally, Fuller implies that quality of work life has various meanings:

1) Quality of work life is a continuous process, and not something that can be turned on today and off tomorrow.
2) Quality of work life utilizes all resources, especially human resources, better today than yesterday, and even better tomorrow.
3) Quality of work life develops among all the members of an organization an awareness and understanding of the concerns and needs of others and a willingness to be more responsive to those concerns and needs.
4) Finally, quality of work life is improving the way things get done to assure the long-term effectiveness and success of organizations. (Roscow, 1981, p. 296)

For many years, experts have known that the psychological state of workers effected their overall performance; however, management theorists and researchers did not understand or identify the importance of this factor until the Hawthorne research conducted at Western Electric on employee productivity was published (Sink, 1985). Today, quality of work life has become a major issue in organizations because of the increased desire to improve the organizational effectiveness through the correct utilization of human resources. Ferguson and Berger (1985) explain that "employees should be considered valuable assets, rather than necessary expenses" (p. 25), and Bennett (1983) further expresses that "workers today

are not necessarily less motivated than before; however, their expectations of work have risen, and work has to compete with other values in their lives more directly than before" (p. 11).

As we begin to move toward the 1990's, two critical factors will significantly affect the future of quality of work life. The first factor is the changing values of the workers. Work is being redefined by today's workers, and they are placing less emphasis on material achievements and more on personal fulfillment. The second critical factor is economic. While organizations are responding to the changing values of workers, the United States is also facing economic changes. Poor productivity improvement rates are a major issue contributing to the United States' economic misfortune. U. S. organizations can no longer ignore the declining productivity rates; the joint effort of organizations, government, and labor are essential in order to respond to the needs of the dynamic work force and to resolve the United States' economic and productivity problem (Roscow, 1981).

Bennett (1983) affirms that productivity improvement cannot be discussed without looking farther beyond the concept of gaining greater output and being efficient. She explains that "Productivity is a concept that finds its roots in human dynamism, because it has an indispensable link with improving the nature and quality of life for each individual at work" (p. 11). In other

words, quality of work life is a major value within an organization that provides purpose, usefulness, and responsibility to the efforts of employees and also proves to offer more permanent solutions to the problems of work-force productivity.

Although it is important to know what quality of work life is, it is also important to know what it is not. Quality of work life is not a happiness program. Leo Rosten (1978) supportively gives his view point in his book Passions of Prejudice. He states that "I cannot believe that the purpose of work life is to be happy. I think the purpose of work life is to be useful, to be responsible, to be honorable, to be compassionate. It is above all, to matter: to count, to stand for something, to have it make some difference that you lived at all" (p. 4)

Quality of work life is also not a personnel department program or an employee incentive program. Although increased productivity is one of quality of work life's better results, quality of work life is not a productivity program, either. In a simple statement, quality of work life improvement is humanistic and productive. Katzell and Yankelovich (1975) summarize six critical ingredients for improving quality of work life and productivity. These critical ingredients include:

1) Financial compensation of workers must be linked to their performance and to productivity gains.
2) Workers and work must be matched as to create a work situation which workers will see as capable

of meeting their needs and expectations, and where they will have the capabilities and resources to be successful.
3) For workers who desire it, their work should provide opportunity for full use of their abilities, making a meaningful contribution, having challenging and diversified duties, and being responsible for others.
4) Workers at all levels must have inputs to plans and decisions affecting their jobs and working lives.
5) Appropriate resources, including work methods and equipment, must be provided to facilitate workers' performance and minimize obstacles to carrying out their jobs.
6) Adequate `hygiene' conditions must exist, including competent and considerate supervision, fair pay and conditions, and sound employee relation. (p.38)

According to Tuttle and Romanowski (1985), quality of work life can be measured directly and indirectly. Quality of work life is measured directly by the utilization of surveys and interviews. These quality of work life surveys focus on the employees' perceptions toward their degree of influence on organizational decisions. These surveys also focus on employee reactions toward pay satisfaction, communication with subordinates, supervision, working conditions, and promotional growth opportunities. Surveys are more suitable for large populations. For smaller populations, interviews provide satisfactory results. It is better to have a consistent set of questions for all interviewers when conducting an interview (Tuttle & Romanowski, 1985, p. 219).

Quality of work life is measured indirectly by using surrogate measures. Surrogate measures are expected to vary as quality of work life varies. Examples of

surrogate measures include: absenteeism, turnover, sick leave usage,
grievances, lost tools, and safety. These measures can be gathered in conjunction with the quality of work life survey data (Tuttle & Romanowski, 1985, p. 219).

Motivation has become a troublesome issue in today's foodservice industry. One of the major downfalls in most foodservice organizations is the lack of advancement and promotion. In many cases, the foodservice employees are not well educated and their jobs are considered non-glamorous. The lack of funding in foodservice also makes it increasingly burdensome to offer appealing motivational rewards. Bennett (1983) offers ten strategies that may help foodservice administrators and dietitians improve the quality of work life in their facilities. These strategies include:

1) Redesign the work in order to give employees more control over their accomplishment of tasks for which they have accepted responsibility.
2) The foodservice organization needs to demonstrate that it is a good place to work in order to attract and employ good employees.
3) Allow for employees at all levels to become involved in setting objectives for themselves and also to share objectives with others.
4) Allow two-way communication between employees and management.
5) Employees should be able to foresee advancement growths to higher levels of responsibility.
6) Allow for increased participation of employees in decisions that directly affect their work.
7) Socialization among employees is needed in order to establish a sense of community and openness within the foodservice organization.
8) Create equitable rewards that positively reinforce employees' performance.

9) Provide an atmosphere and environment conductive to the productive health and well-being of its employees.
10) Most importantly, the foodservice organization must provide those who can manage in motivating ways, who can understand and share the values of the contemporary worker, and who can exercise the skills and capabilities necessary to provide the various aspects of supportive behavior. (p. 13)

Quality of work life is not a quick fix. It cannot be implemented over night. There are no simple solutions when dealing with the situations that affect the quality of life of individuals at work. General Foods' chairman, Clarence Francis, gives his advice by conclusively stating:

> You can buy a man's time, you can buy a man's physical presence at a given place, you can even buy a measured number of skilled muscular motions per hour or day. But you cannot buy enthusiasm, you cannot buy the initiative, you cannot buy loyalty, you cannot buy the devotion of hearts, minds, and souls. You have to earn these things...It is ironic that Americans, the most advanced people technically, mechanically, and industrially, should have waited until a comparatively recent period to inquire into the most promising single source of productivity, namely, the `human will to work.' It is hopeful, on the other hand, that the search is now under way. (Bennet, 1983, p. 18)

Productivity

Productivity, or more accurately, the lack thereof, has been the prominent business issue for many years. Recent data indicate that the United States productivity growth ranks toward the bottom among industrialized countries. Statistics show that the Unites States ranks 12th among the top 13 industrialized nations on the criterion of growth in output per worker. Currently, the

U.S. manufacturing sector has managed to slightly improve productivity, and its rate of growth has increased by three percent. Unfortunately, the United States service industries' productivity still remains "feeble" after 20 years (Rollins & Bratkovich, 1988, p. 51).

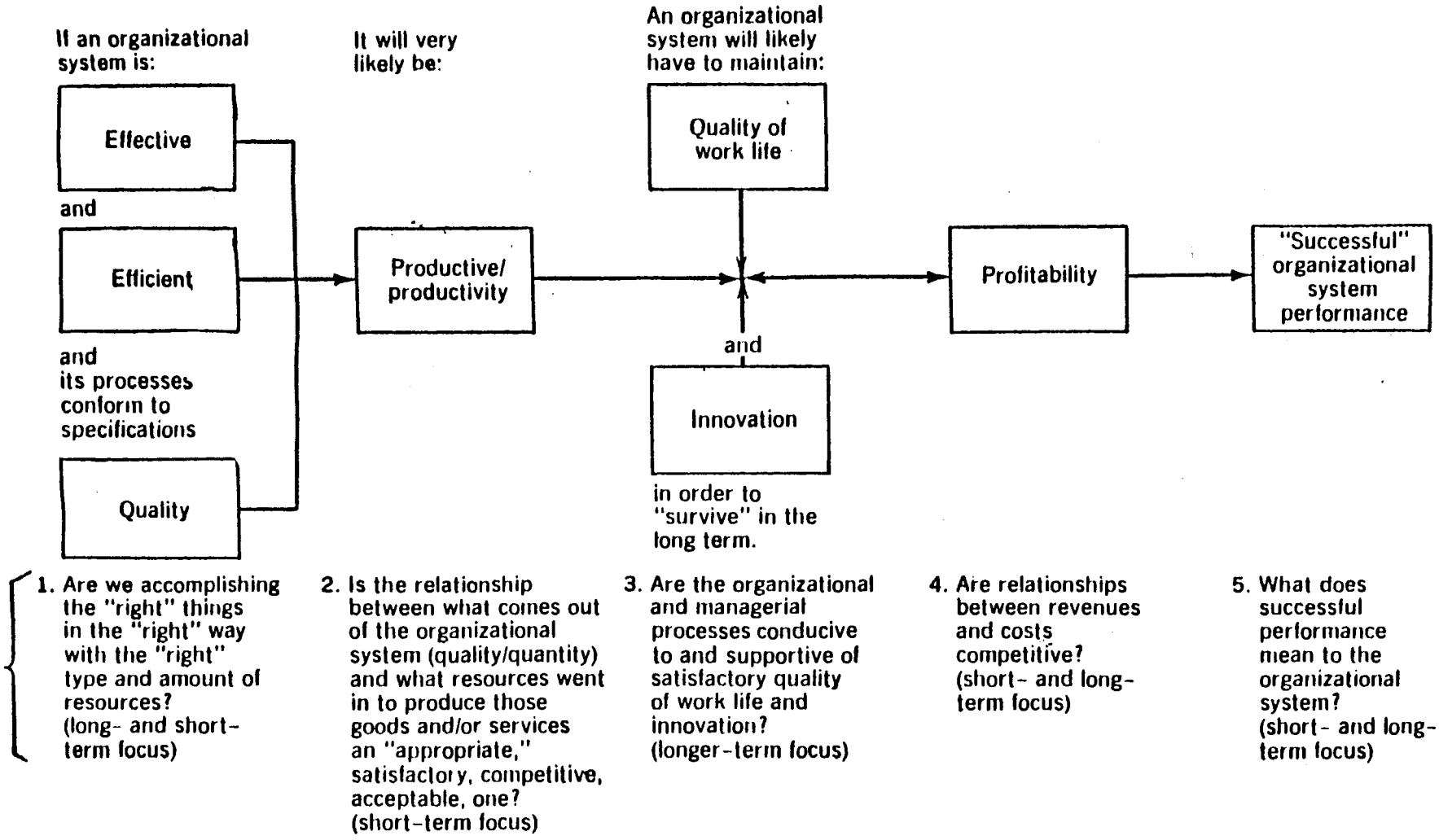
This lag in the United States productivity rate began to terrorize economists and managers in the early 1970's. For awhile, one could not open a newspaper or magazine without reading information on declining productivity. As a result, most managers have experienced productivity overskill. The word, productivity, has become so universal in management, it ceases to indicate any meaningful intent. One of the most important and widely recognized challenges currently facing U.S. industries is productivity enhancement. Various approaches to productivity improvement are being examined by a growing number of organizations and companies in their search for increased productivity. Organizations must begin thinking of productivity as a multidisciplinary concept that focuses on all aspects of inputs and outputs. Pickworth (1987) proclaims that "When an organization embraces productivity as way of thinking, as opposed to a series of quick fixes, it is adopting a strategic rather than tactical orientation" (p. 45).

As emphasized earlier, productivity is an ubiquitous term and has had various terms linked to its concept. Simply defined, productivity is "the ratio of inputs to

outputs" or "the relationship between the outputs generated from a system and the inputs provided to create those outputs" (Sink, 1985, p. 3). According to Drucker (1954), productivity traditionally means "that balance between all factors of production that will give the greatest output for the smallest effort" (p.41). He explains that productivity is remarkably affected by the organization structure and the balance between the various activities within the business.

Tuttle and Romanowski (1985) refer to productivity as "the ratio of quantities of output (goods and services from an organizational system) over a period of time to quantities of input resources consumed by that organizational system for the period of time" (p. 213). Productivity is considered a component on both the input and output sides of the performance equation. It further studies the relationship between "what comes out and what goes in" (Sink, Tuttle, & DeVries, 1984, p. 268).

Sink (1985) indicates that productivity should be viewed as one of the least seven measures of systems performance, and it is notably related to and contingent upon such performance criteria as quality, effectiveness, efficiency, quality of work life, and even innovation. This relationship between productivity and the other six performance criteria can be viewed in Figure 2. There is very little confusion about the definition of productivity; however, previous explanations of



Scott, D. (1985). Productivity Management: Planning, Measurement and Evaluation, Control and Improvement. New York: John Wiley & Sons.

Figure 2. Cause and Effect Relationship Between and Among the Seven Performance Criteria

productivity prove that the difficulties arise in making the concept operational and applicable. First, there are measurement problems; in the service sector, productivity is very difficult to measure and quantify. Second, there is the problem of the ratios and their interrelationship. Third, there is the
problem of finding a theoretical framework in which to organize factual knowledge of productivity (Toombs, 1973).

Sink (1985) introduces productivity measurement as the "selection of physical, temporal, and/or perceptual measures for both input variables and output variables and the development of a ratio of output measures to input variables" (p. 25). Drucker (1974b) views productivity measurement as "the best yardstick for comparing managements of different units within an enterprise, and for comparing managements of different enterprises" (p. 111). He continues by explaining that productivity includes everything it does not control" (p. 111).

In many cases, productivity inputs and outputs are viewed incorrectly by managers and employees. The establishment of meaningful productivity measures is considerably more difficult than the discreet definition would lead one to believe. One reason for these misconceptions is that the U. S. Bureau of Labor Statistics refers to labor productivity as the most widely cited productivity figure. These cited figures are only a portion of the entire productivity picture. Input

variables, stated by Sink (1985), are "any controllable factor or resource that may be acquired in various quantities, types, and/or qualities" (p. 23). Examples of these inputs include: materials, capital, energy, data, as well as labor.

Quantifying and defining outputs is not a simple job. either. Very few organizations produce an individual homogeneous commodity or service; most combine their outputs to arrive at their productivity rates. Again, Sink (1985) defines an output variable as "any controllable factor or resource that results from a transformation of the input variable" (p. 25). Examples of outputs include: energy, people, services, and data/information.

In his book, Productivity: The Burden of Success, Toombs (1973) emphasizes that advantages and limitations exist concerning productivity measurement. The first advantage is that productivity ratios are easily communicated to individuals with varied backgrounds and limited knowledge. Another advantage is that ratios of inputs and outputs can be applied to almost any units and then expanded into meaningful networks.

The first limitation in measurement is that productivity is not a theory but a description tool or an approach to a theory. Secondly, productivity is not a monistic concept. Because productivity is only a unitary concept, it can only measure specified performance objectives. The third limitation is that productivity

ratios are "point-by-point" measures and all information is provided "ex post facto" (p. 13).

According to Wright (1987), eight barriers stand in the way of productivity improvement. These include:

1) lack of direction;
2) poor organizational structure;
3) misunderstood pay systems;
4) ineffective managerial selection and training;
5) negative-effect status symbols;
6) lack of systematic and employee involvement;
7) lack of job security;
8) ill-conceived hiring and training. (p. 31)

Murray and Upton (1988) indicate that the literature on productivity in foodservice operations presently acknowledge three main measurement approaches. The first approach refers to the measurement of quantitative productivity using work sampling to arrive at a measure. The second approach focuses on the measurement of qualitative productivity using judgement assessments to arrive at a numerical value for the quality of the goods and services provided. The third approach suggests that such related factors as absenteeism, turnover, and employee satisfaction correlates directly with both quantitative and qualitative productivity. There appears to be no published studies that actually measure productivity accurately and effectively. The previous measurement approaches that insist that they are measuring productivity are actually measuring other performance criteria, such as efficiency, effectiveness, quality of work life, or quality. These productivity measurement misconceptions could possibly be alleviated by ratio standardization. The ultimate goal of

this study is to produce formal standardized performance ratios that can be implemented by administrators and dietitians in all areas of foodservice.

Profitability

Several years ago, profit was a word rarely used in the hospital foodservice environment; historically, hospitals were classified as non-profit or not-for-profit. In today's society, this historical classification is no longer correct. For-profit hospitals are in existence, and these hospitals are unmistakably emphasizing the word profit. Underwood explains that "hospitals have found that if they can profit from some services, they can in effect reimburse themselves for other less than fully paid for services, thus maintaining an overall break-even financial condition" (Rose, 1984, p . 257). In simpler terms, hospital foodservices are no longer existing primarily as a package deal for hospital patients. Today, foodservice operations are being operated as a business, and these so-called businesses are expected to create sufficient revenue to incorporate costs and in many cases, make a profit.

According to Drucker (1964), "Profits are rewards for making a unique, or at least a distinct, contribution in a meaningful area; and what is meaningful is decided by market and customer" (p. 6). Drucker (1974a) also expresses that "profit is not a cause, but a result--the result of the performance of a business in marketing,

innovation, and productivity" (p. 71). He further indicates that profit serves several economic functions. These functions are explained as followed:

1) Profit is the only effective test of performance;
2) profit is the premium for the risk of uncertainty;
3) profit defines economic progress and supplies the capital for more and better jobs;
4) profit pays for the economic satisfaction and services of a society. (p. 72)

Sink (1985) defines profitability as "a relationship between total revenues and total costs" (p. 43). Walter Rathenau, the German social philosopher, proposes that the word profit should be replaced with the word responsibility. He emphasizes that profit is not a business' entire responsibility, but the business' first responsibility (Drucker, 1974b, p. 73).

Profitability can be measured by applying a variety of ratios. Weston and Brigham (1981) list six financial ratios that can be utilized to judge the financial health of an organization. These ratios include: 1) liquidity ratios; 2) leverage ratios; 3) activity ratios; 4) growth ratios; 5) profitability ratios; and 6) valuation ratios (p. 43).

Profitability can also be measured by utilizing this ratio: $\frac{\text{total revenues}}{\text{total costs}}$ (Sink, 1985, p. 43). Sink (1985) specifically emphasizes that profitability ratios are ordinarily exemplified as profit margins on sales; returns on total assets; and returns on net worth. These

profitability ratio equations can be viewed respectively as the following:

$$\frac{\text{net income (after taxes)}}{\text{sales}}$$

$$\frac{\text{net income}}{\text{total assets}}$$

$$\frac{\text{net income}}{\text{net worth}} \quad \text{(p. 43).}$$

Super (1987) explains that "most hospitals use only 30% to 40% of the capacity of their foodservice departments for patient meal preparation. Administrators are trying to cut back or add services to pay for the staff that remains" (p. 56). The search for new sources of revenue is dominating the health care foodservice sector. Some foodservice facilities are making greater use of their departments by adding delicatessens and bakeries, serving Sunday brunches, offering meal discounts to senior citizens, offering catering services to the public, and selling and delivering meals to homebound people. Because of the strict competition between hospital foodservice operations and contract feeders, independent hospital foodservice directors struggle to remain competitive. Although profits in foodservice is very important, Carol Sherman, director of the Beth Israel Medical Center in New York City, sums up a foodservice's major responsibility by stating that "Our primary goal is to please the patient. It's a market where you can't afford to fail" (Frumkin, 1988, p. 126).

CHAPTER III

METHOD

Introduction

Various research has been conducted by Oklahoma State University's Department of Food, Nutrition, and Institution Administration to identify productivity and performance measures presently being used by foodservice administrators and dietitians in all areas of foodservice. Previous findings indicated that a standardization of ratios is needed in order to assess the overall performance of foodservice organizations. The purpose of this study is to pursue the measurement of the three basic performance ratios over a two- quarter period of time and to further explore the performance ratios being utilized by foodservice administrators and dietitians in health care delivery systems. This study may be used as a guide for foodservice administrators and dietitians to monitor and measure individual performance in their facilities by utilizing these formal standardized performance ratios.

Research Design

Descriptive status survey was the type of research design selected to meet the objectives of this study. ccording to Best and Kahn (1986), descriptive research is concerned with the hypothesis formulation and testing, analysis of the relationship between non-manipulated variables, and the development of generalization (p. 24). Joseph and Joseph (1979) refer to descriptive research as that which systematically describes a situation, area of interest, series of events, opinions, attitudes, or other variables or set of variables in a factual and accurate manner.

Sample

The criterion requirement established for participants in the survey was membership in the American Dietetic Association practice group "ADA Members With Management Responsibilities in Health Care Delivery Systems." Five hundred survey participants were randomly selected by the American Dietetic Association from the 2,370 members of the ADA practice group in 1987. Random selection by ADA was utilized as a means for unbiased selection.

Data Collection

Preliminary Study

As the survey instrument used in this study was an identical version of the questionnaire used by Czajkowski (1988), the need for a repeated preliminary study was not necessary.

The Instrument

The questionnaire was a simplification of previous performance surveys developed by researchers at Oklahoma State University's Department of Food, Nutrition, and Institution Administration (Appendix B). The first section contained demographic data and identified both personal and institutional variables. Personal variables include: respondent's age, educational background, registration status and title, salary level, years in foodservice management, and training received in productivity measurement. The institutional variables include: type and size of facility, hospital affiliation, type of medical services provided, type of foodservice system and managerial control, percentage of annual budget allotted for food/labor, and typed of managerial training programs available.

The performance index section A required participants to compute the following ratios using their departmental figures from the 3rd and 4th quarters of the

1986 fiscal year. A sample entry was provided as an example to help participants calculate the ratios. Precise definitions were also given for further explanation. Section B consisted of additional performance ratios utilized in foodservice. Participants were asked to place a check mark by all ratios that were utilized in their facilities.

The performance measurement component of the instrument consisted of three sections relating to practices and procedures currently being used to monitor and measure performance in departmental foodservices. In section A, respondents were given a list of activities and were asked to determine the frequency of utilization by using a Likert-type scale. Sections B and C required respondents to place a check mark by any additional activities and employee benefit programs practiced.

The instrument was printed on three sheets of lavender- colored paper; both back and front sides were used. The first sheet consisted of a cover letter explaining the increased need for accurate and effective performance measurement in the foodservice industry and eliciting the participants response. The actual questionnaire followed in three sections, one section printed on each side of the paper. Mailing information, codes and return postage were printed on the back side of the final page of the questionnaire. The instrument

could be returned by re- folding and stapling (no envelope was required).

Distribution

The instrument was mailed, First Class, on June 29, 1987. Approximately one month was allowed for response. A follow-up mailing was not performed due to limited time and cost restraints.

Data Analysis

The data collected from the survey were coded and entered into the computer using the software program PC-File III. Statistical Analysis System (SAS) was utilized in the data analysis process. Frequency tables were then constructed to determine the personal and institutional characteristics of the respondents and the degree of utilization of the performance measures.

