PRODUCTIVITY AND OTHER PERFORMANCE MEASURES IN SCHOOL FOODSERVICE

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Stillwater, Oklahoma

1983

Submitted to the Faculty of the
Graduate College of
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
May, 1988

PRODUCTIVITY AND OTHER PERFORMANCE

MEASURES IN SCHOOL FOODSERVICE

Thesis Approved:

Thesis Advisor

Dean of the Graduate College

ACKNOWLEDGEMENTS

I would like to express my appreciation to all the people who helped me during the course of my research and throughout my education. I especially am indebted to Dr. Lea L. Ebro, my major advisor, for her guidance and encouragement. Her assistance has been invaluable to me during the past three years.

Special thanks are due to the other committee members, Dr. Esther Winterfeldt and Dr. George B. Bokorney, for their criticism in the writing of this work and their thorough review of this thesis. I am also thankful to Dr. Ronald W. McNew for his assistance with the statistical analysis for this project.

In addition, I would like to thank my cousin, Helen, for her support and sound advice, my uncle, Bahram, for being there when I needed him, my friend, Sohail, for his assistance in organizing the chi-square tables, Tina for being a dedicated and a very dependable friend, Barbara and Don Smith for being loving and understanding friends, and last, but not least, thanks to Becky Eytcheson and Becky McDougal, for their great typing of this manuscript. Special thanks go to the Winterfeldt family for their financial support in the way of scholarship.

I would like to dedicate this thesis to my two special

families. My family in Iran, especially my mother, Mahin, and my father, Naser, for their financial and moral support, encouragement and great love and trust in me. My adopted parents, Ira and Katherine Hughey, deserve many thanks for their encouragement of me to use all my potential, for always being there when I needed them, and for their unconditional love.

TABLE OF CONTENTS

Chapter

Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Declining U.S. productivity is a dilemma that today's managers have to deal with. According to Judson (1979), the greatest cause of declining productivity in the United States is management ineffectiveness. Judson points out a study in which only three percent of the companies studied had gains above 10 percent. The interesting finding about this study was the fact that 25 percent of the companies did not even know what their productivity performance had been.

The Council of Economic Advisers in 1978 reported that the slowdown in productivity growth is one of the main economic problems of recent years (Anderson and Kimzey, 1978). According to Anderson and Kimzey (1978), the decline has been underway since the 1960's. Output per hour in the private economy during the first two post-World War II decades rose by an average of 3.2 percent annually, but during the 10 years between 1967 through 1977, the rate of increase dropped to 1.6 percent. American managers are finally acknowledging the fact that the decrease in productivity is partially their fault (Judson, 1979), and they are now more aware of the necessity of improving productivity (Brayton, 1983).

In order to improve productivity, a system is needed to measure it. Sumanth (1981) revealed that less than three percent of United States businesses have systems or tools for measuring total productivity.

People interpret productivity in different ways (Brineyer and Sink, 1979). The issues of productivity are complex for most systems, and in order to convey the whole picture, multiple measures are required.

According to Brimeyer and Sink (1979), productivity measurement and improvement is like problem solving. First, we have to identify the problem and then make suggestions for solving the problem. Brimeyer and Sink (1979) suggested that productivity measurement and improvement involves at least three steps:

1. What to measure;
2. How to measure; and
3. What to do to improve system productivity.

"The scope of most productivity improvement efforts is too narrow. Their focus is primarily and often exclusively on cost savings in one or another part of a company (usually in manufacturing), not even throughout the company as a whole. Most common is a concern for the effectiveness of direct labor in manufacturing; rare, by contrast, is a concern for how various functions interact and affect one another." (Judson, 1979, p. 95)

Sink (1983) listed seven measures of performance criteria by which an organization may be evaluated and controlled: effectiveness, efficiency, productivity,

profitability, quality, innovation, and quality of work life. Not all of these criteria are applicable or used by all organizations. Robertson (1982) and Shaw (1983) found that many dietitians and supervisors in hospitals tended to use surrogate measures of productivity, such as efficiency, effectiveness, QWL, or indexes of related functions such as absenteeism or turnover.

According to Freshwater and Bragg (1975), most food service operators do not understand what a standard productivity measure is and how it can be used. To diffuse the confusion that exists with measuring organizational performance and establish a standard tool for measuring performance, it is imperative to assess how dietitians currrently define and measure each of the seven criteria described by Sink (1983).

Objectives of the Study

The objectives of this research were:

1. To identify current organizational performance measures being used by dietitians in school foodservice systems.
2. To determine the relative importance placed on the criteria and the amount of time spent in evaluating them.
3. To aid in further establishment of organizational performance criteria standards for foodservice systems.
4. To formulate suggestions as to how these standards may be used by dietitians in school foodservice.

Purpose of the Research

"Spiraling costs, pressure for accountability and increased productivity, as well as the need to increase the level of professionalism have signaled the need for research endeavors in school foodservices" (Mayo, 1981).

The purpose in this research was to follow up and expand the foodservice productivity studies conducted by Oklahoma State University's Food, Nutrition and Institution Administration Department. Productivity ratios and indexes used by dietitians in school foodservice will be investigated along with the extent of their use. Methods of measuring the other six organizational performance criteria as listed by Sink (1983) will also be analyzed.

Hypothesis of the Study

The hypotheses postulated for this study were:

H1 - There will be no significant difference in the control outputs and control inputs used by dietitians in school foodservice based on selected personal variables:

a. Age
b. Years of education
c. Position title
d. Registration status
e. Route to ADA membership
f. Annual salary
g. Number of years experience
h. Training in productivity measurement

H2 - There will be no significant difference in control outputs and control inputs used by dietitians in school foodservice based on selected institutional variables:

a. Preparation of meals for sites other than regular foodservice

b. Contracting the foodservice to a foodservice management company

H3 - There will be no significant difference in the productivity ratios used by dietitians in school foodservice based on selected personal variables as stated in H1.

H4 - There will be no significant difference in the productivity ratios used by dietitians in school foodservice based on selected institutional variables as stated in H2.

H5 - There will be no significant diffference in effectiveness measures used to evaluate goal attainment by dietitians in school foodservice based on selected personal variables as stated in H1..

H6 - There will be no significant difference in the effectiveness measures used to evaluate goal attainment by dietitians in school foodservice based on selected institutional variables as stated in H2.

H7 - There will be no significant differences in the quality control measures sued by dietitians inschool foodservice based on personal variables as stated in H1.

H8 - There will be no significant difference in the

quality control measures used by dietitians in school food-service based on institutional variables as stated in H2.

H9 - There will be no significant difference in the type of resources controlled used to monitor efficiency by dietitians in school foodservice based on selected personal variables as stated in H1.

H10 - There will be no significant difference in the type of resources controlled used to monitor efficiency by dietitians in school foodservice based on selected institutional variables as stated in H2.

H11 - There will be no significant difference in the QWL measurements used by dietitians in school foodservice based on the personal variables as stated in H1.

H12 - There will be no significant difference in the QWL measurements used by dietitians in school foodservice based on the institutional variables as stated in H2.

H13 - There will be no significant difference in the rewards linked with performance measures used by dietitians in school foodservice based on personal variables as stated in H1.

H14 - There will be no significant difference in the rewards linked with performance measures used by dietitians in school foodservice based on institutional variables as stated in H2.

H15 -There will be no significiant difference in innovation techniques used by dietitians in school

foodservice based on personal variables as stated in H1.

H16 - There will be no significant difference in the innovation techniques used by dietitians in school foodservice based on institutional variables as stated in H2.

H17 - There will be no significant difference in the processes, methods, products, or technology used within the last three years by dietitians in school foodservice based on personal variables as stated in H1.

H18 - There will be no significant difference in the processes, methods, products or technology used within the last three years by dietitians in school foodservice based on institutional variables as stated in H2.

H19 - There will be no significant difference in profitability control measures used by dietitians in school foodservice based on personal variables as stated in H1.

H20 - There will be no significant difference in profitability control measures used by dietitians in school foodservice based on selected institutional variables as stated in H2.

H21 - There will be no significant difference in meal prices used by dietitians in school foodservice based on selected personal variables as stated in H1.

H22 - There will be no significant difference in meal prices used by dietitians in school foodservice based on selected institutional variables as stated in H2.

Assumptions and Limitations of the Study

The following assumptions were made for this study:

1. Dietitians surveyed have adequate knowledge of organizational performance measures, and will respond to the questions objectively.
2. Organizational performance will be among the responsibilities of the respondent in his/her current position.
3. Membership in the American Dietetic Association (ADA) and the practice group, Dietitians in School Foodservice, are not mutually exclusive.

The limitation of this study was that only members of the ADA practice group, Dietitians in School Foodservice, were surveyed. Results of the study can only be generalized to this group.

Definition of Terms

The following definitions were chosen for this study:

Effectiveness: The degree of achievement of objectives (Smalley and Freeman, 1966).

Efficiency: Resources expected to be consumed divided by resources actually consumed (Sink, 1983).

Innovation: Deliberate, novel, specific change aimed at accomplishing the goals of the system more effectively (Mueller, 1971).

Multifactor Productivity Ratio: A productivity ratio which includes some or all of the outputs and some of the

inputs (Swaim and Sink, 1983).

Partial Factors Productivity Ratio: A productivity ratio which includes some or all of the outputs and only one type of input (Swaim and Sink, 1983).

Performance: Measure of organizational performance are primarily composed of seven criteria: efficiency, effectiveness, quality, quality of work life, innovation, profitability, and productivity (Swaim and Sink, 1983).

Productivity: The ratio of quantities of outputs to quantities of inputs (APC, 1979).

Productivity Index: Successive productivity measurements, usually in the form of percentage difference between the measurements for two periods (Swaim and Sink, 1983).

Productivity Measurement: Consists of the selection of physical, temporal, and/or perceptual measures for both input variables and output variables and the development of a ratio of output measure(s) to input measure(s) (Sink, 1980).

Productivity Ratio: A static ratio referring to a particular period of time (Swaim and Sink, 1983).

Profitabilty: The earned return in investment (owner equity) or the return on all this a business owns (Rausch, 1982) or the relationship of revenue to cost.

Quality: The degree to which the system conforms to specifications (Sink, 1983), or at the consumer level, fitness for use (Cole, 1981).

Quality of Work Life: Work with meaning (Mali, 1978),

or the degree to which work provides an opportunity for an individual to meet a variety of personal needs, to survive with security, to interact with others, to feel useful, to be recognized for achievement, and to have an opportunity to improve one's skill and knowledge (Lippitt, 1978).

Surrogate Productivity Measure: Substitute performance measures which are highly correlated with productivity (Swaim and Sink, 1983).

Total Factor Productivity Ratio: A ratio which includes all output measures and all input measures (Sink, 1980).

CHAPTER II

REVIEW OF LITERATURE

Introduction

A review of the literature which is pertinent to the study will be included in this chapter. An understanding of the organizational performance criteria is essential for this study. Sink (1983) identified seven measures of performance criteria by which an organization may be evaluated and controlled: efficiency, effectiveness, quality, quality of work life, innovation, productivity, and profitability. These criteria will be individually discussed in depth in this chapter.

Efficiency

Effectiveness and efficiency are often used interchangeably, as though they mean the same thing. Literatures related to this topic are not clear either.

Freeman (1966) defines efficiency as the relationship between achievement of objectives and the consumption of resources. Katz and Khan (1980) state that efficiency refers to the use and input to obtain a maximum return, while Drucker (1974, p. 45) states that efficiency is "doing things right". The definition of efficiency accepted for this study

is resourses expected to be consumed/resources actually consumed (Sink, 1983).

Emerson (1912) stated that for an organization to be as efficient as possible, it must have ideals, common sense and judgment, competent counsel, discipline, a fair deal, reliability, immediate and accurate records, planning and dispatching, standards and schedules, standardized conditions, standard operations, written standard practice instructions, and efficiency rewards. Before a manager can determine whether or not an organization is performing efficiently, in the normative sense, he or she must quantify both the resources which are used to make outputs and the outputs themselves. Management must create and maintain an up-to-date, accurate, and reasonably comprehensive quantitative data base covering the inputs and major outputs of the organization. These reports could disclose data concerning seasonal fluctuations, and yield figures with which to compare to predetermined standards.

Effectiveness

Toto (1986, p.35) defines effectiveness as using all employees to the fullest to achieve a company's goal, while Drucker (1974, p. 45) calls it "doing the right things". Other definitions of effectiveness include: the maximization of return to the organization by all means-technological, political, market control, personnel policies, etc. (Katz and Kahn, 1971); the extent of an organization's awareness of its goals (Etzioni, 1960); and the state which organizations

strive to attain (Friedlander and Pickle, 1968). The definition accepted for this study was: the degree of achievement of objectives (Smalley and Freeman, 1966).

Effectiveness is a complex performance criteria to measure. Hall (1980, p. 538) states that "effectiveness is measured in the mind of the beholder". A variety of models for measuring effectiveness exist, but the models lack consistency (Steers, 1975). Theoretically, it is very difficult to test an organization for goodness of fit against the effectiveness construct. Steers (1975) outlined construct validity, criterion stability, time perspective, multiple criteria, precision of measurement, generalizability, theoretical relevance, and level of analysis as eight problem areas in measurement of effectiveness.

The mark of a good effectiveness measure is that it closely reflects the objective (Quad, 1982). According to Toto (1986), in measuring effectiveness, an organization must identify operational goals and objectives, then build some foundation in order to achieve the set objectives and, last, but not least, the organization needs to monitor these new foundations in order to measure and consolidate improvements.

Quality

During 1974 through 1982, the packaging industry in the United Kingdom reduced unit cost by approximately 30 percent. This sounds very impressive, until one finds out that during the same period, the real prices went down by 35 percent

(Luchs, 1986).

Luchs (1985) goes on to say that the described situation is not unique in the United Kingdom and has happened in industries across Europe and America. Declining markets and increasing foreign competition have resulted in a great price war and despite cost reductions, profitability has not been good for many businesses. All the above factors have resulted in a renewed interest in quality (Luchs, 1986; Hayes, 1985).

Although there seems to be an awakening about quality improvement, the perception of the U.S. managers is that quality improvement will cause an increase in cost. They also regard product quality and productivity as two different concepts (Shetty, 1986; Luchs, 1986).

Deming, a mentor to Japanese industry mentions that "American management thinks that the way to increase profits is to cut costs. How ridiculous . . . if you concentrate on building quality and eliminating mistakes, your costs will go down automatically" (Ross, 1986, p. 27).

In a recent survey done by Shetty (1986, p. 168), when the managers were asked why they did not pay much attention to quality, the following reasons were given:

1. Quality improvements increases costs and reduces productivity.
2. Data concerning the cost attributed to poor quality is not available.
3. Cutting costs produces more immediate results.
4. The opportunities to improve productivity through quality are limited.

Contrary to the aforementioned point of view, Shetty

(1986, p. 169) states that "improved quality increases sales by both increasing output and reducing defects." Luchs (1986) indicates that quality improvement can lead to: stronger customer loyalty, more repeat purchases, less vulnerability to prices, ability to command higher relative price wihtout affecting share, lower marketing costs, and share improvements.

According to James Harrington, IBM Quality Assurance Manager, repairs of defects and errors takes 25 percent of most manufacturing and administrative time (Shetty, 1986).

Scanlon and Hagan (1983, p. 22) state that "in terms of measured performance, quality can only mean conformance to a standard." In McCabe's (1985, p. 85) view, "product quality means meeting customer requirements". The definition of quality accepted for this study demonstrates that quality can be defined on two levels: the degree to which the system conforms to internal spcifications (Sink, 1983) or, at the consumer level, fitness for use (Cole, 1981).

A successful quality system requires that all employees be committed to the program (Labell, 1986). "Quality is everybody's job", Deming says (Ross, 1986).

In McLaughlin's (1985) view, "people make quality happen" and one reason that American product quality has not been able to keep up with the competitors from other countries is that the people factors have been ignored, or have not been handled well.

Two quality related characteristics that excellent companies in the United States share are: their commitment

to high quality products and involvement of the entire work force in attaining quality (Pascarella, 1983). To achieve quality, according to Feigerbaum (1985), a firm must apply new quality technology such as quality design techniques and computer-aided quality management, measurement and control, and not to be solely dependent on traditional quality control techniques. Pascarella (1983) states that quality requires a blending of scientific management techniques with human resources, of the tangible with the intangible.

One big difference in the service industry and the manufacturing industry is that the service industries generally produce a tangible product as their major commodity (Zimmerman, 1985). Other differences between the twin industries, according to King (1985) are that the service industry involves integration of a primary system with its support systems; services offered to the public are perishable; and immediacy is another characteristic of the service industry. Hotels and restaurants must perform in the presence of their guests and a substandard product may not be caught before it reaches the end user. Another characteristic of the service industry discussed by King is its being amorphouse. Guests' expectations are very hard to identify and are usually based on personal preferences. When looking at product quality, the customer should be the primary consideration of any industry (McCabe, 1985).

Despite the differences between service and manufacturing industries, the concept of quality control such as fitness for use, ability to replicate, timeliness, end

user satisfaction and adherence to preestablished specifications that are being used in the manufacturing process can also be applied to service industry.

Quality control as defined by Juran & Gryna (1980) is the process by which conformance to the standard is measured and any resulting difference is acted upon. According to McLaughlin (1985), there are six keys to improve quality:

1. In order to change any type of standard, one must understand what one wants to change.
2. Commitment of the management is necessary in planning, communication and participation. Realistic and measurable goals must be set forward and standards and specifications should be geared toward the customer's expectations and needs.
3. All involved parties must be knowledgeable about the problems, policy, principles and quality goals of the company.
4. Continuous communication about policies, problems, and the individuals' role is a very important part of an efficient quality improvement program.
5. After the discussion of all the previous steps, action should be taken in the form of problem solving and employees must specifically be assigned to solve problems.
6. Follow-up of all the plans is very important.

Management and employees would probably be more enthusiastic about the program if they were told about the benefits that can be expected from the productivity improvement program such as: improved image, improved productivity, reduced expenses, improved marketability, increased management of quality and quality cost, improved employee environment and improved profitability (Scanlon & Hagan, 1983). Once the goals have been set and accepted by the majority of the participants, standards must be developed. The stanards are for every department in an

organization and the first consideration in developing the standards is the customers' expectations. In order to find out what the customer wants, a firm can do (1) market research; (2) public opinion poll; (3) analysis of customer complaints and compliments; and/or (4) review their competitiors' activities. By doing these, the firm would be able to set standards that would meet the customers expectation (Scanlon & Hagan, 1983). Standards help a firm compare past activities with the present activities, identify areas that need improvements, and act as a base line to measure progress (Scanlon & Hagan, 1983).

Quality of Work Life

Quality of work life, according to Rosow (1982) is an end result of the "human relations" movement of the fifties and the sixties. The idea of quality of work life (QWL) is to create an environment where democracy flourishes and workers' participation is a rule, not an exception. Lane and Hartesvelt (1983) define QWL as giving the workers an opportunity to interact with management and be able to participate in decision making.

Kevin M. Sweeny, President of the American Center for the Quality of Work Life (Business & Social Review, 1982) sees QWL as a process, not a program, a technique or a solution. This process would enable employees to get involved in organizations, problem solving and finding new ways of doing things better. Walton (1974) points out that

QWL should encompass human needs and aspirations, such as: adequate and fair compensation, a safe and healthy environment, development of human capacities, growth and advancement, social integration, constitutionalism (worker's rights), the total life space (a balance between work and life), and social relevance.

Fuller (1980) stated that QWL is a process of utilizing all the organization's resources, especially human resources, in the best way possible; increasing the employee's awareness and understanding of each other's concerns; and improving the organization's procedures and activities in order to have an effective and successful company. In general, QWL means a more effective, challenging and involving workplace. The QWL definition accepted for this study is: work with meaning (Mali, 1978), or the degree to which work provides an opportunity for the employee to meet a variety of personal needs; to survive with security, to interact with others to feel useful, to be recognized for achievement and to have an opportunity to improve one's skill and knowledge (Lippit, 1978).

Case histories of successful QWL programs have shown that they can improve morale, increase productivity, improve product quality, decrease absenteeism, decrease work grievances, improve management and labor relations (Fuller, 1980; Rosco, 1982; Hoerr, 1982). General Motors cites that six years after implementing the QWL in its Tarrytown, Pennsylvania plant, worker complaints fell from 2000 to 300 (Business & Social Review, 1982).

Studies have shown that companies that encourage creativity and problem solving ideas among their employees tend to have a higher productivity rate (Terry and Dar-El, 1980). The idea of QWL is finally catching on, and many organizations, in order to improve the employee's work performance, are giving their workers more freedom in their jobs and allowing them to be a part of the decision making team (Herrick, 1981).

The most popular method to measure QWL is the survey. The Job Diagnostic Survey (JDS), the Job Characteristic Inventory (JCI), and the Brayfield-Rothe Job Satisfaction Index are the surveys which are widely used in industry (Woolf, 1970).

When conducting a survey, confidentiality must be clearly stated. Also, care must be taken to insure that the questionnaire items are easy for employees to understand; give the workers enough time to respond; are not overwhelming for the respondents or the organization; and clearly indicate what the organization wants to know (Marks, 1982). A good QWL measure would be based on the needs of the organizations and would be suitable for comparison over time (Macy & Mirvis, 1976).

Interviewing the employees is another way of gathering data about the workers' needs and attitude in the work place (Bowditch & Buono, 1982). The advantages of interviewing are that questions can be asked directly, and results can provide detailed information. Disadvantages include the amount of money it requires and the need for highly skilled

interviewers. Also, the information collected through interviewing the employees is not easily comparable with those obtained from a mailed questionnaire. There is a problem with self-report and interviewer bias, and it is time consuming (Hackman and Oldhan, 1980).

QWL measures can sometimes be very expensive to conduct, but the organization should ask whether the company can afford not to measure QWL. Studies have shown that a strong correlation exists between absenteeism and satisfaction as well as turn over and satisfaction (Lawler & Porter, 1967). The organization should therefore focus on improving the quality of working life of their employees to decrease absenteeism, improve the quality of products produced, decrease work grievances, and improve worker effectiveness and productivity.

Innovation

In today's world of technology, change is the only constant factor. Every day we are changing things to make them better, more efficient and more cost effective (Pedraja, 1986).

According to Kanter (1985, p. 52) "this is a time of historically unprecedented change for most corporations". To stay ahead of the competition, companies need a continuous flow of new ideas for new products, services, processes, producers, and strategies. The main ingredients for success are knowledge and skill, but creativity is what supplies the winning edge (Godfrey, 1986).

The marketplace is facing new changes. The most important change is a "trend toward a shorter product life cycle" (Goldhar, 1986, p. 26). Also, there are more competitors, more sophisticated customers and a shorter time to introduce new products.

These changes require the business to be more capable, sophisticated and innovative on the part of the production process. Innovation is one of the main factors that places the United States in the leadership position of the world commerce (Bellas & Olson, 1978). Innovation is defined by Quinn (1983) as the means to imagine and introduce exceptional solutions for new or old problems. Parry (1986) defined it as a process that not only includes new ways of making something, but also new marketing and distribution methods. Zaltman and Lin (1971) defined innovation as any idea, practice, or material artifact viewed as new by the appropriate organization. Morton (1971) interpreted innovation as the renewal or improvement of old abilities and the development of new abilities of people as well as the growth of the organization itself. The definition accepted for this study defines innovation as a deliberate novel, specific change, aimed at accomplishing the goals of the system more effectively, or in other words, applied creativity (Mueller, 1971). Godfrey (1986) points out that creativity and innovation do not happen in a "moment of inspiration", but it takes the problem solving process, hard work and persistence. He divides the process into five stages:

1. Perception: the process begins when someone realizes that something isn't right.
2. Preparation: the preparation stage makes us aware of the problem and points out the additional information which we will be needing. The information can be compiled through data gathering and research.
3. Ideation: the information from the previous stage is analyzed and arranged into various formats that may lead to new ideas.
4. Incubation: this is a stage where two things can happen, either frustration sets in and deliberate withdrawal from the problem takes over or a possible solution is realized.
5. Validation: time to test the new idea.

Large companies have been accused of not being as innovative as small businesses (Quinn, 1985). Top management isolation, intolerance of fanatics, short time horizons, excessive rationalism, excessive bureaucracy, and inappropriate incentives have been identified as the common constraints on innovation in large companies.

Innovation represents change, and although change and the need to manage it well have always been with us, people still do not feel comfortable with change. Many businesses regard innovation and productivity as a trade off, and their attitude is that "change costs money", hence, if change is minimized, the company will be more profitable (Goldhar, 1986).

Some managers and employees are threatened by change and would, therefore, resist change. This resistance could discourage creativity and innovation in the work place (Meehan, 1986). According to Meehan (1986), one way to stimulate and reward creativity without the threatening aspects of the creative process is to use suggestion

programs, where employees are encouraged to generate ideas. Since the suggestor's anonymity is kept secret until the suggestion award is made and employee risk-taking is reduced, perhaps the employees will be more willing to participate.

Innovation has been very important in the expansion of the foodservice industry (Bellas & Olson, 1978). The suggestion system is used in order to promote innovation in hospital kitchens. Improved ranges and refrigerators, microwave ovens, and conveyor systems are among the changes that have taken place in the last 10-15 years. Use of the computer has become a very important part of the foodservice industry (Technological Changes & Manpower Trends in Six Industries, 1974). The use of inventory controls, electronic ordering, and coordinated distribution systems are some of the creative measures that hospitals are using, in order to trim food expenses (Siegner, 1986) .

Bellas and Olson (1978) make a note that the average foodservice operators do not spend much of their sales dollar on research and development. Instead, they focus on short-term developmental efforts. As a result, the ideas and products are copied and the competitive edge is lost.

Drucker (1985) believes that in order for innovation to flourish, a systematic management discipline needs to be implemented. Drucker (1985) has identified seven sources of innovation: the unexpected; the incongruity; innovation based on process need; change in industry structure or market structure; demographics; changes in perception, mood and meaning; and new knowledge. Analysis and exploration of the

new sources and new opportunities are the first step in implementing a systematic innovation process.

In order for companies to be innovative, they need to foster a creative environment and encourage entrepreneurial spirit among their people (Peters & Waterman, 1982). Ahlbrandt & Blair's (1786) research indicated that the best way to encourage innovation is to have an adoptive corporate culture that encourages people to say yes to change and the company values and rewards creativity and risk taking.

Peters & Waterman (1982, p. 234) summarized the characteristics of a successful and innovative company as a place where:

> . . . hereos abound, the value system focuses on scrounging, it's okay to fail; there's an orientation toward richmanship and close contact with the customer; there's a well-understood process of taking small, manageable steps; intense, informal communications are the norm; the physical setting provides plenty of sites for experimentation; the organizational structure is not only accommodating but highly supportive of 3-M style innovation; and the absence of overplanning and paperwork is conspicuous, as is the presence of internal competition.

Providing a right environment has been emphasized in all the research involving innovation. Godfrey (1986) suggests that everyone has power of imagination and creative talent. These talents have been highly developed in some people, while in most people their creative qualities are waiting for an opportunity to emerge. A knowledge and understanding of the creative process along with a stimulating environment are necessary in order for those inert qualities to surface.

Productivity

The productivity growth in the private sector averaged

around three percent 20 years after World War II, but it dropped down to a rate less than two percent from 1970-1978. From 1978 through 1982, the growth rate was practically nil (Business Week, Feb. 1984).

The U.S. industrial productivity in 1973-1982 had an average annual increase of 0.1%. With the recovery in November, 1982, the average annual rate increased to 3.1% which is a much better figure compared to 0.1%. When these figures are compared to the productivity figures of other industrial countries, however, the picture still looks bleak (Figure 1).

Over the 1960-1982 period, Canada, Japan, France, Germany, Italy, United Kingdom, Denmark, Netherland, Norway and Sweden had a three percent higher average annual productivity rate than the United States and in 1982 it was almost one percent higher (Alvarez and Cooper, 1984).

A study of 236 top-level executives representing a cross section of 195 U.S. industrial companies, showed that productivity in the U.S. companies is not something to brag about. "Fifty-two percent of the companies studied reported annual gains of less than five percent, another 19 percent reported gains of five to 10 percent, only three percent had gains exceeding 10 percent; and 25 percent did not even know what their productivity performance had been" (Judson, 1982, p. 93). Judson (1982) also reports that about half of the companies did not adjust the figures for inflation and, hence, the reported figures did not show that 32 percent of

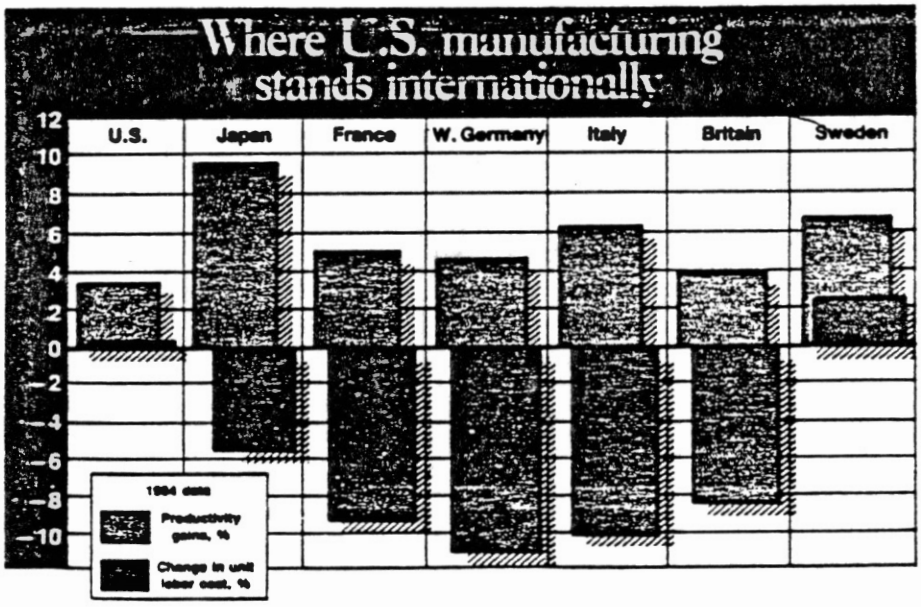

Figure 1. Where U.S. Manufacturers Stand Internationally. (Business Week, February, 1984)

the companies studied actually experienced a decline in productivity.

Productivity in Japan increased 9.5 percent during 1984 compared to 3.5 percent increase in the U.S. (Modern Material Handling, 1985 Manufacturing Guidebook). Looking at these figures, one cannot help but wonder why U.S. productivity is not comparable to other industrial nations and why the U.S. has not been able to improve its productivity with the same intensity as the rival countries (Canada, Japan, France, Germany, Italy, United Kingdom, Denmark, Netherland, Norway, and Sweden), especially since improving productivity is correlated to improving the standard of living, increase in Gross National Products (GNP), increase in real wages, profits, investments, and a low inflation rate (Business Week, 1984; Anderson & Kimzey, 1978).

Economists list five reasons for the decline in U.S. productivity: (1) changes in labor and capital, (2) an increased number of employees who do not have enough experience in the labor force, (3) a slower pace of technological progress, (4) people's attitude about work and leisure, and (5) the difficulty in developing techniques that can measure all these factors (Mayo, 1981).

Some authors name the management ineffectiveness (Judson, 1982) and poor communication skills (Riggs & Pas, 1985) as the major cause for the decline in productivity. Absenteeism, turnovers, accidents, slowdowns, equipment down time, reject rates, and poor quality of supplies or raw materials are also factors which are thought to inhibit

production (Riggs & Pas, 1985, Magill, 1973)

According to Boss & Shuster (1981) the productivity rate in foodservice is 45 percent which is one of the lowest in all businesses and industries. Freshwater and Bragg (1975) point out that one reason for the low productivity rate might be due to the fact that the majority of foodservice managers do not understand what a standard productivity measure is, nor how to use it.

In a recent survey conducted by the Institute of Industrial Engineers (Starr, 1986) 66 percent of the respondants cited management failure to understand how productivity can be improved as an obstacle to productivity improvement. Other factors mentioned include: management's failure to authorize sufficient manpower to direct productivity improvement (62%), inability of labor and management to work toward common productivity improvement (56.3%), insufficient training programs (52.1%), and management's failure to apply proper measurement programs in order to evaluate productivity improvement (56%).

Different people have different perceptions of what productivity is (Brimeyer & Sink, 1979). According to Sink (1980) productivity is real output per hour of work. Jamali (1983, p. 69) defines productivity as "doing the right thing and working right", "working smarter and harder", and "more bang for the buck".

Economists define productivity as "the ratio of physical input to physical output" which is an inverse ratio (English & Marchione, 1983, p. 57). English & Marchione (1983)

further said that this definition is not complete in the sense that output involves more than just quantity; it should also include quality.

Reaching the highest level of performance with the least expenditure of resources is Mali's (1978) definition for productivity. Outputs/inputs is the productivity definition that was chosen for this study (APC, 1979).

Freshwater & Bragg (1975) report that the most commonly used labor productivity measure in industry is labor cost ratio or "percent labor cost". Emma (1971) reported that labor cost was on the top of the budget of food service directors. Labor cost measurement and analysis and its relation to productivity is increasingly becoming a concern to food service managers because this may make it possible for the management to identify areas of high cost or low productivity where payroll savings could be made.

According to Brimeyer & Sink (1979), we have to find the "right mix" of technical and behavioral techniques and methods for application in areas of concern in order to measure and improve productivity. The problem with productivity measurement is that many choose to treat the symptoms rather than the cause. Also, the management's goal is geared toward a fast result and many of the programs have short time horizons (Judson, 1982).

Sink (1980) points out that an effective productivity measurement system should give management new information, indicate the direction of productivity improvement, and when the improvements are effective, a good productivity

measurement should substantiatee it. Productivity measurement and evaluation techniques currently in use can be divided into the following four categories:

(1) Multi Factor Productivity Measurement (MFPMM) which is an aggregated, indexed, and computerized approach to measuring productivity and it can be used to measure productivity changes in labor, materials, energy, and capital. Related models are Total Factor Productivity Model, Total Productivity Model, and Product Oriented Total Productivity Model.

(2) Normative Performance Productivity Measurement Methodology (NP/PMM) which is based on Nominal Group Technique and is a component of a productivity measurement system. In order for NP/PMM to be successful it needs the support of all levels of management and labor. Because NP/PMM uses group processes to identify appropriate productivity measures for work groups, the most important part of the NP/PMM is to provide feedback go the workers in hopes of identifying productivity improvement opportunities.

(3) Multi-Criteria Performance/Productivity Measurement Technique (MCP/PMT), also called the Objective Matrix, is a simple and widely applicable way of measuring productivity or performance. MCP/PMT is a participate and highly structured approach for identifying consensus productivity/performance measures for a given organizational system.

(4) Surrogate approaches which include cost/benefit analysis, budget control, MPBO, CMBO, work measurement, checklists, audits, etc., are quite diverse in character, and do not directly measure productivity (Sink, S.; Tuttle, C.; DeVries, S. J., 1984, pp. 265-287).

In the foodservice industry, meals/labor hour is used to measure productivity (Mayo, 1981). Other productivity measures include: man-hours or man-minutes (Freshwater & Bragg, 1975), meals served/employee, sales/manhours, sales/food cost, and surrogate indicators such as absenteeism and turn over (Drucker, 1974).

In order for a productivity improvement system to be effective, strategies or approaches will need to be systematic and explicit (Brimeyer & Sink, 1974). Management needs to be committed (Judson, 1982), senstive to problems and willing to make changes through the information which will be provided to them by the productivity measurement (Brimeyer & Sink, 1979). Top management support is necessary in order for any change to be successful (Modern Material Handling, 1985).

Profitability

Rausch (1982) defined profitability as the earned return on the owner's investment (equity) or the return on all things owned by the business (assets). Anthony and Herzliger (1980) defined profitability as the difference between an organization's revenue and expenses. Dukas (1976) viewed profitability as dollar value that remains after expenses are deducted from the sales volume. According to Villano (1977), profitability is the percentage of return on sales, owner's equity, or assets. The definition accepted for this study is the earned return on the investment (owner equity), the return on all things a business owns (Rausch, 1982), or the relationship of revenue to cost.

Due to the fact that profitability is a monetary measure, it is one of the easiest criteria to quantify out of the seven criteria which are addressed in this study. But some authors warn against any measuring of the dollar amount in profit evaluation. According to Rausch (1982) and Dudick

(1972), ratio analysis provides an aid to management in diagnosing any problem areas within the organization.

Return on investment and break even analysis are two methods employed by businesses in order to calculate profitability. Return on investment, which, according to Rausch (1982) is the best available tool for deciding between several proposed capital investments, relates earnings produced by a particular capital investment to the money needed to acquire it. Break even analysis can be used to test a flexible budget, determine the volume of sales necessary to obtain desired profit, compare profitability of various products or determine what profitability would result from a range of sales volumes.

Financial aspects such as the income statement, balance sheet, and profit and loss statement of an organization can also play an important role in evaluating profitability. The income statement reveals the accumulated results of operations from one account period to the next. The net profit earned for each period is one part of this statement and can be used to calculate many profitability ratios. The balance sheet, on the other hand, represents the assets, liabilities, and owner's equity of an organization at a particular point in time.

Profitability is sometimes used as a measure of effectiveness. Anthony and Herzlinger (1980) warn against this practice and state that profitability should not be the main criteria for evaluating effectiveness. Because profitability is short-term and monetary measures do not

measure all aspects of output and input, and the standards against which profits are judged are not always accurate, profit can be an indicator of business performance only when it is compared with expected profits, a standard or past performance (Axler, 1979).

According to Rausch (1982 there are two ways of measuring the potential profit of an organization: the past organizational performance or the expected future activities. Anthony and Herzlinger (1980) suggest that it is best to compare profitability with a standard or expected figure rather than previous years. Because to say that profit has increased from one year to the next gives no indication as to what profit could or should have been.

Profit is closely related to productivity. Both are the relationship of inputs and outputs. Profitability is revenue (output) minus expenses (input), while productivity is outputs divided by inputs. Increased productivity is the main solution to the pressure for working capital (Rausch, 1982). When capital becomes scarce, sales volume must increase or expenses must decrease. Careful control of inventory and efficiency in operations are essential for profitability (Dudick, 1972).

CHAPTER III

METHOD

The scope of most productivity improvement efforts is too narrow. In most situations, the manager's primary and often exclusive focus is on cost savings in one or another part of a company (Judson, 1979). Robertson's (1982) findings indicated that food service managers in health care delivery systems are defining and measuring productivity in terms of related performance criteria such as quality, efficiency and effectiveness rather than as the relationship of outputs to inputs. Shaw (1983) went a step further and did a survey on managers in health care delivery systems to determine how six other organizational performance criteria were measured when productivity was defined as output/input.

The purpose in this study was to investigate how dietitians in School Foodservice measure performance when productivity is specifically defined. Results of this study could hopefully contribute toward the development of productivity standards for the foodservice industry.

Research Design

Descriptive research was the research design in this study. Descriptive research is based on certain conditions

which are studied and analyzed in order to answer questions (Best, 1981) or establish existence of a difference (Huck, Cormier, Bounds, 1974). Fox (1969) further characterized descriptive research as describing a specific set of phenomena at a given point in time. Since this study was designed to identify specific performance criteria measures currently being used by management dietitians in school foodservices, descriptive research was an appropriate method to use in this study.

Population and Sample

The research sample, which was also the total population, was comprised of all members of the American Dietetic Association practice group, Dietitians in School Foodservices in 1984 (N=593). Labels were obtained from The American Dietetics Association headquarters in Chicago, Illinois.

Data Collection

The Instrument

The research instrument was developed by modifying two existing questionnaires used by researchers at Oklahoma State University. Shaw's (1983) study of productivity and six other interrelated organizational performance criteria in health care delivery systems was used along with part of the questionnaire used by Pickerel (1984) and Lamb (1984) in their study of performance measures used by members of

the Missouri Restaurant Association. A twin study to the present investigation was conducted by Putz (1985) who surveyed ADA dietitians in colleges and universities. Putz and this researcher worked jointly in developing the major portion of the instrument, however, the surveys were signed by the major investigator of the OSU project, Dr. Lea Ebro and the graduate assistant assigned to the study (Appendix A, B). Variations were made to correspond to the uniqueness of the tasks and work environment of the different subjects used.

The instrument for this research contained two main sections: demographics data, entitled "General Information", and performance criteria. The performance criteria section of the survey was divided into seven subsections, each dealing with a specific criterion. The instrument also provided an opportunity for the respondents to rank the seven criteria in terms of importance and time spent on each criterion (Appendix A, B).

The instrument consisted of three types of questions. In the "Productivity" section, a Likert-type scale was used where respondents could circle from 1 (Always) to 5 (Never), according to how often they used the control measures listed. For statistical purposes, answers were collapsed into two groups: often (frequent) and rarely. The majority of the questions in the instrument required the respondent to check "yes" or "no" or to place a check in the blank beside an evaluation or control measure used. The ranking question required the respondent to use a scale

of 1-7, where "one" was the number to be given to the criteria on which he or she spent the most or believed was most important and where "seven" was the number to be given to the criteria on which they spent the least time or believed were least important.

The instrument used was reviewed for content validity, clarity, and format by the committee made up of graduate faculty members of the Departments of Food, Nutrition and Institution Administration; Industrial Engineering; Statistics, and the School of Hotel and Restaurant Administration. Suggestions were then incorporated into the questionnaire (Appendix B).

The instrument was printed on four sheets of green paper, front and back, and mailed along with a cover letter explaining the project, and instructing the respondents on how to complete and return the survey. Mailing information and codes, along with return postage were printed on a separate sheet and placed at the back of the instrument. This format enabled the instrument to be mailed by first class mail to the 593 dietitians in School Foodservice without being placed in an envelope and returned by simply refolding and stapling, the questionnaire, which were already postmarked for mailing. The questionnaire was distributed by first class mail. A week after the deadline date on the return of the questionnaire, a reminder card was sent to the non-respondents to enhance percentage of return (Appendix A).

Data Analysis

Data obtained from the survey was coded and entered onto the computer using five data sets per respondent. Data was analyzed using the Statistical Analysis System (SAS) (Barr, 1976). Frequency distribution, Chi squares determination and arithmetic mean (for the ranking questions) were derived to answer the research hypotheses.

CHAPTER IV

Results and Discussion

Data for the study was obtained via the instrument described in Chapter III, "Research Design". The questionnaire was mailed to 593 dietitians in School Foodservices. The response rate was 23.3 percent (N=138) and 22.9 percent (N=136) were usable for analysis. Two questionnaires were not usable due to missing data, or employment outside the school foodservice setting.

Characteristics of Respondents

Age and Years of Education

About one-third (N=44; 32%) of the respondents were between 50 to 59 years of age and 30% (N-41) were between 30 and 39 years. In contrast, 39 percent (N=27) of the respondents in Putz's study were 30 to 39 years of age. Only five percent (N=7) of the dietitians in this study were between 20 to 29 years of age (Table I).

The number of respondents with B.S. degrees (N=66, 49%) was about the same as the number of respondents with M.S. degrees (N=65, 48%). Only three respondents had earned a Ph.D. (Table I). Putz's study showed a similar trend. Fifty-one percent (N=35) of her respondents had

TABLE I

FREQUENCY DISTRIBUTION OF
DEMOGRAPHIC VARIABLES OF RESPONDENTS

Variables	N	(%)*
Age		
20-29	7	(5)
30-39	41	(30)
40-49	31	(23)
50-59	44	(32)
60-69	13	(10)
Education		
B.S.	66	(49)
M.S.	65	(48)
Ph.D.	3	(2)
No response	2	(1)
Route to ADA Membership		
Internship	66	(49)
Cup Program	6	(4)
Traineeship	11	(8)
Three year's pre-planned work experience	13	(10)
M.S. plus 6 months work experience	35	(26)
Ph.D. plus 6 months work experience	0	(0)
No response	5	(3)
Position Title		
Director	87	(64)
Assistant Director	9	(7)
Nutritionist	3	(2)
Administrative Dietitian	6	(4)
Dietary Consultant	1	(1)
Other	29	(21)
No response	1	(1)
Years of Experience in Foodservice Management		
1- 5 years	14	(10)
6-10 years	41	(30)
12-15 years	26	(19)
16 or more years	55	(40)

TABLE I (Continued)

Variables	N	(%)*
Annual Salary		
Below $15,000	4	(3)
$15,000 - $19,000	17	(13)
$20,000 - $24,000	22	(16)
$25,000 - $29,000	31	(23)
$30,000 - $34,000	21	(15)
$35,000 - $39,000	24	(18)
$40,000 - $44,000	13	(10)
$45,000 and above	4	(3)

*Totals may be more or less than 100, due to rounding error.

obtained their B.S. and 49 percent (N=34) had obtained their M.S. Only one of the dietitians in Putz's (1985) study had a Ph.D.

ADA Registration Status and Route to ADA Membership

The majority of dietitians in School Foodservice (SFS) were registered (N=112, 84%). This is similar to Putz's (1985) study, where 85 percent of the dietitians in College and University Foodservice (C&UFS) were registered. This is to be expected, since these groups of dietitians have elected to join their respective practice groups.

Almost half of the respondents completed the internship, while about one-fourth completed the M.S. and six months work experience as a route to ADA membership (Table I). Similarly, dietitians in colleges and universities also became ADA members mostly via those two routes (Putz, 1985).

Position Title and Years of Experience in Foodservice Management

Almost two-thirds (N=87; 64%) of the dietitians in School Foodservice in this study had the title of Director; while about one-fifth (N=29, 21%) gave a variety of titles, such as District Manager, Manager or Foodservice Supervisor, School Lunch District Supervisor, Area Specialist, Dietitian, Training Officer and others (Table 1). In College and University Foodservice, however, the statistics

are different in that only 23 percent of the respondents in Putz's study were titled Director. Thirty-six percent of dietitians in her study identified "other" as title. In College and University Foodservice, 22 percent of the respondents were administrative dietitians compared to only four percent (N=6) in this study (Table I).

Salary and Productivity Training

Thirty percent (N=41) of the respondents earned $35,000 or more annually, which is higher than what was reported by Putz (1985) where 58 percent of the dietitians in College and University earn between $20,000 to $29,000 annually. Thirty-nine percent (N=53) of the dietitians in this study earn between $20,000 and $29,000 per year (Table I).

A little over one-half (N=69, 51%) of the respondents indicated that they have not received training in productivity measurement. The remaining dietitians have had some training. In Putz's study (1985), almost 60 percent did not have productivity training. School foodservice and college and university foodservices are generally nonprofit operations,hence, productivity training may not be priorities for staff development and training.

Characteristics of the Institutions

Type of Foodservice System and Contracted Foodservice

The majority of the respondents (N=131, 96%) indicated

that they used a conventional foodservice system where menu items are prepared from basic ingredients on the day they will be served and held in a hot or cold state until served. In combination with the conventional system, 17 (13%) used assembly/serve, 11 (8%) used cook/chill, and seven (5%) used cook/freeze. In Putz's study, all of the respondents (N=69, 100%) used a conventional system. In addition to conventional, very few people used assembly, cook/chill and cook/freeze (N=2, 3%; N=3, 4%; N=1, 1%; respectively).

The majority of the foodservices in this survey (N=130, 96%) were managed by the schools, while only four percent (N=6) were contracted to a food management company. In contrast, 12 percent of the respondents in Putz's study (1985) were employed by a contracted foodservice management company. It appears that a majority of school foodservices are still managing their own operations.

Offsite Meal Distribution

Two-thirds of the respondents indicated that they do prepare food for satellite schools. Only four percent of dietitians in College and University, however, reported preparing meals for satellite schools (Putz, 1985). Twenty-one percent (N=28) of the respondents also prepare meals for one or more of the following: Headstart, Senior Citizens Center, School Nutrition Action Program (SNAP), School Lunch, Administration Office, Children's Orphanage, Day Care, Summer Recreational Programs, Day Care

Supplemental Fundings, Summer feedings and others (Figure 2).

Number of Meals Served Daily

Almost all of the respondents checked the type of meals they served such as breakfast, lunch, dinner or other, but did not indicate number of meals served.

Performance Criteria

Productivity

Productivity, in the survey instrument, was defined as the ratio of quantities of outputs to quantities of inputs (APC, 1979). Respondents were asked to state how often they used certain input and output control measures in their foodservice. Answer selections were given using a five-point Likert-type scale ranging from "Never" to "Always" (Appendix B). For statistical purposes, the categories always and usually were combined, and sometimes, rarely or never were also combined.

Inputs. "Use of detailed specifications when purchasing equipment and supplies", was the first input listed. Almost all of the participants (N=127, 95%) often made use of this measure. An association ($p=.0001$, $X^2=12.450$, $df=1$) existed between this control and whether the foodservice was contracted or not (Table II). The foodservices that were not contracted out made more use of this control measure (N=126, 97%) than contracted

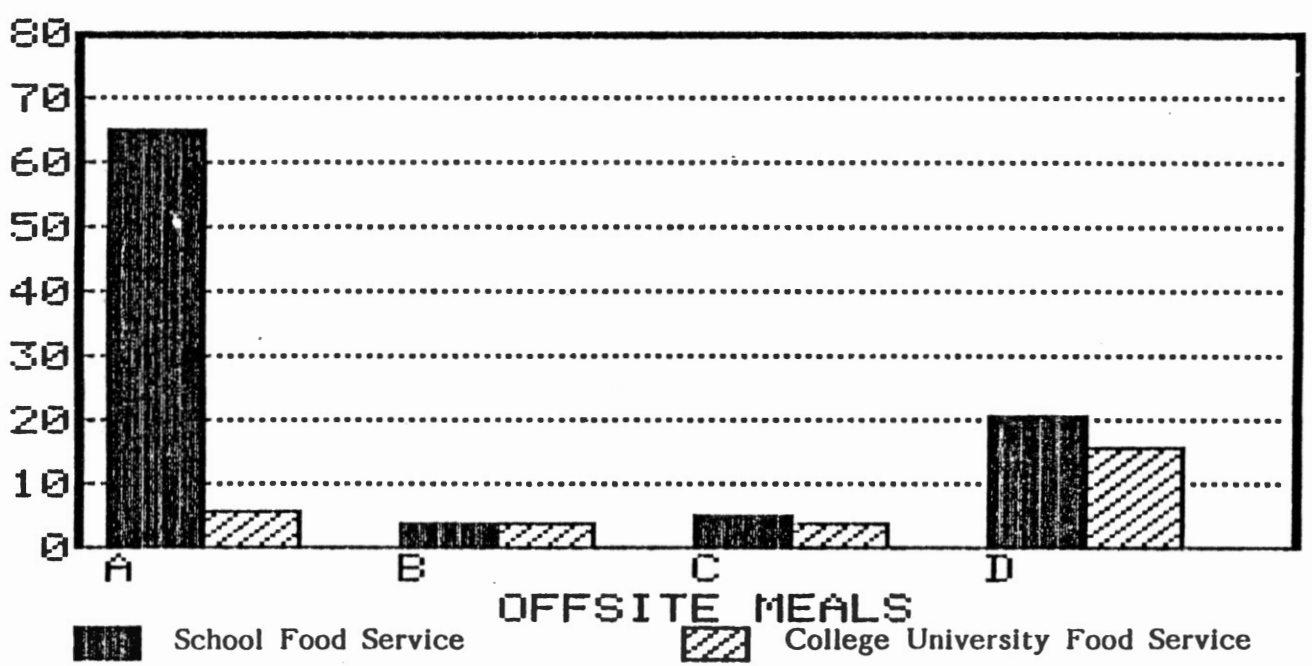

Figure 2. Distribution of Offsite Meals.