For more accurate statistical analysis and for more effective comparison of the personal and institutional characteristics, these categories were further condensed to the following groupings:

Age: 20-39 and 40 years and over

Route to Registration: CUP, internship, and other

Salary: $34,999 and below and $35,000 and above

Years in Foodservice Management: 1-10 and 11 or more years

Facility: hospital and other

Size: 101-300 beds and 301 or more beds

Facility Location: Urban/Rural (49,999 and less inhabitants and Metropolitan (50,000+ inhabitants)

As the process of statistical analysis progressed, the list of performance measure frequencies (Survey, Section IIIA) were also reduced to eliminate similar and unnecessary groupings. The new categories included:

Frequently: (Daily and Weekly)

Occasionally: (Biweekly, Monthly, Yearly, and Never)

Statistical tests performed on the data were the chi-square analysis which assessed the relationship between demographic characteristics and the utilization of performance measures and ratios.

CHAPTER IV

RESULTS AND DISCUSSION

Data for this study were obtained via the instrument described in Chapter III, "Methods and Procedures." The questionnaire was mailed to 500 randomly selected members of the ADA practice group "ADA Members With Management Responsibilities in Health Care Delivery Systems." The response rate was 10.2 percent (N=51). Ten percent (N=50) of the returned questionnaires were usable for analysis purpose. The reason for exclusion of the one respondent was failure to respond to two pages of the questionnaire. Results and statistical analysis from the remaining 50 respondents are summarized in the following sections.

Characteristics of the Respondents

Age and Educational Background

Six percent (N=3) of the respondents were between 20 to 29 years of age, 28 percent (N=14) were between the ages of 30 to 39, 32 percent (N=16) were between 40 to 49 years of age, and 34 percent (N=17) were 50 years or older

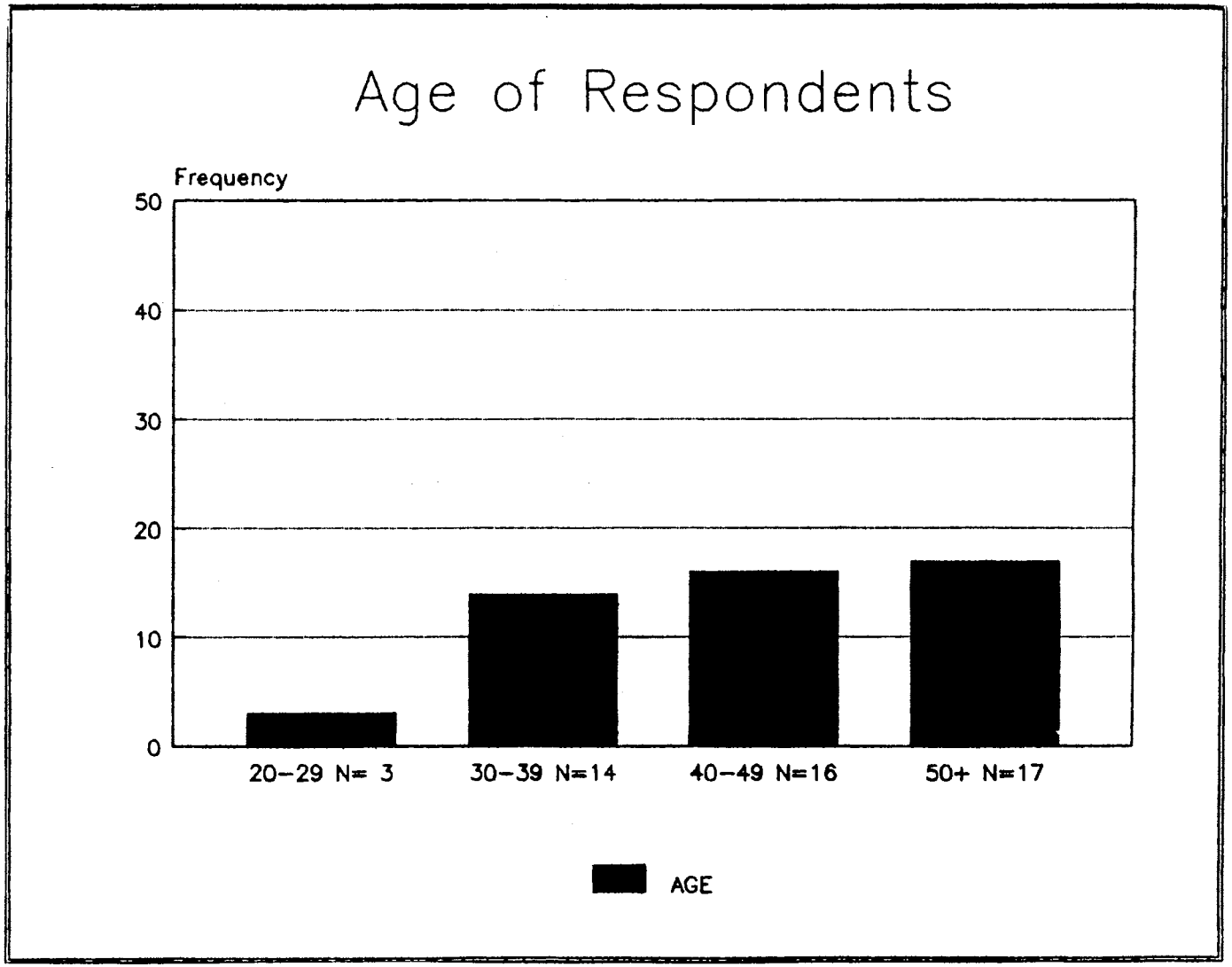


Figure 3. Age of the Respondents

(Figure 3). With regard to educational background, every respondent received a bachelor degree (100%, N=50). Twenty-four percent (N=12) of these relate to some area of food, nutrition, or dietetics, while 12 percent (N=6) specify foodservice administration, institutional administration, or food, nutrition, and institution administration as their areas of study. There was one respondent (2%) each in the area of home economics, health, and science. Majority of the respondents (N=29, 58%) did not specify their chosen area of study.

One half of the respondents (50%) also received a master's degree. Thirty-six percent (N=9) of the respondents received an advanced degree in some aspect of institutional administration, business administration, or management, while twenty-four percent (N=6) of the respondents chose some aspect of food, nutrition, or dietetics as their advanced area of study. The remaining masters level degrees were in allied health (N=1, 4%) or education (N=2, 8%). Twenty-eight percent (N=7) of the respondents listing an earned master's degree chose not to specify an area of study (Figure 4).

ADA Registration and Route

Ninety-six percent (N=48) of the respondents were registered dietitians, while 2 percent (N=1) were not.

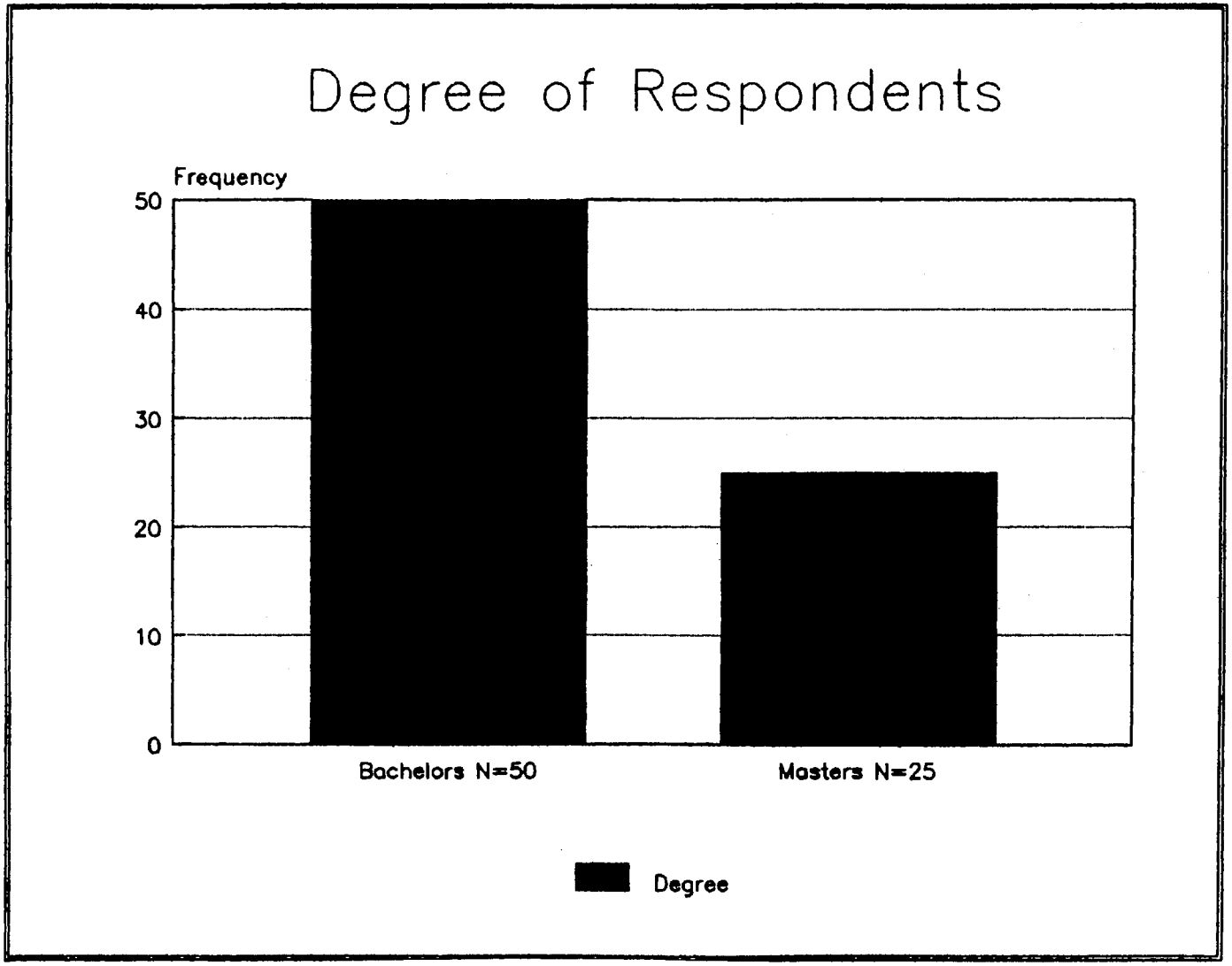


Figure 4. Degree of the Respondents

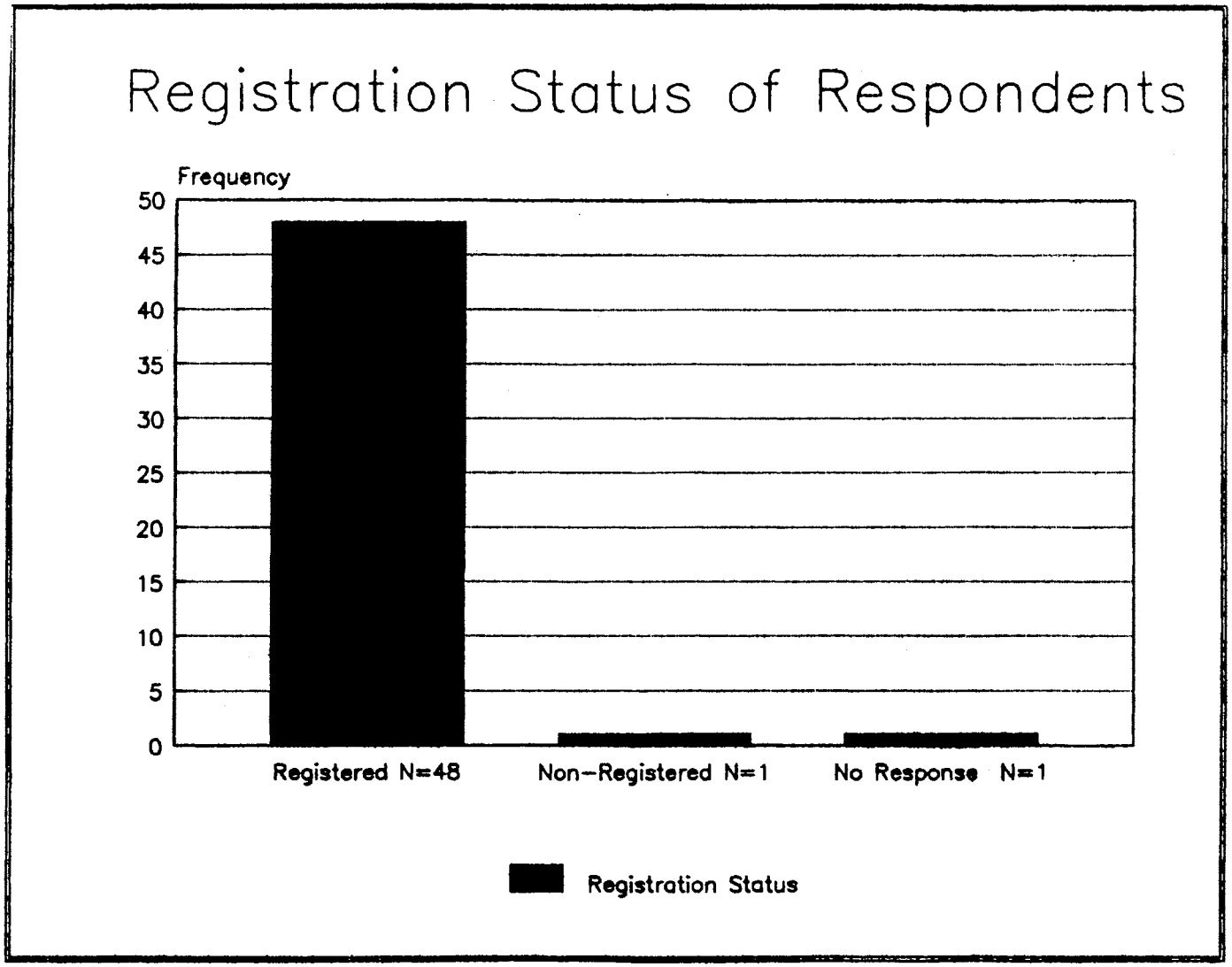


Figure 5. Registration Status of the Respondents

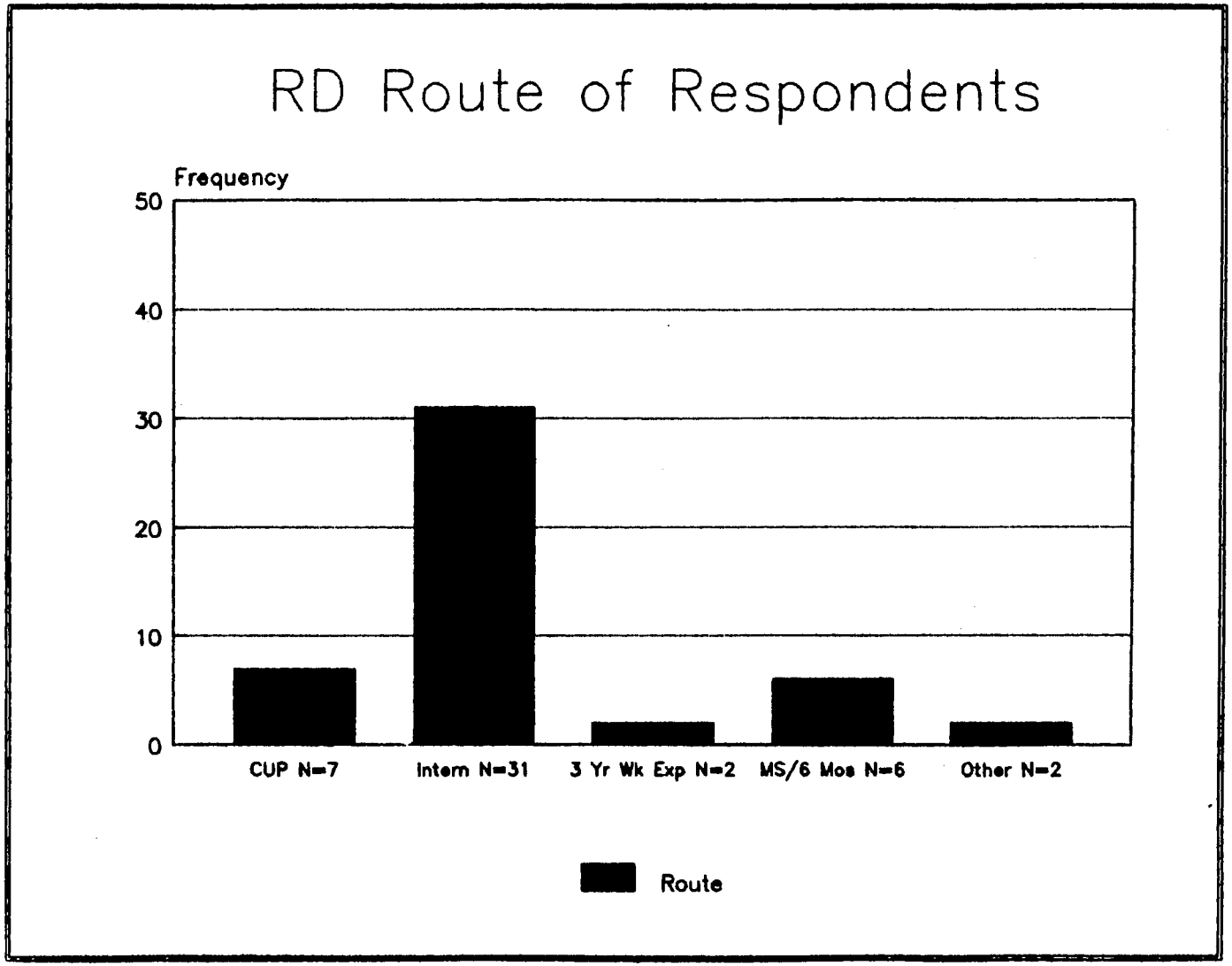


Figure 6. Route Characteristics of the Respondents

(Figure 5). Sixty-two percent (N=31) of the respondents listed dietetic internship as their route to membership. The CUP program was ranked next in popularity, utilized by 14 percent (N=7). Twelve percent (N=6) completed a master's degree plus six month pre-planned work experience. Eight percent (N=4) completed a 3 year work experience, while two of the respondents (4%) checked the "other" category, both specifying "dietetic traineeship" as their route to registration (Figure 6).

Position Title, Salary, and Years in Foodservice Management

The predominant position title of the respondents was that of foodservice director or chief dietitian (N=31, 62%). There were six respondents (12%) each that held the titles of associate director or administrative dietitian. The remaining seven (16%) checked the "other" category under position title. The remaining chosen titles were clinical dietitian (N=2, 4%), dietetic consultant (N=1, 2%), survey and certification specialist (N=1, 2%), planning dietitian (N=1, 2%), material management service coordinator (N=1, 2%), or research and quality assurance director (N=1, 2%) (Figure 7).

The majority of the respondents' salaries ranged from $35,000 to 39,999 (N=13, 26%). Twenty percent (N=10) of the respondents earned between $40,000 to

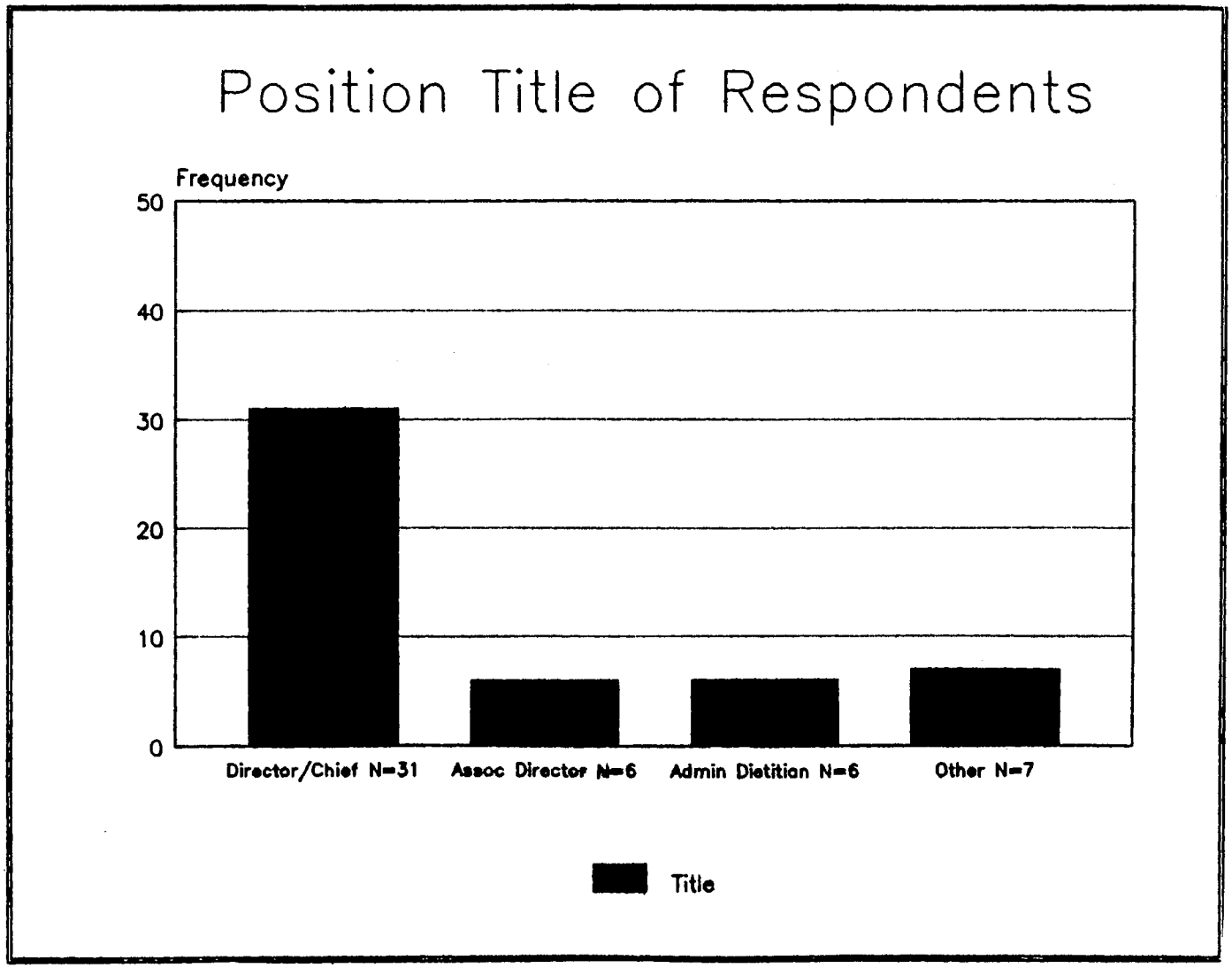


Figure 7. Position Title of the Respondents

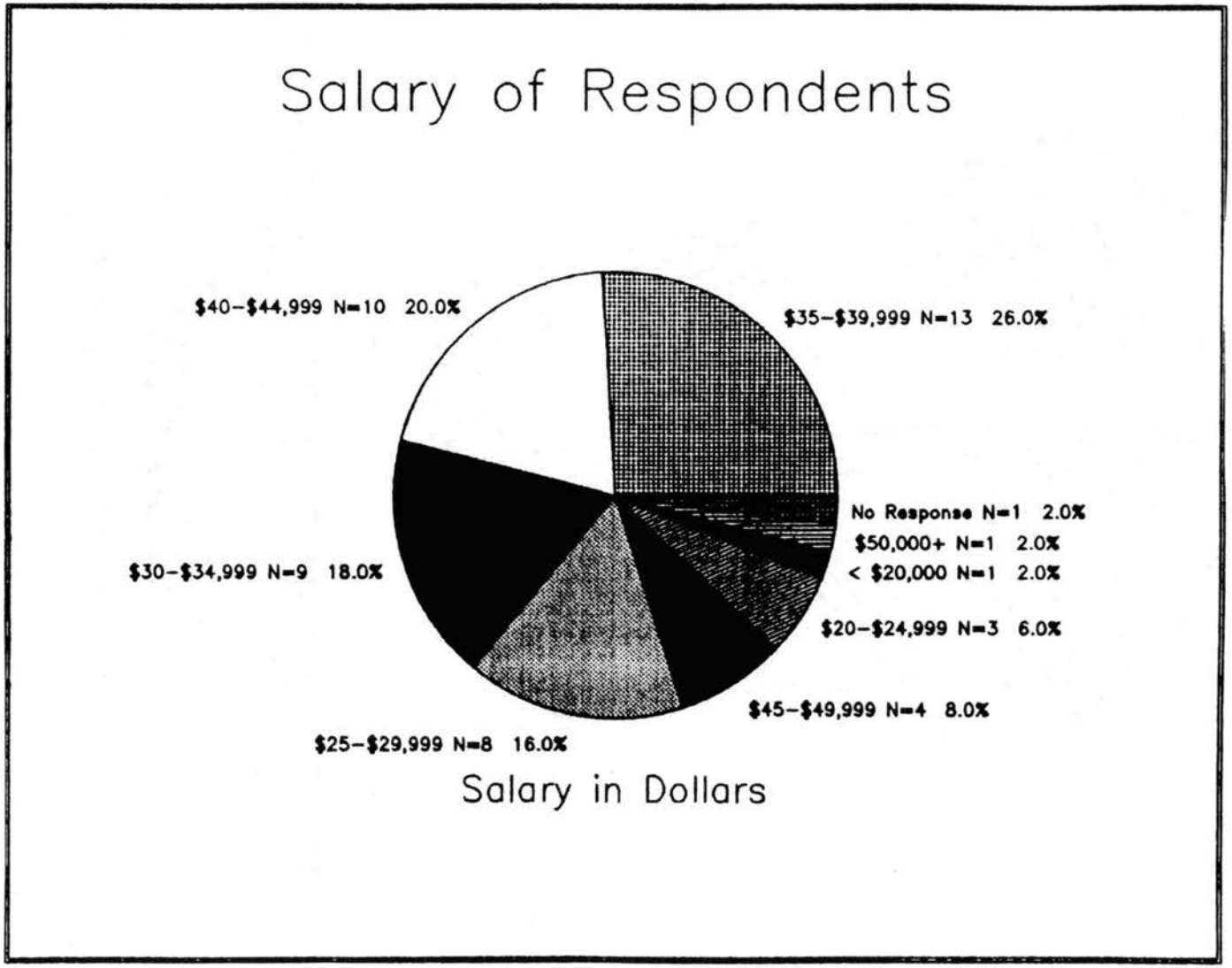


Figure 8. Salary of the Respondents

$44,999, and 18 percent (N=9) received $30,000 to $34,999 (Figure 8). The majority of the respondents (42%) had 16 or more years as foodservice managers. The next largest group had an average of 6 to 10 years (N=16, 32%) (Figure 9).

Productivity Training

Twenty-seven respondents (59%) indicated that they had not received any type of productivity training, while only 19 of the respondents (N=41%) had received training in productivity (Figure 10).. These findings were similar to Czajkowski (1988), where 48 percent (N=31) also had received some form of productivity training.

Characteristics of the Institution

Type of Hospital, Hospital Membership, and Type of Service

Forty-six percent (N=22) of the respondents were employed by non-government, non-profit hospital facilities. Forty-two percent (N=20) were employed by government, non-federal, non-profit hospital facilities, while 10 percent (N=5) were employed by investor owned, for profit hospital facilities (Figure 11).

With regard to hospital affiliation and accreditation, joint membership in AHA and JCAH was the most prominent response (N=23, 52%). Membership

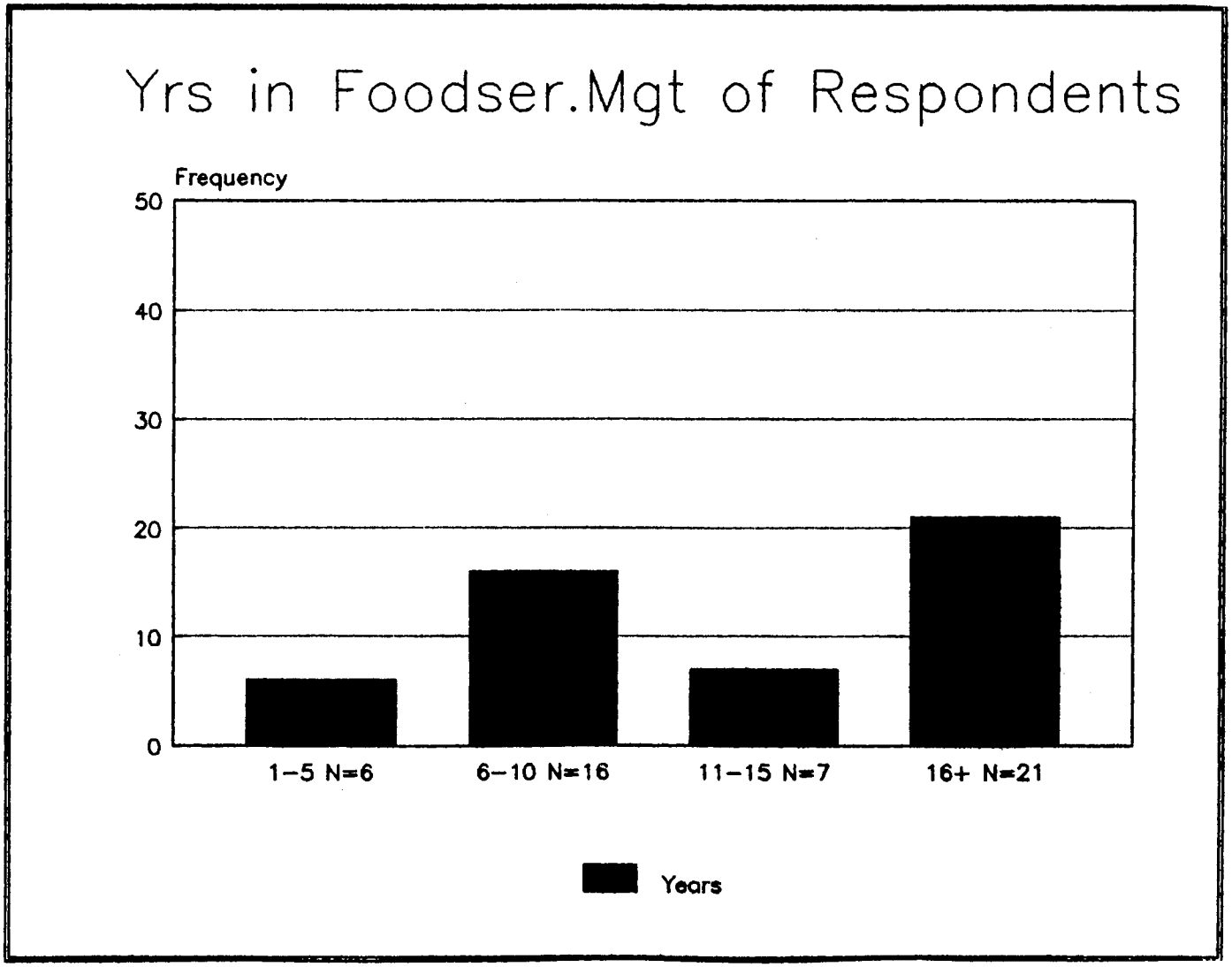


Figure 9. Years in Foodservice Management of the Respondents

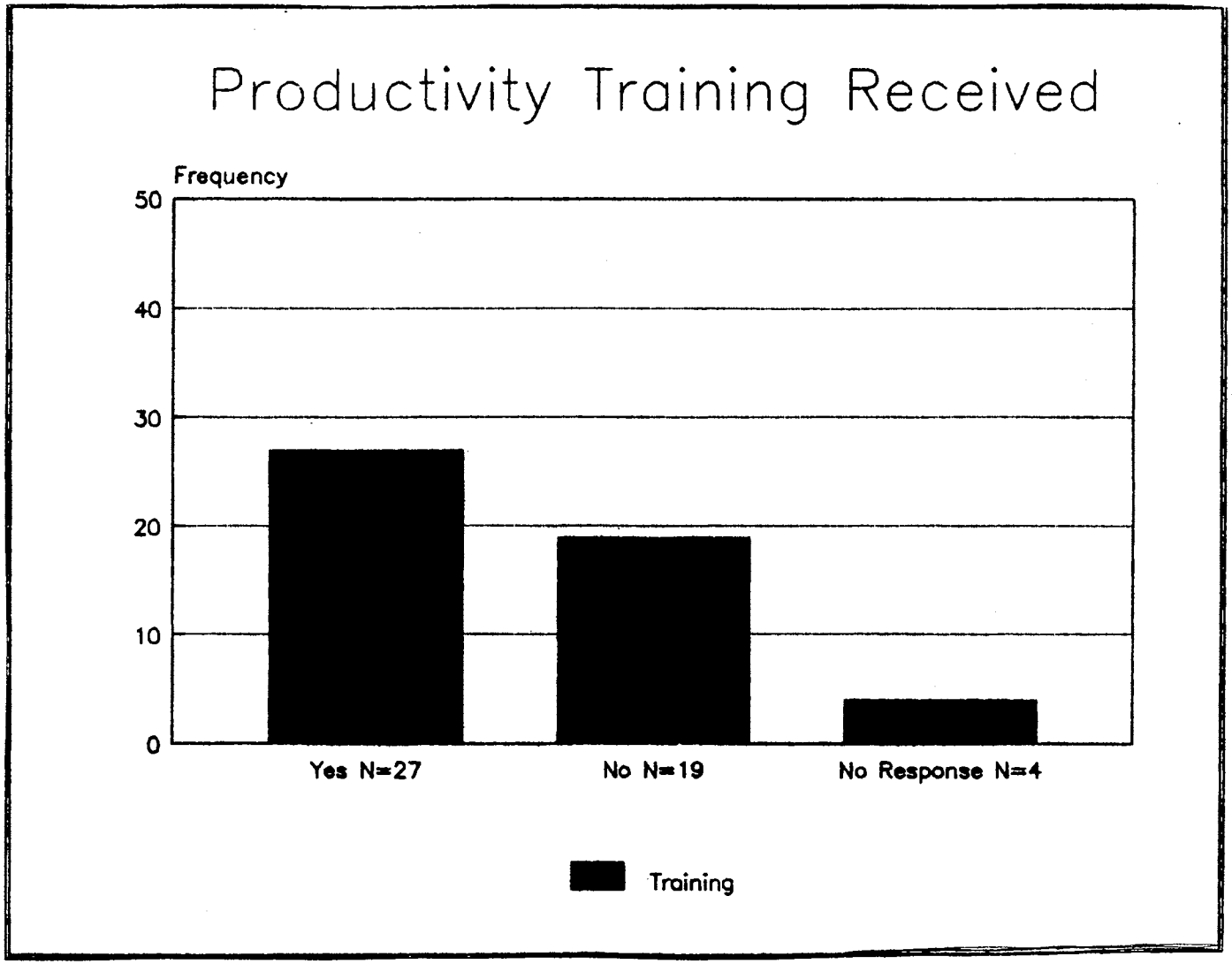


Figure 10. Productivity Training of the Respondents

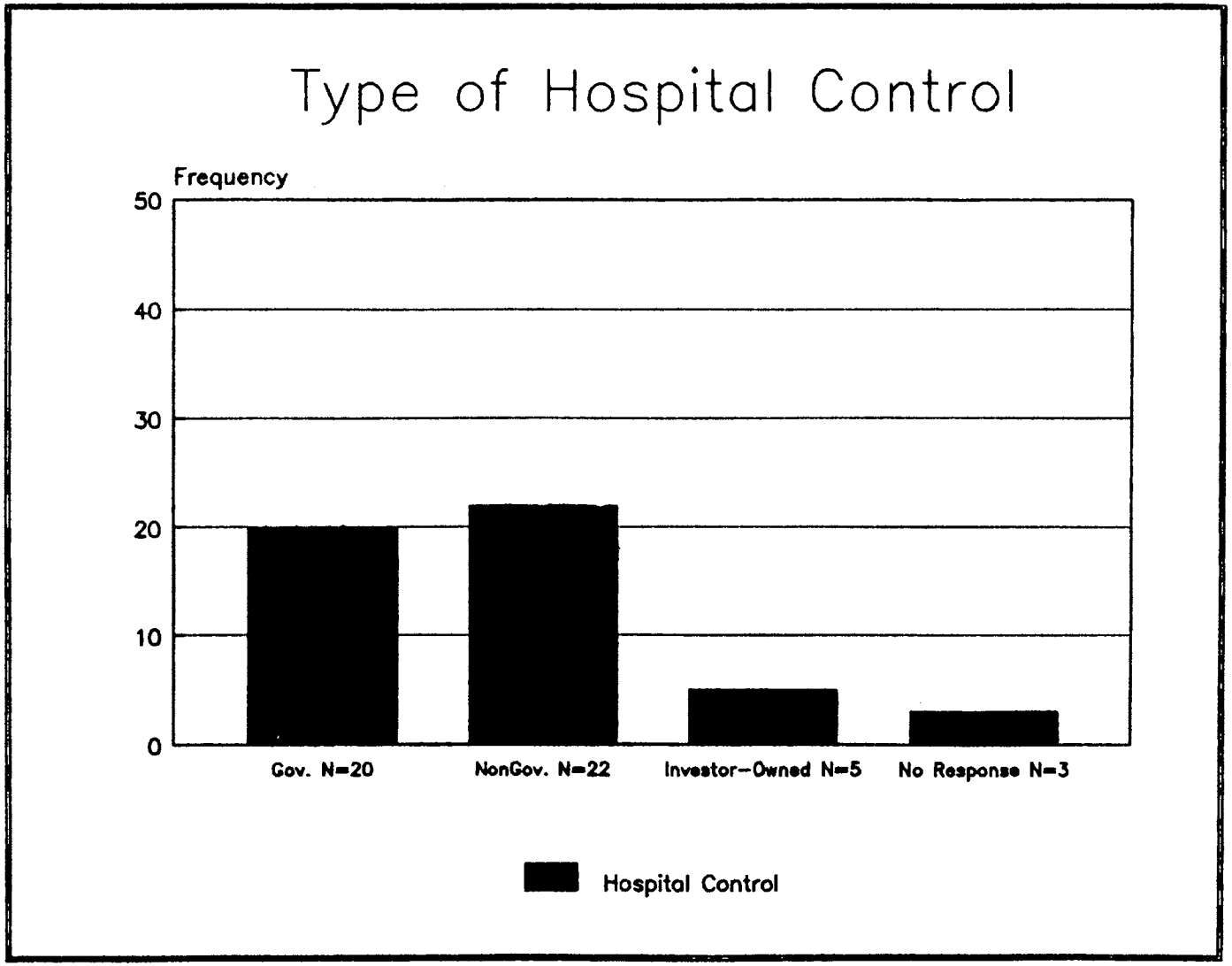


Figure 11. Hospital Control of the Responding Facilities

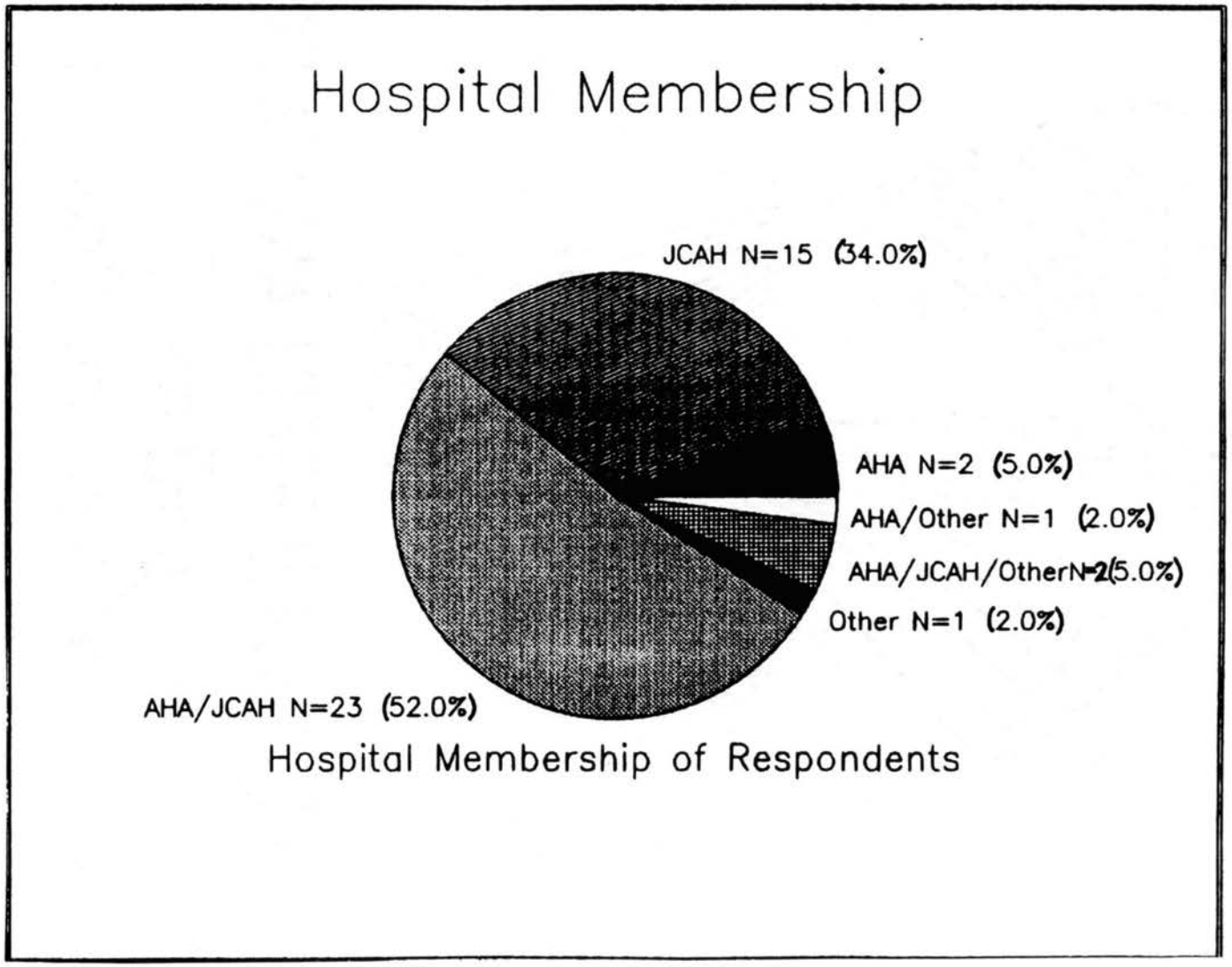


Figure 12. Hospital Membership of the Responding Facilities

independent of JCAH was the second ranked category (N=15, 34%) (Figure 12).

The majority of the respondents indicated their type of medical service to be general (N=36, 80%). Twenty percent (N=9) of the respondents, however, chose the "other" category, listing tertiary care, catastrophic care, psychiatric care, orthopedic care, long term care, and chemical dependency unit care (Figure 13).

Type, Size, and Location of Facility

Sixty percent (N=33) of the respondents were singularly hospital-type facilities, while 18 percent (N=9) were hospital-nursing home combinations. Eight respondents (16%) checked the "other" category, primarily listing mental retardation facilities, medical correctional facilities, and exclusive nursing home facilities (Figure 14).

The most favored response regarding facility size was between 101 and 300 beds (N=24, 54%). The following responses substantially decreased in numerical order from this point, with 18 percent (N=8) having between 301 to 500 beds and 16 percent (N=7) having between 501 to 700 beds (Figure 15).