TABLE II

SIGNIFICANT ASSOCIATIONS FOUND IN PRODUCTIVITY CONTROLS

Productivity Controls	Factors Showing Association	Respondents Control N	Using Measures %
Inputs			
Detailed specifications in purchasing supplies and equipment	Contracted foodservices* ($p=0.0001$, $X^2=12.450$, $df=1$)	127	95
Labor usage is checked and adjusted quarterly	Annual Salary ($p=0.011$, $X^2=11.205$, $df=3$)	97	73
Evaluate kitchen energy costs at least quarterly	Prepare other meals ($p=0.027$, $X^2=4.865$, $df=1$)	25	19
Monitor energy usage of specific pieces of equipment	Annual Salary ($p=0.008$, $X^2=11,850$, $df=3$)	10	8
	Training in productivity measurement ($p=0.018$, $X^2=5.618$, $df=1$)	10	8
Monitor breakage and pilferage of supplies	Training in productivity measurement ($p=0.004$, $X^2=8.517$, $df=1$)	119	90
Periodically review and revise job descriptions in order to prevent duplication of tasks	Training in productivity* measurement ($p=0.007$, $X^2=7.382$, $df=1$)	103	95
Routinely follow food costs	Age ($p=0.040$, $X^2=4.219$, $df=1$)	103	95
	Prepare meals for Satellite Schools ($p=0.003$, $X^2=8.539$, $df=1$)	103	95
Outputs			
Production records kept cafeteria and/or catering	Contracted foodservice ($p=0.014$, $X^2=6.085$, $df=1$)	132	98
Follow amounts prepared versus amount served	Prepare Meals on Wheels ($p=0.001$, $X^2=10.214$, $df=1$)	125	95
Profit and loss statement	Age ($p=0.001$, $X^2=11.052$, $df=1$)	109	81

TABLE II (Continued)

Productivity Controls	Factors Showing Association	Respondents Control N	Using Measures %
Daily operation control sheets	Training in productivity measurement ($p=0.006$, $X^2=7.649$, $df=1$)	111	84
Ratios			
Develop ratios and/or indexes to assess productivity	Annual Salary ($p=0.001$, $X^2=21.668$, $df=3$)	118	87
	Prepare meals for Satellite Schools ($p=0.044$, $X^2=4.044$, $df=1$)	118	87
Use of ratio: Meals/labor hours worked	Annual Salary ($p=0.024$, $X^2=9.463$, $df=3$)	93	69
	Training in productivity* measurement ($p=0.0150$, $X^2=5.932$, $df=1$)	93	69
Use of ratio: Sales/labor hours worked	Contracted foodservice* ($p=0.003$, $X^2=9.075$, $df=1$)	26	19
Use of ratio: Meals/labor hours paid	Prepare other meals ($p=0.011$, $X^2=6.437$, $df=1$)	41	30
Use of ratio: Sales/labor hours paid	Degree ($p=0.018$, $X^2=5.636$, $df=1$)	15	11
	Contracted foodservice* ($p=0.002$, $X^2=9.615$, $df=1$)	15	11
Use of ratio: Customers/labor hours	Contracted foodservice ($p=0.007$, $X^2=7.305$, $df=1$)	18	13

*Similar associations were found in Putz's study (1985).

foodservice (N=4, 67%). This is different from the results of Putz's (1985) study where all of the contracted foodservices used this control measure frequently along with 95 percent of those not contracted.

Input control 2. "Check labor usage at least quarterly", was used often by 73 percent (N=97) of the respondents. A significant association ($p=0.011$, $X^2 = 11.2005$, $df=3$) was observed between this input measure and salary of the participants. The survey participants in the highest salary bracket ($40,000 and up) (N=17, 100%) used this measure often. Only 52 percent (N=11) of the respondents in the lower bracket (below $15,000 to $19,000) made use of this measure. The majority of the respondents are often using "comparison shop" for food and supplies (N=120, 92%). Seventy-nine percent (N=104) "take advantage of seasonal buys", while 92 percent (N=122) of the respondents make use of standardized recipes. Input control number six, "evaluate kitchen energy costs at least quarterly" was not commonly practiced. Only 19 percent (N=25) made frequent use of this control measure, however, there was a significant association ($p=.027$, $X^2 = 4.865$, $df=1$) between input control #6 and the institutions that prepared meals for places other than satellite schools, Meals on Wheels and Congregate Meals. The respondents who checked the other categories (Headstart, Day Care, Senior Citizens, etc.) (N=28, 2%) seemed to evaluate kitchen energy cost more often than the ones who did not check the other category (N=11, 39% vs. N=21, 19%, respectively).

Perhaps institutions with these programs have to account for energy usage in their government reports more so than others.

The next input listed on the survey instrument was "monitor energy usage of specific pieces of equipment". Two significant associations were found relative to salary and training in productivity measurement. The first association ($p=.008$, $X^2 = 11.850$, $df=3$) revealed that the respondents earning $19,000 or less rarely monitored energy usage. Three-fourths (N=42) of the respondents earning $20,000 to $29,000, ninety-three percent (N=42) of those earning $30,000 to $39,000 and eighty-three percent (N=14) of those earning $40,000 and above, rarely made use of this measure. The next association ($p=.018$, $X^2 = 5.618$, $df=1$) showed that 93 percent (N=64) of the survey participants with no productivity training did not often monitor energy use. In Putz's (1985) study, no significant association was found, but the results showed that the majority of the respondents in her study did not use this input control either. Sixty-six percent rarely or never made use of this particular control measure, and 22 percent used this measure sometimes.

"Routinely conduct physical inventory of storeroom" was the eighth input control measure listed. Ninety-seven percent (N=129) of the respondents indicated that they often used this control. Similarly, Putz (1985) reported that 98 percent of dietitians in College and University used this measure.

The ninth input listed was "monitor breakage and pilferage of supplies". Ninety percent (N=119) of the survey repondents made use of this measure often. Similar results were observed in Putz's (1985) study. Three-fourths of her subjects implemented this control measure in their foodservice. Significant association ($p=.004$, $X^2 = 8.517$, $df=1$) was observed between the respondents who have received training in productivity measurement and use of this control measure. Ninety-eight percent (N=64) of the respondents who have received training, did monitor breakage and pilferage of supplies. Frequently, eighty-four percent (N=58) of the respondents who did not receive training made use of this control measure.

The 10th input listed on the questionnaire was "periodically review and revise job descriptions of tasks". Seventy-seven percent (N=103) of all respondents used this measure often. Ninety-six percent of Putz's (1985) respondents did review and revise job description frequently. Training in productivity measurement was associated ($p=.007$, $X^2 = 7.382$, $df=1$) with the review and revision of job description. Eighty-eight percent (N=57) of the respondents with training employed this input method; whereas, 68 percent (N=47) of the people with no training in productivity measurement used this input method. Similar associations were observed in Putz's (1985) study.

"Routinely follow food costs" was the last input

control measure listed. Ninety-five percent (N=126) of all respondents made frequent use of this measure. Age was associated ($p=.040$, $X^2=4.219$, $df=1$) with routinely following the food cost. The 40 years old and older group routinely followed food costs (97 percent, N=86); whereas, the 30 and younger group (90 percent, N=43) did not use this measure as often. A significant association ($p=.003$, $X^2=8.539$, $df=1$) was observed between serving to satellite schools and routinely following food costs. Almost all of the respondents who were serving meals to satellite schools (99 percent, N=88) made use of this measure. Only one person rarely followed the food cost.

Fourteen percent of the respondents checked that they used other control inputs besides the ones we listed in the questionnaire. Some listed weekly production, menu for cost, labor cost, cost all meals, check inventory, monitor absenteeism, monthly food/labor cost, performance evaluation of all employees once a year.

Outputs. "Keep production records for cafeteria and/or catering" was the first output control (#13 on the questionnaire). All but three respondents (N=132, 98%) indicated that they often used this control measure. An association ($p=.014$, $X^2=6.085$, $df=1$) existed between this control and whether the foodservice was contracted or not ($p=.014$, $X^2=6.085$, $df=1$) (Table II). Contrary to the researcher's expectations, the foodservices that were not contracted (N=128, 98%) used this control measure more often than the foodservices that were contracted out (N=5,

83%). Putz's (1985) study revealed associations between this output, and the participant's experience and the registration status of the respondents.

The second output control "check production records at least quarterly" was frequently used by 90 percent (N=120) of the respondents. Ninety-three percent (N=125) did "check daily census reports" and 97 percent (N=131) often "had a system for utilizing leftover bulk foods". Ninety-eight percent (N=131) of foodservices who responded to this survey "used daily meals served" as a control output.

The sixth output control "follow amounts prepared versus amounts served" was favored by 95 percent (N=125) of the respondents. An association ($p=.001$, $X^2 = 10.214$, $df=1$) showed that 96 percent (N=125) of foodservices not preparing food for meals on wheels frequently use this measure. In Putz's (1985) study, no association was found, although 96 percent of her respondents did indicate that they used this measure frequently. "Dollar sales daily" control outputs was utilized by 84 percent (N=111) of the respondents.

"Profit and loss statement", the eighth output control measure, was used by 81 percent (N=109) of the dietitians. The age of the participants showed an association ($p=.001$, $X^2 = 11.052$, $df=1$) with this measure. Ninety percent (N=79) of the participants, 40 and older, used this measure often; whereas, only 66 percent (N=32) of 39 and younger participants made frequent use of this measure.

The ninth control output "computerized cash register"

was being used often by less than one-half of the respondents (N=54, 43%). Forty percent (N=50) had never utilized computer cash registers in their foodservices. This is comparable with Putz's (1985) study where only 39 percent of dietitians in college and universities used this control measure in their foodservice.

"Daily operation control sheets" was used as a control measure by 84 percent (N=111) of the respondents while 16 percent (N=21) rarely made use of this control measure. Training in productivity and this control measure showed an association ($p=.006$, $X^2 = 7.649$, $df=1$). Dietitians who had training in productivity used daily operation control sheets (N=61, 94%) while six percent (N=4) rarely used it. In comparison, only 77 percent (N=53) of the dietitians with no training made use of the mentioned control measure and 23 percent (N=16) rarely used it. Two-thirds of the dietitians in colleges and universities used this measure frequently (Putz, 1985).

The 11th output control "sales last year versus sales this year" was used by about four-fifths of the respondents (N=104, 74%). Twenty-one percent (N=28) rarely used this measure. "Custom count daily" was used by almost all but seven (N=128, 95%) of the respondents. Eight percent (N=11) of the respondents indicated that they used other control outputs besides the ones we had included in the questionnaire. These included monthly reimbursement, reports, customer count monthly, immediate use of leftovers, etc.

Ratios and Indexes Used to Assess Productivity.

Question #26 (Appendix B), under the "Productivity" section asked the dietitians in School Foodservices if they developed ratios and/or indexes to use in their productivity assessment, and if so, to please indicate which ones. Eighty-seven percent (N=118) of the respondents indicated that they used ratio and/or indexes in their place of employment. Two significant associations were found relative to salary ($p=.0001$, $X^2 = 21,668$, $df=3$) and satellite schools (Table II). There was a positive correlation between increase in the dietitian's salary and the increase in use of the ratio and/or indexes. Fifty-seven percent (N=12) of the respondents earning below $15,000 and $19,000, seventy-seven percent (N=46) of those earning $20,000 and $29,000, 96 percent (N=43) of the respondent's with earnings of $30,000 and $39,000 and 100 percent (N=17) of the dietitians with the annual salary of $40,000 and up used ratio and/or indexes. The second association indicated that the school foodservices which prepared food for satellite schools used ratio indexes more (N=81, 91%) than those not preparing meals for satellite schools (N=37, 79%).

The survey instrument listed six productivity ratios plus the "other" option, where the respondents could write some ratios which were not listed. Sixty-nine percent (N=93) of the respondents indicated that they used the "Meals/labor hours worked" ratio. This ratio showed a significant association with two other variables. The

first association was relative to salary (p=.024, X^2 =.463, df=3). As in the question #26, in the survey instrument (Appendix B), a positive correlation existed between this ratio and the annual salary of the participants. As the salary increased, so did the use of the "meals/labor hours worked" ratio. Forty-two percent (N=4) of the respondents earning below $15,000 and $19,000 used this ratio. So did 68 percent (N=36) of the ones with an annual salary of $20,000 to $29,000, seventy-eight percent of dietitians in the $30,000 to $39,000 salary bracket and eighty-one percent of those earning $40,000 and up. This ratio, "Meals/labor hours worked" was the most popular productivity ratio.

The second association (p=.015, X^2 =5.932, df=1) indicated that 78 percent (N=51) of the dietitians with productivity training used the mentioned ratio in contrast to 59 percent (N=40) of the dietitians with no training in productivity measurement. Similar associations were found by Putz, (1985).

"Sales/labor hours worked" were used by 19 percent (N=26) of the dietitians. An association (p=.003, X^2 =9.075, df=1) showed that 66 percent (N=4) of contracted foodservices used this ratio in contrast to 17 percent (N=22) of non-contracted operations. Putz (1985) reported a similar result in her study where five out of eight (62%) contracted foodservices used sales/labor hours worked ratio and only six out of 58 (10%) non-contracted operation used the mentioned ratio.

"Meals/labor hours paid" was favored by 30 percent (N=41) of the respondents. All of the foodservices that prepared meals for sites other than those listed (N=14, 100%) utilized this ratio whereas only one-fourth of those foodservices that did not prepare meals for other sites did likewise (p=0.011, X^2 =6.437, df=1).

One out of nine dietitians in School Foodservice (N=15, 11%) made use of the "sales/labor hours paid". Significant associations were observed between this ratio and two variables, degree of the participant and contracted foodservice. The participants with a M.S. or Ph.D. degrees tended to use this ratio more often (N=12, 17%) than the ones with B.S. degrees (N=3, 4.5%) (p=.018, X^2 =5.636, df=1). Also, one-half of the respondents (N=3, 50%) who were working for contracted foodservice used this ratio, whereas only nine percent of the non-contracted dietitians made use of this ratio.

"Customers/Labor hour" was marked by 13 percent (N=18) of the survey respondents. Contracted foodservices tended to use this ratio more often (N=3, 50%) than non-contracted ones (N=15, 12%). The significant association was (p=.007, X^2 =7.305, df=1).

The second highest used ratio in this survey was "meals/total food cost". Forty-four percent (N=60) of the dietitians used this ratio (the ratio being used the most was Meals/Labor hours worked, N=93, 69%).

Under the "other" category, respondents were asked to list other ratios that were not listed. Meals/Non-food,

customers sales/enrollment were among the few that were mentioned. In this part of the survey, dietitians were also asked if they used inverse of any of the productivity ratios. Labor hours worked/meals served, Labor hour/customer, Labor hours worked/sales, Labor hours worked/meals, and total food cost/meals were the inverse ratios that were currently being utilized.

Discussion of Productivity

Inputs. Over three-fourths of the respondents used eight out of the 11 input control measures on a frequent basis. Checking and adjusting labor usage was used by 73 percent of the respondents. As in Putz's (1985) and Shaw's (1982) studies, evaluating kitchen energy costs and monitoring energy usage did not seem to be as important to monitor as all the other input measures. Since the foodservices in this survey were part of the school system, perhaps the energy costs were assumed by the school administration.

Contracted foodservices did not make use of detailed specifications as much as the non-contracted foodservices. This may be due to the fact that school foodservices have to comply with rigid rules and regulations.

Outputs. The output control measure, keeping production records for the cafeteria and/or catering and meals served daily was frequently utilized by 98 percent of the respondents similar to Putz' (1985) study.

Computerized cash registers were used by less than half of the respondents. School foodservices have restricted budgets. Keeping production records and the number of meals served each day are standard routine and can be done with some investment in time, whereas computerized cash registers require an investment of money. The association between the output control, daily operation control sheets, and training in productivity revealed that dietitians with training in productivity made use of this measure more so than the ones with no productivity training. Training in productivity was also associated with" monitoring energy usage" and "monitoring breakage and pilferage of supplies", and the "review and revision of job descriptions periodically". These associations show that training in productivity does make a difference in the way dietitians perform their job.

Ratios and Indexes. About 90 percent of the respondents indicated that they were using ratios and indexes to assess productivity. Meals/labor hours worked was the most popular ratio used. This was different from Putz's (1985) data which identified meals/total food cost as the most popular ratio used in college and university foodservices. Dietitians with higher salaries and those with training in production utilized this ratio more than others. This could be due to the dietitian's recognition that this is a more accurate ratio since it excludes hours used for sick leave, vacation time, and other hours paid that are not actually worked.

Effectiveness

Effectiveness in this survey was defined as the degree of achievement of objectives (Smalley and Freeman, 1966). Eighty-six percent (N=108) of the dietitans specified that they do set specific goals for their operation (Table III).

The survey instrument listed 11 methods that could be used to evaluate goal attainment. "Cost and profit" was the first method mentioned and it received the highest response (Table IV). Seventy-five percent (N=101) of the respondents did use this method. Eighty-one percent (N=72) of the respondents who prepared food for satellite schools used the "cost and profit" method ($p=.037$, $X^2=4.360$, $df=1$). (Appendix C)

Monitoring "sales-volume" was the second popular method of evaluating goal attainment. Sixty-two percent (N=83) of the dietitians favored this method.

"Percent profit" method was significantly associated with four variables: "route to ADA membership" ($p=0.039$, $X^2=4.249$, $df=1$), "position title" ($p=0.044$, $X^2=4.062$, $df=1$), "preparing congregate meals" ($p=0.008$, $X^2=0.008$, $X^2=7.094$, $df=1$) and "contracted foodservice" ($p=0.029$, $X^2=4.793$, $df=1$). Thirty-six percent (N=23) of dietitians who became a member of ADA through other means than internship used "percent profit" to evaluate goal attainment. Only 20 percent (N=14) of ADA members who completed internship used this method. Dietitians who were the directors of School Foodservice tended to use "percent profit" method more

TABLE III

SIGNIFICANT ASSOCIATIONS FOUND IN EFFECTIVENESS CONTROLS

Effectiveness Controls	Factors Showing Association	Respondents Control N	Using Measures %
Profit and Loss Statement	Prepare meals for Satellite Schools ($p=0.037$, $X^2=4.360$, $df=1$)	101	75
Percent Profit	Route to ADA Membership ($p=0.039$, $X^2=4.249$, $df=1$)	37	28
	Position Title ($p=0.044$, $X^2=4.062$, $df=1$)	37	28
	Prepare Congregate Meals ($p=0.008$, $X^2=7.094$, $df=1$)	37	28
	Contracted Foodservice ($p=0.029$, $X^2=4.793$, $df=1$)	37	28
Increase in sales over previous year	Position Title ($p=0.016$, $X^2=5.852$, $df=1$)	84	63
Personnel Audit	Training in Productivity Measurement ($p=0.017$, $X^2=5.661$, $df=1$)	35	26
MBO for Management Staff	Position Title ($p-0.028$, $X^2=4.844$, $df=1$)	31	23
Break Goals Into Small Measurable Sub-Goals	Degree ($p=0.012$, $X^2=6.351$, $df=1$)	36	27
	Registration Status ($p=0.036$, $X^2=4.400$, $df=1$)	36	27
Administration Evaluates Goal Attainment	Training in Productivity Measurement ($p=0.039$, $X^2=4.272$, $df=1$)	61	46
Personnel Statistical Reports	Years of Experience ($p=0.028$, $X^2=7.122$, $df=2$)	31	23
	Training in Productivity Measurement ($p=0.014$, $X^2=6.015$, $df=1$)	31	23

TABLE IV

EFFECTIVENESS MEASURES USED TO EVALUATE GOAL ATTAINMENT

Method to Evaluate Goal Attainment	SFS* Frequency (%)	CUFS** (%)
Costs and Profit	101 (75)	(73)
Sales Volume	83 (62)	(23)
Percent Profit	37 (28)	(39)
Increase in Sales Over Previous Year	84 (63)	(33)
Actual Performance Compared with Forecasted Performance	66 (49)	(56)
Personnel Audit	35 (26)	(18)
MBO for Management Staff	31 (23)	(36)
Break Goals Into Small Measurable Sub-Goals	36 (27)	(53)
Evaluation Meetings	68 (51)	(62)
Administration Evaluates Goal Attainment	61 (46)	(47)
Personnel Statistical Reports	31 (23)	(27)

* School Foodservice
** College and University Foodservice, (Putz, 1985)

often (N=29, 33%) than non-directors (N=8, 17%). Seventy-one (5%) of the respondents who prepared congregate meals evaluated their goal attainment by monitoring the "percent profit" method in comparison to 25 percent (N=32) of the dietitians who did not prepare congregate meals. Also contracted foodservices used "percent profit" method more often (N=4, 66%) than non-contracted foodservice (N=33, 26%).

"Increase in sales over previous year" was significantly associated with position title of the respondents ($p=0.016$, $X^2=5.852$, $df=1$). Directors tended to use this method more often (N=61, 70%) than non-directors (N=23, 49%) (Table III).

Respondents who had training in productivity tended to use "personnel audit" (N=23, 36%) method of goal attainment more often than the dietitians who did not have any productivity training (N=12, 18%) with the significant association being ($p=0.017$, $X^2=5.661$, $df=1$). (Tables III, IV)

"MBO for management staff" was used more by non-directors (N=16, 34%) than by the directors in school foodservices (N=15, 17%) ($p=0.028$, $X^2=4.844$, $df=1$). "Break goals into small measurable subgoal" was favored by 27 percent (N=36) of the respondents and showed two significant associations. The first association ($p=0.012$, $X^2=6.351$, $df=1$) revealed that dietitians with M.S. or Ph.D. degrees utilized this method more frequently (N=25, 36%) than the dietitians with a B.S. degree (N=11, 17%).

The second association (p=0.036, X^2 =4.400, df=1) showed that the registered dietitians (R.D.) favored this method or evaluating goal attainment (N=34, 31%) more so than non-registered dietitians (N=2, 9%). It is interesting to note that, dietitians with graduate degrees and having an Ph.D. would break down goals into measurable subgoals. Perhaps these dietitians have had productivity training and more management experience, hence, the tendency to measure subgoals and goals.

Forty-six percent (N=61) of the dietitians indicated that the "administration evaluates goal attainment". Over one-half of the dietitians (N=35, 55%) with training in productivity checked this method. (p=0.039, X^2 =4.272, df=1).

"Personnel statistical reports" was compiled by 23 percent (N=31) of the dietitians and showed two significant associations. The dietitians with 16 or more years of experience monitored this method of evaluation more often (N=19, 35%) than the dietitians with less than 16 years experience (p=0.028, X^2 =7.122, df=2). (Appendix C) Also, dietitians with training in productivity favored this method (N=21, 33%) more than the respondents with no productivity training (p=0.014, X^2 =6.015, df=1).

Discussion of Effectiveness

Profit and loss statement was the measure used by the majority of the survey participants. Position, title and training in productivity were the factors showing the most

associations with the various measures of goal attainment. In most cases, the dietitians who were directors and the dietitians with training in productivity were more likely to measure this performance criteria. Perhaps goal setting is emphasized extensively in the higher education and in productivity training.

Quality

Quality was defined as the degree to which the system conforms to specifications (Sink, 1983), or at consumer level, fitness for use (Cole, 1981). In response to whether the dietitians utilize quality standard in their operation, 94 percent (N=118) indicated that they did. Sixty-six percent of the contracted food services (N=4) had quality standard as part of their operation whereas 94 percent (N=120) of non-contracted foodservices utilized quality standard in their operation ($p=0.002$, $X^2 =9.739$, $df=1$) (Table V).