In regard to the facility location, 61 percent (N=30) of the respondents indicated that their facility was located in the metropolitan area. Thirty-three percent

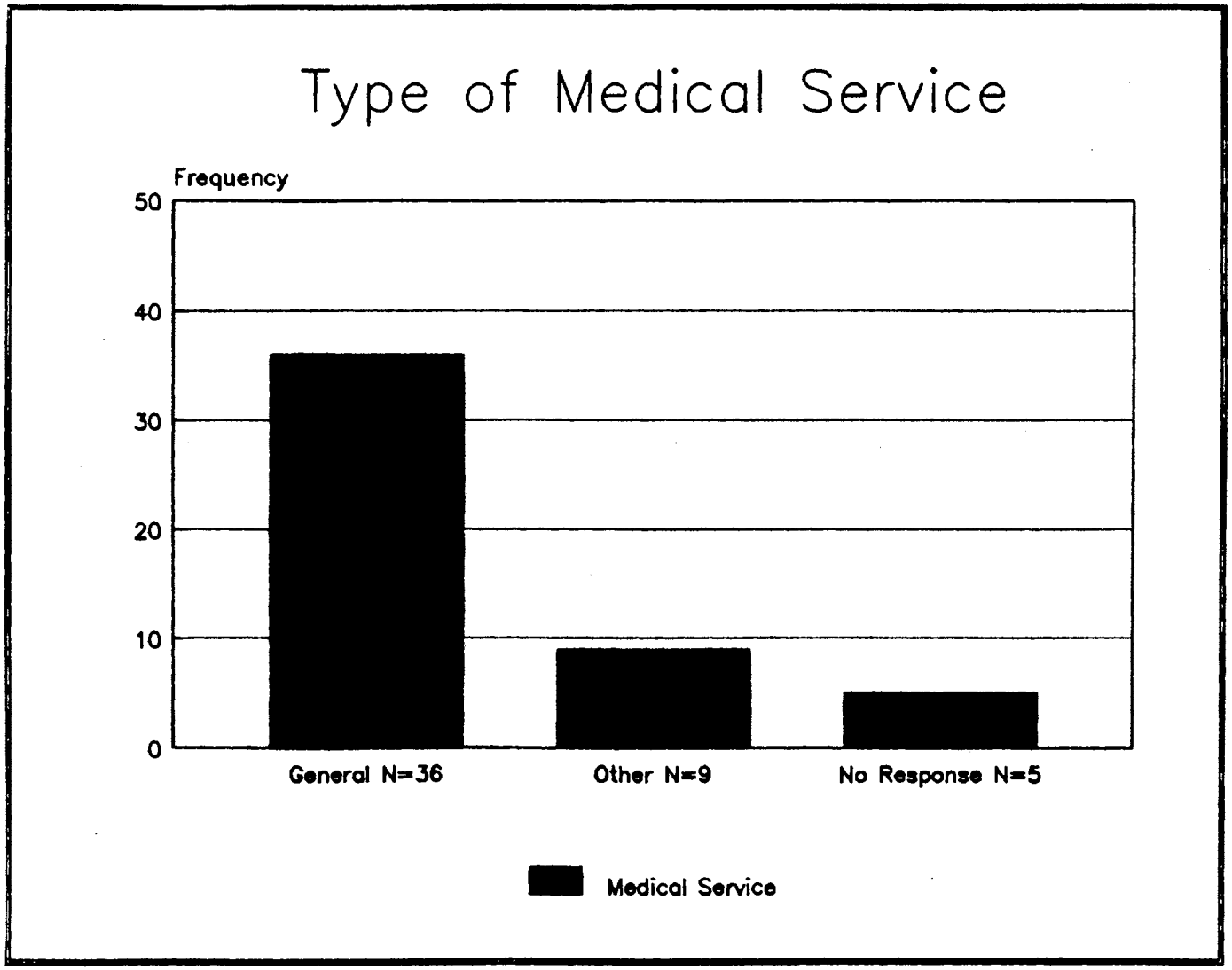


Figure 13. Provided Medical Service of the Responding Facilities

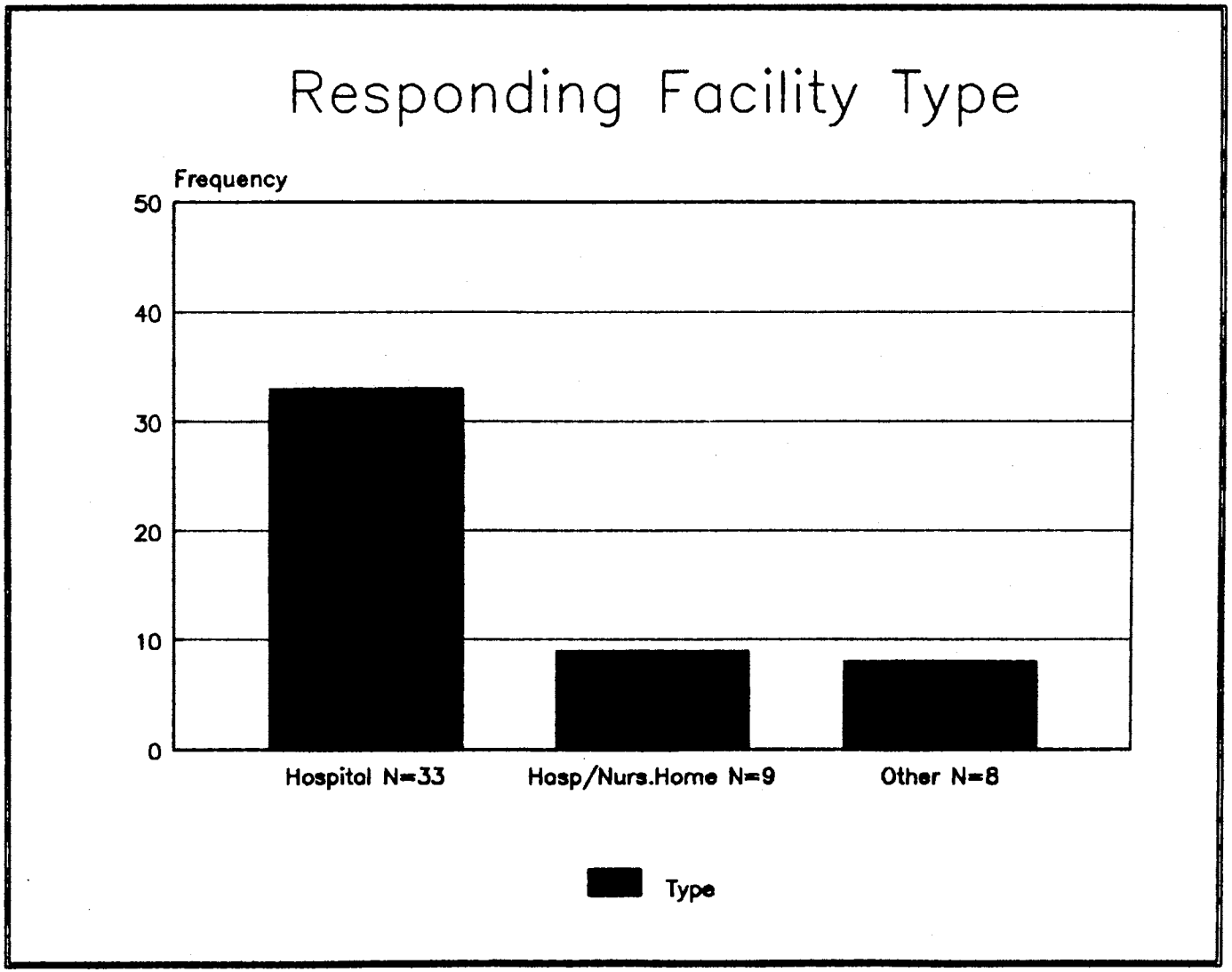


Figure 14. Facility Type of the Responding Facilities

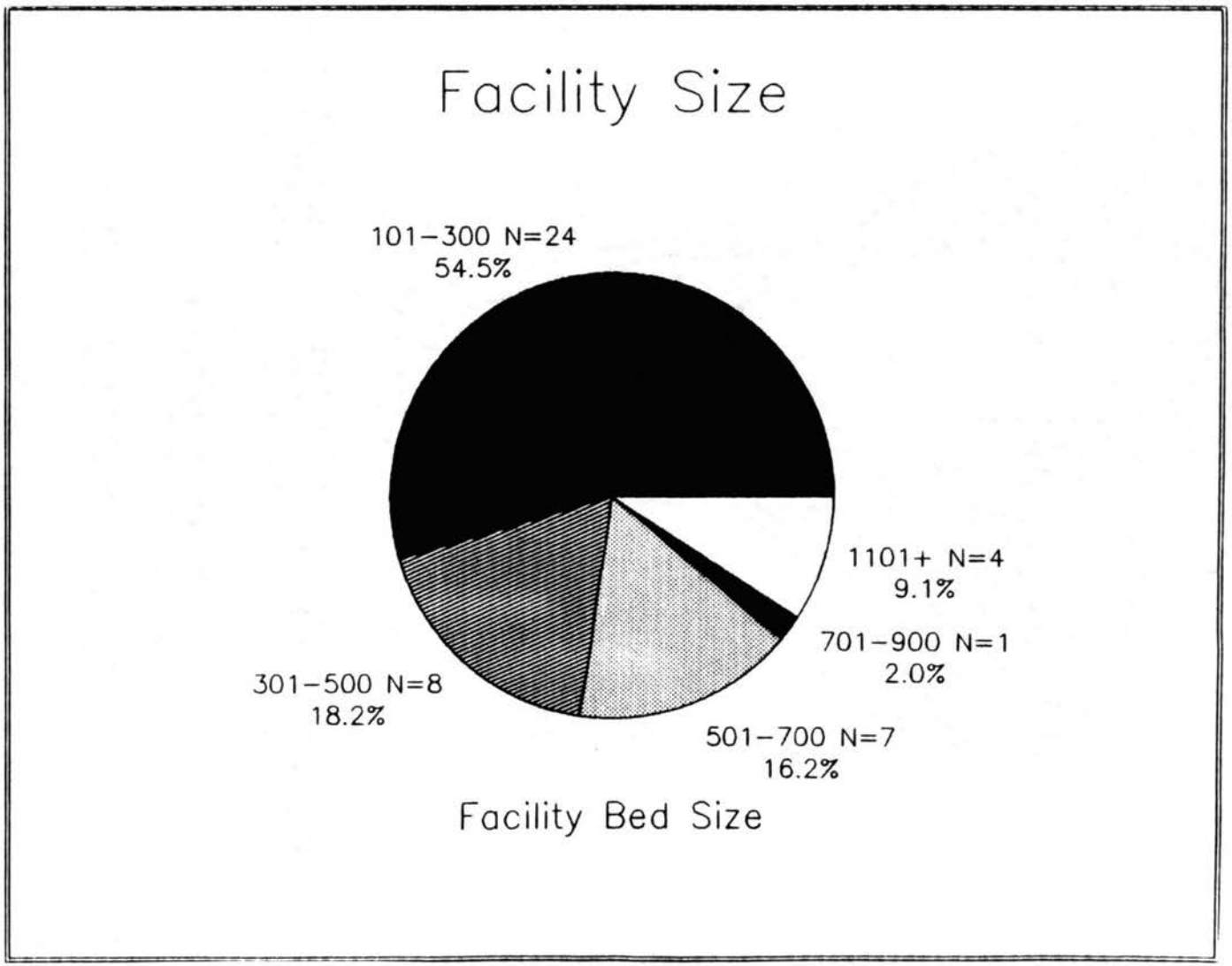


Figure 15. Size of the Responding Facilities

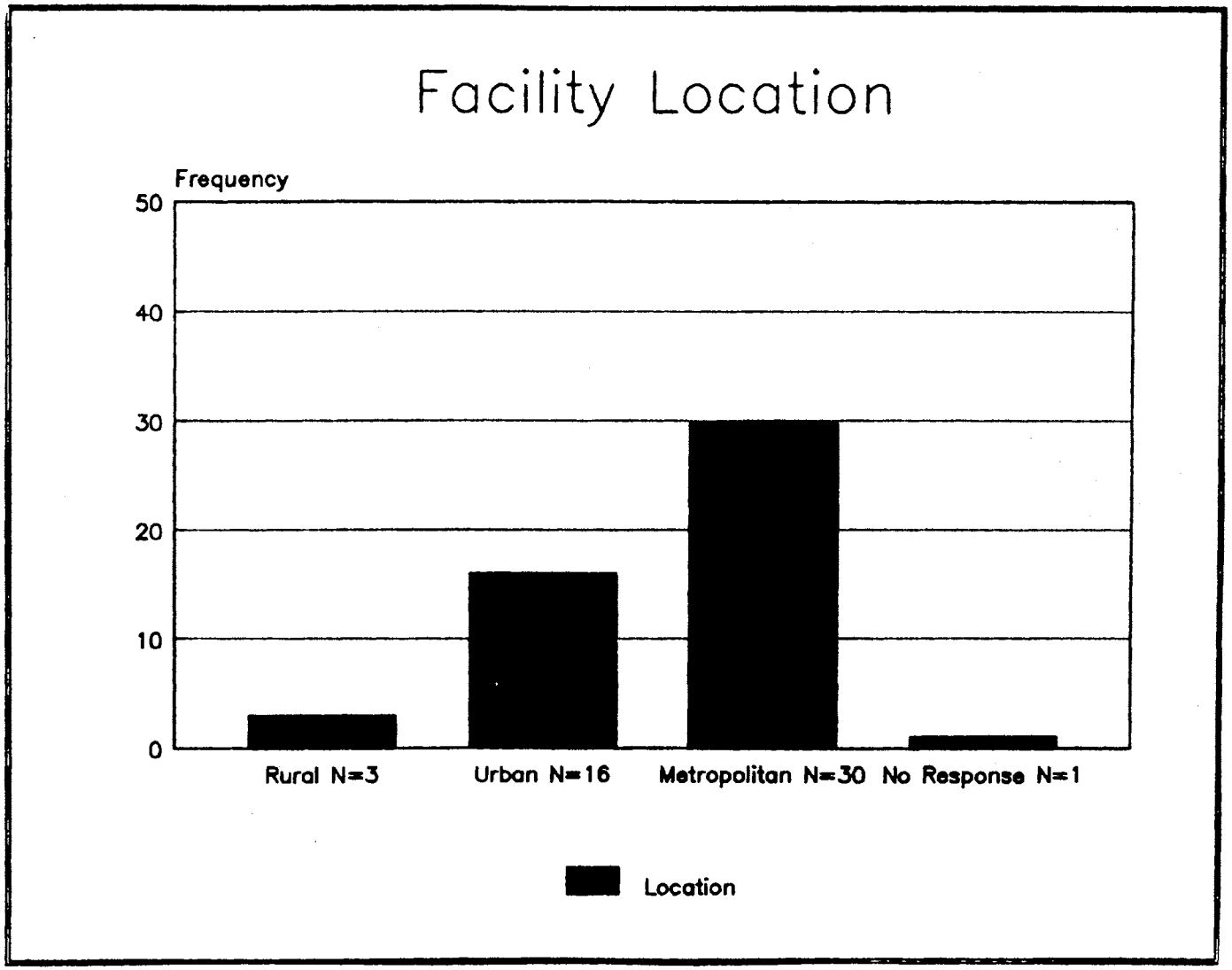


Figure 16. Location of the Responding Facilities

(N=16) of the institutions were located in urban areas, and 6 percent (N=3) were from rural areas (Figure 16).

Type of Foodservice Management/ Foodservice System

The majority of the participating facilities were not contracted to foodservice management corporations (N=46, 96%), while only 4 percent (N=2) of the facilities participated in such arrangements. Marriott was the contracting company listed (Figure 17).

Ninety percent (N=43) of the respondents utilized a conventional foodservice system, while 10 percent (N=5) utilized a non-conventional system. Alternate responses included cook-freeze (N=1, 2%), minimal cook (N=1, 2%), cook-chill (N=1, 2%), convenience method (N=1, 2%), and Aladdin-Tempt Rite II (Figure 18).

Percentage of Annual Budget/Allocated to Food/Labor

The findings for this category are summarized in Table 1. In regard to the responses given, the interpretation of this question may have differed among respondents due to their institutional definition of food and labor costs. Some interpreted food and labor to equal 100 percent of the total budget, while others included additional factors plus food and labor when summing the total budget. This may be an indication that standardized

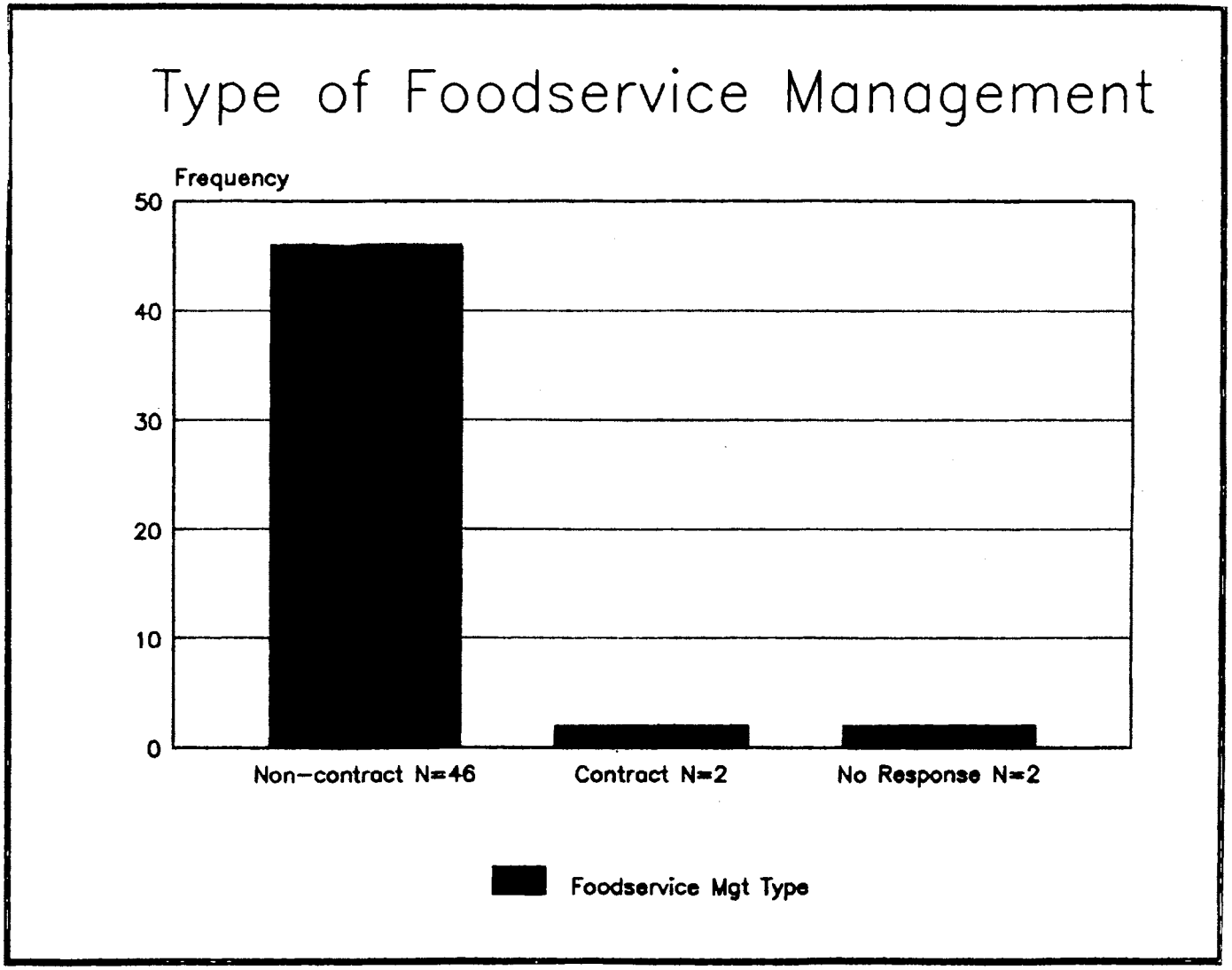


Figure 17. Type of Foodservice Management of the Responding Facilities

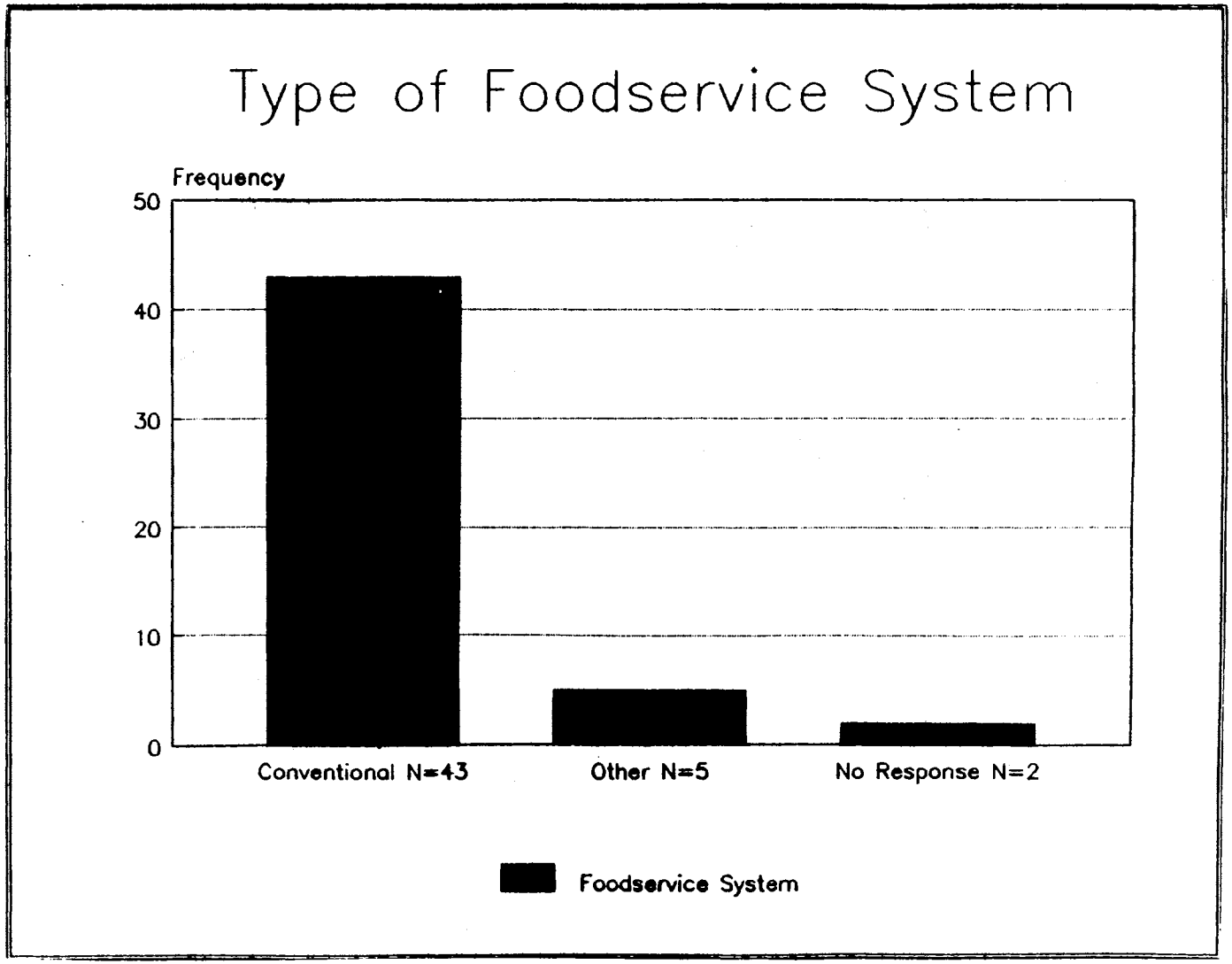


Figure 18. Type of Foodservice System of the Responding Facilities

TABLE I

PERCENTAGE OF ANNUAL BUDGET FOR FOOD AND LABOR

Food (%)	Labor (%)	N	Percentage of Respondents
2	2	1	4
27	60	1	4
27	66	1	4
30	40	1	4
30	55	1	4
30	60	1	4
30	70	1	4
31	61	1	4
32	56	1	4
32	61	1	4
35	38	1	4
35	56	1	4
35	65	1	4
35	75	1	4
37	63	1	4
38	51	1	4
39	50	1	4
39	61	1	4
40	60	3	12
45	54	1	4
45	55	1	4
50	50	1	4
64	32	1	4
100	0	1	4

NOTE Food and Labor may not equal 100.

definitions of food and labor cost need to be developed and explained in all foodservice operations.

Managerial Training Program

Seventy-two percent (N=34) of the dietitians indicated that they have participated in some type of managerial training program, such as off the job workshops, in-service training, orientation training, correspondence testing, and computer based courses. Twenty eight percent (N=13) indicated that they have not received managerial training. (Figure 19).

Performance Measures

As previously emphasized by Sink (1985), a difference does exist between productivity and the other six performance criteria. Section II and III of the survey instrument attempted to determine the degree of utilization of various ratios and performance measures.

In Section II, Part A, participants were given three basic ratios and were asked to obtain and calculate actual departmental figures for the third and fourth quarters of the 1986 fiscal year. Section II, Part B listed 12 additional ratios requiring that participants indicate utilization with a check mark.

In Section III, Part A, participants were given a list of 16 activities that were previously identified as useful assessments of performance within foodservice

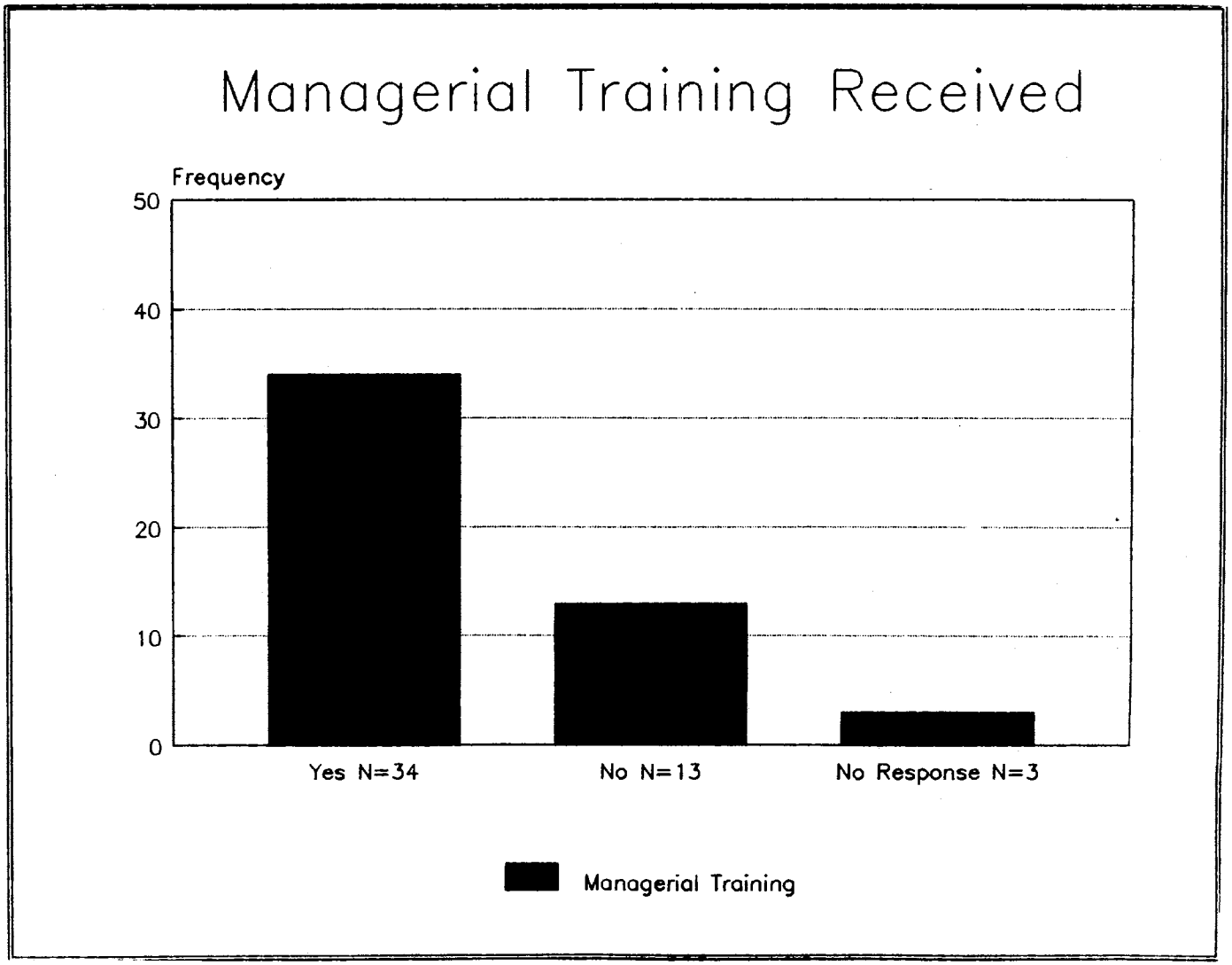


Figure 19. Management Training Programs Offered
Offered By Responding Facilities

operations. The participants were then asked to indicate frequency of utilization by placing a number from 1 to 7 in the blank space preceding each activity (1=never, 2=daily, 3=weekly, 4=biweekly, 5=monthly, 6=yearly, 7=other. As the process of statistical analysis progressed, the list of frequencies were reduced to two categories in order to eliminate similar and unnecessary groupings.

Survey Section III, Part B and C listed 11 additional activities and 9 benefit programs, respectively, asking that participants indicate utilization with a check mark. Definitions were provided appropriately within the questionnaire in order to prevent terminology misinterpretations. The activities and programs in the following discussion will be grouped according to the individual performance measure they represent.

Effectiveness Measures

Effectiveness was defined as "the extent to which the outputs produced enable the organization to achieve its goods and objectives" (Tuttle & Romanowski, 1985, p. 95). Effectiveness measures associated with this research included: verbal/written statement of departmental goals and management by objectives (MBO/employee evaluation) (Table II).

Verbal/written statement of departmental goals are utilized by 98 percent (N=46) of the respondents

TABLE II

SIGNIFICANT ASSOCIATION FOUND IN EFFECTIVENESS CONTROLS

Effectiveness Controls	Demographic Variables	Observed Significance	x^2	df
MBO/Employee Evaluations*	Hospital Membership	.002	9.732	1

*Warning: 75 percent of the cell has an expected count less than 5.

TABLE III

SIGNIFICANT ASSOCIATIONS FOUND IN EFFICIENCY CONTROLS

Efficiency Controls	Demographic Variables	Observed Significance	x^2	df
Meal Price Analysis*	Facility Type	.035	4.456	1
	Degree	.079	3.078	1
Labor Analysis of Turnover and Absenteeism Rates*	Position Title	.011	6.429	1

*Warning: 50 to 75 percent of the cells have expected counts less than 5.

occasionally and 2 percent (N=1) frequently. With regard to MBO techniques, the majority of the respondents utilized this effectiveness measure occasionally (N=46, 98%), while 2 percent (N=1) used it frequently. A statistical association existed between MBO/employee evaluation and membership in an affiliation other than AHA or JCAH ($p=.022$, $x^2=9.732$, $df=1$). Of the 4 responding facilities that are affiliated with some other membership, 3 (75%) of these facilities utilized MBO/employee evaluations on an occasional basis, whereas only 1 responding facility (25%) utilized this measure more frequently.

Efficiency Measures

Efficiency was defined as "the ratio resources expected to be consumed on the right things, to resources actually consumed" (Sink, Tuttle, & DeVries, 1984, p. 267). For the purpose of this research, efficiency measures included meal price analysis, budget analysis, inventory turnover analysis, and labor analysis of turnover and absenteeism rates (Table III).

The first of these, meal price analysis, was used occasionally by the majority of the respondents (N=45, 96%), and frequently by two respondents (4%). Statistical associations were present between this measure and facility type ($p=.035$, $x^2=4.456$, $df=1$), as well as degree ($p=.079$, $x^2=3.078$, $df=1$).

Facility type appeared to be associated in a positive manner with occasional use of meal price analysis. Of the 45 institutions affirmatively citing occasional meal price analysis, 32 (71%) were categorized as hospitals, as opposed to 13 (29%) of those institutions classified as "other" (i.e. hospital nursing homes). These results were not surprising due to increased competition among hospitals forcing them to utilize new, efficient technologies. Educational background also seemed to have an effect on this measure of efficiency. Sixty-two percent (N=28) of the respondents who received a bachelor's degree utilized meal price analysis on an occasional basis, whereas 38 percent (N=17) received a master's degree.

Budget analysis was the next efficiency measurement, and it was utilized occasionally by 44 respondents (94%) and frequently by 3 respondents (6%). Although this measure is highly utilized on an occasional basis by the majority of respondents, there seemed to be no apparent statistical association between budget analysis and the demographic characteristics.

The third measure of efficiency was inventory turnover analysis. Eighty-nine percent of the respondents (N=41) utilized this measure occasionally, whereas 11 percent (N=5) utilized inventory turnover analysis frequently. This was parallel with the existing trend established in this research for occasional use of

performance measures.

In the final category of efficiency, 42 of the respondents (93%) utilized labor analysis of turnover and absenteeism ratios occasionally and 3 of the respondents (7%) utilized it frequently. Statistical analysis had shown this aspect of efficiency to be associated with position title ($p=.011$, $x^2=6.429$, $df=1$). This measure was used by the majority of respondents occasionally, and in this instance, 71 percent (N=30) of the respondents held the title of director and chief clinical dietitian, while 29 percent (N=12) held the position of either associate director, administrative dietitian, or "other" title.

Innovation Measures

Innovation was defined by Sink (1985) as "applied creativity" (p. 45). Performance measures relating to innovation included new recipe implementation, menu analysis/ revision, equipment review, and computer usage in nutrition and foodservice (Table IV).

The first innovation measure, new recipe implementation, was utilized occasionally by the majority of respondents (N=43, 96%), and frequently by 2 respondents (4%). These figures were similar to those indicated by Czajkowski (1988), where new recipe implementation was used occaisionally by the majority of respondents (N=53, 82%) and only frequently by 15 percent (N=9) of the respondents. Although a very high percentage

TABLE IV

SIGNIFICANT ASSOCIATIONS FOUND IN INNOVATION CONTROLS

Innovation Controls	Demographic Variables	Observed Significance	x^2	df
Menu Analysis/ Revision*	Years in Food-service Management	.047	3.948	1
Equipment Review*	Route to Registration	.005	10.483	2
Computer Usage (nutrition services)	Food Percentage	.036	4.937	1
Computer Usage (nutrition services)	Productivity Training	.032	4.582	1
Computer Usage (nutrition services)*	Route to Registration	.067	5.407	2
Computer Usage (foodservice)	Degree	.036	4.394	1
Computer Usage (foodservice)*	Type of Food-service System	.018	5.610	1

*Warning: 33 to 67 percent of the cells have expected counts less than 5.

utilized this measure on an occasional basis, no significant statistical association was found between new recipe implementation and other demographic characteristics.

The category of menu analysis was utilized occasionally by 89 percent (N=41) and frequently by 11 percent (N=5). This category was statistically associated with years in foodservice management ($p=.047$, $x^2=3.948$, $df=1$). Those respondents that have managed foodservice operations for 11 or more years utilized menu/analysis revision on a frequent basis (N=5, 100 %), whereas those who have managed foodservice operations for 10 years or less did not utilize this measure frequently (N=0, 0%).

In regard to equipment review, 98 percent (N=44) utilized this measure occasionally, while 2 percent (N=1) utilized it frequently. Equipment was used by the majority of respondents on an occasional basis. A statistical association existed with route to registration ($p=.067$, $x^2=5.407$, $df=2$). Sixty-four percent (N=28) of those respondents who completed an internship, 30 percent (N=13) of the CUP graduates, and seven percent (N=3) of those who utilized other routes to registration utilized equipment review on an occasional basis.

In the area of computer usage in nutrition, 21 respondents (43%) utilized this innovative measure, while 28 respondents (57%) did not. A statistical association existed between computer usage in nutrition and food

percentage of yearly budget (p=.036, x^2=4.397, df=1), productivity training (p=.032, x2=4.582, df=1), and route to registration (p=.067, x^2=5.407, df=2).

Concerning food percentage, 19 of the responding institutions (90%) that utilize computers in nutrition had a food percentage less than or equal to 35 percent of the total yearly budget. Only two of those (10%) who utilized this measure had a food percentage that was greater than 35 percent of the total yearly budget.

Productivity training also had some effect on this innovation measure. Of the 18 respondents who have received productivity training, 12 (67%) did utilize computer usage in nutrition, while 6 (33%) did not.

Finally, route to registration also affected computer usage in nutrition. Of the 21 respondents that utilized this measure, 12 respondents (57%) completed an internship, while 9 (43%) completed a CUP program

With regard to computer usage in foodservice, 47 percent (N=23) utilized this measure, while 53 percent (N=26) did not. The practice of computer usage in foodservice was associated with degree (p=.036, x^2=4.394, df=1) and type of foodservice system (p=.018, x^2=5.610, df=1).

In the area of education, 57 percent (N=3) of those receiving a master's degree utilized computers in foodservice, as opposed to 43 percent (N=10) of those who received only a bachelor's degree. Type of foodservice

system was another influential factor, where 78 percent (N=18) of the responding facilities utilizing conventional foodservice system used this measure of innovation, as opposed to 22 percent (N=5) who used some other type of foodservice system.

Quality Measures

Quality was defined as "conformity to customer requirements" (Shettey, 1986, p. 166). The six measures addressed in this research included temperature checks on food items, tray audits, patient surveys of foodservice quality, prior-to-service quality food checks/taste tests, food quality checks against actual product specifications, and quality circles (Table V).

The majority of the respondents utilized temperature checks on food frequently (N=43, 91%), whereas 4 respondents (9%) utilized this measure occasionally. In Czajowski's (1988) study, there were similar results indicating that the majority of the respondents (N=62, 97%) also utilized temperature checks on a more frequent basis. These findings may verify the importance of this measure. Temperature checks on food were statistically associated with hospital control ($p=.050$, $x^2=6.008$, $df=2$) and facility type ($p=.053$, $x^2=3.735$, $df=1$). Of the responding facilities utilizing this measure on a frequent basis, 21 (51%) were non-government, non-profit control facilities, 15 (37%) were government, non-federal, non-

TABLE V

SIGNIFICANT ASSOCIATIONS FOUND IN QUALITY CONTROLS

Quality Controls	Demographic Variables	Observed Significance	x^2	df
Temperature Checks on Food Items*	Hospital Control	.050	6.008	2
	Facility Type	.053	3.735	1
Patient Surveys of Foodservice Quality*	Hospital Control	.031	6.957	2
	Degree	.022	5.231	1
	Facility Type	.040	4.237	1
	RD Status	.028	4.856	1
Prior-to-Service Quality Food Checks/ Taste Tests*	Facility Location	.037	4.340	1

*Warning: 25 to 66 percent of the cells have expected counts less than 5.

profit control facilities, and 5 (12%) were investor owned, for profit facilities. Among the 43 responding facilities that utilized this measure, 31 (72%) were categorized as hospitals, as opposed to 12 (28%) that were categorized as "other."

Tray audit was the next quality measure, and it was almost evenly divided between frequency of utilization; 51 percent (N=23) of the respondents utilized this measure frequently, whereas 49% (N=22) utilized this occasionally. These findings indicated high levels of utilization and time spent on this activity.

The third measure of quality was patient surveys of foodservice quality. This measure was performed occasionally by 83 percents (N=38) and frequently by 17 percent (N=8). Patient surveys of foodservice quality was statistically associated with hospital control (p=.031, x^2=6.957, df=2), degree (p=.022, x^2=5.231, df=1), facility type (p=.040, x^2= 4.237, df=1), and RD status (p=.028, x^2=4.856, df=1).

Hospital control was associated with occasional use of patient surveys of foodservice quality. Eighty-nine percent (N=17) of the responding government, non-federal, non-profit facilities utilized this measure on an occasional basis, whereas the remaining 11 percent (N=2) employed this frequently. Non-government, non-profit facilities responses werre similar to the above results: 86 percent (N=18), occasionally and 14 percent (N=3),

frequently. In the investor-owned, for-profit category , however, the respondents were almost equally divided between occasional use (N=2, 40%) and frequent use (N=3, 60%).

Implementation of patient surveys of foodservice quality was also associated with educational background. Among the respondents who had received a bachelor's degree, 93 percent (N=26) utilized this measure occasionally and 7 percent (N=2) utilized this frequently. This can be compared with 67 percent (N=12) utilized occasionally and 33 percent (N=6) utilized frequently, respectively, among participants who had obtained a master's degree.

With regard to facility type, all of the responding facilities (N=8, 100%), categorized as hospitals, were found to frequently utilize patient surveys in foodservice quality. In reference to occasional utilization, again the majority of responding facilities were hospitals (N=24, 63%), as opposed to those facilities categorized as "other" (N=14, 37%).

All of the respondents utilizing this measure on an occasional basis (N=38) were registered dietitians. In the category of frequent utilization, 88 percent (N=7) and 12 percent (N=1) were registered and non-registered, respectively.

Prior-to-service quality checks/tests were statistically associated with facility location (p=.028,

x^2=4.856, df=1). Among responding facilities with frequent utilization of this quality measure, 67 percent (N=27) were located in the metropolitan area, while 33 percent (N=12) were located in rural/urban areas. With occasional utilization, however, the percentages were reversed, indicating a 70 percent (N=7) response rate for facilities located in urban/rural areas, as opposed to a 30 percent (N=3) response rate for those metropolitan located facilities.

Food quality checks against actual product specifications were performed frequently by 44 percent (N=20) of the respondents and occasionally by 56 percent (N=25). This high utilization response rate may have indicated that this measure is an integral part of most foodservice operations.

The last measure of quality was quality circles. Of the 45 respondents that employed this measure, 93 percent (N=43) utilized this measure on an occasional basis and 7 percent (N=3) utilized this on a more frequent basis. No apparent statistical association was found between quality circles and the demographic variables.

Quality of Work Life Measures

Quality of work life (QWL) wass defined by Sink, Tuttle, and DeVries (1984) as "the human beings' effective response or reaction to working and living in organizational systems" (p. 268). QWL measures associated

TABLE VI

SIGNIFICANT ASSOCIATIONS FOUND IN QWL CONTROLS

QWL Controls	Demographic Variables	Observed Significance	x^2	df
Employee Suggestion System	Facility Type	.008	6.979	1
	Degree	.024	5.101	1
	Years in Food-service Management	.047	3.930	1
	Route to Registration	.039	6.470	2
Employee Recognition Program*	Hospital Membership (AHA)	.001	10.872	1
	Training Program	.013	6.177	1
Employee Reward System (non-monetary)*	Facility Size	.010	6.599	1

*Warning: 33 to 50 percent of the cells have expected counts less than 5.

with this research included employee suggestion systems, employee recognition programs, and employee reward systems (monetary and non-monetary) (Table VI).

Employee suggestion systems were utilized by 53 percent (N=26) of the respondents. Four variables were found to have an influence on this QWL measure. The first of these, facility type, was found to be positively associated with employee suggestion system (p=.008. x^2=6.979, df=1). Eighty-six percent (N=12) of the responding facilities, categorized as "other" were found to utilize this QWL measure, whereas only 14 percent (N=2) did not.

The second of the four was educational background. Seventy percent (N=19), (p=.024, x^2=5.101, df=1), of those respondents who received a bachelor's degree utilized employee suggestion systems, as opposed to 30 percent (N=8) that did not.

The third variable exhibiting association was years in foodservice management (p=.047, x^2=3.930, df=1). Among the respondents having 11 or more years, 69 percent (N=18) utilized employee suggestion system, as opposed to 31 percent (N=8) who had 10 years or less.

The fourth and final variable effecting employee suggestion system was route to registration (p=.039,x^2=6.470, df=2). Seventy-three percent (n=19) of the respondents that completed an internship utilized this measure. In contrast, only 15 percent (N=4) of the CUP

graduates and 12 percent (N=3) of those obtaining registration via other routes used this measure.

The next QWL measure, employee recognition program (i.e. employee of the month), was statistically associated with AHA membership ($p=.018$, $x^2=5.571$, $df=1$),training program for management staff ($p=.013$, $x^2=6.177$, $df=1$), and food percentage of total yearly budget ($p=.001$, $x^2=.10.872$, $df=1$). Seventy-four percent (N=36) of the responding institutions utilized employee recognition program, as opposed to 26 percent (N=13) that did not. Seventy-five percent (N=24) of those responding facilities that implement this measure were members of AHA, while only 25 percent (N=8) were not members. These results are quite opposite of those discussed by Czajkowski (1988). The results of Czajkowski's study revealed that employee recognition systems were statistically associated with membership in an affiliation other than AHA or JCAH. With regard to training programs for management staff, all of the respondents (N=19, 100%) that have participated in some form of training program implemented this QWL measure,as opposed to 35 percent (N=10) that did utilize this measure but did not participate in a training program. Eighty-six percent (N=31) of the responding facilities whose food percentage was less than or equal to 35 percent of the yearly budget utilized employee recognition programs, as opposed to 14 percent (N=5) of the facilities whose food percentage was greater than 35

percent of the total yearly budget.

The category of employee reward system (monetary) was not utilized by 69 percent (N=34) of the respondents. In contrast, only 31 percent (N=15) did utilize it. This low utilization rate was not surprising in that most non-profit foodservice operations do not have sufficient funds available for implementing monetary employee rewards. In contrast, the results of Czajkowski's (1988) study revealed that 75 percent (N=15) of the responding facilities did utilize employee monetary rewards.

The outcome was vastly different concerning non-monetary reward systems. A statistical association was found between non-monetary reward systems and facility size ($p=.010$, $x^2=6.599$, $df=1$). Eighty percent (N=8) of the responding facilities that utilize this measure had more than 301 beds, as opposed to 20 percent (N=2) that had less than 300 beds. Again, these results were similar to Czajkowski's (1988), where the majority of the responding facilites that utilized this measure had more than 301 beds.

Quality of Work Life/Innovation Measures

There were several performance measures identified in this research that have characteristics that involve both QWL and innovation. These measures included employee health/fitness programs, profit sharing, flextime, job sharing, cafeteria-style benefit programs, and

TABLE VII

SIGNIFICANT ASSOCIATIONS FOUND IN QWL/INNOVATION

QWL/Innovation Controls	Demographic Variables	Observed Significance	x^2	df
Employee Health and Fitness Program*	Hospital Membership (Other)	.023	5.200	1
	Hospital Membership (JCAH)	.052	3.792	1
Job Sharing*	Productivity Training	.058	3.601	1
Cafeteria-Style Benefits*	Facility Location	.056	3.641	1
	Facility Size	.004	8.310	1
Employee Brainstorming Sessions	Route to Registration	.005	10.733	2

*Warning: 25 to 50 percent of the cells have expected counts less than 5.

brainstorming sessions (Table VII).

Employee health and fitness programs had become very popular in the past few years. Various hospitals were implementing these programs in order to improve the quality of work life for their employees. The frequency of utilization vs. non-utilization of these fitness programs were almost equally divided with 49 percent (N=24) of the responding facilities utilizing this measure and 51 percent (N=25) not utilizing this measure. A statistical association also existed between this measure and JCAH membership ($p=.052$, $x^2=3.792$, $df=1$) and membership in an affiliation other than JCAH or AHA ($p=.023$, $x^2= 5.200$, $df= 1$). One hundred percent (N=21) of the responding facilities that belong to JCAH utilized this measure, whereas those facilities that belong to an affiliation other than JCAH or AHA appeared not to utilize employee health and fitness programs.

The technique of profit sharing was not utilized by the majority of the respondents (N=48, 98%). Again, this may have been due to the lack of profit generated within foodservice facilities.