In the questionnaire, the respondents were asked to indicate the person responsible for developing the quality standards. The majority of respondents (N=101, 78%) indicated that the "director" was the person in charge of developing these standards (Figure 2). Eighty-four percent (N=73) of the respondents who were over 40 indicated that the director was responsible for developing the standards along with 69 percent (N=33) of the respondents under 40 years of age ($p=0.040$, $X^2 =4.214$, $df=1$) (Table V) An Association ($p=0.0001$, $X^2 =15.341$, $df=1$) also observed with

TABLE V

SIGNIFICANT ASSOCIATIONS FOUND IN QUALITY CONTROLS

Quality Controls	Factors Showing Association	Respondents Control N	Using Measures %
Have quality standard specific to the operation	Contracted foodservice ($p=0.002$, $X^2=9.739$, $df=1$)	118	94
Director Dev. Stds.	Age ($p=0.0400$, $X^2=4.214$, $df=1$)	101	78
	Position Title ($p=0.0001$, $X^2=15.341$, $df=1$)	101	78
	Contracted foodservice ($p=0.0006$, $X^2=7.601$, $df=1$)	101	78
Dietitian Dev. Stds.	Position title ($p=0.024$, $X^2=5.061$, $df=1$)	41	33
	Prepare meals for Satellite Schools ($p=0.038$, $X^2=4.293$, $df=1$)	41	33
Foodservice Mgt. Company	Contracted foodservice* ($p=0.0001$, $X^2=27.970$, $df=1$)	3	2
Temperature check of food	Degree ($p=0.035$, $X^2=4..437$, $df=1$)	105	80
Regular sanitation inspections	Annual Salary ($p=0.037$, $X^2=8.504$, $df=3$)	113	86
Taste testing/can cutting of new food items by management	Route to ADA membership ($p=0.022$, $X^2=5.220$, $df=1$)	116	89
Written standards for quality of food	Degree ($p=0.002$, $X^2=9.509$, $df=1$)	79	60
	Route to ADA membership ($p=0.042$, $X^2=4.153$, $df=1$)	79	60
	Annual salary ($p=0.047$, $X^2=7.958$, $df=3$)	79	60

TABLE V (Continued)

Quality Controls	Factors Showing Association	Respondents Control N	Using Measures %
Written standards for quality of food (continued)	Prepare Congregate Meals ($p=0.027$, $X^2=4.860$, $df=1$)	79	60
Written standards for quality of service	Degree ($p=0.019$, $X^2=5.472$, $df=1$)	52	40
	Training in productivity measurement ($p=0.001$, $X^2=10.727$, $df=1$)	52	40
Manager personally inspecting all food deliveries	Age ($p=0.025$, $X^2=5.020$, $df=1$)	97	74
Manager personally tasting all food	Annual salary ($p=0.024$, $X^2=9..400$, $df=3$)	83	63
Purchasing specifications	Degree ($p=0.l039$, $X^2=4.280$, $df=1$)	120	92
	Registration status ($p=0..003$, $X^2=8.881$, $df=1$)	120	92
	Annual Salary ($p=0.016$, $X^2=10.364$, $df=3$)	120	92
	Contracted foodservice ($p=0.013$, $X^2=6.219$, $df=1$)	120	92
Detailed instructions to employees	Training in productivity measurement* ($p=.002$, $X^2=5.283$, $df=1$)	84	64
Menus and charts, production schedules	Training in productivity measurement ($p=0.002$, $X^2=9.431$, $df=1$)	113	86
Other	Prepare other meals ($p=0.049$, $X^2=3.886$, $df=1$)	13	10

TABLE V (Continued)

Quality Controls	Factors Showing Association	Respondents Control N	Using Measures %
Quality standards discussed with employees beyond their initial training	Annual salary ($p=0.038$, $X^2=8.405$, $df=3$)	126	98
Assistant manager in charge of quality control	Training in productivity measurement ($p=0.030$, $X^2=4.682$, $df=1$)	17	13
Production manager in charge of quality control	Registration status ($p=0.037$, $X^2=4.336$, $df=1$)	18	14
	Training in productivity measurement ($p=0.030$, $X^2=4.682$, $df=1$)	18	14
Contract company	Contracted foodservice* ($p=0.00001$, $X^2=21.827$, $df=1$)	1	0.80
Director in charge of quality control	Position title ($p=0.0001$, $X^2=18.842$, $df=1$)	91	70
	Annnual Salary* ($p=0.0178$, $X^2=10.212$, $df=3$)	91	70
Assistant director in charge of quality control	Position title* ($p=0.0001$, $X^2=12.596$, $df=1$)	34	26
Other	Position title ($p=0.25$, $X^2=5.020$,. $df=1$)	32	25
	Years of experience ($p=0.50$, $X^2=5.999$, $df=2$)	32	25
	Annual salary ($p=0.004$, $X^2=13.087$, $df=3$)	32	25
	Prepare Congregate meals ($p=0.037$, $X^2=4.341$, df+1)	32	25

TABLE V (Continued)

Quality Controls	Factors Showing Association	Respondents Control N	Using Measures %
State health codes	Route to ADA membership ($p=0.042$, $X^2=4.149$, $df=1$)	103	79
	Position title* ($p=0.012$, $X^2=6.378$, $df=1$)	103	79
County Health	Annual salary ($p=0.019$, $X^2=9.981$, $df=3$)	71	55
City health codes	Degree ($p=0.003$, $X^2=8.867$, $df=1$)	46	35
	Prepare meals for Satellite Schools ($p=0.035$, $X^2=4.446$, $df=1$)	46	35
Contract company standards	Contracted foodservice* ($p=0.0001$, $X^2=112.468$, $df=1$)	5	4
Other	Registration status ($p=0.036$, $X^2=4.399$, $df=1$)	43	33

*Similar associations were found in Putz's study (1985).

this response was the title of the respondents, 89 (N=78) percent of the dietitians who identified themselves as a director, indicated that the director was the person responsible for developing quality standards in comparison to non-director respondents (60%, N=28).

Another significant association was observed with contracted foodservices ($p=0.006$, $X^2=7.601$, $df=1$). Eighty-one percent (N=104) of non-contracted foodservices mentioned the director as the main person in charge, whereas 33 percent (N=2) of the contracted foodservices indicated that the director was the person in charge of developing the standards.

After directors, "dietitians" were the second most likely person to be responsible for developing the quality standards of the operations (N=41, 33%) (Figure 3). The non-directors respondents (N=20, 43%) mentioned the dietitians as the person in charge of setting up quality standards, while one-quarter (N=21, 24%) of directors in this survey mentioned the dietitians as the one who develops quality standards ($p=0.024$, $X^2=5.061$, $df=1$). The dietitian set standards for 36 percent (N=32) of institutions preparing meals for satellite schools ($p=0.038$, $X^2=4.293$, $df=1$), whereas, only 19 percent (N=19) of the respondents who work for institutions which do not prepare meals for satellite schools indicated that the dietitian set quality standards.

One-third of the contracted foodservice operations (N=2, 33%), responded that the "foodservice management

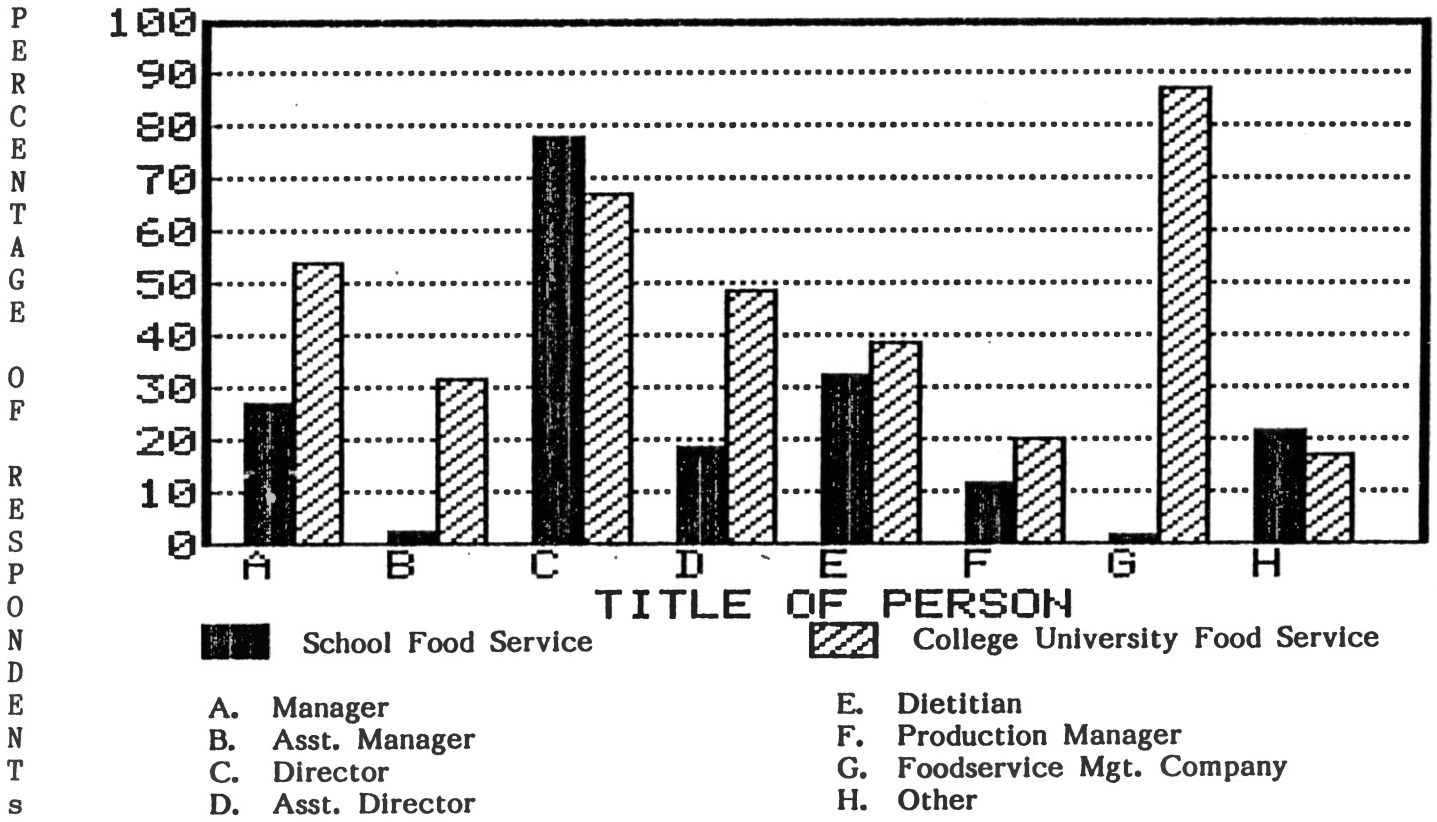

Figure 3. Person Responsible for Developing Standards

company" was responsible for developing their quality standards (p=0001, X^2 =27.970, df=1). Only one respondent who worked for a non-contracted institution mentioned that the quality standards for their operation was set by a foodservice management company. Twenty-two percent (N=29) of the respondents indicated that "others" such as supervisors, government agencies, health department, and fire department were responsible for developing quality standards for their operation.

When asked about the type of quality control used in the operation, purchasing specifications got the highest response (N=120, 92%) (Table VI). Four significant associations relative to degree (p=0.039, X^1 =4.280, df=1), route to ADA (p=0.003, X^2 =8.881, df=1); salary (p=0.016, X^2 =10.364, df=3), and contracted foodservice (p=0.013, X^2 =6.219, df=1) were observed. Ninety-seven percent (N=68) of the dietitians with an M.S. or a Ph.D. degree used purchasing specifications, while only two did not use this measure. Dietitians with B.S. degrees tended to use this control method 87 percent (N=58) of the time and registered dietitians tended to use purchasing specifications more so than non-registered dietitians (96 percent vs. 77 percent, respectively). Dietitians earning $30,000 to $39,000 favored this control measure (N=44, 97%) more than the dietitians in other salary brackets. Seventy-six percent (N=16) of the dietitians earning below $15,000 to $19,000 made use of this quality control measure in their operation. Ninety-four percent (N=50) of dietitians with

TABLE VI

FREQUENCY OF DIETITIANS USING QUALITY CONTROL MEASURES

Quality Control Measures	N	%
Purchasing specifications	120	92
Taste testing/can cutting of new food items by management	116	89
Regular (unannounced) sanitation inspections	113	86
Menus and charts, production schedules	113	86
Use of fresh food, if available and economical	113	86
Temperature check of food in steam table	105	80
Periodic survey of customers as to quality of foodservice	104	79
Manager personally inspecting all food deliveries	97	74
Detailed instructions to employees	84	64
Managers personally tasting all cooked foods for quality	83	63
Written standards for quality of food	79	60
Written standards for quality of service	52	40
Other	13	10

earnings in the $20,000 to $29,000 range and ninety-four percent (N=16) of the dietitians with $40,000 and above used purchasing specifications. Also, two out of three (N=4, 66%) of the contracted foodservices used purchasing specifications, while non-contracted foodservice used this control measure 94 percent (N=122) of the time.

The second most popular quality control measure was "taste testing". (Table VI) Ninety-five percent (N=62) of the dietitians who became ADA members through other means than internship (Appendix B) favored "taste testing". In contrast, 83 percent (N=59) of the dietitians with internship background favored this quality control measure ($p=0.022$, $X^2 = 5.220$, $df=1$).

"Regular sanitation inspections", "menus and charts, production schedule", and "use of fresh food" were utilized by 86 percent of the respondents. All but one dietitian (N=16, 94%) earning $45,000 and above used regular sanitation inspection. Ninety-six percent (N=43) of the dietitians making $30,000 to $39,000, 77 percent (N=41) of dietitians earning $20,000 to $29,000 and 90 percent (N=19) of those with a salary below the $15,000 to $19,000 range favored regular sanitation checks as a "quality control measure" ($p=0.037$, $X^2 = 8.504$, $df=3$). All but two of the dietitions who have received training in productivity measurement used "menus and charts, production schedule" to order control quality (N=63, 97%). Eighty percent (N=55) of the dietitians who did not have productivity training, however, also made use of this quality control ($p=0.002$, X^2

=9.431, df=1).

Checking "temperature of food in steamtable" was used by 80 percent (N=105) of the respondents. Dietitians with graduate degrees used this quality control measure more often (N=61, 87%) than the dietitians with B.S. degrees (N=48, 72%) (p=0.035; X^2 =4.437, df=1).

Seventy-four (N=97) of the respondents indicated that the "manager personally inspects all food deliveries". Nine out of 11 dietitians (N=82, 82%) age 40 to 69 noted that their operation used this quality control measure. Thirty-one (65%) of dietitians younger than 40 years old, however used this control measure (p=0.025, X^2 =5.020, df=1).

"Detailed instructions to employees" was used by 64 percent (N=84) of the respondents. Three-fourths (N=49, 75%) of the dietitians with productivity training made use of this quality control, while only 57 percent (N=39) of the dietitians with no productivity training favored this control measure (p=0.022, X^2 =5.283, df=1).

"Manager personally tasting all cooked foods" was checked by 63 percent (N=83) of the dietitians. Dietitians with a salary below the $15,000 to $19,000 (81%, N=17) and $30,000 to $39,000 (76%, N=34) salary brackets checked this control measure more often than the dietitians in other salary brackets (p=0.024, X^2 =9.400, df=3). (Appendix C)

For 60 percent (N=79) of the respondents, "written standards for quality of food" was the way to control the quality in their operation. Four significant associations

relative to degree ($p=0.002$, $X^2=9.509$, $df=1$), route to ADA ($p=0.042$, $X^2=4.153$, $df=1$), salary ($p=0.047$, $X^2=7.958$, $df=3$) and preparing congregate meals ($p=0.027$, $X^2=4.860$, $df=1$) were observed. Seventy-three percent (N=51) of dietitians with graduate degrees used written standards for quality of food in comparison to 47 percent (N=31) of dietitians with B.S. degrees. Fifty-two percent (N=37) of the dietitians who went through an internship and nine out of 13 (N=45, 69%) of dietitians who became ADA members through means other than the internship used written standards for quality of food control. Dietitians earning $30,000 to $39,000 favored this measure of quality control more often than dietitians in other salary brackets (N=33, 73%) (Appendix C). All of the dietitians who worked for institutions preparing food for congregate meals used written standards for quality of food (N=7, 100%, while only 58% (N=75) of those who did not prepare food for congregate meals used this measure.

"Written standards for quality of service" was chosen by 40 percent (N=52) of the respondents. One-half (N=35, 50%) of the dietitians with an M.S. or Ph.D. degree made use of this measure in comparison to only 30 percent (N=20) of dietitians with B.S. degrees ($p=0.019$, $X^2=5.472$, $df=1$). Also, over one-half (N=36, 55%) of the dietitians with training in productivity used written standards for quality of service, whereas, only 28 percent (N=19) of dietitians with no productivity training made use of this measure.

Ten percent of the respondents checked the "other" categories. Plate waste study, daily food usage report, U.S.D.A commodities, using exact serving utensil numbers and sizes listed on the menu to conform with federal meal patterns, were listed under the other categories. Twenty-one percent (N=6) of the dietitians preparing meals for other than satellite, meals on wheels, and congregate meals, checked this category ($p=0.049$, $X^2 = 3.886$, $df=1$).

Ninety-eight (N=126) of the dietitians indicated that quality standards are discussed with employees beyond their initial training. All the dietitians making $20,000 to $29,000 (N=52) and those making $30,000 to $39,000 (N=45) did discuss quality standards with their employees. Ninety percent (N=19) of the dietitians making below $15,000 to $19,000 and 94 percent (N=16) of the ones making $45,000 and above responded postively to this question.

When asked about the person in charge of quality control, 71 percent (N=92) mentioned the manager (Figure 4). Assistant manager was mentioned by 13 percent (N=17) of the dietitians. Twenty percent (N=13) of the dietitians with training in productivity, and 7 percent of the ones with no training in productivity mentioned the assistant manager as the person in charge of quality control ($p=0.030$, $X^2 = 4.682$, $df=1$). This survey indicated that 14 percent (N=18) of the production managers were in charge of quality control. Eleven percent (N=12) of the registered dietitians cited the production manager as the one in charge of quality control in comparison to 27 percent (N=6)

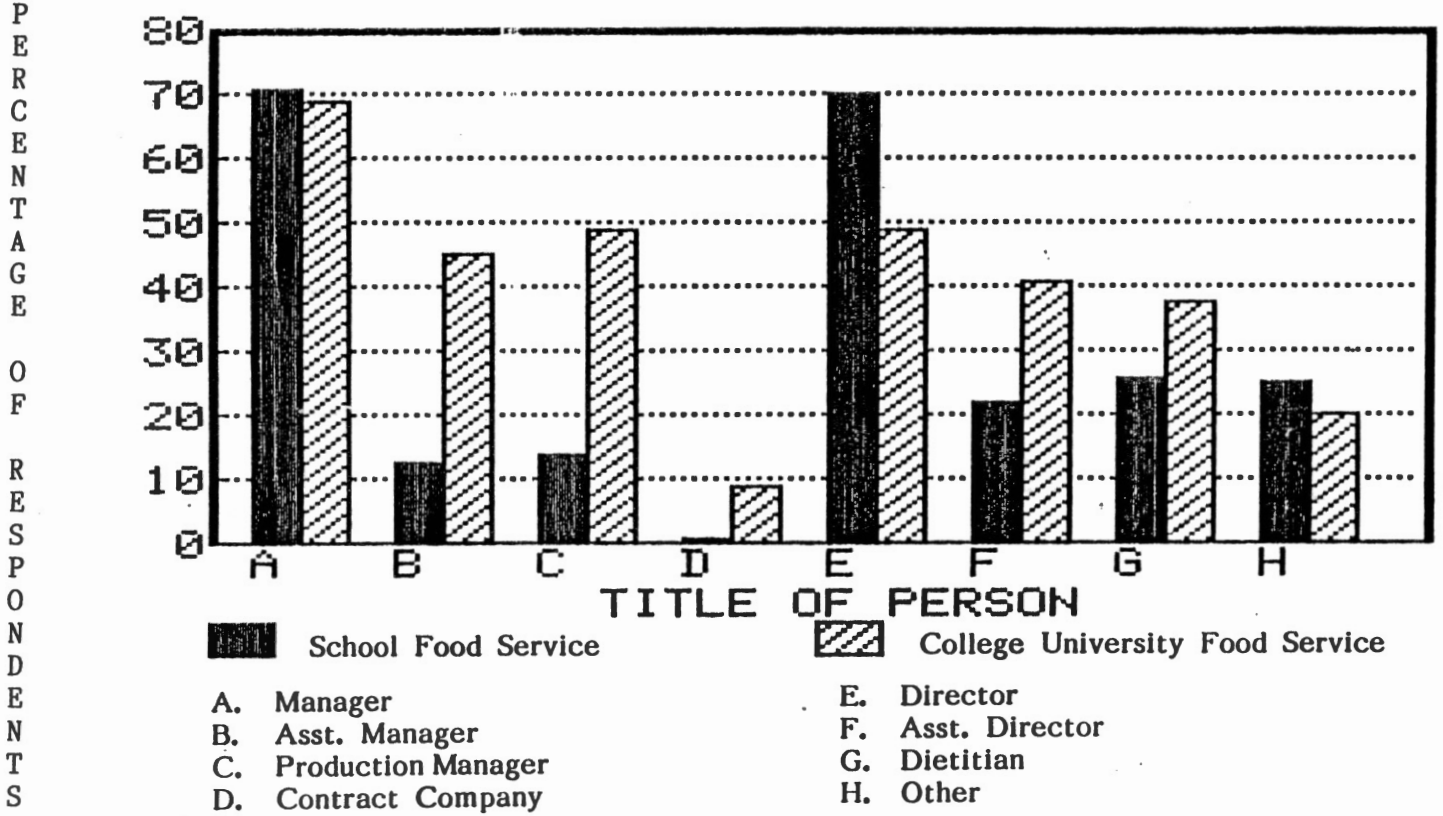

Figure 4. Person in Charge of Quality Control

of the non-registered dietitians ($p=0.037$, $X^2=4.336$, $df=1$). Respondents with training in productivity mentioned production managers more often (N=13,d 20%) than the dietitians with no productivity training (N=5, 7%) ($p=0.030$, $X^2=4.682$, $df=1$). Only one person indicated that a contract company was in charge of the quality control and as it could be expected the dietitian was working in a contracted foodservice ($p=0.001$, $X^2=21,827$, $df=1$).

Eighty-two (N=72) percent of the dietitians with the title of director stated that they were solely responsible for the quality control in their department While only 46 percent (N=22) of the non-directors did the same ($p=0.001$, $X^2=18.842$, $df=1$). Seventy-five percent (N=40) of the dietitians earning $20,000 to $29,000 and 77 percent (N=35) of the dietitians earning $30,000 to $39,000 checked director as the one in charge of quality control in comparison to 41 percent (N=7) of dietitians in $45,000 and above and 57 percent (N=12) of the dietitians earning below $15,000 to $19,000 annually ($p=0.017$, $X^2=10.212$, $df=3$).

Twenty-two percent (N=28) of the respondents indicated that the assistant director was in charge of quality control. Thirty-three percent (N=16) of the non-director dietitians checked assistant director in comparison to 16 percent (N=14) of the director dietitians ($p=0.019$ $X^2=5.485$, $df=1$). Forty-four percent (N=21) of the dietitians cited themselves as being in charge of quality control and 16 percent (N=14) of the directors indicated that the dietitians were responsible for quality control.

One-fourth (N=31) of the respondents checked the "other" category and cited supervisors, area specialist, warehouse personnel, every employee in foodservice, head of food technology, head cook and head baker as being the person in charge of quality control. Four significant associations relative to title ($p=0.025$, $X^2=5.020$, $df=1$), experience ($p=0.050$, $X^2=5.999$, $df=2$), salary ($p=0.004$, $X^2=13.087$, $df=3$), congregate meals ($p=0.037$, $X^2=4.341$, $df=1$) were observed. Non-director dietitians checked the "other" category for quality control more often (N=17, 35%) than did the directors (N=16, 18%). Thirty-five percent (N=19) of the dietitians with 16 or more years of experience checked the other category in comparison to 20 percent (N=11) of the dietitians with one to 10 years of experience. Forty-one percent (N=7) of the dietitians with an annual salary of $40,000 and above and 38 percent (N=17) of the dietitians earning $30,000 to $39,000 checked the other category in comparison to 14 percent (N=3) of the dietitians earning below $15,000 to $19,000. Over one-half of the dietitians who served food to congregate meals (N=4, 57%) checked the "other" category for the quality control in comparison to 22 percent (N=29) of the dietitians not serving foods to congregate meals.

In response to the question asking which organizations govern quality standards, the majority checked "state health codes" (N=103, 79%) (Table VII). Route to ADA ($p=0.042$, $X^2=4.149$, $df=1$) and position title ($p=0.013$, $X^2=6.378$, $df=1$) influenced this choice. Eighty-six percent

TABLE VII

ORGANIZATIONS GOVERNING QUALITY STANDARDS

Organization	SFS* Frequency (%)	CUFS** %
State Health Codes	103 (79)	(83)
County Health Codes	71 (55)	(51)
City Health Codes	46 (35)	(39)
Contract Company Standards	5 (4)	(12)
Other	43 (33)	(35)

* School Foodservice
** College and University Foodservice, (Putz, 1985)

(N=56) of the non-interns checked state health codes in comparison to 72 percent (N=51) of the dietitians who became ADA members through internship. Eighty-five percent (N=75) of the directors indicated that their foodservice was governed by state health codes as did 67 percent (N=32) of the non-directors.

Fifty-five percent (N=71) of the dietitians indicated that their operations were governed by "county health codes". There was a positive correlation between this answer and the annual salary of the respondents ($p=0.003$, $X^2=8.867$, $df=1$). As the salary increased so did the number of the respondents to this answer. Eighty-eight percent (N=15) of the dietitians earning $40,000 and above were governed by "county health codes" while only about one-half as much (N=9, 43%) of dietitians earning below $15,000 to $19,000 were governed by the same.

"City health codes" govern 35 percent (N=46) of the represented operations. An association ($p=0.003$, $X^2=8.867$, $df=1$) existed between use of this measure and the degree attained. Forty-seven percent (N=33) of the respondents with an M.S. or Ph.D. degree indicated that they were governed by city health codes; whereas, only 23 (N=15) of the B.S. degree holders made the same indication. The foodservices that prepared meals for satellite schools influenced ($p=0.035$, $X^2=4.446$, $df=1$) the responses in this particular situation. Forty-two percent (N=37) of the foodservices that prepared meals for satellite schools were governed by city health codes in comparison to on 23 percent (N=11)

of the other foodservices.

Only five dietitians (4%) identified themselves as being governed by "contracted company standards", and all five dietitians were working for operations that were contracted to a foodservice management company ($p=0.0001$, $X^2=112.468$, $df=1$). "Other" organizations governing quality were checked by 33 percent (N=43) of the respondents. The other category included: Armed Forces, health codes, the foodservice had their own quality standards, child nutrition programs and city school lunch policies, State Department of Education, U.S.D.A., JCAH, Federal government, and clients. Over one-third (N=41, 37%) of the dietitians checked the "other" category ($p=0.036$, $X^2=4.399$, $df=1$) in comparison to 17 percent (N=3) of the non-registered dietitians.

Discussion of Quality

Similar to Putz's (1985) findings, over 90 percent of the survey participants indicated that they had specific quality standards in their operation. The director was the person most frequently mentioned as being responsible for developing the quality standards.

The most frequently used quality control measure was purchasing specification. The association between this measure and the degree attained, revealed that those who had M.S. or Ph.D degrees were the most likely to make use of this measure. This relationship may indicate that the use of purchasing specifications is emphasized in the

graduate school programs. Regular sanitation inspections were favored by 86 percent of the respondents. The more annual earnings the respondents received, the more likely they were to measure this performance criteria. This relationship is also related with educational degree obtained. Sanitation in foodservice is linearly related with education. The more education a respondent received, the more likely he or she would consider sanitation or a priority index in the foodservice operation.