Flextime was the third QWL/innovation measure, and it was also not utilized by the majority of the respondents (N=46, 94%). The results seemed quite likely, since many foodservice facilities could not implement a time schedule that required the employees to be present during the meal period and at the same time please the employees seeking

time off during the meal-time period. Czajkowski's (1988) study also revealed a very low response rate to flextime (N=7, 11%).

The response to utilization of job sharing was also very low among respondents (N=5, 10%), however, an association existed between this measure and productivity training (p=.058, x^2=3.601, df=1). In this situation, the respondents that have received productivity training (N=4, 80%) did utilize job sharing, as opposed to those who had not received training in productivity management (N=1, 20%).

Cafeteria style benefits were utilized somewhat more frequently by respondents (N=12, 25%); however, this percentage was still rated low. This measure was statistically associated with facility size (p=.004, x^2 =8.310, df=1) and facility location (p=.056, x =3.641, df=1). With regard to facility size, 82 percent (N=9) of the responding facilities with more than 301 beds tended to utilize cafeteria style benefits, as opposed to 18 percent (N=2) of facilities with less than 300 beds. Also, the facilities that were located in a metropolitan area (N=10, 83%) utilized this measure, whereas only 17 percent (N=2) of these facilities located in urban/rural areas utilized this.

Employee brainstorming sessions were the last QWL/innovation measures, and these were utilized occasionally by the majority of the respondents (N=45,

98%). A statistical association existed between this measure and route to registration ($p=.005$, $x^2=10.733$, $df=2$). The majority of the respondents that occasionally utilized brainstorming sessions obtained their registration status by means of an internship (N=29, 64%). Of those respondents who completed a CUP program or obtained registration via other routes, 29 percent (N=13) and 7 percent (N=3), respectively, occasionally utilized this measure.

Profitability Measures

Profitability was defined as "a relationship between total revenues and total costs" (Sink, 1985, p. 43). Performance measures relating to profitability as defined in this research included meals-on-wheels program (for profit), congregate meals for the elderly (for profit), and various catering operations (in-house, satellite, public, bakeshop) (See Table VIII).

A for-profit meals-on-wheels program was utilized by 14 percent (N=7) of the respondents. The remaining 86 percent (N=42) did not utilize this program. The high response of non-utilization may have been due to the misconception by administrative dietitians that meals-on-wheels was more of a service than a money-making opportunity. Czajkowski's (1988) results were similar in that only 27 percent (N=17) of the respondents utilized this profitability measure in her study. This aspect of

TABLE VIII

SIGNIFICANT ASSOCIATIONS FOUND IN PROFITABILITY CONTROLS

Profitability Controls	Demographic Variables	Observed Significance	x^2	df
Meals-on-Wheels Program*	Food Percentage	.025	5.011	1
	Age	.046	3.995	1
Catering (in-house)	Age	.041	4.167	1
Catering (satellite)*	Degree	.025	5.027	1
	Productivity Training	.030	4.683	1
Catering (public)	Years in Food-service Management	.062	3.494	1
	Facility Type	.093	2.816	1
Catering (bakeshop)*	Age	.017	5.662	1

*Warning: 25 to 50 percent of the cells have expected counts less than 5.

profitability was statistically associated with age ($p=.046$, $x^2=3.995$, $df=1$) and food percentage of yearly budget ($p=.025$, $x^2=5.011$, $df=1$).

Among those participants responding affirmatively to this program, 7 (100%) were over 40 years of age, while no responding participants were 39 years or younger. Among the participating facilities whose food percentage was less than 35 percent of the yearly budget, 57 percent (N=4) utilized the meals-on-wheels program, while 43 percent (N=3) did not.

The second profitability index, congregate meals for the elderly (for profit), was not used by the majority of the respondents (N=48, 98%). Similar findings were indicated in Czajkowski's study, where 89 percent (N=57) also did not utilize congregate meals for the elderly. In many cases, state and locally sponsored nutrition centers provided services for the elderly.

Inhouse catering was the most popular form of catering, utilized by 53 percent (N=27) of the responding institutions. Significant associations were indicated in this area with regard to age ($p=.041$, $x^2=4.167$, $df=1$). Of the respondents between the age of 20 and 39 years old, 12 (80%) utilize in house catering, while only 3 (20%) of these respondents did not.

Catering by satellite location was utilized by only 6 respondents (12%); however, statistical association was evident between this measure and degree ($p=.025$, $x^2=5.027$,

df=1) and productivity training (p=.030, x^2=4.683, df=1). In this situation, 5 out of the 6 respondents (83%) utilizing this form of catering received an advanced degree. With regard to productivity training, again 5 out of the 6 participants (83%) responding to this form of catering received some form of productivity training.

Public catering (i.e. visitor cafeteria) was utilized by 51 percent (N=25) of the respondents, and it was associated with years in foodservice management (p=.062, x^2=3.494, df=1) and type of facility (p=.093, x^2=2.816, df=1). Among those 20 respondents having 10 years or less in foodservice management, 70 percent (N=14) did utilize this form of catering while only 30 percent (N=6) of those respondents did not. Also, 80 percent (N=20) of the responding facilities categorized as hospitals were found to utilize public catering, as opposed to 20 percent (N=5) of the facilities categorized as "other."

The last aspect of catering operations, public hospital bake shop, was utilized by 14 percent (N=7) of the respondents. Low utilization of this measure was also evident in Czajkowski's study (N=15, 23%). This profitability measure was statistically associated with age (p=.017, x^2=5.662, df=1). Of the respondents utilizing bakeshop catering, 71 percent (N=5) of those respondents 39 years or younger utilized bakeshop catering, as opposed to 29 percent (N=2) of those 40 years or older.

Performance Ratios

Primary Ratios

Lischke (1986) originally synthesized 13 performance ratios, that were further condensed by Czajowski (1988) to include what was believed by previous performance researchers to be three of the most basic and frequently utilized ratios in the foodservice industry. These included:

R_1 $\frac{\text{Total meals served}}{\text{Total labor hours worked}}$

R_2: $\frac{\text{Total meals prepared}}{\text{Total food cost}}$

R_3: $\frac{\text{Total revenue}}{\text{Total expenses}}$

Participants were asked to obtain and compute these three basic ratios using their departmental figures from the third and fourth quarters of the 1986 fiscal year.

Among the 50 respondents, 60 percent (N=28) offered a response to this section of the instrument. These responses can be found in Tables IX, X, XI.

With regard to the three ratios, R_1 was the most frequently utilized ratio by the respondents (N=25, 89%). Two respondents (#6 and #18) provided a figure for R_2, but did not respond to R_1, while one respondent (#12) listed a numerical response in the fourth quarter, but did not respond to the third quarter.

R_2 was utilized by 21 respondents (75%), however, 6 facilities did not respond to this ratio (#1, #7, #10,

TABLE IX

QUARTERLY VALUES FOR R_1

$$\frac{\text{TOTAL MEALS SERVED}}{\text{TOTAL LABOR HRS. WORKED}}$$

	3rd Quarter Values	4th Quarter Values	N	Percentage of Respondents
1	4.05	4.01	1	4
2	3.68	3.59	1	4
3	3.59	3.59	1	4
4	6.08	6.42	1	4
5	5.32	4.85	1	4
6				
7	2.82	2.33	1	4
8	3.02	2.87	1	4
9	4.98	4.28	1	4
10	.54	.50	1	4
11	1.78	1.75	1	4
12		3.48	1	4
13	2.36	2.42	1	4
14	5.60	4.84	1	4
15	4.70	4.49	1	4
16	3.32	2.87	1	4
17	3.03	3.04	1	4
18				
19	4.61	4.22	1	4
20	4.16	4.30	1	4
21	4.43	3.48	1	4
22	3.02	3.07	1	4
23	5.9	5.7	1	4
24	4.17	4.17	1	4
25	4.34	5.50	1	4
26	8.18	7.03	1	4
27	3.17	3.33	1	4
28	3.33	3.54	1	4

TABLE X

QUARTERLY VALUES FOR R_2

$$\frac{\text{TOTAL REVENUES}}{\text{TOTAL EXPENSES}}$$

	3rd Quarter Values	4th Quarter Values	N	Percentage of Respondents
1				
2	1.05	1.03	1	4
3	.49	.49	1	4
4	.88	.91	1	4
5	.90	.95	1	4
6	.44	.42	1	4
7				
8	.72	.70	1	4
9	.61	.54	1	4
10				
11	.44	.41	1	4
12		.70	1	4
13	.75	.80	1	4
14				
15	1.08	1.04	1	4
16	.52	.45	1	4
17	.73	.65	1	4
18	1.17	.94	1	4
19				
20				
21	1.04		1	4
22	.67	.69	1	4
23	.54	.57	1	4
24	.31	.31	1	4
25	.73	.72	1	4
26	.62	.67	1	4
27	.58	.60	1	4
28	.63	.41	1	4

TABLE XI

QUARTERLY VALUES FOR R_3

$$\frac{\text{TOTAL MEALS PREPARED}}{\text{TOTAL FOOD COST}}$$

	3rd Quarter Values	4th Quarter Values	N	Percentage of Respondents
1	.34	.29	1	4
2	1.05	1.03	1	4
3				
4	1.04	1.11	1	4
5				
6				
7	.27	.18	1	4
8	.28	.27	1	4
9	.62	.61	1	4
10				
11				
12		.27	1	4
13				
14	.17	.16	1	4
15	.44	.46	1	4
16	.10	.10	1	4
17				
18				
19				
20				
21	.22	.20	1	4
22				
23	.16	.14	1	4
24	.03	.03	1	4
25	.60	.58	1	4
26	.13	.13	1	4
27	.49	.51	1	4
28	.55	.41	1	4

#14, #19, and #20). Also, respondent #12 provided a numerical response for the fourth quarter only, while one respondent (#21) responded to the second and third quarter only.

R_3 received the lowest response rate (N=17, 61%), and a total of 10 respondents chose not to indicate a response for this ratio (#5, #6, #10, #11, #13, #17, #18, #19, #20, and #22). One respondent (#12) responded to the fourth quarter category only. This low response rate may have been due to the lack of access by foodservice administrators to the required information concerning total expenses (i.e. utilities).

Third and fourth quarter values frequencies were somewhat similar in that the majority of the third quarter values were larger than the fourth quarter values. In R_1, 15 cases were identified where the third quarter values were larger than the fourth quarter values, and in eight cases where the fourth quarter values were larger than the third quarter values. In R_2, 11 third quarter values were larger than their corresponding fourth quarter values, and in seven cases the opposite occurred. In R_3, again, third quarter values were larger than the fourth quarter values, with only 4 occurrences where the fourth quarter values were larger than the third quarter values.

Among the responses to R_1 (Total meals served/Total labor hours worked), statistical associations existed between type of hospital control, type of foodservice

system ,facility size, and location in both its usage during the third and fourth quarters (Table XII). As expected, the investor owned, for-profit facilities tended to measure R_1 (3rd quarter-N=5, 100%; 4th quarter-N=5, 100%). In terms of type of foodservice systems, all respondents that worked in a conventional foodservice system utilized R_1 in both the third (N=25, 100%) and fourth (N=26, 100%) quarters. With regard to facility size, dietitians employed for facilities with a bed capacity less than 300 also utilized this ratio (3rd quarter-N=16, 70%; 4th quarter-N=17; 71%). Finally, those facilities located in urban or rural areas were found to utilize R_1 (3rd quarter-N=15, 60%; 4th quarter-N=15, 58%), as opposed to those located in metropolitan areas The personal characteristics of position title was also found to be statistically associated with the R_1 measure, however, only in the fourth quarter category (p=.067, x^2=3.362, df=1). Among the respondents utilizing this measure, 73 percent (N=19) held the title of director or chief dietitian, as opposed to 27 percent (N=7) that held the title of associate director or administrative dietitian.

Among the responses to R_2 (Total meals prepared/ Total food costs), statistical associations were found with type of foodservice system, position title, and AHA membership (Table XIII). In terms of type of foodservice systems, all of the responding facilities using a

TABLE XII

SIGNIFICANT ASSOCIATIONS FOUND IN R_1*

TOTAL MEALS SERVED
TOTAL LABOR HRS. WORKED

	Third Quarter			Fourth Quarter		
Demographic Variables	observed sig.	x^2	df	observed sig.	x^2	df
Hospital Control	.081	5.029	2	.086	4.905	2
Type of Foodservice System	.014	6.067	1	.010	6.596	1
Facility Size	.036	4.385	1	.017	5.650	1
Facility Location	.002	9.685	1	.004	8.349	1
Position Title				.067	3.362	1

*Warning: 33 to 50 percent of the cells have expected counts less than 5.

TABLE XIII

SIGNIFICANT ASSOCIATIONS FOUND IN R_2*

TOTAL MEALS PREPARED
TOTAL FOOD COST

	Third Quarter			Fourth Quarter		
Demographic Variables	observed sig.	x^2	df	observed sig.	x^2	df
Type of Foodservice System*	.037	4.341	1	.037	4.341	1
Position Title	.014	6.092	1	.014	4.341	1
Hospital Membership	.098	2.736	1	.098	2.736	1
Facility Location	.022	5.222	1			

*Warning: 50 percent of the cell has an expected count of less than 5.

conventional foodservice system utilized R_2 in both third (N=21, 100%) and fourth (N=21, 100%) quarters. With regard to position title, those respondents holding the title of foodservice director or chief dietitian also utilized this measure (3rd quarter-N=17, 81%; 4th quarter-N=17; 81%). Responding facilities that were members of AHA were also found to utilize R_2 (3rd quarter-N=16, 76%; 4th quarter-N=16, 76%). An additional characteristics was also found to be associated with R_2, but only in the third quarter category. The association was with facility location ($p=.022$, $x^2=5.222$, $df=1$). Fifty-seven percent (N=12) of the responding facilities that were located in urban or rural areas utilized this measure, as opposed 43 percent (N=9) that were located in metropolitan areas.

Among the responses to R_3 (Total revenues/Total expenses), statistical associations were found between this measure and type of hospital control, type of foodservice system, position title, and facility location in both third and fourth quarters (Table XIV). In terms of hospital control, respondents employed for non-government, non-profit facilities utilized R_3 (3rd quarter-N=9, 56%; 4th quarter-N=10, 59%), as opposed to those employed for government, non-profit facilities (3rd quarter-N=3, 19%; 4th quarter-N=3, 18%) or investor owned, for-profit facilities (3rd quarter-N=4, 25%; 4th quarter-N=4, 24%). With regard to foodservice system type, all of the responding facilities that used conventional

TABLE XIV

SIGNIFICANT ASSOCIATIONS FOUND IN R_3*

TOTAL REVENUES
TOTAL EXPENSES

Demographic Variables	Third Quarter observed sig.	x^2	df	Fourth Quarter observed sig.	x^2	df
Hospital Control*	.015	8.395	2	.012	8.864	2
Type of Foodservice System*	.095	2.791	1	.080	3.061	1
Position Title	.043	4.097	1	.026	4.977	1
Facility Location	.000	13.132	1	.001	11.097	1
Facility Size				.015	5.948	1

*Warning: 33 to 50 percent of the cells have expected counts less than 5.

foodservice systems utilized this ratio in both the third (N=16, 100%) and fourth (N=17, 100%) quarters. Those respondents that held the position title of foodservice director or chief dietitian also tended to utilize R_3 (3rd quarter-N=13, 81%; 4th quarter-N=14, 82%). Finally, with regard to facility location, the majority of the responding facilities that utilized R_3 were located in urban or rural areas (3rd quarter-N=12, 75%; 4th quarter-N=12, 71%). A statistical association also existed between R_3 and facility size, but only in the fourth quarter ($p=.015$, $x^2=5.948$, $df=1$). Eighty percent (N=12) of those responding facilities that had a bed capacity less than 300 utilized this measure, as opposed to 20 percent (N=3) that had more than 301 beds.

Additional Ratios

In Section II, Part B of the survey instrument, 11 additional ratios were presented in an attempt to further expand upon the types of measurement ratios utilized by foodservice administrators and administrative dietitians. Participants were asked to place a check mark next to those additional ratios that they may be using, and an "other" ratio category was included to compensate for other ratios that may be used but were not listed.

Money spent on labor/Money budgeted for labor was the most popular ratio, utilized by 60 percent (N=29) of the respondents. This ratio was followed by Total meals

prepared/Total labor hours worked (N=26, 54%) and Dollars spent on materials/Dollars budgeted for materials (N=42, 50%). These results were quite similar to those in Czajkowski's (1988) study. In Czajkowksi's (1988) study, Total meals prepared/ Total labor hours worked (N=39, 61%) was the most popular ratio, followed by Dollars spent on labor/ Dollars budgeted for labor (N=38, 59%) and Dollars spent on materials/Dollars budgeted for materials (N=37, 58%). These similar results may indicate that these ratios are being utilized by foodservice administrators and dietitians.

Total meals prepared/Total labor hours worked measures productivity, while Dollars spent on materials/Dollars budgeted for materials and Dollars spent on labor/Dollars budgeted for labor are ratios used to measure efficiency. Again, these results may reveal that steps are being taken by foodservice administrators and dietitians to measure performance within their operations.

Number of unauthorized absence/Number total employees x 100 and Money spent on utilities/Money budgeted for utilities both received the least response (N=4, 8%). This may be due to the inappropriate record keeping and lack of assess to this information by foodservice administrators. Responses to the remaining eight categories of additional ratio utilization are summarized in Table XV. Common responses in regard to the "other" ratios utilized by certain participants include:

TABLE XV

UTILIZATION OF ADDITIONAL RATIOS

Additional Ratios	Respondent Frequency (N)	Utilization Percentage (%)
Money spent on labor / Money budgeted for labor	29	60
Total meals prepared / Total labor hours worked	26	54
Money spent on materials.... / Money budgeted for materials	24	50
Cafeteria revenues / Cafeteria expenses	16	33
Total cafeteria sales / Total cafeteria labor hrs. worked	15	31
No. of employees who left dept. / No. of total employees x 100	13	27
Actual sales / Forecasted sales	8	17
No. of patients served / No. of trays prepared	7	15
Money spent for improvements / Money budgeted for improvements	5	10
Money spent/utilities / Money budgeted/utilities	4	8
No. of unauthorized absences / No. of total employees x 100	4	8

department labor cost/patient days per month, department food and supplies cost/ patient days month, total patient days/total food cost, total patient days/total labor hours paid, minutes/rations served, total meals/productive labor hours, and paid hours/100 meals served.

Statistical association exists between utilization of additional ratios and several demographic characteristics of the respondents. These include: received bachelor's degree, position title of associate director or administrative dietitian, RD status, and less than 10 years in foodservice management (Table XVI). Statistical association also exists between ratio utilization and several institutional characteristics. These include: labor percentage less than or equal to 65 percent of yearly budget, larger facilities (301 or more beds), urban/rural facility location, AHA affiliation, and non-government, non-profit hospital control (Table XVII).

Hypothesis Testing

In H_1, the personal variables of degree, position title, and RD registration status affected the utilizationof the performance ratios (Survey Part II, A and B), hence, the researcher rejects Hypothesis 1.

In H_2, the institutional variables of hospital affiliation, size of facility, facility location, and type of foodservice system affected the utilization of the

TABLE XVI

SIGNIFICANT ASSOCIATIONS BETWEEN ADDITIONAL RATIOS AND CHARACTERISTICS OF RESPONDENTS

Additional Ratios	Demographic Variables	Observed Significance	x^2	df
Total meals prepared / Total labor hrs. worked*	Degree	.032	4.573	1
No. of patients served / No. of trays prepared *	Position Title	.009	6.841	1
No. of patients served / No. of trays prepared *	RD Status	.039	4.261	1
Actual sales / Forecasted sales*	Position Title	.026	4.946	1

*Warning: 25 to 50 percent of the cells have expected counts less than 5.

TABLE XVII

SIGNIFICANT ASSOCIATIONS BETWEEN ADDITIONAL RATIOS AND CHARACTERISTICS OF INSTITUTIONS

Additional Ratios	Demographic Variables	Observed significance	x^2	df
$\frac{\text{Total meals prepared}}{\text{Total labor hrs worked}}$*	Labor Percentage	.019	5.506	1
$\frac{\text{No. of patients served}}{\text{No. of trays prepared}}$ *	Hospital Membership (AHA)	.021	5.358	1
$\frac{\text{Total cafeteria sales}}{\text{Total cafeteria labor hrs. worked}}$	Size	.048	3.927	1
$\frac{\text{No. of employees who left dept.}}{\text{No. of total employees}} \times 100$	Location	.012	6.361	1
$\frac{\text{Cafeteria revenues}}{\text{Cafeteria expenses}}$	Hospital Membership (AHA)	.024	5.115	1
$\frac{\text{Money spent on materials}}{\text{Money budgeted for materials}}$	Labor Percentage	.040	4.235	1
$\frac{\text{Money spent on improvements}}{\text{Money budgeted for improvements}}$*	Control	.022	7.643	2
$\frac{\text{Actual sales}}{\text{Forecasted sales}}$*	Size	.026	4.941	1

*Warning: 50 to 66 percent of the cells have expected counts less than 5.

performance ratios, hence, the researcher rejects Hypothesis 2.

In H_3, no significant associations were found between utilization of performance ratios and training received in productivity management, hence, the researcher fails to reject Hypothesis 3.

In H_4, significant associations were found between utilization of performance ratios and type of hospital control, hence, the researcher rejects Hypothesis 4.

In H_5, significant associations were found between the frequency and type of performance measures (Survey III, A, B, and C) and the personal variables of age, degree, Rd registration status, route to ADA membership. position title, and number of years in foodservice management, hence, the researcher rejects Hypothesis 5.

In H_6, significant associations were found between the frequency and type of performance measures and variables of hospital affiliation, type of facility, size of facility, facility location, and type of foodservice system, hence, the researcher rejects Hypothesis 6.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

This research focused on methods of measurement used by a sample of members in the ADA practice group, "ADA Members With Management Responsibilities in Health Care Delivery Systems." The objectives and hypotheses of this study were clearly stated in Chapter I. The hypotheses were tested, and the results were listed in Chapter IV, "Summary and Recommendations." The overall purpose of the study was to expand upon research previously conducted at Oklahoma State University and to determine if three basic ratios could be formally standardized for universal implementation in all types of foodservice.

Characteristics of the Respondents

Thirty-four percent of the respondents were 39 years or less, while 66 percent were 40 years or older (Figure 3). All of the respondents received a bachelor's degree, while 50 percent received a master's degree (Figure 4).

Forty-eight of the 50 respondents were registered dietitians and 62 percent completed a dietetic internship as their route to ADA registration (Figure 5 & 6). Sixty-two percent held the title of foodservice director or

chief dietitian, while 24 percent were assistant directors or administrative dietitians (Figure 7). Fifty-six percent of the respondents earned $35,000 or more, while 42 percent earned $34,999 or less (Figure 8). Fifty-six percent of the respondents had 11 or more years of experience in foodservice management, while 44 percent had 1 to 10 years in this area (Figure 9). The majority of the respondents (59%) had not received any type of productivity training, while 41 percent had received training in productivity (Figure 10).