Efficiency

In this survey, efficiency was defined as resources expected to be consumed/resources actually consumed (Sink, 1983). In this section, the respondents were asked to identify the resource categories (labor, materials, capital, energy, other) they monitored. "Labor" and "materials" usage were monitored by the majority of the respondents (N=126, 98%). (Table VIII, IX) All but one of the foodservices (N=6, 86%) preparing food for congregate meals kept a record of their materials ($p=0.004$, $X^2=8.222$, $df=1$).

"Capital" was monitored by 82 percent (N=103) of the respondents. An association ($p=0.010$, $X^2=6.706$, $df=1$) revealed that the majority of the participants (N=63, 90%) with a Master's and a Ph.D. degree monitored capital in comparison to 73 percent (N=45) of the participants with a bachelor's degree.

Twenty-four percent (N=28) of the respondents

TABLE VIII

SIGNIFICANT ASSOCIATIONS FOUND IN EFFICIENCY CONTROLS

Efficiency Controls	Factors Showing Association	Respondents Control N	Using Measures %
Records kept of materials used	Prepare Congregate Meals ($p=0.004$, $X^2=8.222$, $df=1$)	126	98
Records kept of capital usage	Degree ($p=0.010$, $X^2=6.706$, $df=1$)	103	82
Records kept of energy use	Degree ($p=0.008$, $X^2=7.136$, $df=1$)	28	24
	Prepare Congregate Meals ($p=0.023$, $X^2=5.149$, $df=1$)	28	24
Compare resources used with resources utilization target	Prepare meals for Satellite Schools* ($p=0.025$, $X^2=5.006$, $df=1$)	78	63

*Similar associations were found in Putz's study (1985).

TABLE IX

DISTRIBUTION OF RESPONDENCE MONITORING EFFICIENCY MEASURES

Efficiency Measure	SFS* Frequency (%)	CUFS** (%)
Labor	126 (98)	(98)
Materials	126 (98)	(100)
Capital	103 (82)	(75)
Energy	28 (24)	(38)
Other	15 (2)	----

* School Foodservice
** College and University Foodservice, (Putz, 1985)

indicated that they monitored "energy". Similar to the capital usage, the dietitians with a Master's and a Ph.D. degree had more tendency to monitor energy (N=21, 32%) than the dietitians holding a bachelor's degree (N=7, 12%) ($p=0.008$, $X^2 = 78.136$, $df=1$). Another association ($p=0.023$, $X^2 = 5.149$, $df=1$) revealed that over one-half (N=4, 57%) of the foodservices that prepare foods for congregate meals kept energy usage records while only 20 percent (N=24) of those not preparing congregate meals did so.

Twelve percent (N=15) of the respondents answered that they kept a record of "other" resources such as leases, equipment and repairs, travel and supplies. "Compare resources used with resource utilization targets" was the last question in the efficiency section. Sixty-three (N=78) of the respondents indicated that they were using this measure. An association ($p=0.025$, $X^2 = 5.026$, $df=1$) revealed that 70 percent (N=58) of the foodservices preparing meals for satellite schools used this measure while only 50 percent (N=23) of those not preparing satellite meals did so.

Discussion of Efficiency

The majority of respondents kept a record of labor usage, material used, and capital invested in their foodservice. Energy was monitored by only 24 percent of the respondents. Institutions preparing food for congregate meals tended to keep track of labor, material and energy usage more so than those not providing

congregate meals. Perhaps fodservices providing congregate meals keep tighter control of their operations, due to their large size and/or specific operating policies.

Quality of Work Life

Quality of work life (QWL) on the survey instrument was defined as work with meaning (Mali, 1978) or the degree to which work provides an opportunity for an individual to meet a variety of personal needs, to survive with security, to interact with others, to feel useful, to be recognized for achievement and to have an opportunity to improve one's skill and knowledge (Lippitt, 1978). Over one-half (N=73, 58%) of respondents in this survey indicated that they measured the quality of work life of their employees. A significant association ($p=0.008$, $X^2 = 7.017$, $df=1$) indicated that the dietitians with training in productivity did measure QWL more frequently (N=43, 69%) than the ones with no productivity training (N=31, 46%) (Table X).

"Written job satisfaction questionnaires" was used by 13 percent (N=17) of the respondents (Table XI). The majority of the dietitians (N=122, 95%) "encourage employees to make suggestions, participate and cooperate with management on new projects, problem solving, goal setting, etc."; the position title of the respondents influenced their decision to use this measure ($p=0.037$, $X^2 = 4.361$, $df=1$). Ninety-eight percent (N=86) of the directors used this measure while 89 percent (N=42) of the non-directors did the same (Table XI).

TABLE X

SIGNIFICANT ASSOCIATIONS FOUND IN QUALITY OF WORK LIFE CONTROLS

Quality of Works Life Controls	Factors Showing Association	Respondents Control N	Using Measures %
Measure QWL	Training in productivity measurement ($p=0.008$, $X^2=7.017$, $df=1$)	73	58
Encourage employees to make suggestions, participate and cooperate with management on new projects, problem solving, etc.	Title ($p=0.037$, $X^2=4.361$, $df=1$)	122	95
Provide promotion opportunities	Age ($p=0.0001$, $X^2=12.429$, $df=1$)	100	78
	Years of experience ($p=0.022$, $X^2=7.635$, $df=2$)	100	78
Provision of supplies, materials, and assistance to employees	Age ($p=0.033$, $X^2=4.527$, $df=1$)	116	90
	Registration Status ($p=0.014$, $X^2=6.032$, $df=1$)	116	90
Link performance to rewards	Registration status ($p=0.047$, $X^2=4.144$, $df=1$)	74	61
	Training in productivity measurement ($p=0.029$, $X^2=4.749$, $df=1$)	74	61
Raises based on performance appraisals	Contracted foodservice ($p=0.003$, $X^2=9.060$, $df=1$)	39	30
Commendation letters	Registration status ($p=0.009$, $X^2=6.799$, $df=1$)	68	53
Non-monetary performance award	Degree ($p=0.002$, $X^2=9.690$, $df=1$)	42	31

TABLE X (Continued).

Quality of Works Life Controls	Factors Showing Association	Respondents Control N	Using Measures %
Monetary performance award	Training in productivity measurement ($p=0.020$, $X^2=5.402$, $df=1$)	9	7
Plaques and certificates	Annual salary ($p=0.042$, $X^2=8.194$, $df=3$)	50	37
Recognition in newsletter, newspaper	Route to ADA membership ($p=0.006$, $X^2=7.562$, $df=1$)	43	32
Bonuses (time, pay)	Contracted foodservice ($p=0.042$, $X^2=4.142$, $df=1$)	4	3
Suggestion system	Contracted foodservice ($p=0.041$, $X^2=4.196$, $df=1$)	40	30
Quality Circles	Training in productivity measurement ($p=0..005$, $X^2=7.738$, $df=1$)		

TABLE XI

FREQUENCY DISTRIBUTION OF QWL MEASURES

QWL Measures	SFS* Frequency	(%)	CUFS** (%)
Use Written Job Satisfaction Questionnaire	17	(13)	(15)
Encourage Employees to make Suggestions, Participate and Cooperation with Management on New Projects, Problem Solving, Goal Setting, Etc.	122	(95)	(88)
Monitor Turnover, Absenteeism, and Tardiness	102	(79)	(79)
Make the Job More Interesting by Redesigning, Job Enrichment, Task Indentification, Etc.	60	(47)	(35)
Provide Promotion Opportunities	100	(78)	(73)
Provide Supplies, Materials, and Assistance to Employees as Needed	116	(90)	(79)

* School Foodservice
** College and University Foodservice

Seventy-eight percent (N=100) of the respondents did "provide promotion opportunity" to their employees. Two significant associations relative to age ($p=0.0001$, $X^2=12.429$, $df=1$) and experience ($p=0.022$, $X^2=7.635$, $df=2$) were observed. Dietitians who were 40 years or older favored this measure more so (N=76, 86%) than the dietitians under 40 (N=28, 60%). Also, 89 percent (N=49) of the respondents with 16 or more years of experience provided promotion opportunities to their employees, while 69 percent (N=38) of dietitians with one to five years of experience did the same.

Ninety percent (N=116) of the respondents "provided supplies, materials and assistance to employees as needed". Age ($p=0.033$, $X^2=4.527$, $df=1$) and registration status ($p=0.014$, $X^2=6.032$, $df=1$) were associated with this QWL category. Dietitians over 40 years of age (N=83, 94%) tended to check this category more often than those under 40 years of age (N=39, 83). Also, registered dietitians (N=104, 94%) favored this QWL measure more than non-registered dietitians (N=17, 77%).

In this part of the survey, three-fifths of the respondents (N=74, 61%) indicated that they "linked performance to rewards". Registration status ($p=0.042$, $X^2=4.144$, $df=1$) and training in productivity ($p=0.029$, $X^2=4.749$, $df=1$) influenced this measure. Sixty-four percent (N=65) of the R.D.'s answered positively to this answer; whereas, only 41 percent (N=9) of the non-R.D.'s did the same. The majority of the dietitians with training in

productivity (N=41, 71%) did link performance to rewards in comparison to 52 percent (N=34) of those with no training in productivity.

Thirty percent (N=39) of the respondents indicated that "raises were based upon performance appraisals"; this was asociated with contracted foodservice ($p=0.003$, $X^2=9.060$, df=1) (Table XII). All but one (N=5, 83%) of the dietitians working for contracted foodservice used this measure in comparison to 26 percent (N=34) of the dietitians working for non-contracted foodservices.

"Commendation letters" were used by more than one-half of the respondents (N=68, 53%). The majority of R.D.'s used this measure (N=64, 58%), whereas, only 27 percent (N=6) of the non-registered dietitians made use of this measure.

"Verbal recognition" was the most popular way to reward employees (N=121, 94%) while "merit pay for management staff" was used by only 11 percent (N=14) of the respondents. "Non-monetary performance rewards" was used by 31 percent (N=42) of the respondents. Dietitians with graduate degrees were more likely to use this measure (N=30, 43%) than the ones with a B.S. degree (N=12, 18%) ($p=0.002$, $X^2=9.690$, df=1). The dietitians who did not go through internship used this measure more often (N=26), 40%) than those who interned (N=16, 23%).

"Monetary awards" were used mainly by the dietitians who did not receive any productivity training (N=8, 12%). Only one dietitian (1.5%) who received productivity

TABLE XII

REWARDS LINKED WITH PERFORMANCE MEASURE

Types of Rewards	SFS* Frequency	(%)	CUFS** (%)
Raises Based Upon Performance Appraisals	39	(30)	(62)
Commendation Letters	68	(53)	(32)
Verbal Recognition	121	(94)	(90)
Merit Pay for Management Staff	14	(11)	(39)
Performance Awards (Non-monetary)	42	(31)	(29)
Performance Awards (Monetary)	9	(7)	(12)
Plaques and Certificates or Other Forms of Recognition	50	(37)	(47)
Recognition in Newsletters, Newspapers	43	(32)	(44)
Bonuses (Time, Pay)	4	(3)	(8)
Scheduling Preferences	19	(14)	(29)
Other	12	(10)	(3)

* School Foodservice
** College and University Foodservice

training used this measure to reward the employees ($p=0.020$, $X^2 = 5.402$, $df=1$).

"Plaques and certificates" were favored by the dietitians earning $20,000 and above. Only 10 percent (N=2) of those earning below $15,000 used this reward system, whereas, 47 percent (N=8) of those earning $40,000 and above, 40 percent (N=18) of dietitians with earnings of $30,000 to $39,000 and 42 percent (N=22) of those earning $20,000 to $29,000 used this measure.

"Recognition in newsletter or newspaper" was used by 32 percent (N=43) of the respondents. Forty-three percent (N=28) of the dietitians who did not go through an internship used this reward system in comparison to 21 percent (N=15) of those who interned ($p=0.006$, $X^2 = 7.562$, $df=1$).

Not many of the respondents used "bonuses" as a reward system, but those working for contracted foodservices were more likely to give bonuses (N=1, 16%) than the others (N=3, 2%) ($p=0.042$, $X^2 = 4.142$, $df=1$). "Scheduling preferences" was used as a reward by 14 percent (N=19) of the respondents, while 10 percent (N=13) of the dietitians used "other" means such as promotions (more hours) based on work performance and attendance, as a way to reward their employees.

"Suggestion system" was used by 30 percent (N=40) of the respondents. Two-thirds (N=44) of the dietitians working for contracted foodservice used this system while 28 percent (N=36) of the other dietitians did the same

($p=0.041$, $X^2 = 4.196$, $df=1$). In response to how many suggestions were accepted last year, the reply ranged from 5 to 25. The type of the reward that was given to the employees whose suggestions were accepted ranged from informal recognition, verbal and written recognition; statement to other employees; and that the most effective suggestion received a $100.00 bonus.

Thirty-six percent (N=49) of the dietitians used "quality circles". Forty-eight percent (N=31) of the dietitians with productivity training used this measure. In contrast, only 25 percent (N=17) of those without productivity training did the same. The dietitians were asked ($p=0.005$, $X^2 = 7.738$, $df=1$) to describe their quality circle group and responses included: regular management meetings; menu planning, training designs; all employee meetings each semester to evaluate the operation needs for improvement; safety committees; building representatives meetings, sharing ideas, cooks and baker's meeting, cashier's meetings; and three established quality circle groups that meet two times a month.

"Incentive system" was used only by seven percent (N=9) of the respondents. The participants were asked to describe the type of incentives that they used and responses included: continuing education program; step system of pay raises for the first four years of employment; salary increment for foodservice certification; and the one individual who made the most cost effective suggestion on a day-to-day basis receives a $100.00 bonus.

Discussion of Quality of Work Life

Quality of work life was measured most frequently by respondents who had training in productivity. Perhaps this is due to the fact that in the last decade QWL has become more popular in the business community and perhpas dietitans with training in productivity are more aware of new techniques and ideas in regard to improving productivity.

The suggestion system was used by the majority of the respondents, perhaps because this technique is not as time consuming and as expensive as other techniques. Directors favored using this QWL measure more so than non-directors.

Provision of supplies, materials, and assistance to employees was a QWL measure used by the majority of respondents who were registered dietitians and the dietitians over 40 years of age.

Quality circles was a measure used by those who had received productivity measurement training. This technique has attracted a great amount of attention in recent years and its affect on productivity is most likely a major topic in such training.

Written job satisfaction questionnaires was used by only 13 percent of the survey respondents. The unpopularity of this measure is perhaps due to the high cost associated with using questionnaires.

Innovation

On the questionnaire, innovation was defined as a deliberate, novel, or specific change aimed at accomplishing the goals of the system more effectively (Mueller, 1971). "Brainstorming" was used by 47 percent (N=64) of the respondents (Table XIII). Two significant associations related to years of experience ($p=0.017$, $X^2=8.106$, $df=1$) and annual salary ($p=0.015$, $X^2=10.482$, $df=3$) were observed (Table XIV). A positive association did exist between the years of experience and use of this method. The more experience the dietitian had, it was more likely for them to use brainstorming. Thirty-six percent (N=20) of the dietitians with one to five years of experience used this measure in comparison to 62 percent (N=34) of those with 16 or more years of experience. Respondents making $40,000 and above annually (N=12, 71%) and those making $20,000 to $29,000 (N=29, 55%) also did favor brainstorming. Only 24 percent (N=5) of the ones making below $15,000 to $19,000 annually used "brainstorming" as a technique.

Forty-two percent (N=57) of the survey respondents used an "active suggestion system". Three significant association were identified. The first association ($p=0.033$, $X^2=4.529$, $df=1$) revealed that none of the fooodservices that prepared foods for meals on wheels used active suggestion system. The second association ($p=0.004$, $X^2=8.380$, $df=1$) revealed that 18 percent (N=5) of the

TABLE XIII

FREQUENCY DISTRIBUTION OF INNOVATIVE TECHNIQUES

Innovative Technique	SFS* Frequency (%)	CUFS** (%)
Brainstorming Sessions	64 (47)	(55)
Active Suggestion System	57 (42)	(36)
Employee Participation at Meetings	112 (82)	(69)
Reward Employee Input	12 (9)	(6)
Incentive Systems	7 (5)	----
Employee Training Seminars	105 (77)	(74)
Other	11 (8)	(1)

* School Foodservice
** College and University Foodservice (Putz, 1985)
---- Not available

TABLE XIV

SIGNIFICANT ASSOCIATIONS FOUND IN INNOVATIVE TECHNIQUES

Innovative Techniques	Factors Showing Association	Respondents Control N	Using Measures %
Brainstorming session	Years of experience ($p=0.017$, $X^2=8.106$, $df=1$)	64	47
	Annual salary ($p=0.015$, $X^2=10.482$, $df=3$)	64	47
Active suggestion system	Prepare Meals on Wheels ($p=0.033$, $X^2=4.529$, $df=1$)	57	42
	Prepare other meals* ($p=0.004$, $X^2=8.380$, $df=1$)	57	42
	Contracted foodservice ($p=0.035$, $X^2=4.424$, $df=1$)	57	42
Employee participation	Age ($p=0.033$, $X^2=4.545$, $df=1$)	112	82
	Route to ADA Membership ($p=0.013$, $X^2=6.200$, $df=1$)	112	82
	Position title ($p=0.033$, $X^2=4.545$, $df=1$)	112	82
	Years of experience ($p=0.032$, $X^2=6.908$, $df=2$)	112	82
Reward employee input	Years of experience ($p=0.017$, $X^2=8.118$, $df=2$)	12	9
	Training in productivity measurement ($p=0.093$, $X^2=2.814$, $df=1$)	12	9
Employee training seminar	Age ($p=0.030$, $X^2=4.682$, $df=1$)	105	77
	Degree ($p=0.015$, $X^2=5.934$, $df=1$)	105	77
	Years of experience ($p=0.008$, $X^2=9.733$, $df=2$)	105	77

TABLE XIV (Continued)

Innovative Techniques	Factors Showing Association	Respondents Control N	Using Measures %
Employee training seminar (continued)	Annual salary ($p=0.028$, $X^2=9.075$, $df=3$)	105	77
	Training in productivity measurement ($p=0.004$, $X^2=8.321$, $df=1$)	105	77
Other innovative techniques	Prepare other meals* ($p=0.004$, $X^2=8.441$, $df=1$)	11	8
Computer, word processor	Degree ($p=0.017$, $X^2=5.676$, $df=1$)	82	60
	Annual salary* ($p=0.001$, $X^2=15.952$, $df=3$)	82	60
New kitchen, new services	Degree ($p=0.022$, $X^2=5.272$, $df=1$)	59	43
	Route to ADA membership ($p=0.044$, $X^2=4.038$, $df=1$)	59	43
Participative management method/quality circles	Degree ($p=0.029$, $X^2=4.749$, $df=1$)	34	25
	Prepare meals for satellite schools ($p=0.017$, $X^2=5.733$, $df=1$)	34	25
New cleaning agents	Route to ADA Membership ($p=0.032$, $X^2=4.623$, $df=1$)	67	50
Other	Route to ADA Membership ($p=0.040$, $X^2=4.228$, $df=1$)	14	10

*Similar associations were found in Putz's study (1985).

foodservices preparing other meals used this innovation technique compared to 48 percent (N=52) of the foodservices that did not prepare other meals. The third significant association (p=0.035, X^2 =4.424, df=1) showed that five out of six contracted foodservices used active suggestion system compared to 40 percent (N=52) of the non-contracted foodservices.

"Employee participating at meetings" was the most popular way to promote innovation (N=112, 82%). Four significant associations related to age (p=0.033, X^2 =4.545, df=1), route to ADA (p=0.013, X^2 =6.200, df=1), position title (P=0.033, X^2 =4..545, df=1), and years of experience (p=0.032, X^2 =6.908, df=2) were identified. Eight-nine percent (N=77) of the dietitians 40 years of age and older favored employee participation compared to 73 percent (N=35) of those under 40 years of age. Dietitians who went through internship used this technique more often (N=64, 90%) than those who did not go through an internship (N=48, 74%). Eighty-eight percent (N=77) of the directors used employee participating to promote innovation compared to 73 percent (N=35) of non-directors. Ninety-three percent (N=51) of the dietitians with 16 or more years of experience favored this technique compared to 75 percent (N=41) of those with one to five years of experience..

Twelve out of 136 participants "rewarded employee input". The dietitians with 12 to 15 years of experience favored this technique much more (N=6, 23%) than the dietitians with five years of experience (N=3, 61%)

($p=0.017$, $X^2=8.118$, $df=1$). Twelve percent (N=8)) of dietitians with productivity training used this technique compared to only four percent (N=3) of those with no training in productivity ($p=0.093$, $X^2=2.814$, $df=1$). "Incentive system" was only used by five percent (N=7) of the respondents.

"Employee training seminars" was another popular technique and it was used by 77 percent (N=105) of the survey participants. Six significant associations were identified. The first association ($p=0.030$, $X^2=4.682$, $df=1$) revealed that 83 percent (N=73) of 40 years or older dietitians and 67 percent (N=32) of under 40 years of age dietitians used this technique. A second association ($p=0.015$, $X^2=5.934$, $df=1$) indicated that six out of seven dietitians with a Master's or a Ph.D. degree used employee training seminars compared to 68 percent (N=45) of the dietitians with a Bachelor's degree. A positive association between this technique and years of experience were identified ($p=0.008$, $X^2=9.733$, $df=2$). Eighty-seven percent (N=48) of the dietitians with 16 or more years of experience favored this measure compared to 64 percent of the dietitians with one to five years of experience. The fifth association was salary ($p=0.028$, $X^2=9.075$, $df=3$). Eighty-four percent (N=38) of the respondents with $30,000 to $39,000 annual salary and 82 percent of those with $45,0000 and above (N=14) used this technique compared to 52 percent (N=11) of those making below $15,000 to $19,000 annually. The last association ($p=0.004$, $X^2=8.321$, $df=1$)

revealed that 88 percent (N=57) of the dietitians with productivity training used employee training seminars compared to 67 percent (N=46) of the dietitians with no productivity training.

Eleven (8%) of the dietitians indicated that they used other techniques such as cross impact matrix, student involvement in menu planning and taste testing to promote innovation. Three out of 14 (21%) foodservices preparing meals for sites other than those listed on the questionnaire used other innovation techniques. In contrast, only five percent (N=5) of the operations that did not prepare other meals answered this question positively.

Sixty percent (N=82) of the dietitians indicated that a "computer or word processor" was added to their operation within the last few years (Table XV). Seventy percent (N=49) of the dietitians with a Master's or a Ph.D. degree and 50 percent of the dietitians with a Bachelor's degree added a computer or a word processor to their operation ($p=0.017$, $X^2 = 5.676$, $df=1$). The dietitians with more salary were more likely to have added a computer to their operation than the ones with less salary. All but one of the dietitians earning $40,000 and above (N=16, 94%) had added a computer to their operation compared to only 33 percent (N=7) of those earning below $15,000 to $19,000 annually ($p=0.001$, $X^2 = 15.952$, $df=3$) (Table XIV).

"New menus and recipes" were added to the operation by 97 percent (N=132) of the respondents and 85 percent

TABLE XV

FREQUENCY DISTRIBUTION OF INNOVATIVE PROCESSES, METHODS, PRODUCTS, OR TECHNOLOGY ADDED TO THE FOODSERVICE SYSTEM

Process/Methods/Products/Technology	SFS* Frequency	(%)	CUFS** (%)
Computer/Word Processor	82	(60)	(56)
New Menus and Recipes	132	(97)	(100)
New Equipment (cooking, catering, etc.)	116	(85)	(87)
New Kitchen/New Services/Etc.	59	(43)	(32)
Participative Management Method/Quality Circle	34	(25)	(17)
New Benefits Plan	67	(50)	(47)
Watt Mizer Light Bulbs	6	(4)	(4)
New Cleaning Agents	67	(50)	(47)
Other	14	(10)	----

* School Foodservice
** College and University Foodservice (Putz, 1985)
---- Not available

(N=116) have added new equipment. Over one-half of the dietitians (N=37, 53%) with a Master's or a Ph.D. degree indicated that they have added a new kitchen or new services to their operation compared to 33 percent (N=22) of those with a Bachelor's degree ($p=0.022$, $X^2=5.272$, $df=1$). Route to ADA membership influenced the addition of a new kitchen or new services within the represented foodservices. Fifty-two percent (N=34) of those who completed their requirement through other means than internship answered this question affirmatively compared to 35 percent (N=25) of those who had gone through an internship ($p=0.044$, $X^2=4.038$, $df=1$).

"Participative management method/quality circles" was used by 25 percent of the survey participants. One out of three (N=23) of the respondents with a Master's or a Ph.D. degree used this innovation technique compared to one out of six (N=11) of those with Bachelor's degrees ($p=0.029$, $X^2=4.749$, $df=1$). An association ($p=0.017$, $X^2=5.733$, $df=1$) revealed that 31 percent (N=28) of the operation preparing meals for satellite schools used participative management/quality circle compared to 13 percent (N=6) of foodservices not preparing meals for satellite schools.

"New benefits plan" was used by 26 percent (N=35) of the dietitians. Only four percent (N=6) of the survey participants made use of the "watt mizer light bulbs".

One-half of the survey participants (N=67, 50%) used new cleaning agents. Route to ADA membership influenced the use of new agents. About three-fifths (N=29, 59%) of

the dietitians who have completed their requirements through other means than internship used new cleaning agents in their operation compared to 41 percent of those who had gone through an internship ($p=0.032$, $X^2=4.623$, $df=1$).

Ten percent of the respondents indicated that they have added other things such as computerized ordering system and cash register; plastic "strip curtains" for walking refrigrator and freezer to conserve energy; and renovation of production and office building; to their operation. Fifteen percent (N=11) of the dietitians who have completed an internship have added other innovative techniques to their foodservice operation compared to only five percent (N=3) of those who did not go through an internship ($p=0.040$, $X^2=4.228$, $df=1$).

Discussion of Innovation

Employee participation at meetings was favored by those who had more years of experience in foodservice and those over 40 years of age. Experience may have shown the positive effects of employee participation on employees' morale. Employee training seminars were also used more by those who had more experience in food service, perhaps for the same reason.

Dietitians with training in productivity measurement also tended to favor using employee training seminars as an innovation technique.in order to promote innovation.

Respondents with higher degrees and higher annual

salaries were more likely to add computers or word processors. This may be due to the fact that the foodservices that can afford to pay their dietitians higher salaries may also have more capital with which to purchase new equipment.

The use of new menus and recipes was an innovative method employed by the majority of the respondents. Higher education seemed to have stressed the importance of work improvement methods and of providing the employees with the needed tools, since the dietitians with M.S. or Ph.D degress tended to place heavy emphasis on adding new equipment into their operation.

Profitability

In this survey instrument, profitability was defined as the earned return on investment (owner equity), or the return on all things a business owns (Rausch, 1982) or the relationship of revenue to costs. In the first part of this section, the respondents were asked to state the formula that they used to measure profitability.

The majority of the respondents answered that they were non-profit organizations and that their main objective is to break even. One stated revenue to cost as the formula that they use in their operation. In the second part of profitability section the question was asked as to what happened when their budget was exceeded and listed 15 response choices. Sixty-four percent (N= 87) indicated that they would control labor cost (Table XVI), while 61

TABLE XVI

END RESULT OF EXCEEDED BUDGET

Results	SFS* Frequency	(%)	CUFS** (%)
Nothing in Particular	4	(3)	(12)
Investigation of Causes and Budget Readjustment	82	(61)	(72)
Written Justification	19	(14)	(22)
Demerits	0	(0)	(0)
Cut-off of Funds	2	(1)	(1)
Price Increases	59	(44)	(21)
Sales Analysis	39	(29)	(16)
Performance Audit	29	(21)	(25)
Review of Funds	47	(35)	(32)
Labor Control	87	(64)	(54)
Inventory Control	74	(55)	(48)
Volume Increase	19	(14)	(6)
Cut Costs	60	(44)	(32)
Portion Controls	58	(43)	(40)
Other	6	(4)	----

* School Foodservice
** College and University Foodservice
---- Not available

percent (N=82) investigate the casues and readadjust the budget.

Fourteen percent (N=19) of the respondents revealed that a "written justification" was required whenever the budget was exceeded. An association ($p=0.034$, $X^2=4.509$, $df=1$) existed between degree attained and the use of this method. Twenty percent (N=14) of the dietitians with Master's or Ph.D. degrees were required to submit a written justification compared to eight percent (N=5) of the dietitians with a Bachelor's degree (Table XVII).

According to this survey, exceeding the budget did not result in "demerits", however, two participants (1%) indicated that "cut of funds was implemented when the budget was exceeded. Forty-four percent (N=59) of the respondents indicated that "price increases" would be the result of an over extended budget. Three significaant associations related to registration status ($p=0.013$, $X^2=6.117$, $df=1$), position title ($p=0.030$, $X^2=4.695$, $df=1$), and annual salary ($p=0.004$, $X^2=13.496$, $df=1$) were observed. Forty-eight percent (N=54) of the registered dietitians cited price increases as a result of over extended budget compared to only 19 percent (N=4) of non-registered dietitians. Over one-half of the directors (N=44, 51%) also indicated that exceeding the budget results in price increases while 31 percent of non-directors answered in the same manner. Eighty-two percent (N=14) of the dietitians earning $40,000 and above also indicated that exceeding the budget causes the food

TABLE XVII

SIGNIFICANT ASSOCIATIONS FOUND IN PROFITABILITY CONTROLS

Profitability Controls	Factors Showing Association	Respondents Control N	Using Measures %
Exceeding budget results in written justification	Degree ($p=0.034$, $X^2=4.509$, $df=1$)	19	14
Exceeding budget results in price increases	Registration status ($p=0.013$, $X^2=6.117$, $df=1$)	59	44
	Position title ($p=0.030$, $X^2=4.695$, $df=1$)	59	44
	Annual Salary ($p=0.004$, $X^2=13.496$, $df=1$)	59	44
Exceeding budget results in sales analysis	Position title ($p=0.006$, $X^2=7.420$, $df=1$)	39	29
	Contracted foodservice ($p=0.003$, $X^2=9.060$, $df=1$)	39	29
Exceeding budget results in performance audit	Degree ($p=0.030$, $X^2=4.712$, $df=1$)	29	21
	Years of experience ($p=0.034$, $X^2=6.771$, $df=2$)	29	21
	Annual Salary ($p=0.020$, $X^2=9.842$, $df=3$)	29	21
Exceeding budget results in labor control	Age ($p=0.046$, $X^2=3.985$, $df=1$)	87	64
	Position title ($p=0.001$, $X^2=11.259$, $df=1$)	87	64
	Prepare Congregate Meals ($p=0.012$, $X^2=6.255$, $df=1$)	87	64
Exceeding budget results in inventory control	Age ($p=0.036$, $X^2=4.377$, $df=1$)	74	55
	Position Title ($p=0.003$, $X^2=9.016$, $df=1$)	74	55

TABLE XVII (Continued)

Profitability Controls	Factors Showing Association	Respondents Control N	Using Measures %
Exceeding budget results in inventory control (continued)	Training in productivity measurement ($p=0.043$, $X^2=4.094$, $df=1$)	74	55
Exceeding budget results in volume increase	Annual Salary ($p=0.042$, $X^2=8.195$, $df=3$)	19	14
Exceeding budget results in cutting costs	Age ($p=0.012$, $X^2=6.273$, $df=1$)	60	44
	Position title ($p=0.008$, $X^2=7.041$, $df=1$)	60	44
Exceeding budget results in portion controls	Position title ($p=0.041$, $X^2=4.170$, $df=1$)	58	43
Meal Prices			
Meal prices determined by food cost and markup	Training in productivity measurement ($p=0.050$, $X^2=3.837$, $df=1$)	15	11
Meal prices determined by food cost and overhead and labor and markup	Degree ($p=0.011$, $X^2=6.537$, $df=1$)	45	33
	Annual Salary (0.010, $X^2=11.380$, $df=3$)	45	33
Meal prices determined by cost of meal, popularity of item	Training in productivity measurement ($p=0.044$, $X^2=4.049$, $df=1$)	15	11
Meal prices determined by volume sold and cost	Age ($p=0.033$, $X^2=4.542$, $df=1$)	8	6

prices to go up in contrast to only 38 percent (N=8) of those dietitians earning below $15,000 to $19,000 annually.

"Sales analysis" was used by 29 percent (N=39) of the respondents. Thirty-seven percent (N=32) of the directors indicated that they used this measure when the budget was over spent, while 15 percent (N=7) of the non-directors did the same ($p=0.006$, $X^2 = 7.420$, $df=1$). All but one of the contracted foodservices used this method (N=5, 83%); whereas, only 26 percent (N=34) of the non-contracted foodservices used sales analysis ($p=0.003$, $X^2 = 9.060$, $df=1$).

Twenty-one percent (N=29) of the respondents indicated that "performance audit" were conducted in order to identify problems with their budgets. Three associations were observed. The first association ($p=0.030$, $X^2 = 4712$, $df=1$) revealed that the dietitians with a Master's or a Ph.D. degree were more likely to conduct an audit (N=20, 29%) than the dietitians with a Bachelor's degree (N=9, 14%). Five out of 13 (N=10, 38%) respondents with 12 to 15 years of experience also favored auditing in order to correct the over extended budget compared to 13 percent (N=7) of the dietitians with one to five years of experience and 22 percent (N=12) of those with 16 or more years of experience ($p=0.034$, $X^2 = 6.771$, $df=1$). The higher the salary of the dietitians, the more likely that they would conduct an audit. Forty-one percent (N=7) of those earning $40,000 and above did use this method compared to 21 percent (N=1) of those earning $20,000 to $29,000

annually. None of the dietitians with the salary of below $15,000 to $19,000 used this method. "Review of funds" was used by 35 percent of the respondents.

The most frequently used method was "labor control" (N=87, 64%). Labor control was implemented by 70 percent (N=62) of the dietitians 40 years or older and 53 percent (N=25) of the dietitians under 40 years of age ($p=0.046$, $X^2=3.985$, $df=1$). The directors were more likely to implement this method (N=65, 75%) than non-directors (N=22, 46%) ($p=0.001$, $X^2=11.259$, $df=1$). Sixty-seven percent (N=86) of the foodservices not preparing congregate meals used labor control as a result of over extended budget compared to only 16 percent (N=1) of those preparing congregate meals ($p=0.012$, $X^2=6.255$, $df=1$).

"Inventory control" was used by more than one-half of the surveyed participants (N=74, 55%). Three significant associations related to age ($p=0.036$, $X^2=4.377$, $df=1$), position title ($p=0.003$, $X^2=9.016$, $df=1$), and training in productivity measurement ($p=0.043$, $X^2=4.094$, $df=1$) were found.

Sixty-one percent (N=54) of the dietitians over the age of 40 used inventory control methods; whereas, 43 percent (N=20) of the dietitians under the age of 40 used the same method similar to the previous method (labor control). Directors were more likely to use inventory control (N=56, 64%) than the non-directors (N=18, 38%), in order to identify and/or correct the exceeding budget. The dietitians who had training in productivity measurement

(N=41, 63%) favored using inventory control more than the ones without training in productivity measurement (N=31, 46%).

Fourteen percent (N=19) of the participants indicated that volume increase was employed when their foodservice exceeded its budget. A negative correlation existed between this method and the salary of the respondents. Twenty-four percent (N=5) of the dietitians earning below $15,000 and $19,000 used this method in contrast to only five percent (N=1) of those earning $40,000 and above employed volume increase as a result of over spent budget ($p=0.042$, $X^2=8.195$, $df=3$).

"Cut costs" was used by 44 percent (N=60) of the respondents. The dietitians over the age 40 favored the use of this method more (N=46, 52%) than the dietitians under the age of 40 (N=14, 30%) ($p=0.012$, $X^2=6.273$, $df=1$). Over one-half of the directors (N=46, 53%) did cut costs as a profit measure compared to 29 percent (N=14) of the non-directors ($p=0.008$, $X^2=7.041$, $df=1$).

"Portion control" was used by 43 percent (N=58) of the respondents. As in many other profitability control methods, directors were more likely to use this method (N=43, 49%) than the non-directors (N=15, 31%) ($p=0.041$, $X^2=4.170$, $df=1$). Four percent of the survey participants indicated that exceeding the budget would result in other control measures such as adjustment of budget the following year, extreme reviewing; and food cost, equipment and labor adjustments.

In the last part of the profitability section, the respondents were asked to indicate how their meal prices were determined. Eleven percent (N=15) used "food cost and mark up" to determine their meal prices (Figure 5). An association ($p=0.050$, $X^2 = 3.837$, $df=1$) was found between this control measure and training in productivity. Fifteen percent (N=10) of the dietitians with no training in productivity measurement favored this method compared to five percent (N=3) of those with productivity measurement training (Table XVII). "Food cost and labor costs" was used by 21 percent (N=28) of the respondents.

"Food cost and overhead and labor and percent markup" was the method most frequently used (N=45, 33%) in this survey. The participants with a Master's or a Ph.D. degree were more likely to use this method (N=30, 43%) than the ones with Bachelor's degrees (N=15, 23%) ($p=0.011$, $X^2 = 6.537$, $df=1$). The dietitians earning $30,000 to $39,000 favored using this method more so than the dietitians in other salary brackets. Forty-nine percent (N=22) of the dietitians in the $30,000 to $39,000 bracket used this method compared to 33 percent of those with the earning of below $15,000 to $19,000 ($p=0.010$, $X^2 = 11.380$, $df=3$).

Eleven percent (N=15) of the participants indicated that they used the "cost of meal, and popularity of item" to determine the meal prices. The dietitians with training in productivity measurement were more apt to use this method (N=11, 17%) than those with no training productivity measurement (N=4, 6%) ($p=0.044$, $X^2 = 4.049$, $df=1$).

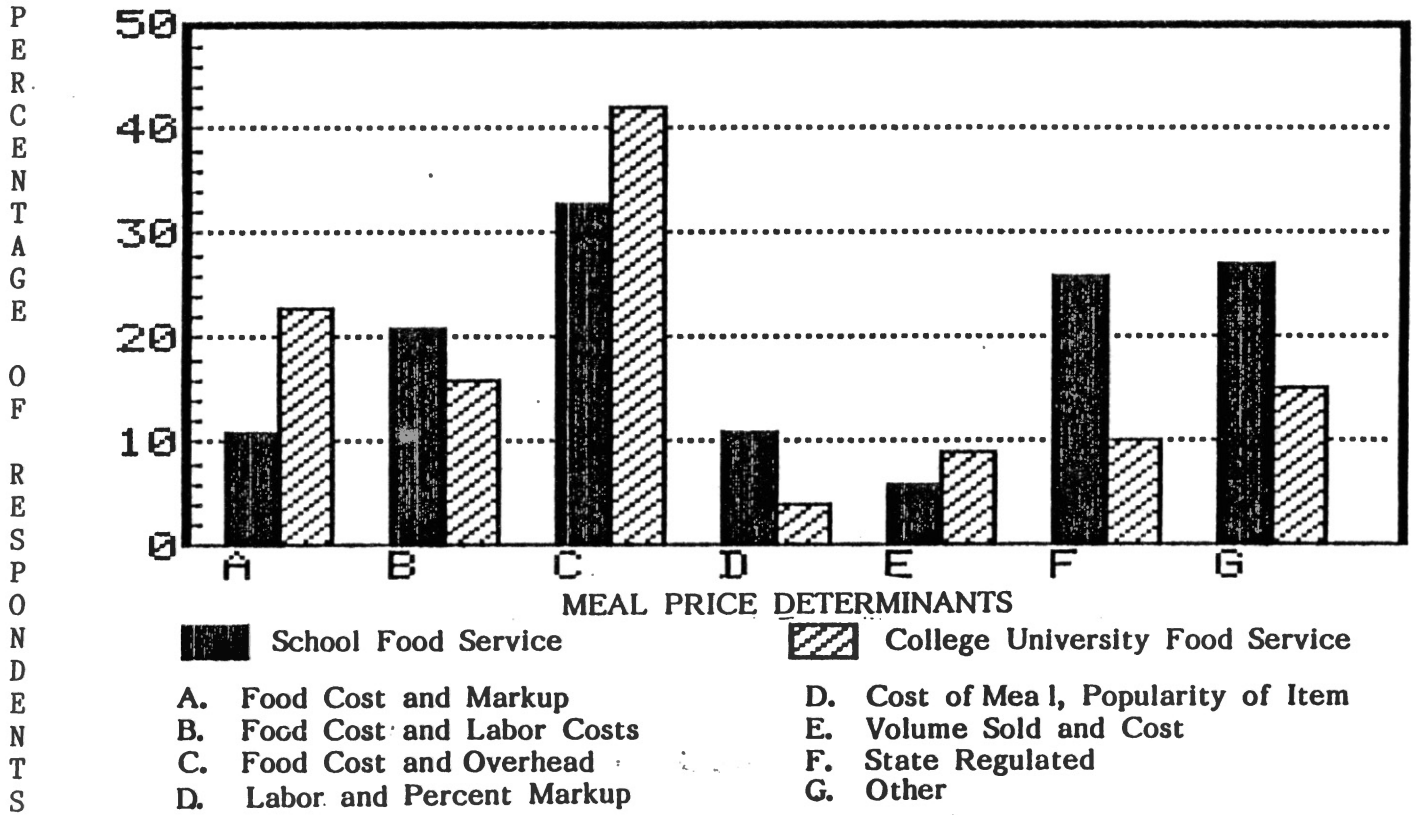

Figure 5. Meal Price Comparison

The "volume sold and cost" was identified as a method of price determination by six percent (N=8) of the respondents and a significant association ($p=0.033$, $X^2=4.542$, df=1) showed that none of the dietitians under 40 years of age used this method compared to 9 percent (N=8) of those over the age of 40 years. Twenty-six percent (N=35) of the respondents indicated that meal prices were "state regulated". Twenty-seven percent (N=36) of the respondents indicated meal prices were determined by "other" ways than those stated in the questionnaire, such as: food, labor and miscellaneus; food, labor and non-food type; "a cost" = 40% of sales price for a la carte; all cost-reimbursement = charge to students; school board regulated; or regulated by congressional reimbursement rates.

Discussion of Profitability

Institutions that prepared meals for congregate meals indicated the use of labor control when their budget was exceeded. Perhaps this is due to limited funds in federally funded agencies.

The most frequently used method for determination of meal prices was the calculation of food costs, overhead, labor, and percent markup. Similar results were reported by Putz (1985) and Lamb (1984). Dietitians with training in productivity tended to use this method more often than those without the training. Perhaps it is common for such training to emphasize the importance of including the cost

of overhead when determining the meal prices.

Performance Criteria Ranking by Time Spent and Importance

In the last two sections of the questionnaire, the respondents were asked to rank the seven performance criteria on the basis of the time spent in evaluating each and how important each is to the successful operation of their foodservice. Quality, productivity, effectiveness and efficiency were all ranked the same in terms of time spent in evaluation and perceived importance. The other three performance criteria were ranked differently depending on time or importance (Table XVIII).

These results are to some degree similar to Putz's (1985) study, but there are also differences too. In both studies, quality was considered to be the most important performance criteria, based on the amount of time spent on evaluation and perceived importance. Under the amount of evaluation time category, Putz's (1985) rankings were similar to this study except for the effectiveness and efficiency criteria (Table XVIII). The performance criteria rankings were also similar under the perceived importance category except for QWL and innovations criteria (Table XVIII).

QWL was considered to be the least important criteria in the evaluation time category and it was ranked fifth (out of seven) in determining the success of the represented foodservices. In the amount of evaluation time

TABLE XVIII

ARITHMETIC MEANS FOR EACH INDIVIDUAL CRITERIA
PERFORMANCE COMPARED TO PERSONAL VARIABLES

	Time Spent/Importance Measures*						
Personal Variables	Q	P	Effect	Eff.	I	Prof.	QWL
Age:							
20-39	1.91/1.89	2.67/2.82	3.42/3.91	3.58/4.07	5.09/5.07	5.56/5.40	5.71/4.84
40-69	2.06/1.76	2.44/2.69	3.67/3.80	3.74/3.79	5.07/5.03	5.44/5.48	5.70/4.99
Degree:							
B.S.	2.33/1.89	2.57/2.75	3.87/3.84	3.51/3.65	5.22/5.10	5.22/5.42	5.40/4.86
M.S. & PhD.	1.71/1.72	2.46/2.72	3.32/3.84	3.84/4.10	4.94/5.00	5.71/5.48	5.99/5.01
Route to ADA Internship	2.01/1.86	2.36/2.74	3.68/5.16	3.68/3.82	5.26/5.16	5.43/5.25	5.72/4.80
Others	2.00/1.75	2.68/2.73	3.48/3.86	3.68/3.86	4.87/4.92	5.52/5.67	5.68/5.10
Title:							
Director	2.06/1.77	2.48/2.70	3.74/4.05	3.57/3.93	5.05/4.91	5.33/5.40	5.70/5.08
Non Director	1.91/1.87	2.58/2.80	3.28/3.44	3.89/3.80	5.13/5.31	5.76/5.56	5.72/4.67
Experience:							
1-10 years	1.89/1.78	2.58/2.85	3.68/3.91	3.64/4.02	5.09/5.19	5.42/5.32	5.57/4.81
12-15 years	2.04/1.60	2.64/2.89	3.24/3.44	3.92/4.08	5.16/4.96	5.04/5.88	5.96/4.68
16 or more years	2.11/1.93	2.39/2.55	3.65/3.96	3.61/3.67	5.02/4.94	5.74/5.89	5.72/5.19
Salary:							
$15,000 - $19,000	1.86/1.76	2.43/2.67	3.71/4.10	3.90/3.67	4.86/5.48	5.86/5.43	5.38/4.90
$20,000 - $29,000	1.86/1.52	2.64/2.94	3.32/3.56	3.62/4.02	4.94/5.06	5.70/5.82	5.80/5.00
$30,000 - $39,000	2.20/2.18	2.09/2.48	3.70/4.84	3.57/4.23	5.18/4.84	5.45/5.28	5.70/4.80
$40,000 and above	2.12/1.71	3.35/2.88	3.88/3.31	3.88/4.12	5.47/5.00	4.41/4.82	5.82/5.18

*Where "1" is high and "7" is low.

category, profitability was ranked sixth and it was perceived to be the least important criteria in determining the success of the represented foodservices. School foodservices are non-profit organizations, hence, profitability is not a priority as compared with other performance criteria.

HYPOTHESIS TESTING

In H1, the respondents salary, training in productivity measurement, and age affected the use of inputs, while age and productivity measurement training affected the use of outputs (Table II). Based on these results, the researcher rejected H1.

Contracted foodservices and meals prepared for sites other than regular foodservice affected the use of inputs and outputs in H2 (Table II), therefore, the researched rejected H2.

In H3, the factors that affected the use of productivity ratios included: annual salary, training in productivity measurement, and years of education (Table II). Due to these associations, the researcher rejected H3.

In H4, meals prepared for sites other than the regular foodservice, and contracted foodservices affected the use of productivity ratios (Table II). Based on these results, H4 was rejected by the researcher.

Route to ADA membership, position title, training in productivity measurement, years of education, and years of

experience affected the measures used to evaluate goal attainment in H5 (Appendix C). Therefore, H5 was rejected by the researcher.

The effectiveness measures used to evaluate goal attainment in H6 were affected by both institutional variables: meals prepaared for sites other than the regular foodservices; and contracted foodservices (Table III). H6 was rejected by the researcher, due to these associations.

The personal variable that affected quality control measures in H7, were the age and the position title of the dietitians (Table V), hence, the researcher rejected H7.

In H8, the institutional variable that affected quality control measures included: contracted foodservices and the meals prepaared for other sites than the regular foodservice (Table V). Based on these results, the researcher rejected H8.

Highest degree obtained did affect the type of resources used to monitor efficiency in H9 (Table VIII). Since only one out of eight personal variables did have an affect on this hypothesis, the researcher failed to reject H9.

In H10 preparing meals for sites other than regular foodservices affected the type of resources used to monitor efficiency. Although only one association was found, the researcher rejected H10 because there were four associations related to preparing meals for congregate meals and preparing meals for satellite schools (Table VIII).

Position title, age, years of experience, and registration status did influence the type of QWL measures used by the dietitians in school foodservice in H11 Table X). Due to these associations, the researcher rejects H11.

No significant difference in the QWL measurements used by dietitians in school foodservice based on institutinal variables were observed. Therefore, the researcher failed to reject H12.

In H13, years of education, registration status, route to ADA membership, salary and training in productivity measurements affected the reward linked with performance measures (Table X). Based on these results, H13 was rejected by the researcher.

The institutional factor which affected the rewards linked with performance in H14 was contracted foodservices (Table X). Since one out of two institutional variables affected the rewards linked with performance, the researcher rejected H14.

In H15, years of experience, annual salary, age, route to ADA membership, position title, training in productivity measurement, and highest degree obtained affected the innovation techniques used by the dietitians in this study (Table XIV), and therefore H15 was rejected.

In H16, both institutional variables, preparing meals for sites other than the regular foodservice and contracted foodservice had an affect on innovation techniques (Table XIV). Based on these results, the researcher rejected H16.

Highest degree obtained, annual salary, route to ADA

membership affected the processes, methods, products or technology used within the last three years in H17 (Table XIV). Due to these associations, the researcher rejected H17.

Processes, methods, products, or technology used within the last three years in H18 were affected by: meals prepared for sites other than the regular foodservice (satellite schools, Table XIV). Based on these results, the researcher rejected H18.

In H19, highest degree obtained, registration status, position title, annual salary, years of experience, age and training in productivity, affected the profitability measures used by dietitians (Table XVII); therefore, the researcher rejected H19.

Contracted foodservice and preparing meals for sites other than the regular foodservice affected the profitability measures used by the respondents (Table XVII). Both of the institutional variables influenced profitability, therefore H20 was rejected.

In H21, training in productivity measurement, highest degree obtained, annual salary, and age affected the meal prices used by dietitians (Table XVII); therefore, the researcher rejected H21.

In H22, there was no significant difference in meal prices used by dietitians in school foodservice based on selected institutional variables (Table XVII); hence, the researcher failed to reject H22.

CHAPTER V

SUMMARY, RECOMMENDATIONS, AND IMPLICATIONS

Introduction

The objectives of this research were: to identify current organizational performance measures used by dietitians in school foodservice systems; to determine the relative importance placed on the criteria and the amount of time spent in evaluating them; to aid in further establishment of organizational performance criteria standards for the foodservice system; and to formulate suggestions as to how these standards may be used by dietitians in school foodservice. To accomplish these objectives, a closed-question instrument was mailed to 593 dietitians who were members of the American Dietitians in School Foodservice. One hundred and thirty-six (22.91) usable responses were received and analyzed using frequency distribution and chi square.

Description of Sample

The majority of the survey participants were 40 years or older (N=88, 651) and 59 percent had 12 or more years of experience. Eighty-four percent of the respondents were registered dietitians and 64 percent of them held the title

of director (Table I).

Sixty-six of the dietitians in this survey had earned a Bachelor's degree, 65 held a Master's degree and three had Ph.Ds (Table I).

About half of the participants became American Dietetic Association Members through internships and 54% were earning between $15,000 and $29,000 a year (Table I). Of all participants in this survey, 49 percent had received training in productivity measurement while 51 percent had not received such training.