Characteristics of the Institutions

Forty-six percent of the respondents worked for non-government, non-profit hospitals; forty-two percent worked for government, non-federal, non-profit hospitals; and 10 percent were employed for investor owned, for-profit hospitals (Figure 11). Fifty-two percent of the participating facilities were affiliated with both AHA and JCAH; 34 percent with JCAH alone; 5 percent with AHA alone; 5 percent with AHA, JCAH, and an alternate affiliation; and 2 percent with an alternate affiliation only (Figure 12). Eighty percent provided general medical services, while 20 percent were more specialized (Figure 13). Sixty percent of the responding facilities were hospitals; 18 percent were combination hospital-nursing homes; and 16 percent belonged to a non-specific category (i.e. psychiatric center) (Figure 14). With regard to

facility size, 54 percent were in the category of 101 to 300 beds; 18 percent had 301 to 500 beds; 16 percent had 501 to 700 beds; 9 percent had 1101 or more beds; and the remaining 2 percent had 701 to 900 beds (Figure 15). Sixty-one percent of the responding facilities were located in metropolitan areas (50,000 or more inhabitants); 33 percent were located in urban areas (2,500-49,999 inhabitants); and 6 percent were located in rural areas (1-24,999 inhabitants) (Figure 16).

Ninety-six percent of the responding facilities managed their own foodservice department, while only 4 percent were operated by contract management companies (Figure 17). Ninety percent of the participating facilities utilized a conventional foodservice system, while 10 percent utilized some alternate method, such as cook chill or cook freeze (Figure 18). The percentage of the yearly budget allotted for food varied from two to 64 percent, while labor figures ranged from two to 70 percent (Figure Table I). These responses were dependent upon the organizational type and the respondent's interpretation of the question. For example, one respondent indicated that 2 percent of their budget was allotted for food and 2 percent for labor; these percentages were very low indicating that the respondent may have misunderstood or misinterpreted the question. Seventy-two percent of the respondents had participated in some type of managerial training program, while 28 percent had not (Figure 19).

Performance Measures

Previous performance studies conducted by Oklahoma State University's Department of Food, Nutrition, and Institution Administration numerically ranked the seven performance criteria in order of importance and amount of time dedicated to each by the respondents. This study's questionnaire did not ask the importance of each performance criterion; however, the rate of utlization could be derived from frequency tables. The results of this study and Czajkowski's (1988) study were somewhat different from the previous performance studies where quality ranked first in overall utilization. The results of this study and Czajkowksi's (1988) supported the beliefs expressed by Sink, Tuttle, and DeVries (1984) ranking effectiveness as the most important performance criterion. In terms of rate of utlization, the results from this study and Czajkowski's (1988) study were almost identical. The rankings are as followed:

	Present Study		Czajkowksi Study	
1	Effectiveness	(88%)	Effectiveness	(93%)
2	Quality	(83%)	Quality	(91%)
3	Efficiency	(81%)	Efficiency	(90%)
4	Innovation	(77%)	Innovation	(75%)
5	QWL	(46%)	QWL	(50%)
6	QWL/Innovation	(29%)	Profitability	(41%)
7	Profitability	(25%)	QWL/innovation	(36%)

The difference among ranking was with the performance measurements, profitability and QWL/innovation. This may have been due to the fact that Czajkowski's study had a

higher percentage of for-profit responding facilities than this study.

In this research, effectiveness measures were ranked first, with an average utilization factor of 88 percent. Included in this category were verbal/written statement of departmental goals (94% utilization), and MBO/employee evaluations (83% utilization). Hospital membership, specifically membership in an affiliation other than AHA or JCAH, was shown to be statistically associated with MBO/employee evaluation. Both MBO and departmental goal statements were practiced most often on a yearly basis (Table II).

Efficiency measures utilized, in order of popularity among respondents included: meal price analysis (94%), budget analysis (100%), inventory turnover analysis (63%), and labor analysis of turnover and absenteeism rates (69%). These efficiency measures were statistically associated with hospital-type facilities and respondents that had received a bachelor's degree and held the title of foodservice director or chief dietitian. With regard to overall utilization, efficiency measures ranked third among respondents, with an average rate of 81 percent (Table III).

Innovation measures used included: new recipe implementation (100% utilization). menu analysis/revision (98% utilization), equipment review (96% utilization), and computer usage in nutrition (43% utilization) and

foodservice (47% utilization). Overall, innovation measures ranked fourth among the performance measure categories, with an average utilization rate of 77 percent. These measures were statistically associated with several variables, including: route to registration (internship), master's degree, productivity training, 11 or more years in foodservice management, and facilities whose food percentage was less than or equal to 35 percent of the total yearly budget that also utilized conventional foodservice systems (Table IV).

Quality measures in order of utilization by respondents included: temperature checks on food items (100%), tray audits (91%), patient surveys of foodservice quality (91%), prior-to-service quality food checks/taste tests (96%), food quality checks against actual product specifications (76%), and quality circles (42%). Significant associations were found between quality measure utilization and non-profit facility status, hospital-type facilities located in metropolitan areas, and respondents that received bachelor's degree and were registered dietitians. Among the categories of the additional performance measures identified in the research, those relating to quality were ranked second in terms of utilization, with an average of 83 percent (Table V).

Quality of work life was ranked fifth, overall, with an average utilization of 46 percent. These measures

included: employee suggestion systems (53% utilization), employee recognition programs (74% utilization), and monetary (31% utilization) and non-monetary (27% utilization) employee reward systems. These measures tended to be associated with more specialized types of facilities with 301 or more beds, respondents that received a bachelor's degree with 11 or more years in foodservice management, respondents that pursued an internship as their means to ADA registration and had previous managerial training, and facilities affiliated with AHA whose food percentage was less than or equal to 35 percent of the total yearly budget (Table VI).

A combined QWL/innovation category was also addressed in the research. This category included measures, such as employee health/fitness programs (49% utilization), profit sharing (2% utilization), flextime (6% utilization), job sharing (10% utilization), cafeteria-style benefit programs (25% utilization), and brainstorming sessions (81% utilization). These combined measures were ranked sixth among the performance measures, with an average utilization rate of 29 percent. These measures were shown to be associated with facilities that had more than 301 beds located in metropolitan areas affiliated with JCAH, and respondents that had received productivity training that completed an internship (Table VII).

The final performance measure category was profitability, and it was ranked last among the

performance measures with an average of 25 percent in utilization. Profitability measures included: meals-on-wheels program (14% utilization), congregate meals for the elderly (2% utilization), and in-house (53% utilization), satellite (12 % utilization), public (51% utilization), and bakeshop catering (14% utilization). Statistical associations were found between these measures and respondents that received a master's degree and productivity training with 10 years or less in foodservice management and hospital-type facilities with a food percentage less than or equal to 35 percent of the total yearly budget. Also, both age groups, 20 to 39 years of age and 40 years and older, were significantly associated with profit, dependent upon the certain measure (Table VIII).

Performance Ratios

The three basic performance ratios were used by Czajkowski (1988) in her study attempted to determine the variation of organizational performance of the respondents over a two-quarter period of time. The ratios included:

R_1: $\frac{\text{Total meals served}}{\text{Total labor hours worked}}$

R_2: $\frac{\text{Total meals prepared}}{\text{Total food cost}}$

R_3: $\frac{\text{Total revenues}}{\text{Total expenses}}$

These three ratios represented productivity measurements, or specifically, output/input; however, only 60 percent used them. Again, this may be due to the lack of knowledge or available information needed to compute these ratios by foodservice administrators and dieticians. The majority of the respondents (89%) provided information for R_1; it was also identified that the majority of the respondent's figures for this ratio were higher for third quarter than the fourth quarter. This may be due to seasonal changes and/or total patient census. R_2 was utilized by 75 percent of the participants, indicating that meals prepared were also being recorded along with meals served. In contrast, R_3 received the lowest response rate (61%); however, the percentage of utilization was above 50 percent, indicating that those foodservice administrators that were utilizing this measure were also computing revenues and expenses.

Statistical associations were found between R_1(Total meals served/Total labor hours worked) utilization and investor owned, for-profit facilities that utilized conventional type foodservice systems with less than 300 beds located in urban or rural areas and respondents that held the position title of foodservice director or chief dietitian (Table XII). With regard to R_2 (Total meals prepared/Total food cost), significance were associated with facilities using conventional type foodservice systems, affiliated with AHA, and located in rural or

urban areas, as well as respondents that held the position title of foodservice director or chief dietitian (Table XIII). Among responses to R_3 (Total revenues/Total expenses), statistical associations were found between this ratio and non-government, non-profit facilities that used conventional type foodservice systems, located in urban or rural areas with less than 300 beds and respondents that held the position title of foodservice director or chief dietitian (Table XIV).

Eleven additional ratios were presented in an attempt to further expand upon the types of measurement ratios utilized by foodservice administrators and administrative dietitians. The most commonly utilized ratio in this category was $\frac{\text{Money spent on labor}}{\text{Money budgeted for labor}}$ (60%). Statistical assocations were found between these categories of additional ratios and the following demographic characteristics: received bachelor's degree, position title of associate director or administrative dietitian, RD status, less than 10 years in foodservice management, labor percentage less than or equal to 65 percent of yearly budget, facilities with 301 or more beds, urban/rural facility locations, AHA affiliation, and non-government, non-profit hospitals (Table XVIII).

Recommendations

Questionnaire

An endeavor was made to clarify and simplify this questionnaire, however, it is believed that perhaps the administrative dietitians surveyed were overwhelmed by the variety and amount of information requested. One suggestion may be to divide the study into separate surveys based on the performance ratios and performance measurements. Another suggestion may be to mail additional information (i.e. detailed definitions, related subject literature) before sending the survey instrument, informing the subjects that they will be receiving a questionnaire, and that this additional information will help them answer the questionnaire completely and accurately. This literature may help to educate the subjects in the area of performance measurements and to allow them to gather the needed information in order to effectively answer the questionnaire. A follow-up mailing is also recommended in order to increase the rate of response.

Recommendations Based on the Results of the Study

Based on the results of the survey, the researcher makes the following recommendations:

1. Although an attempt was made to formally standardize performance ratios for universal implementation in all areas of foodservice, confusion among administrative dietitians still remains concerning accepted definitions of performance and other interpretable terms. Foodservice and hospital organizations must develop universally accepted definitions of performance and related terms. This could be initiated through educational modules, correspondence studies, or requirements by an affiliate hospital membership or the American Dietetic Association.

2. Further studies concerning the area of productivity and the other performance measurements is needed in order to clearly evaluate performance in specific foodservice facilities.

3. The results of this study, which supports the results of the previous performance studies at Oklahoma State University, reveals that dietitians and foodservice administrators lack the knowledge to measure performance measures. Additional education is needed in the undergraduate and graduate courses pertaining to foodservice management; also, additional research is

needed in regard to management knowledge of entry-level administrative and clinical dietitians.

4. Further analysis is required to determine the most widely utilized performance measurements in foodservice and to determine if these measures are being computed and calculated correctly.

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APPENDIXES

APPENDIX A

CORRESPONDENCE

O K L A H O M A S T A T E U N I V E R S I T Y

Department of Food, Nutrition and Institution Administration

June 22, 1987

Dear Colleague:

Productivity and its improvement through measurement and evaluation techniques has been a growing concern of American businesses and vital to the economy as a whole. Although the business sector is the broadest area for which productivity is measured, this by no means indicates that the service industry is not affected by production losses. In light of the recent "productivity crisis" experienced by many U.S. industries, productivity monitoring and improvement techniques are no longer exclusive to the factory floor.

New developments such as Medicare's Prospective Payment System (PPS) and DRG's have forced hospital administration to begin focusing on end results, along with the full scale services necessary to achieve these results. Because foodservice systems are very much a part of total patient service and satisfaction, foodservice administrators must also take a closer look at productivity and performance within their respective departments.

This study is an attempt to standardize ratios and indexes that can be used to measure productivity in all foodservice areas. The identities of individual facilities and administrators will be held in strict confidence, but numerical figures are needed to establish a basis for comparison and evaluation of measurement trends. The code number on your questionnaire is used to facilitate response follow-up.

The results of this study center around your participation and input, and will help us to further the future of the foodservice industry. Please assist us in our endeavor by returning the completed questionnaire on or before July 6, 1987. Refold to display the return address and postage. Thank you.

Sincerely,

(Signed) Lea L. Ebro, Ph.D., R.D.
Professor and Interim Head
Department of Food, Nutrition
and Institution Administration

APPENDIX B

RESEARCH INSTRUMENT

Oklahoma State University
DEPARTMENT OF FOOD, NUTRITION AND
INSTITUTION ADMINISTRATION
COLLEGE OF HOME ECONOMICS
STILLWATER, OKLAHOMA 74078-0337

FOODSERVICE PRODUCTIVITY STUDY

I. General Information

Directions: Please check (✓) the most appropriate response to each of the questions below.

1. Age Group: ____(1) 20-29 ____(2) 30-39 ____(3) 40-49 ____(4) 50 & above

2. Degree Attained and Major:
   ____(1) BS/BA _____
   ____(2) MS/MA _____
   ____(3) Other (please specify) _____

3. Registration Status (R.D.): ____(1) Registered ____(2) Non-Registered

4. Route to ADA Membership & Registration:
   ____(1) CUP
   ____(2) Internship
   ____(3) 3-Year Work Experience
   ____(4) MS plus 6 Month Work Experience
   ____(5) Other: _____

5. Position Title:
   ____(1) Director/Chief
   ____(2) Assoc./Asst. Director
   ____(3) Administrative Dietitian
   ____(4) Other: _____

6. Annual Salary:
   ____(1) Below $20,000
   ____(2) $20,000-24,999
   ____(3) $25,000-29,999
   ____(4) $30,000-34,999
   ____(5) $35,000-39,999
   ____(6) $40,000-44,999
   ____(7) $45,000-49,999
   ____(8) $50,000 and above

7. Number of years in foodservice management:
   ____(1) 1-5 years ____(2) 6-10 years ____(3) 11-15 years ____(4) 16 or more

8. Have you received training in productivity measurement?
   ____(1) Yes (please specify): _____ ____(2) No

9. Type of Hospital Control:
   ____(1) Government, non-federal, non-profit (state, county, city)
   ____(2) Non-government, non-profit (church)
   ____(3) Investor owned, for-profit (private, partnership, corporation)

10. Hospital Membership:
    ____(1) AHA ____(2) JCAH ____(3) Other: _____

11. Type of medical service provided:
    ____(1) General ____(2) Other: _____

12. Type of facility:
    ____(1) Hospital ____(2) Hospital/Nursing Home ____(3) Other: _____

13. Size of facility:
    ____(1) 101-300 beds
    ____(2) 301-500 beds
    ____(3) 501-700 beds
    ____(4) 701-900 beds
    ____(5) 901-1100 beds
    ____(6) 1101 or more beds

14. Facility Location:
    ____(1) Rural (1-2,499 inhabitants)
    ____(2) Urban (2,500-49,999 inhabitants)
    ____(3) Metropolitan (50,000+ inhabitants)

15. Type of foodservice management:
    ____(1) Non-contract ____(2) Contract (please specify): _____

16. Type of foodservice system:
    ____(1) Conventional ____(2) Other (please specify): _____

17. Current % of yearly budget: _____(1) Food _____(2) Labor

18. Training program for management staff:
    ____(1) Yes (please specify): _____ ____(2) No

PLEASE TURN OVER

II. Performance Indexes

A. Directions: Please compute the following ratios using figures from your 3rd and 4th quarters of the 1986 fiscal year. All figures should be totals, including catering, snack shop, employee and patient feeding, etc. (If an entire ratio cannot be computed, please provide the figures you do have available.)

Note: -- *Total meals prepared is generally a larger figure than total meals served, due to patient deaths, discharges, leftovers and any other factors that may not have been accounted for.*

-- *Total labor hours worked does not include paid sick time, personal leave, vacation hours, etc.*

-- *Total expenses include food and labor, as well as materials, equipment, departmental improvements, etc. Total revenues include all income taken in by the department through its various services.*

Ratio	3rd quarter	4th quarter
Example: $\frac{\text{Total meals prepared}}{\text{Total food cost}}$	$\frac{30,341}{\$44,191} = 0.6979$	$\frac{28,621}{\$43,619} = 0.6561$
(1) $\frac{\text{Total meals served}}{\text{Total labor hours worked}}$		
(2) $\frac{\text{Total meals prepared}}{\text{Total food cost}}$		
(3) $\frac{\text{Total revenues}}{\text{Total expenses}}$		

B. Directions: Please check any of these additional ratios used to measure performance in your foodservice.

____(1) $\frac{\text{Total meals prepared}}{\text{Total labor hours worked}}$

____(2) $\frac{\text{Number of patients served}}{\text{Number of trays prepared}}$

____(3) $\frac{\text{Total cafeteria sales}}{\text{Total cafeteria labor hours worked}}$

____(4) $\frac{\text{\# of employees who left dept.}}{\text{\# of total employees}} \times 100$

____(5) $\frac{\text{\# of unauthorized absences}}{\text{\# of total employees}} \times 100$

____(6) $\frac{\text{Cafeteria revenues}}{\text{Cafeteria expenses}}$

____(7) $\frac{\text{Money spent on materials*}}{\text{Money budgeted for materials}}$

____(8) $\frac{\text{Money spent on utilities**}}{\text{Money budgeted for utilities}}$

____(9) $\frac{\text{Money spent on improvements}}{\text{Money budgeted for improvements}}$

____(10) $\frac{\text{Money spent on labor}}{\text{Money budgeted for labor}}$

____(11) $\frac{\text{Actual sales}}{\text{Forecasted sales}}$

____(12) Other (please specify):

_____

_____

_____

_____

*Materials include items such as papergoods, china, flatware, linens, etc.
**Utilities include all energy costs such as gas, electricity, water, etc.

III. Performance Measures

A. How frequently are the following activities performed in your foodservice? Please place the number of the most appropriate response in the blanks provided.

1= Never 3= Weekly. 5- Monthly 7= Other (please specify)
2= Daily 4= Biweekly 6= Yearly

____ Temperature checks on food items
____ Tray audits
____ Patient surveys of foodservice quality
____ Prior-to-service quality food checks/taste tests
____ Food quality checks against actual product specifications
____ Verbal/written statement of departmental goals
____ Management by Objectives (MBO)/ employee evaluations
____ New recipe implementation
____ Menu analysis/revision
____ Equipment review
____ Meal price analysis
____ Budget analysis
____ Inventory turnover analysis
____ Labor analysis of turnover and absenteeism rates
____ Quality circles (employee initiated sessions for the purpose of suggesting and implementing improvements in operations)
____ Employee "brainstorming" sessions (informal meetings to generate ideas and discuss problems)

B. Please check any of the additional activities practiced/utilized by your department.

____ Employee suggestion system
____ Meals-on-Wheels program (for profit)
____ Congregate meal for the elderly (for profit)
____ Catering (for profit):
____(1) in-house (employee feeding, staff functions, etc.)
____(2) satellite locations
____(3) public (cafeteria/dining area available for service of guests, families and the general public)
____(4) bakeshop
____ Computer usage: ____(1) in nutrition services ____(2) in foodservice

C. Do your employees have access to the following benefits? Please check all that apply.

____ Employee health/fitness programs
____ Employee recognition programs (employee of the month, etc.)
____ Profit sharing
____ Employee reward systems: ____(1) Monetary
____(2) Non-monetary (please specify): _____
____ Flextime (an arrangement whereby employees have a degree of freedom in choosing the hours they will work each day as long as they are present during a core period specified by the department)
____ Job sharing (a program enabling two employees to share the same job, along with its allotted salary and benefits)
____ "Cafeteria-style" benefits (a program which enables employees to select health related and personal benefits that are most suited to their individual needs)

THANK YOU FOR YOUR PARTICIPATION!!!