Almost all of the foodservices used conventional food service systems (96%). In addition to conventional foodservices, 13 percent used assembly/serve, eight percent used cook/chill, and five percent used cook/freeze foodservice systems. Only six out of the 136 represented foodservices managed by contracted companies. Sixty-five percent of the school foodservices prepared meals for satellite schools, five percent prepared food for congregate meals, four percent prepared meals for Meals on Wheels. In addition, 21 percent prepared meals for other sites such as Headstart, Senior Citizens' Center, School Nutrition Action Program (SNAP), etc. (Figure 1). The respondents did not indicate the number of meals that were served per day.

Performance Criteria

A significant number of respondents controlled all input measures with the exception of the two energy

controls. Only 19 percent of the dietitians were monitoring the energy costs on a regular basis along with eight percent who were monitoring the energy usage of equipment. These findings are similar to results reported by Shaw (1983), Lamb (1984) and Putz (1985). This study showed that the dietitians with training in productivity were more likely to monitor energy usage than other dietitians with no such training. It is possible that the foodservice department is not responsible for monitoring the energy usage and that the records of energy usage are kept by other departments in the school system. Routinely conducting physical inventory of the storeroom was the most widely used input control.

All output measures were being followed regularly by the majority of the respondents with one exception; a computerized cash register was regularly being used by only 43 percent of the respondents. Keeping production records for cateteria and/or catering was being used by 98 percent of the respondents and contrary to the researcher's expectations, the non-contracted foodservices used this control measure more often then the contracted foodservices. Meals served daily was also another popular output control means and was used by 98 percent of the dietitians in the study.

Meals/labor hours worked was the most popular productivity ratio and was related to salary and training in productivity measurement. Since this ratio excludes hours paid but not actually worked, it is considered to be

an accurate measure of productivity.

Setting specific goals and profit and loss statements were the most effective measures used most often at school foodservices and especially by those who prepared food for satellite schools. Developing quality standards for the school foodservices was mainly done by the directors and the respondents who were over 40; also, those who were directors indicated this response more frequently than others.

Purchasing specifications was the most popular quality control measure used by the dietitians in this survey. The dietitians with registered status, holding M.S. or Ph.D degrees, earning $30,000 to $39,000 and working for non-contracted foodservices tended to use this control measure more often than other dietitians. Managers who were in charge of quality control in a majority of the foodservices and state health codes governed the quality standards of more than three-fourths of the represented organizations.

Ninety-eight percent of survey participants monitored labor and material usage in order to control efficiency. Over half of the respondents (58%) measured QWL of employees in their foodservices. Dietitians with training in productivity measured QWL more often than those with no productivity training. Encouraging employees to make suggestions and to participate in projects and goal setting was the most popular QWL method used. Using job satisfaction questionnaires was one of the least popular

methods and was used by only 13 percent of the respondents. Directors were more likely to use this method than non directors. Verbal recognition was the most popular way to reward employees and was used by 94 percent of the surveyed dietitians.

Brainstorming sessions were used by approximately half (47%) of the participants. While new menus and recipes were added to 97 percent of the represented institutions as an innovation techniques. New equipment was added to 85 percent of the school foodservices, while computers or word processors were added to 60 percent of the surveyed insitutions. The participants with graduate degrees and higher incomes were then likely to use the computer/word processor as an innovative method.

As in Lamb's (1984) and Putz's (1985) studies, profitability was not used as much as other control measures. When the budget was exceeded, labor control was administered by the majority of the respondents. Dietitians over 40 year of age and directors were more likely to use this method than other survey respondents. Also, the school not preparing food for congregate meals used this control measure more frequently than the institutions preparing food for congregate meals. Exceeding the budget did not result in demerits. And only two participants indicated that a cut of funds was implemented when the budget was exceeded.

As in Putz's study (1985), the performance criteria, quality, emerged as the most important criteria and also

received the largest amount of evaluation time by the respondents (Table XVIII). Productivity was ranked second out of seven criteria in both time and importance while quality of work life received the least amount of evaluation time.

Recommendations

Questionnaire

Although extreme care was taken in regard to the validity, reliability, objectivity, and applicability of the data gathering instrument, a few points on which clarity could have been improved surfaced during data analysis. These points are outlined as follows to serve as a guide or as suggestions for future researchers:

1. On question 2, page 1, under degree attained, respondents were asked to check their education level (high school, B.S., M.S., Ph.D) and across from their degree, they were asked to write their major. Many checked their degree but wrote their major on a wrong line.

2. Question 12, page 1, asked if respondents had received any training in productivity measurement and if they answered yes, to please specify. Half of the dietitions checked yes, but many did not specify what kind. More information could be obtained if under yes we would have put different ways of getting productivity training such as college curriculum, special seminars, practical training, etc.

3. Question 26, page 3, under the ratio section of the questionnaire, the respondents were asked if they developed any ratios and/or indexes by which to assess productivity. An example of ratio was given and they had to check yes or no . This apparently was not clear for some because they would check "No", but in the next section where they were asked to specify which of the seven

given ratios they were using, they would check one.

Even though a postcard follow-up mailing was sent to dietitians in this survey, the response rate was still low. Probably, a second copy of the questionnaire could have been sent in order to increase the response rate. In question 6, page 1, respondents were asked to check the number of years in food service management positions. This question contained a typographical error: the 11 to 15 years response option was listed incorrectly as 12 to 15 years.

Recommendations Based on the Results of the Study

1. Productivity training had a great effect on many of the control measures. Since productivity is one of the biggest concerns in foodservice, training in this area needs to be emphasized through seminars and educational materials for dietetics students and in continuing education programs for dietetic practitioners.

2. Standardization of ratios being used in foodservices is recommended, so that a data base can be formed and comparison studies can be made between different foodservices at different time periods, e.g., quarterly, annually, etc.

3. Due to the rising energy costs, energy usage in the foodservice department needs to be monitored by dietitians or administrators because their operation could

benefit from productivity ratios which incorporate energy as an input.

4. Quality of work life was not a very important issue to many of the dietitians in this study. Since quality of work life plays a major role in employee productivity, perhaps it should be included in managemnt courses, required for dietetic students, and in seminars for dietetic practioners. Monitoring and maintaining a healthy and happy workplace can impart not only on productivity but on the other performance criteria as well.

Implications

The importance of productivity and the six other organizational performance criteria described in this study cannot be overemphasized. It has become more evident in the productivity studies conducted by Oklahoma State University researchers, that in order to do a performance evaluation at an institution, not only labor, but all four resources, materials, labor, capital, and energy, need to be considered as part of the input resource. Literature on foodservice productivity deals almost exclusively with labor productivity, and emphasizes productivity improvement. How can a manager improve a phenomenon that has not been defined? Productivity measurement needs to be defined for foodservice organizations. Ratios and indexes need to be monitored over time. Certain ratios and indexes may not always be appropriate for a particular foodservice operation, hence, each foodservice manager should perhaps

select and prioritize specific measures to monitor. When results are defined, then improvement strategies can be identified if an improvement is called for.

This study, along with research by Shaw (1983), Pickerel (1984), Lamb (1984), Putz (1985), and Lischke (1986) indicate that organizational performance measures can be identified and measured. The performance measures found in this study need to be shared with all dietitians to make them more aware and knowledgeable concerning the measurement of performance in their foodservice and/or clinical department.

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APPENDIXES

APPENDIX A

CORRESPONDENCE

Oklahoma State University

Department of Food, Nutrition and Institution Administration

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

March 6, 1985

Dear Colleague:

As a foodservice manager, you are well aware that the productivity of the foodservice industry has traditionally been only half that of the manufacturing industry. Perhaps this is due to the sporadic nature of our industry or to the lack of standardization of terminology and/or measurement practices that exist (or are on-going) in foodservices. This is of critical importance to the industry since the first step toward improvement of productivity is measurement of productivity.

This phase of the study examines seven highly inter-related organizational performance criteria (productivity, profitability, quality, quality of worklife, effectiveness, efficiency, and innovation). These criteria differ in importance from one establishment to another. By better understanding the role each criteria plays in our industry, we can better understand the importance of productivity. We would like to know how you view these performance factors and how you evaluate each in your foodservice department. Will you please read the definitions for each criteria carefully and answer the questions with these definitions in mind. The answers from which you will select were generated from two research studies conducted with DPG-41, ADA Members with Management Responsibilities in Health Care Delivery Systems and with the members of the Missouri Restaurant Association.

If you are not involved in the evaluation of organizational performance in your department, will you please pass this survey on to the person who has this responsibility. The forms are coded for analysis only; results will not be identified with your department at any time. After completing the questionnaire please fold, staple and return it to us. We would appreciate hearing from you by March 20, 1985. If you have any questions call us at (405) 624-5039.

Sincerely,

Lea L. Ebro

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

Barbara Putz

Barbara Putz
Graduate Research Assistant

CENTENNIAL DECADE
1980 • 1990

Dear Dietition in School Foodservice:

If you have not yet filled out the green questionairre concerning organizational performance, please disregard the due date. Kindly return the completed questionairre as your input is very important to our study.

Thank-you.

Sincerely,

Fatemeh Nazarieh

Barbara E. Putz
Graduate Research Assistant

APPENDIX B

RESEARCH INSTRUMENT

OKLAHOMA STATE UNIVERSITY
Department of Food, Nutrition and Institution Administration

FOODSERVICE PRODUCTIVITY STUDY

I. General Information

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

1. **Age group:** ____(1) 20-29 ____(2) 30-39 ____(3) 40-49 ____(4) 50-59 ____(5) 60-69

2. **Degrees attained:**

		Major:
____(1) High School Diploma	(5)	_____
____(2) B.S.	(6)	_____
____(3) M.S.	(7)	_____
____(4) Ph.D.	(8)	_____

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

4. **Route to ADA Membership:**

____(1) Internship	____(4) Three year's pre-planned work experience
____(2) CUP Program	____(5) M.S. + 6 months work experience
____(3) Traineeship	____(6) Ph.D. + 6 months work experience

5. **Position Title:**

____(1) Director	____(4) Administrative Dietitian
____(2) Asst. Director	____(5) Dietary Consultant
____(3) Nutritionist	____(6) Other(please specify)_____

6. **Number of years in foodservice management positions:**

____(1) 1 - 5 years	____(3) 12 - 15 years
____(2) 6 - 10 years	____(4) 16 or more years

7. **Annual Salary:**

____(1) Below $15,000	____(5) $30,000 - $34,000
____(2) $15,000 - $19,000	____(6) $35,000 - $39,000
____(3) $20,000 - $24,000	____(7) $40,000 - $44,000
____(4) $25,000 - $29,000	____(8) $45,000 and above

8. **Number of meals served per day:**

____Breakfast	____Dinner
____Lunch	____Other(please specify)_____

9. **Do you prepare meals for any of the following:**

____(1) Satellite schools	____(3) Congregate meals
____(2) Meals on wheels	____(4) Other(please specify)_____

10. **Are your foodservices contracted to a foodservice management company?**
____(1) No ____(2) Yes(please specify) _____

11. **Type of foodservice system:**
____(1) Conventional - menu items prepared from basic ingredients on day they will be served and held in hot or cold state until served.
____(2) Assembly/serve - primarily commercially prepared food purchased in ready-to-serve form.
____(3) Cook/chill - menu items prepared one or more days in advance and held in chilled state until served.
____(4) Cook/freeze - menu items prepared one or more days in advance and held in frozen state until served.

12. **Have you received any training in productivity measurement?**
____(1) No ____(2) Yes (please specify) _____

(over)

II. Performance Criteria

1. PRODUCTIVITY - is defined as the ratio of quantities of outputs to quantities of inputs.

   Directions: Please circle the number which corresponds with the current procedures in your operation.

Which of the following do you use to control inputs?

	Method	Always	Usually	Sometimes	Rarely	Never
(1)	Detailed specifications when purchasing equipment and supplies	1	2	3	4	5
(2)	Check (and appropriately adjust if necessary) labor usage at least quarterly	1	2	3	4	5
(3)	"Comparison shop" for food and supplies	1	2	3	4	5
(4)	Take advantage of seasonal food buys	1	2	3	4	5
(5)	Use of standardized recipes	1	2	3	4	5
(6)	Evaluate kitchen energy costs at least quarterly	1	2	3	4	5
(7)	Monitor energy usage of specific pieces of equipment	1	2	3	4	5
(8)	Routinely conduct physical inventory of storeroom	1	2	3	4	5
(9)	Monitor breakage and pilferage of supplies	1	2	3	4	5
(10)	Periodically review and revise job descriptions in order to prevent duplication of tasks	1	2	3	4	5
(11)	Routinely follow food costs	1	2	3	4	5
(12)	Other (please specify) _____ _____	1	2	3	4	5

Which of the following do you use to control <u>outputs</u>?

	Methods	Always	Usually	Sometimes	Rarely	Never
(13)	Keep production records for cafeteria &/or catering	1	2	3	4	5
(14)	Check production records at least quarterly to see that production is appropriate for demand	1	2	3	4	5
(15)	Check daily census reports and plan production accordingly	1	2	3	4	5
(16)	Have a system for utilizing leftover bulk foods	1	2	3	4	5
(17)	Meals served daily	1	2	3	4	5
(18)	Follow amounts prepared versus amounts served	1	2	3	4	5
(19)	Dollar sales daily	1	2	3	4	5
(20)	Profit and loss statement	1	2	3	4	5
(21)	Computerized cash register	1	2	3	4	5
(22)	Daily operation control sheets	1	2	3	4	5
(23)	Sales last year versus sales this year	1	2	3	4	5
(24)	Customer count daily	1	2	3	4	5
(25)	Other (please specify)	1	2	3	4	5

_____

_____

(26) Do you develop ratios and/or indexes by which to assess productivity?

_____(1) Yes _____(2) No

Exa. Ratio:

$$\frac{\text{Meals produced}}{\text{Labor hours used}}$$

Exa. Index:

$$\frac{\text{Meals produced, 1984}}{\text{Labor hours used, 1984}} \Big/ \frac{\text{Meals produced, 1983}}{\text{Labor hours used, 1983}}$$

(over)

If yes, do you use any of the following ratios? (please check)

_____(27) Meals/labor hours worked
_____(28) Sales/labor hours worked
_____(29) Meals/labor hours paid
_____(30) Sales/labor hours paid
_____(31) Customers/labor hour
_____(32) Meals/total food cost
_____(33) Others (please specify)
_____

If you use the inverse of any of these ratios (i.e., labor hours worked per meal served), please specify which one in the space below:

2. EFFECTIVENESS - is defined as the degree of achievement of objectives.

Example: Goal is to cut labor hours by 10% in the next quarter--labor records show that goal has been reached.

Do you set specific goals for your operation? _____(1) Yes _____(2) No

Which of the following do you use to evaluate goal attainment? (Please check all that apply):

_____(3) Costs and profit (profit and loss statement)
_____(4) Sales volume
_____(5) % profit
_____(6) Increase in sales over previous year
_____(7) Actual performance compared with forecasted performance
_____(8) Personnel audit
_____(9) MBO for managment staff
_____(10) Break goals into small measureable sub-goals
_____(11) Evaluation meetings
_____(12) Administration evaluates goal attainment
_____(13) Personnel statistical reports

3. QUALITY - is defined as the degree to which the system conforms to specifications, or at the consumer level, fitness for use. Example: Meeting health department regulations.

Do you have quality standards which are specific to your operation?

_____(1) Yes _____(2) No

Who developed those standards? (Please check all that apply):

_____(3) Manager
_____(4) Asst. Manager
_____(5) Director
_____(6) Asst. Director
_____(7) Dietitian
_____(8) Production Manager
_____(9) Foodservice Mgt. Company
_____(10) Other(please specify)_____

Which of the following do you use to control quality in your operation?

_____(11) Temperature check of food in steamtable
_____(12) Periodic survey of customers as to quality of foodservice
_____(13) Regular (unannounced) sanitation inspections
_____(14) Taste testing/can cutting of new food items by management
_____(15) Written standards for quality of food
_____(16) Written standards for quality of service
_____(17) Manager personally inspecting all food deliveries
_____(18) Manager personally tasting all cooked foods for quality
_____(19) Purchasing specifications
_____(20) Detailed instructions to employees
_____(21) Menus and charts, production schedules
_____(22) Use of fresh food, if available and economical
_____(23) Other(please specify) _____

Are quality standards discussed with employees at any time beyond their initial training?

_____(24) Yes
_____(25) No

Who is in charge of quality control in your operation? (Please check all that apply):

_____(26) Manager
_____(27) Asst. Manager
_____(28) Production Manager
_____(29) Contract Company
_____(30) Director
_____(31) Asst. Director
_____(32) Dietitian
_____(33) Other (please specify):
_____

Which of the following organizations govern quality standards in your operation? (Please check all that apply):

_____(34) State health codes
_____(35) County health codes
_____(36) City health codes
_____(37) Contract company standards
_____(38) Other (please specify):
_____

(over)

4. EFFICIENCY - is defined as resources expected to be consumed resources actually consumed.

Example: $\frac{\text{\$ budgeted for food, 1984}}{\text{\$ actually spent on food, 1984}}$

Of the following resources, which do you keep records of the amounts used: (Materials include food and supplies)

	Yes	No
(1) Labor	_____	_____
(2) Materials	_____	_____
(3) Capital	_____	_____
(4) Energy	_____	_____

(5) Other (please specify): _____

Do you compare resources used with resource utilization targets?

_____(6) Yes _____(7) No

5. QUALITY OF WORKLIFE (QWL) - is defined as work with meaning, or the degree to which work provides an opportunity for an individual to meet a variety of personal needs, to survive with security, to interact with others, to feel useful, to be recognized for achievement and to have an opportunity to improve one's skill and knowledge. Example: job satisfaction, motivation, pay satisfaction...

Do you measure the quality of worklife in your operation?

_____(1) Yes _____(2) No

Do you perform any of the following? (Please check all that apply):

_____(3) Use written job satisfaction questionnaires

_____(4) Encourage employees to make suggestions, participate and cooperate with management on new projects, problem solving, goal setting, etc.

_____(5) Monitor turnover, absenteeism, and tardiness

_____(6) Make the job more interesting by redesigning, job enrichment, task identification, etc.

_____(7) Provide promotion opportunities

_____(8) Provide supplies, materials, and assistance to employees as needed

Do you link performance to rewards? _____(9) Yes _____(10) No

Which of the following do you use? (Please check all that apply):

_____(11) Raises based upon performance appraisals

_____(12) Commendation letters

_____(13) Verbal recognition

_____(14) Merit pay for management staff

_____(15) Performance awards (non-monetary)

_____(16) Performance awards (monetary)

_____(17) Plaque and certificate or other forms of recognition

_____(18) Recognition in newsletter, newspaper

_____(19) Bonuses (time, pay)

_____(20) Scheduling perferences

_____(21) Other (please specify): _____

Do you use any of the following forms of participative management?

_____(23) Suggestion system (if yes, please tell approximately how many suggestions have been accepted in the last year and what type of reward is given)

_____

_____

_____(24) Quality circles - defined as groups of employees, typically drawn from the same department, who meet regularly to identify, analyze, and solve work-related problems. If you use this (or a variation thereof,) please describe : _____

_____

_____(25) Incentive system (usually in the form of pay plans, but not always) - defined as a plan which ties day-to-day earnings or periodic bonuses directly and automatically to relatiavely objective indices of individual, group, or sometimes oraanizational performance. Please describe: _____

_____

6. INNOVATION - is defined as a deliberate, novel, specific change aimed at accomplishing the goals of the system more effectively.

Which of the following do you use to promote innovation? (Please check all that apply

_____(1) Brainstorming sessions

_____(2) Active suggestion system

_____(3) Employee participation at meetings

_____(4) Reward employee input

_____(5) Incentive systems

_____(6) Employee training seminars

____(7) Other (please specify) _____

Have you added any of the following in your operation within the last few years?

_____(8) Computer, word processor

_____(9) New menus and recipes

_____(10) New equipment (cooking, catering, etc.)

_____(11) New kitchen, new services, etc.

_____(12) Participative mgt. method/quality circles

(over)

_____(13) New benefits plan

_____(14) Watt mizer light bulbs

_____(15) New cleaning agents

_____(16) Other (please specify):_____

7. PROFITABILITY - is defined as the earned return on investment (owner equity), or the return on all things a business owns, or the relationship of revenue to costs. If your organization is for profit, how do you measure profitability? (Please give formulas):

Exceeding the budget in your operation results in:

_____(1) Nothing in particular

_____(2) Investigation of causes and budget readjustment

_____(3) Written justification

_____(4) Demerits

_____(5) Cut-off of funds

_____(6) Price increases

_____(7) Sales analysis

_____(8) Performance audit

_____(9) Review of funds

_____(10) Labor control

_____(11) Inventory control

_____(12) Volume increase

_____(13) Cut costs

_____(14) Portion controls

_____(15) Other (please specify)

_____

How do you determine meal prices?

_____(16) Food cost + markup

_____(17) Food cost + labor costs

_____(18) Food cost + overhead + labor + % markup

_____(19) Cost of meal, popularity of item

_____(20) Volume sold and cost

_____(21) State regulated

_____(22) Other (please specify):

_____

8. Please rate the 7 performance criteria according to how much time you spend evaluating each of them in your operation. Rank (on a scale of 1 to 7), giving the criteria on which you spend the most time a "1" and so on to "7", which is the criteria you spend the least amount of time. Do not use a number twice.

_____Productivity _____Innovation _____Efficiency _____Profitability

_____Quality _____Effectiveness _____Quality of worklife

9. Please rate the 7 performance criteria according to how important they are to the successful operation of your food service. Rank (on a scale of 1 to 7), giving the criteria which you feel is the most important a "1" and so on to "7", which is the criteria you feel is the least important. Do not use a number twice.

_____Productivity _____Innovation _____Efficiency _____Profitability

_____Quality _____Effectiveness _____Quality of worklife

Please check to see if you have completed eight pages.

THANK YOU FOR YOUR PARTICIPATION

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APPENDIX C

CHI SQUARE TABLES

TABLE OF CONTRACT BY PI1

CONTRACT PI1

FREQUENCY	1	2	TOTAL
0	126	4	130
1	4	2	6
TOTAL	130	6	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	12.450	0.000

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF SALARY BY PI2

SALARY PI2

FREQUENCY	1	2	TOTAL
1	11	10	21
2	39	14	53
3	34	11	45
4	17	0	17
TOTAL	101	35	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	11.205	0.011

TABLE OF OTHERMLS BY PI6

OTHERMLS PI6

FREQUENCY	1	2	TOTAL
0	21	87	108
1	11	17	28
TOTAL	32	104	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.865	0.027

TABLE OF SALARY BY PI7

SALARY PI7

FREQUENCY	1	2	TOTAL
1	0	21	21
2	14	39	53
3	3	42	45
4	3	14	17
TOTAL	20	116	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	11.850	0.008

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TRNPRDM BY PI7

TRNPRDM PI7

FREQUENCY	1	2	TOTAL
1	5	64	69
2	14	51	65
TOTAL	19	115	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.618	0.018

TABLE OF TRNPRDM BY PI9

TRNPRDM PI9

FREQUENCY	1	2	TOTAL
1	58	11	69
2	64	1	65
TOTAL	122	12	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.517	0.004

TABLE OF TRNPRDM BY PI10

TRNPRDM PI10

FREQUENCY	1	2	TOTAL
1	47	22	69
2	57	8	65
TOTAL	104	30	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.382	0.007

TABLE OF AGE BY PI11

AGE PI11

FREQUENCY	1	2	TOTAL
1	43	5	48
2	86	2	88
TOTAL	129	7	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.219	0.040

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF SATSCHOL BY PI11

SATSCHOL PI11

FREQUENCY	1	2	TOTAL
0	41	6	47
1	88	1	89
TOTAL	129	7	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.539	0.003

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF CONTRACT BY PO13

CONTRACT PO13

FREQUENCY	1	2	TOTAL
0	128	2	130
1	5	1	6
TOTAL	133	3	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.085	0.014

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF MWHEELS BY PO18

MWHEELS PO18

FREQUENCY	1	2	TOTAL
0	125	5	130
1	4	2	6
TOTAL	129	7	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	10.214	0.001

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF AGE BY PO20

AGE PO20

FREQUENCY	1	2	TOTAL
1	32	16	48
2	79	9	88
TOTAL	111	25	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	11.052	0.001

TABLE OF TRNPRDM BY PO22

TRNPRDM	PO22		
FREQUENCY	1	2	TOTAL
1	53	16	69
2	61	4	65
TOTAL	114	20	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.649	0.006

TABLE OF SALARY BY RATIO26

SALARY	RATIO26		
FREQUENCY	0	1	TOTAL
1	9	12	21
2	7	46	53
3	2	43	45
4	0	17	17
TOTAL	18	118	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	21.668	0.000

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF SATSCHOL BY RATIO26

SATSCHOL	RATIO26		
FREQUENCY	0	1	TOTAL
0	10	37	47
1	8	81	89
TOTAL	18	118	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.044	0.044

TABLE OF SALARY BY RATIO27

SALARY RATIO27

FREQUENCY	0	1	TOTAL
1	12	9	21
2	17	36	53
3	10	35	45
4	3	13	16
TOTAL	42	93	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	9.463	0.024

TABLE OF TRNPRDM BY RATIO27

TRNPRDM RATIO27

FREQUENCY	0	1	TOTAL
1	28	40	68
2	14	51	65
TOTAL	42	91	133

FREQUENCY MISSING = 3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.932	0.015

TABLE OF CONTRACT BY RATIO28

CONTRACT RATIO28

FREQUENCY	0	1	TOTAL
0	107	22	129
1	2	4	6
TOTAL	109	26	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.075	0.003

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF OTHERMLS BY RATIO29

OTHERMLS / FREQUENCY	RATIO29 0	RATIO29 1	TOTAL
0	80	27	107
1	14	14	28
TOTAL	94	41	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.437	0.011