APPENDOX C

CHI-SQUARE TABLES

Key to Chi-Square Tables

RR1_3 = $\frac{\text{Total meals served}}{\text{Total labor hours worked}}$, third quarter

RR1_4 = $\frac{\text{Total meals served}}{\text{Total labor hours worked}}$, fourth quarter

RR2_3 = $\frac{\text{Total meals prepared}}{\text{Total food cost}}$, third quarter

RR2_4 = $\frac{\text{Total meals prepared}}{\text{Total food cost}}$, fourth quarter

RR3_3 = $\frac{\text{Total revenues}}{\text{Total expenses}}$, third quarter

RR3_4 = $\frac{\text{Total revenues}}{\text{Total expenses}}$, fourth quarter

Ratio Additional ratios (Survey Section II, Part B)

PMeas Performance measures (Survey Section III, Part A)

PMeasB Additional activities (Survey Section III, Part B)

PMeasC Benefits (Survey Section III, Part C)

1 Respondent Utilization

0 No utilization by the Respondent

SAS

TABLE OF CONTROL BY PMEAS1

CONTROL PMEAS1

FREQUENCY / ROW PCT / COL PCT	1	2	TOTAL
1	4 21.05 100.00	15 78.95 36.59	19
2	0 0.00 0.00	21 100.00 51.22	21
3	0 0.00 0.00	5 100.00 12.20	5
TOTAL	4	41	45

FREQUENCY MISSING = 6

STATISTICS FOR TABLE OF CONTROL BY PMEAS1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	6.008	0.050

SAS

TABLE OF ROUTE BY PMEAS10

ROUTE PMEAS10

FREQUENCY / ROW PCT / COL PCT	0	1	2	TOTAL
1	0 0.00 0.00	13 100.00 28.55	0 0.00 0.00	13
2	1 3.45 100.00	28 96.55 63.64	0 0.00 0.00	29
3	0 0.00 0.00	3 75.00 6.82	1 25.00 100.00	4
TOTAL	1	44	1	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF ROUTE BY PMEAS10

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	4	11.293	0.023

SAS

TABLE OF OTH_HOSP BY PMEAS7

OTH_HOSP PMEAS7

FREQUENCY / ROW PCT / COL PCT	1	2	TOTAL
0	38 100.00 92.68	0 0.00 0.00	38
3	3 75.00 7.32	1 25.00 100.00	4
TOTAL	41	1	42

FREQUENCY MISSING = 9

STATISTICS FOR TABLE OF OTH_HOSP BY PMEAS7

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.732	0.002

SAS

TABLE OF YRS_FS_M BY PMEAS9

YRS_FS_M PMEAS9

FREQUENCY / ROW PCT / COL PCT	1	2	TOTAL
2	19 100.00 46.34	0 0.00 0.00	19
3	22 81.48 53.66	5 18.52 100.00	27
TOTAL	41	5	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF YRS_FS_M BY PMEAS9

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.948	0.047

SAS

TABLE OF FACILITY BY PMEAS1

FACILITY PMEAS1

FREQUENCY / ROW PCT / COL PCT	1	2	TOTAL
1	1 3.13 25.00	31 96.88 72.09	32
2	3 20.00 75.00	12 80.00 27.91	15
TOTAL	4	43	47

FREQUENCY MISSING = 4

STATISTICS FOR TABLE OF FACILITY BY PMEAS1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.735	0.053

SAS

TABLE OF DEGREE BY PMEAS11

DEGREE PMEAS11

FREQUENCY / ROW PCT / COL PCT	1	2	TOTAL
BS	28 100.00 62.22	0 0.00 0.00	28
MS	17 89.47 37.78	2 10.53 100.00	19
TOTAL	45	2	47

FREQUENCY MISSING = 4

STATISTICS FOR TABLE OF DEGREE BY PMEAS11

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.078	0.079

SAS

TABLE OF TITLE BY PMEAS14

TITLE PMEAS14

FREQUENCY / ROW PCT / COL PCT	0	1	2	TOTAL
1	0 0.00 0.00	30 100.00 71.43	0 0.00 0.00	30
2	1 6.25 100.00	12 75.00 28.57	3 18.75 100.00	16
TOTAL	1	42	3	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF TITLE BY PMEAS14

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	8.214	0.016

SAS

TABLE OF YRS_FS_M BY PMEASB1

YRS_FS_M PMEASB1

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	12 60.00 60.00	8 40.00 30.77	20
3	8 30.77 40.00	18 69.23 69.23	26
TOTAL	20	26	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF YRS_FS_M BY PMEASB1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.930	0.047

SAS

TABLE OF ROUTE BY PMEAS16

ROUTE PMEAS16

FREQUENCY / ROW PCT / COL PCT	1	2	TOTAL
1	13 100.00 28.89	0 0.00 0.00	13
2	29 100.00 64.44	0 0.00 0.00	29
3	3 75.00 6.67	1 25.00 100.00	4
TOTAL	45	1	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF ROUTE BY PMEAS16

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	10.733	0.005

SAS

TABLE OF ROUTE BY PMEASB1

ROUTE PMEASB1

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	10 71.43 50.00	4 28.57 15.38	14
2	9 32.14 45.00	19 67.86 73.08	28
3	1 25.00 5.00	3 75.00 11.54	4
TOTAL	20	26	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF ROUTE BY PMEASB1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	6.470	0.039

SAS

TABLE OF DEGREE BY PMEASB1

DEGREE PMEASB1

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
BS	8 29.63 40.00	19 70.37 73.08	27
MS	12 63.16 60.00	7 36.84 26.92	19
TOTAL	20	26	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF DEGREE BY PMEASB1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.101	0.024

SAS

TABLE OF FACILITY BY PMEASB1

FACILITY PMEASB1

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	18 56.25 90.00	14 43.75 53.85	32
2	2 14.29 10.00	12 85.71 46.15	14
TOTAL	20	26	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF FACILITY BY PMEASB1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.979	0.008

SAS

TABLE OF GPC_FOOD BY PMEASB2

GPC_FOOD PMEASB2

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	32 91.43 82.05	3 8.57 42.86	35
2	7 63.64 17.95	4 36.36 57.14	11
TOTAL	39	7	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF GPC_FOOD BY PMEASB2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.011	0.025

SAS

TABLE OF GPC_FOOD BY PMEASB2

GPC_FOOD PMEASB2

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	32 91.43 82.05	3 8.57 42.86	35
2	7 63.64 17.95	4 36.36 57.14	11
TOTAL	39	7	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF GPC_FOOD BY PMEASB2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.011	0.025

SAS

TABLE OF AGE BY PMEASB2

AGE PMEASB2

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	15 100.00 38.46	0 0.00 0.00	15
3	24 77.42 61.54	7 22.58 100.00	31
TOTAL	39	7	46

FREQUENCY MISSING = 6

STATISTICS FOR TABLE OF AGE BY PMEASB2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.995	0.046

SAS

TABLE OF AGE BY PMEASB5

AGE PMEASB5

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	3 20.00 15.79	12 80.00 44.44	15
3	16 51.61 84.21	15 48.39 55.56	31
TOTAL	19	27	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF AGE BY PMEASB5

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.167	0.041

SAS

TABLE OF TR_PROD BY PMEASB6

TR_PROD PMEASB6

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	13 72.22 36.11	5 27.78 83.33	18
2	23 95.83 63.89	1 4.17 16.67	24
TOTAL	36	6	42

FREQUENCY MISSING = 9

STATISTICS FOR TABLE OF TR_PROD BY PMEASB6

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.683	0.030

SAS

TABLE OF DEGREE BY PMEASB6

DEGREE PMEASB6

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
BS	26 96.30 65.00	1 3.70 16.67	27
MS	14 73.68 35.00	5 26.32 83.33	19
TOTAL	40	6	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF DEGREE BY PMEASB6

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.027	0.025

SAS

TABLE OF FACILITY BY PMEASB7

FACILITY	PMEASB7		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	12 37.50 57.14	20 62.50 80.00	32
2	9 64.29 42.86	5 35.71 20.00	14
TOTAL	21	25	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF FACILITY BY PMEASB7

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	2.816	0.093

SAS

TABLE OF FACILITY BY PMEASB7

FACILITY PMEASB7

FREQUENCY / ROW PCT / COL PCT | 0 | 1 | TOTAL

1 | 12 | 20 | 32
37.50 | 62.50
57.14 | 80.00

2 | 9 | 5 | 14
64.29 | 35.71
42.86 | 20.00

TOTAL 21 25 46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF FACILITY BY PMEASB7

STATISTIC DF VALUE PROB

CHI-SQUARE 1 2.816 0.093

SAS

TABLE OF YRS_FS_M BY PMEASB7

YRS_FS_M	PMEASB7		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	6 30.00 28.57	14 70.00 56.00	20
3	15 57.69 71.43	11 42.31 44.00	26
TOTAL	21	25	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF YRS_FS_M BY PMEASB7

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.494	0.062

SAS

TABLE OF AGE BY PMEASB8

AGE	PMEASB8		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	10 66.67 25.64	5 33.33 71.43	15
3	29 93.55 74.36	2 6.45 28.57	31
TOTAL	39	7	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF AGE BY PMEASB8

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.662	0.017

SAS

TABLE OF TR_PROD BY PMEASB10

TR_PROD	PMEASB10		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	6 33.33 27.27	12 66.67 60.00	18
2	16 66.67 72.73	8 33.33 40.00	24
TOTAL	22	20	42

FREQUENCY MISSING = 9

STATISTICS FOR TABLE OF TR_PROD BY PMEASB10

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.582	0.032

SAS

TABLE OF ROUTE BY PMEASB10

ROUTE	PMEASB10		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	5 35.71 20.00	9 64.29 42.86	14
2	16 57.14 64.00	12 42.86 57.14	28
3	4 100.00 16.00	0 0.00 0.00	4
TOTAL	25	21	46

FREQUENCY MISSING = 5

STATISTICS FOR TABLE OF ROUTE BY PMEASB10

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	5.407	0.067

SAS

TABLE OF DEGREE BY PMEASB11

DEGREE PMEASB11

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
BS	17 62.96 73.91	10 37.04 43.48	27
MS	6 31.58 26.09	13 68.42 56.52	19
TOTAL	23	23	46

FREQUENCY MISSING = 6

STATISTICS FOR TABLE OF DEGREE BY PMEASB11

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.384	0.036

SAS

TABLE OF FS_SYST BY PMEASB11

FS_SYST PMEASB11

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	23 56.10 100.00	18 43.90 78.26	41
2	0 0.00 0.00	5 100.00 21.74	5
TOTAL	23	23	46

FREQUENCY MISSING = 6

STATISTICS FOR TABLE OF FS_SYST BY PMEASB11

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.640	0.018

SAS

TABLE OF OTH_HOSP BY PMEASC1

OTH_HOSP PMEASC1

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
0	14 40.00 77.78	21 60.00 100.00	35
3	4 100.00 22.22	0 0.00 0.00	4
TOTAL	18	21	39

FREQUENCY MISSING = 12

STATISTICS FOR TABLE OF OTH_HOSP BY PMEASC1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.200	0.023

SAS

TABLE OF SIZE BY PMEASC4

SIZE PMEASC4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	16 72.73 72.73	6 27.27 33.33	22
2	6 33.33 27.27	12 66.67 66.67	18
TOTAL	22	18	40

FREQUENCY MISSING = 11

STATISTICS FOR TABLE OF SIZE BY PMEASC4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.208	0.013

SAS

TABLE OF TR_PROD BY PMEASC8

TR_PROD PMEASC8

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	12 75.00 35.29	4 25.00 80.00	16
2	22 95.65 64.71	1 4.35 20.00	23
TOTAL	34	5	39

FREQUENCY MISSING = 12

STATISTICS FOR TABLE OF TR_PROD BY PMEASC8

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.601	0.058

SAS

TABLE OF LOCATION BY PMEASC9

LOCATION PMEASC9

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	15 88.24 48.39	2 11.76 16.67	17
3	16 61.54 51.61	10 38.46 83.33	26
TOTAL	31	12	43

FREQUENCY MISSING = 8

STATISTICS FOR TABLE OF LOCATION BY PMEASC9

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.641	0.056

SAS

TABLE OF LOCATION BY RR1_3

LOCATION RR1_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	4 21.05 16.67	15 78.95 60.00	19
3	20 66.67 83.33	10 33.33 40.00	30
TOTAL	24	25	49

FREQUENCY MISSING = 2

STATISTICS FOR TABLE OF LOCATION BY RR1_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.689	0.002

SAS

TABLE OF SIZE BY RR1_3

SIZE RR1_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	8 33.33 38.10	16 66.67 69.57	24
2	13 65.00 61.90	7 35.00 30.43	20
TOTAL	21	23	44

FREQUENCY MISSING = 7

STATISTICS FOR TABLE OF SIZE BY RR1_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.385	0.036

SAS

TABLE OF CONTROL BY RR1_3

CONTROL RR1_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	11 55.00 50.00	9 45.00 36.00	20
2	11 50.00 50.00	11 50.00 44.00	22
3	0 0.00 0.00	5 100.00 20.00	5
TOTAL	22	25	47

FREQUENCY MISSING = 4

STATISTICS FOR TABLE OF CONTROL BY RR1_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	5.029	0.081

SAS

TABLE OF FS_SYST BY RR1_3

FS_SYST RR1_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	18 41.86 78.26	25 58.14 100.00	43
2	5 100.00 21.74	0 0.00 0.00	5
TOTAL	23	25	48

FREQUENCY MISSING = 3

STATISTICS FOR TABLE OF FS_SYST BY RR1_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.067	0.014

SAS

TABLE OF LOCATION BY RR3_4

LOCATION RR3_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	7 36.84 21.88	12 63.16 70.59	19
3	25 83.33 78.13	5 16.67 29.41	30
TOTAL	32	17	49

FREQUENCY MISSING = 2

STATISTICS FOR TABLE OF LOCATION BY RR3_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	11.087	0.001

SAS

TABLE OF SIZE BY RR1_4

SIZE RR1_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	7 29.17 35.00	17 70.83 70.83	24
2	13 65.00 65.00	7 35.00 29.17	20
TOTAL	20	24	44

FREQUENCY MISSING = 7

STATISTICS FOR TABLE OF SIZE BY RR1_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.650	0.017

SAS

TABLE OF FS_SYST BY RR1_4

FS_SYST	RR1_4		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	17 39.53 77.27	26 60.47 100.00	43
2	5 100.00 22.73	0 0.00 0.00	5
TOTAL	22	26	48

FREQUENCY MISSING = 3

STATISTICS FOR TABLE OF FS_SYST BY RR1_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.596	0.010

SAS

TABLE OF CONTROL BY RR1_4

CONTROL	RR1_4		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	11 55.00 52.38	9 45.00 34.62	20
2	10 45.45 47.62	12 54.55 46.15	22
3	0 0.00 0.00	5 100.00 19.23	5
TOTAL	21	26	47

FREQUENCY MISSING = 4

STATISTICS FOR TABLE OF CONTROL BY RR1_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	4.905	0.086

SAS

TABLE OF SIZE BY RR1_4

SIZE	RR1_4		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	7 29.17 35.00	17 70.83 70.83	24
2	13 65.00 65.00	7 35.00 29.17	20
TOTAL	20	24	44

FREQUENCY MISSING = 7

STATISTICS FOR TABLE OF SIZE BY RR1_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.650	0.017

SAS

TABLE OF LOCATION BY RR1_4

LOCATION	RR1_4		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	4 21.05 17.39	15 78.95 57.69	19
3	19 63.33 82.61	11 36.67 42.31	30
TOTAL	23	26	49

FREQUENCY MISSING = 2

STATISTICS FOR TABLE OF LOCATION BY RR1_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.348	0.004

SAS

TABLE OF FS_SYST BY RR2_3

FS_SYST	RR2_3		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	22 51.16 81.48	21 48.84 100.00	43
2	5 100.00 18.52	0 0.00 0.00	5
TOTAL	27	21	48

FREQUENCY MISSING = 3

STATISTICS FOR TABLE OF FS_SYST BY RR2_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.341	0.037

SAS

TABLE OF TITLE BY RR2_3

TITLE	RR2_3		
FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	14 45.16 46.67	17 54.84 80.95	31
2	16 80.00 53.33	4 20.00 19.05	20
TOTAL	30	21	51

STATISTICS FOR TABLE OF TITLE BY RR2_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.092	0.014

SAS

TABLE OF AHA BY RR2_4

AHA RR2_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
0	11 68.75 47.83	5 31.25 23.81	16
1	12 42.86 52.17	16 57.14 76.19	28
TOTAL	23	21	44

FREQUENCY MISSING = 7

STATISTICS FOR TABLE OF AHA BY RR2_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	2.736	0.098

SAS

TABLE OF AHA BY RR2_3

AHA RR2_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
0	11 68.75 47.83	5 31.25 23.81	16
1	12 42.86 52.17	16 57.14 76.19	28
TOTAL	23	21	44

FREQUENCY MISSING = 7

STATISTICS FOR TABLE OF AHA BY RR2_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	2.736	0.098

SAS

TABLE OF LOCATION BY RR2_3

LOCATION RR2_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	7 36.84 25.00	12 63.16 57.14	19
3	21 70.00 75.00	9 30.00 42.86	30
TOTAL	28	21	49

FREQUENCY MISSING = 2

STATISTICS FOR TABLE OF LOCATION BY RR2_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.222	0.022

SAS

TABLE OF FS_SYST BY RR2_4

FS_SYST RR2_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	22 51.16 81.48	21 48.84 100.00	43
2	5 100.00 18.52	0 0.00 0.00	5
TOTAL	27	21	48

FREQUENCY MISSING = 3

STATISTICS FOR TABLE OF FS_SYST BY RR2_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.341	0.037

SAS

TABLE OF TITLE BY RR2_4

TITLE RR2_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	14 45.16 46.67	17 54.84 80.95	31
2	16 80.00 53.33	4 20.00 19.05	20
TOTAL	30	21	51

STATISTICS FOR TABLE OF TITLE BY RR2_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.092	0.014

SAS

TABLE OF CONTROL BY RR3_3

CONTROL RR3_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	17 85.00 54.84	3 15.00 18.75	20
2	13 59.09 41.94	9 40.91 56.25	22
3	1 20.00 3.23	4 80.00 25.00	5
TOTAL	31	16	47

FREQUENCY MISSING = 4

STATISTICS FOR TABLE OF CONTROL BY RR3_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	8.395	0.015

SAS

TABLE OF FS_SYST BY RR3_3

FS_SYST RR3_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	27 62.79 84.38	16 37.21 100.00	43
2	5 100.00 15.63	0 0.00 0.00	5
TOTAL	32	16	48

FREQUENCY MISSING = 3

STATISTICS FOR TABLE OF FS_SYST BY RR3_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	2.791	0.095

SAS

TABLE OF TITLE BY RR3_3

TITLE RR3_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	18 58.06 51.43	13 41.94 81.25	31
2	17 85.00 48.57	3 15.00 18.75	20
TOTAL	35	16	51

STATISTICS FOR TABLE OF TITLE BY RR3_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.087	0.043

SAS

TABLE OF LOCATION BY RR3_3

LOCATION RR3_3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	7 36.84 21.21	12 63.16 75.00	19
3	26 86.67 78.79	4 13.33 25.00	30
TOTAL	33	16	49

FREQUENCY MISSING = 2

STATISTICS FOR TABLE OF LOCATION BY RR3_3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	13.132	0.000

SAS

TABLE OF SIZE BY RR3_4

SIZE RR3_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	12 50.00 41.38	12 50.00 80.00	24
2	17 85.00 58.62	3 15.00 20.00	20
TOTAL	29	15	44

FREQUENCY MISSING = 7

STATISTICS FOR TABLE OF SIZE BY RR3_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.948	0.015

SAS

TABLE OF CONTROL BY RR3_4

CONTROL RR3_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	17 85.00 56.67	3 15.00 17.65	20
2	12 54.55 40.00	10 45.45 58.82	22
3	1 20.00 3.33	4 80.00 23.53	5
TOTAL	30	17	47

FREQUENCY MISSING = 4

STATISTICS FOR TABLE OF CONTROL BY RR3_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	8.864	0.012

SAS

TABLE OF TITLE BY RR3_4

TITLE RR3_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	17 54.84 50.00	14 45.16 82.35	31
2	17 85.00 50.00	3 15.00 17.65	20
TOTAL	34	17	51

STATISTICS FOR TABLE OF TITLE BY RR3_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.977	0.026

SAS

TABLE OF FS_SYST BY RR3_4

FS_SYST RR3_4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	28 60.47 93.87	17 39.53 100.00	43
2	8 100.00 16.13	0 0.00 0.00	8
TOTAL	31	17	48

FREQUENCY MISSING = 3

STATISTICS FOR TABLE OF FS_SYST BY RR3_4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.061	0.080

SAS

TABLE OF DEGREE BY RATIO1

DEGREE RATIO1

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1S	3 14.29 30.00	18 85.71 69.23	21
MS	7 46.67 70.00	8 53.33 30.77	15
TOTAL	10	26	36

FREQUENCY MISSING = 15

STATISTICS FOR TABLE OF DEGREE BY RATIO1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.573	0.032

SAS

TABLE OF GLAB_PC BY RATIO1

GLAB_PC RATIO1

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	2 100.00 20.00	0 0.00 0.00	2
2	8 23.53 80.00	26 76.47 100.00	34
TOTAL	10	26	36

FREQUENCY MISSING = 15

STATISTICS FOR TABLE OF GLAB_PC BY RATIO1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.506	0.019

SAS

TABLE OF TITLE BY RATIO2

TITLE RATIO2

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	23 92.00 79.31	2 8.00 28.57	25
2	6 54.55 20.69	5 45.45 71.43	11
TOTAL	29	7	36

FREQUENCY MISSING = 15

STATISTICS FOR TABLE OF TITLE BY RATIO2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.841	0.009

SAS

TABLE OF AHA BY RATIO2

AHA RATIO2

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
0	7 58.33 25.00	5 41.67 71.43	12
1	21 91.30 75.00	2 8.70 28.57	23
TOTAL	28	7	35

FREQUENCY MISSING = 16

STATISTICS FOR TABLE OF AHA BY RATIO2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.358	0.021

SAS

TABLE OF RD BY RATIO2

RD RATIO2

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	29 82.86 100.00	6 17.14 85.71	35
2	0 0.00 0.00	1 100.00 14.29	1
TOTAL	29	7	36

FREQUENCY MISSING = 15

STATISTICS FOR TABLE OF RD BY RATIO2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.261	0.039

SAS

TABLE OF SIZE BY RATIO3

SIZE RATIO3

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	14 70.00 73.68	6 30.00 40.00	20
2	5 35.71 26.32	9 64.29 60.00	14
TOTAL	19	15	34

FREQUENCY MISSING = 17

STATISTICS FOR TABLE OF SIZE BY RATIO3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.927	0.048

SAS

TABLE OF LOCATION BY RATIO4

LOCATION RATIO4

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
2	6 40.00 26.09	9 60.00 69.23	15
3	17 80.95 73.91	4 19.05 30.77	21
TOTAL	23	13	36

FREQUENCY MISSING = 15

STATISTICS FOR TABLE OF LOCATION BY RATIO4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.361	0.012

SAS

TABLE OF AHA BY RATIO6

AHA RATIO6

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
0	10 83.33 50.00	2 16.67 13.33	12
1	10 43.48 50.00	13 56.52 86.67	23
TOTAL	20	15	35

FREQUENCY MISSING = 16

STATISTICS FOR TABLE OF AHA BY RATIO6

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.115	0.024

SAS

TABLE OF GLAB_PC BY RATIO7

GLAB_PC RATIO7

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	2 100.00 16.67	0 0.00 0.00	2
2	10 29.41 83.33	24 70.59 100.00	34
TOTAL	12	24	36

FREQUENCY MISSING = 15

STATISTICS FOR TABLE OF GLAB_PC BY RATIO7

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.235	0.040

TABLE OF CONTROL BY RATIO9

CONTROL RATIO9

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	9 69.23 29.03	4 30.77 100.00	13
2	17 100.00 54.84	0 0.00 0.00	17
3	5 100.00 16.13	0 0.00 0.00	5
TOTAL	31	4	35

FREQUENCY MISSING = 16

STATISTICS FOR TABLE OF CONTROL BY RATIO9

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	7.643	0.022

SAS

TABLE OF TITLE BY RATIO11

TITLE RATIO11

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	22 88.00 78.57	3 12.00 37.50	25
2	6 54.55 21.43	5 45.45 62.50	11
TOTAL	28	8	36

FREQUENCY MISSING = 15

STATISTICS FOR TABLE OF TITLE BY RATIO11

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.846	0.028

SAS

TABLE OF SIZE BY RATIO11

SIZE RATIO11

FREQUENCY / ROW PCT / COL PCT	0	1	TOTAL
1	18 90.00 69.23	2 10.00 25.00	20
2	8 57.14 30.77	6 42.86 75.00	14
TOTAL	26	8	34

FREQUENCY MISSING = 17

STATISTICS FOR TABLE OF SIZE BY RATIO11

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.941	0.026

VITA[2]

Tiffany Ervin Steers

Candidate for the Degree of

Master of Science

Thesis: HOSPITAL FOODSERVICE PERFORMANCE MEASUREMENTS UTILIZED BY ADMINISTRATIVE DIETITIANS

Major Field: Food, Nutrition and Institution Administration

Biographical:

Personal Data: Born in Vicksburg, Mississippi, January 15, 1966, the daughter of Charles Tommie and Emily Ruth Ervin.

Education: Graduated from Tallulah Academy, Talllulah, Louisiana, in May 1984; received Bachelor of Science Degree in Dietetics from Northeast Louisiana University, Monroe, Louisiana, in December, 1987; completed requirements for the Master of Science degree at Oklahoma State University, Stillwater, Oklahoma, in May 1989.

Professional Experience: Graduate research assistant, Department of Food, Nutrition and Institution Administration, Oklahoma State University, January, 1988-May, 1989; Six-month advanced degree qualifying experience, E.A. Conway Memorial Hospital, Monroe, Louisiana, June, 1988-August, 1988 and Oklahoma State University, Stillwater, Oklahoma, September, 1988 May, 1989.