TABLE OF DEGREE BY RATIO30

DEGREE / FREQUENCY	RATIO30 0	RATIO30 1	TOTAL
. 1	63	3	66
2	57	12	69
TOTAL	120	15	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.636	0.018

TABLE OF CONTRACT BY RATIO30

CONTRACT / FREQUENCY	RATIO30 0	RATIO30 1	TOTAL
0	117	12	129
1	3	3	6
TOTAL	120	15	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.615	0.002

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF CONTRACT BY RATIO31

CONTRACT	RATIO31		
FREQUENCY	0	1	TOTAL
0	114	15	129
1	3	3	6
TOTAL	117	18	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.305	0.007

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF SATSCHOL BY EFFCTV3

SATSCHOL	EFFCTV3		
FREQUENCY	0	1	TOTAL
0	16	29	45
1	17	72	89
TOTAL	33	101	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.360	0.037

TABLE OF RTTOADA BY EFFCTV5

RTTOADA	EFFCTV5		
FREQUENCY	0	1	TOTAL
1	56	14	70
2	41	23	64
TOTAL	97	37	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.249	0.039

TABLE OF TITLE BY EFFCTV5

TITLE	EFFCTV5		
FREQUENCY	0	1	TOTAL
1	58	29	87
2	39	8	47
TOTAL	97	37	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.062	0.044

TABLE OF CONGMLS BY EFFCTV5

CONGMLS	EFFCTV5		
FREQUENCY	0	1	TOTAL
0	95	32	127
1	2	5	7
TOTAL	97	37	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.094	0.008

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF CONTRACT BY EFFCTV5

CONTRACT	EFFCTV5		
FREQUENCY	0	1	TOTAL
0	95	33	128
1	2	4	6
TOTAL	97	37	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.793	0.029

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TITLE BY EFFCTV6

TITLE EFFCTV6

FREQUENCY	0	1	TOTAL
1	26	61	87
2	24	23	47
TOTAL	50	84	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.852	0.016

TABLE OF TRNPRDM BY EFFCTV8

TRNPRDM EFFCTV8

FREQUENCY	0	1	TOTAL
1	56	12	68
2	41	23	64
TOTAL	97	35	132

FREQUENCY MISSING = 4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.661	0.017

TABLE OF TITLE BY EFFCTV9

TITLE EFFCTV9

FREQUENCY	0	1	TOTAL
1	72	15	87
2	31	16	47
TOTAL	103	31	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.844	0.028

TABLE OF DEGREE BY EFFCTV10

DEGREE EFFCTV10

FREQUENCY |	0 |	1 |	TOTAL
1 |	54 |	11 |	65
2 |	44 |	25 |	69
TOTAL	98	36	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.351	0.012

TABLE OF RDSTATUS BY EFFCTV10

RDSTATUS EFFCTV10

FREQUENCY |	0 |	1 |	TOTAL
1 |	76 |	34 |	110
2 |	20 |	2 |	22
TOTAL	96	36	132

FREQUENCY MISSING = 4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.400	0.036

TABLE OF TRNPRDM BY EFFCTV12

TRNPRDM EFFCTV12

FREQUENCY |	0 |	1 |	TOTAL
1 |	43 |	25 |	68
2 |	29 |	35 |	64
TOTAL	72	60	132

FREQUENCY MISSING = 4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.272	0.039

TABLE OF EXPERNCE BY EFFCTV13

EXPERNCE EFFCTV13

FREQUENCY	0	1	TOTAL
2	44	9	53
3	23	3	26
4	36	19	55
TOTAL	103	31	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	7.122	0.028

TABLE OF TRNPRDM BY EFFCTV13

TRNPRDM EFFCTV13

FREQUENCY	0	1	TOTAL
1	58	10	68
2	43	21	64
TOTAL	101	31	132

FREQUENCY MISSING = 4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.015	0.014

TABLE OF CONTRACT BY Q1

CONTRACT	Q1		
FREQUENCY	0	1	TOTAL
0	5	120	125
1	2	4	6
TOTAL	7	124	131

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.739	0.002

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF AGE BY Q5

AGE	Q5		
FREQUENCY	0	1	TOTAL
1	15	33	48
2	14	73	87
TOTAL	29	106	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.214	0.040

TABLE OF TITLE BY Q5

TITLE	Q5		
FREQUENCY	0	1	TOTAL
1	10	78	88
2	19	28	47
TOTAL	29	106	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	15.341	0.000

TABLE OF CONTRACT BY Q5

CONTRACT Q5

FREQUENCY |	0 |	1 |	TOTAL
0 |	25 |	104 |	129
1 |	4 |	2 |	6
TOTAL	29	106	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.601	0.006

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST

TABLE OF TITLE BY Q7

TITLE Q7

FREQUENCY |	0 |	1 |	TOTAL
1 |	67 |	21 |	88
2 |	27 |	20 |	47
TOTAL	94	41	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.061	0.024

TABLE OF SATSCHOL BY Q7

SATSCHOL Q7

FREQUENCY |	0 |	1 |	TOTAL
0 |	38 |	9 |	47
1 |	56 |	32 |	88
TOTAL	94	41	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.293	0.038

TABLE OF CONTRACT BY Q9

CONTRACT Q9

FREQUENCY |	0 |	1 |	TOTAL
0 |	128 |	1 |	129
1 |	4 |	2 |	6
TOTAL	132	3	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	27.970	0.000

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF DEGREE BY Q11

DEGREE Q11

FREQUENCY |	0 |	1 |	TOTAL
1 |	18 |	48 |	66
2 |	9 |	61 |	70
TOTAL	27	109	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.437	0.035

TABLE OF SALARY BY Q13

SALARY Q13

FREQUENCY |	0 |	1 |	TOTAL
1 |	2 |	19 |	21
2 |	12 |	41 |	53
3 |	2 |	43 |	45
4 |	1 |	16 |	17
TOTAL	17	119	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	8.504	0.037

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF RTTOADA BY Q14

RTTOADA	Q14		
FREQUENCY	0	1	TOTAL
1	12	59	71
2	3	62	65
TOTAL	15	121	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.220	0.022

TABLE OF DEGREE BY Q15

DEGREE	Q15		
FREQUENCY	0	1	TOTAL
1	35	31	66
2	19	51	70
TOTAL	54	82	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.509	0.002

TABLE OF RTTOADA BY Q15

RTTOADA	Q15		
FREQUENCY	0	1	TOTAL
1	34	37	71
2	20	45	65
TOTAL	54	82	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.153	0.042

TABLE OF SALARY BY Q15

SALARY Q15

FREQUENCY	0	1	TOTAL
1	. 13	8	21
2	23	30	53
3	12	33	45
4	6	11	17
TOTAL	54	82	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	7.958	0.047

TABLE OF CONGMLS BY Q15

CONGMLS Q15

FREQUENCY	0	1	TOTAL
0	54	75	129
1	0	7	7
TOTAL	54	82	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.860	0.027

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF DEGREE BY Q16

DEGREE Q16

FREQUENCY	0	1	TOTAL
1	46	20	66
2	35	35	70
TOTAL	81	55	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.472	0.019

TABLE OF TRNPRDM BY Q16

TRNPRDM Q16

FREQUENCY	0	1	TOTAL
1	50	19	69
2	29	36	65
TOTAL	79	55	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	10.727	0.001

TABLE OF AGE BY Q17

AGE Q17

FREQUENCY	0	1	TOTAL
1	17	31	48
2	16	72	88
TOTAL	33	103	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.020	0.025

TABLE OF SALARY BY Q18

SALARY Q18

FREQUENCY	0	1	TOTAL
1	4	17	21
2	26	27	53
3	11	34	45
4	7	10	17
TOTAL	48	88	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	9.400	0.024

TABLE OF RDSTATUS BY Q19

RDSTATUS Q19

FREQUENCY	0	1	TOTAL
1	5	107	112
2	5	17	22
TOTAL	10	124	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.881	0.003

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF DEGREE BY Q19

DEGREE Q19

FREQUENCY	0	1	TOTAL
1	8	58	66
2	2	68	70
TOTAL	10	126	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.280	0.039

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF SALARY BY Q19

SALARY Q19

FREQUENCY	0	1	TOTAL
1	5	16	21
2	3	50	53
3	1	44	45
4	1	16	17
TOTAL	10	126	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	10.364	0.016

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF CONTRACT BY Q19

CONTRACT Q19

FREQUENCY |	0 |	1 |	TOTAL
0 |	8 |	122 |	130
1 |	2 |	4 |	6
TOTAL	10	126	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.219	0.013

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TRNPRDM BY Q20

TRNPRDM Q20

FREQUENCY |	0 |	1 |	TOTAL
1 |	30 |	39 |	69
2 |	16 |	49 |	65
TOTAL	46	88	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.283	0.022

TABLE OF TRNPRDM BY Q21

TRNPRDM Q21

FREQUENCY |	0 |	1 |	TOTAL
1 |	14 |	55 |	69
2 |	2 |	63 |	65
TOTAL	16	118	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.431	0.002

TABLE OF OTHERMLS BY Q23

OTHERMLS Q23

FREQUENCY	0	1	TOTAL
0	99	9	108
1	22	6	28
TOTAL	121	15	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.886	0.049

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF SALARY BY Q24

SALARY Q24

FREQUENCY	0	1	TOTAL
1	2	19	21
2	0	52	52
3	0	45	45
4	1	16	17
TOTAL	3	132	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	8.405	0.038

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TRNPRDM BY Q27

TRNPRDM Q27

FREQUENCY	0	1	TOTAL
1	64	5	69
2	52	13	65
TOTAL	116	18	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.682	0.030

TABLE OF RDSTATUS BY Q28

RDSTATUS Q28

FREQUENCY	0	1	TOTAL
1	100	12	112
2	16	6	22
TOTAL	116	18	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.336	0.037

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TRNPRDM BY Q28

TRNPRDM Q28

FREQUENCY	0	1	TOTAL
1	64	5	69
2	52	13	65
TOTAL	116	18	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.682	0.030

TABLE OF CONTRACT BY Q29

CONTRACT Q29

FREQUENCY	0	1	TOTAL
0	130	0	130
1	5	1	6
TOTAL	135	1	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	21.827	0.000

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TITLE BY Q30

TITLE Q30

FREQUENCY	0	1	TOTAL
1	16	72	88
2	26	22	48
TOTAL	42	94	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	18.842	0.000

TABLE OF SALARY BY Q30

SALARY Q30

FREQUENCY	0	1	TOTAL
1	9	12	21
2	13	40	53
3	10	35	45
4	10	7	17
TOTAL	42	94	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	10.212	0.017

TABLE OF TITLE BY Q31

TITLE Q31

FREQUENCY	0	1	TOTAL
1	74	14	88
2	32	16	48
TOTAL	106	30	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.485	0.019

TABLE OF TITLE BY Q32

TITLE	Q32		
FREQUENCY	0	1	TOTAL
1	74	14	88
2	27	21	48
TOTAL	101	35	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	12.596	0.000

TABLE OF TITLE BY Q33

TITLE	Q33		
FREQUENCY	0	1	TOTAL
1	72	16	88
2	31	17	48
TOTAL	103	33	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.020	0.025

TABLE OF EXPERNCE BY Q33

EXPERNCE	Q33		
FREQUENCY	0	1	TOTAL
2	44	11	55
3	23	3	26
4	36	19	55
TOTAL	103	33	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	5.999	0.050

TABLE OF SALARY BY Q33

SALARY	Q33		
FREQUENCY	0	1	TOTAL
1	18	3	21
2	47	6	53
3	28	17	45
4	10	7	17
TOTAL	103	33	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	13.087	0.004

TABLE OF CONGMLS BY Q33

CONGMLS	Q33		
FREQUENCY	0	1	TOTAL
0	100	29	129
1	3	4	7
TOTAL	103	33	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.341	0.037

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF RTTOADA BY Q34

RTTOADA	Q34		
FREQUENCY	0	1	TOTAL
1	20	51	71
2	9	56	65
TOTAL	29	107	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.149	0.042

TABLE OF TITLE BY Q34

TITLE Q34

FREQUENCY	0	1	TOTAL
1	13	75	88
2	16	32	48
TOTAL	29	107	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.378	0.012

TABLE OF SALARY BY Q35

SALARY Q35

FREQUENCY	0	1	TOTAL
1	12	9	21
2	27	26	53
3	18	27	45
4	2	15	17
TOTAL	59	77	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	9.981	0.019

TABLE OF DEGREE BY Q36

DEGREE Q36

FREQUENCY	0	1	TOTAL
1	51	15	66
2	37	33	70
TOTAL	88	48	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.867	0.003

TABLE OF SATSCHOL BY Q36

SATSCHOL	Q36		
FREQUENCY	0	1	TOTAL
0	36	11	47
1	52	37	89
TOTAL	88	48	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.446	0.035

TABLE OF CONTRACT BY Q37

CONTRACT	Q37		
FREQUENCY	0	1	TOTAL
0	130	0	130
1	1	5	6
TOTAL	131	5	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	112.468	0.000

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF RDSTATUS BY Q38

RDSTATUS	Q38		
FREQUENCY	0	1	TOTAL
1	71	41	112
2	19	3	22
TOTAL	90	44	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.399	0.036

TABLE OF CONGMLS BY EFFIC2

CONGMLS / FREQUENCY	EFFIC2 0	EFFIC2 1	TOTAL
0	1	126	127
1	1	6	7
TOTAL	2	132	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.222	0.004

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF DEGREE BY EFFIC3

DEGREE / FREQUENCY	EFFIC3 0	EFFIC3 1	TOTAL
1	17	45	62
2	7	63	70
TOTAL	24	108	132

FREQUENCY MISSING = 4

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.706	0.010

TABLE OF DEGREE BY EFFIC4

DEGREE / FREQUENCY	EFFIC4 0	EFFIC4 1	TOTAL
1	52	7	59
2	45	21	66
TOTAL	97	28	125

FREQUENCY MISSING = 11

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.136	0.008

TABLE OF CONGMLS BY EFFIC4

CONGMLS / FREQUENCY	EFFIC4 0	EFFIC4 1	TOTAL
0	94	24	118
1	3	4	7
TOTAL	97	28	125

FREQUENCY MISSING = 11

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.149	0.023

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF SATSCHOL BY EFFIC6

SATSCHOL / FREQUENCY	EFFIC6 0	EFFIC6 1	TOTAL
0	23	23	46
1	25	58	83
TOTAL	48	81	129

FREQUENCY MISSING = 7

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.006	0.025

TABLE OF TRNPRDM BY QWL1

TRNPRDM	QWL1		
FREQUENCY	0	1	TOTAL
1	36	31	67
2	19	43	62
TOTAL	55	74	129

FREQUENCY MISSING = 7

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.017	0.008

TABLE OF TITLE BY QWL4

TITLE	QWL4		
FREQUENCY	0	1	TOTAL
1	2	86	88
2	5	42	47
TOTAL	7	128	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.361	0.037

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF AGE BY QWL7

AGE	QWL7		
FREQUENCY	0	1	TOTAL
1	19	28	47
2	12	76	88
TOTAL	31	104	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	12.429	0.000

TABLE OF EXPERNCE BY QWL7

EXPERNCE QWL7

FREQUENCY	0	1	TOTAL
2	17	38	55
3	8	17	25
4	6	49	55
TOTAL	31	104	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	7.635	0.022

TABLE OF AGE BY QWL8

AGE QWL8

FREQUENCY	0	1	TOTAL
1	8	39	47
2	5	83	88
TOTAL	13	122	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.527	0.033

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF RDSTATUS BY QWL8

RDSTATUS QWL8

FREQUENCY	0	1	TOTAL
1	7	104	111
2	5	17	22
TOTAL	12	121	133

FREQUENCY MISSING = 3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.032	0.014

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF RDSTATUS BY QWL9

RDSTATUS QWL9

FREQUENCY	0	1	TOTAL
1	36	65	101
2	13	9	22
TOTAL	49	74	123

FREQUENCY MISSING = 13

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.144	0.042

TABLE OF TRNPRDM BY QWL9

TRNPRDM QWL9

FREQUENCY	0	1	TOTAL
1	32	34	66
2	17	41	58
TOTAL	49	75	124

FREQUENCY MISSING = 12

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.749	0.029

TABLE OF CONTRACT BY QWL11

CONTRACT QWL11

FREQUENCY	0	1	TOTAL
0	95	34	129
1	1	5	6
TOTAL	96	39	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.060	0.003

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF RDSTATUS BY QWL12

RDSTATUS QWL12

FREQUENCY	0	1	TOTAL
1	47	64	111
2	16	6	22
TOTAL	63	70	133

FREQUENCY MISSING = 3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.799	0.009

TABLE OF DEGREE BY QWL15

DEGREE QWL15

FREQUENCY	0	1	TOTAL
1	54	12	66
2	40	30	70
TOTAL	94	42	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.690	0.002

TABLE OF RTTOADA BY QWL15

RTTOADA QWL15

FREQUENCY	0	1	TOTAL
1	55	16	71
2	39	26	65
TOTAL	94	42	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.849	0.028

TABLE OF TRNPRDM BY QWL16

TRNPRDM	QWL16		
FREQUENCY	0	1	TOTAL
1	61	8	69
2	64	1	65
TOTAL	125	9	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.402	0.020

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF SALARY BY QWL17

SALARY	QWL17		
FREQUENCY	0	1	TOTAL
1	19	2	21
2	31	22	53
3	27	18	45
4	9	8	17
TOTAL	86	50	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	8.194	0.042

TABLE OF RTTOADA BY QWL18

RTTOADA	QWL18		
FREQUENCY	0	1	TOTAL
1	56	15	71
2	37	28	65
TOTAL	93	43	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.562	0.006

TABLE OF CONTRACT BY QWL19

CONTRACT	QWL19		
FREQUENCY	0	1	TOTAL
0	127	3	130
1	5	1	6
TOTAL	132	4	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.142	0.042

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF CONTRACT BY QWL23

CONTRACT	QWL23		
FREQUENCY	0	1	TOTAL
0	94	36	130
1	2	4	6
TOTAL	96	40	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.196	0.041

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TRNPRDM BY QWL24

TRNPRDM	QWL24		
FREQUENCY	0	1	TOTAL
1	52	17	69
2	34	31	65
TOTAL	86	48	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.738	0.005

TABLE OF EXPERNCE BY INNOV1

EXPERNCE FREQUENCY | INNOV1 0	INNOV1 1	TOTAL
2	35	20	55
3	16	10	26
4	21	34	55
TOTAL	72	64	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	8.106	0.017

TABLE OF SALARY BY INNOV1

SALARY FREQUENCY | INNOV1 0	INNOV1 1	TOTAL
1	16	5*	21
2	24	29	53
3	27	18	45
4	5	12	17
TOTAL	72	64	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	10.482	0.015

TABLE OF MWHEELS BY INNOV2

MWHEELS FREQUENCY | INNOV2 0	INNOV2 1	TOTAL
0	73	57	130
1	6	0	6
TOTAL	79	57	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.529	0.033

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF OTHERMLS BY INNOV2

OTHERMLS	INNOV2		
FREQUENCY	0	1	TOTAL
0	56	52	108
1	23	5	28
TOTAL	79	57	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.380	0.004

TABLE OF CONTRACT BY INNOV2

CONTRACT	INNOV2		
FREQUENCY	0	1	TOTAL
0	78	52	130
1	1	5	6
TOTAL	79	57	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.424	0.035

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF AGE BY INNOV3

AGE	INNOV3		
FREQUENCY	0	1	TOTAL
1	13	35	48
2	11	77	88
TOTAL	24	112	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.545	0.033

TABLE OF RTTOADA BY INNOV3

RTTOADA	INNOV3		
FREQUENCY	0	1	TOTAL
1	7	64	71
2	17	48	65
TOTAL	24	112	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.200	0.013

TABLE OF TITLE BY INNOV3

TITLE	INNOV3		
FREQUENCY	0	1	TOTAL
1	11	77	88
2	13	35	48
TOTAL	24	112	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.545	0.033

TABLE OF EXPERNCE BY INNOV3

EXPERNCE	INNOV3		
FREQUENCY	0	1	TOTAL
2	14	41	55
3	6	20	26
4	4	51	55
TOTAL	24	112	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	6.908	0.032

TABLE OF EXPERNCE BY INNOV4

EXPERNCE INNOV4

FREQUENCY	0	1	TOTAL
2	52	3	55
3	20	6	26
4	52	3	55
TOTAL	124	12	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	8.118	0.017

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TRNPRDM BY INNOV4

TRNPRDM INNOV4

FREQUENCY	0	1	TOTAL
1	66	3	69
2	57	8	65
TOTAL	123	11	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	2.814	0.093

TABLE OF AGE BY INNOV6

AGE INNOV6

FREQUENCY	0	1	TOTAL
1	16	32	48
2	15	73	88
TOTAL	31	105	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.682	0.030

TABLE OF DEGREE BY INNOV6

DEGREE	INNOV6		
FREQUENCY	0	1	TOTAL
1	21	45	66
2	10	60	70
TOTAL	31	105	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.934	0.015

TABLE OF EXPERNCE BY INNOV6

EXPERNCE	INNOV6		
FREQUENCY	0	1	TOTAL
2	20	35	55
3	4	22	26
4	7	48	55
TOTAL	31	105	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	9.733	0.008

TABLE OF SALARY BY INNOV6

SALARY	INNOV6		
FREQUENCY	0	1	TOTAL
1	10	11	21
2	11	42	53
3	7	38	45
4	3	14	17
TOTAL	31	105	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	9.075	0.028

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF TRNPRDM BY INNOV6

TRNPRDM	INNOV6		
FREQUENCY	0	1	TOTAL
1	23	46	69
2	8	57	65
TOTAL	31	103	134

FREQUENCY MISSING = 2

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.321	0.004

TABLE OF OTHERMLS BY INNOV7

OTHERMLS	INNOV7		
FREQUENCY	0	1	TOTAL
0	103	5	108
1	22	6	28
TOTAL	125	11	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.441	0.004

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF DEGREE BY INNOV8

DEGREE	INNOV8		
FREQUENCY	0	1	TOTAL
1	33	33	66
2	21	49	70
TOTAL	54	82	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.676	0.017

TABLE OF SALARY BY INNOV8

SALARY	INNOV8		
FREQUENCY	0	1	TOTAL
1	14	7	21
2	24	29	53
3	15	30	45
4	1	16	17
TOTAL	54	82	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	15.952	0.001

TABLE OF DEGREE BY INNOV11

DEGREE	INNOV11		
FREQUENCY	0	1	TOTAL
1	44	22	66
2	33	37	70
TOTAL	77	59	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.272	0.022

TABLE OF RTTOADA BY INNOV11

RTTOADA	INNOV11		
FREQUENCY	0	1	TOTAL
1	46	25	71
2	31	34	65
TOTAL	77	59	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.038	0.044

TABLE OF DEGREE BY INNOV12

DEGREE INNOV12

FREQUENCY	0	1	TOTAL
1	55	11	66
2	47	23	70
TOTAL	102	34	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.749	0.029

TABLE OF SATSCHOL BY INNOV12

SATSCHOL INNOV12

FREQUENCY	0	1	TOTAL
0	41	6	47
1	61	28	89
TOTAL	102	34	136

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.733	0.017

TABLE OF RTTOADA BY INNOV15

RTTOADA INNOV15

FREQUENCY	0	1	TOTAL
1	42	29	71
2	26	38	64
TOTAL	68	67	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.623	0.032

TABLE OF RTTOADA BY INNOV16

RTTOADA	INNOV16		
FREQUENCY	0	1	TOTAL
1	60	11	71
2	61	3	64
TOTAL	121	14	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.228	0.040

TABLE OF DEGREE BY EXCBUD3

DEGREE	EXCBUD3		
FREQUENCY	0	1	TOTAL
1	61	5	66
2	55	14	69
TOTAL	116	19	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.509	0.034

TABLE OF TITLE BY EXCBUD6

TITLE EXCBUD6

FREQUENCY	0	1	TOTAL
1	43	44	87
2	33	15	48
TOTAL	76	59	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.695	0.030

TABLE OF RDSTATUS BY EXCBUD6

RDSTATUS EXCBUD6

FREQUENCY	0	1	TOTAL
1	58	54	112
2	17	4	21
TOTAL	75	58	133

FREQUENCY MISSING = 3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.117	0.013

TABLE OF SALARY BY EXCBUD6

SALARY EXCBUD6

FREQUENCY	0	1	TOTAL
1	13	8	21
2	29	23	52
3	31	14	45
4	3	14	17
TOTAL	76	59	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	13.496	0.004

TABLE OF TITLE BY EXCBUD7

TITLE	EXCBUD7		
FREQUENCY	0	1	TOTAL
1	55	32	87
2	41	7	48
TOTAL	96	39	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.420	0.006

TABLE OF CONTRACT BY EXCBUD7

CONTRACT	EXCBUD7		
FREQUENCY	0	1	TOTAL
0	95	34	129
1	1	5	6
TOTAL	96	39	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.060	0.003

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF DEGREE BY EXCBUD8

DEGREE	EXCBUD8		
FREQUENCY	0	1	TOTAL
1	57	9	66
2	49	20	69
TOTAL	106	29	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.712	0.030

TABLE OF EXPERNCE BY EXCBUD8

EXPERNCE EXCBUD8

FREQUENCY	0	1	TOTAL
2	47	7	54
3	16	10	26
4	43	12	55
TOTAL	106	29	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	6.771	0.034

TABLE OF SALARY BY EXCBUD8

SALARY EXCBUD8

FREQUENCY	0	1	TOTAL
1	21	0	21
2	41	11	52
3	34	11	45
4	10	7	17
TOTAL	106	29	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	9.892	0.020

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF AGE BY EXCBUD10

AGE EXCBUD10

FREQUENCY	0	1	TOTAL
1	22	25	47
2	26	62	88
TOTAL	48	87	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.985	0.046

TABLE OF TITLE BY EXCBUD10

TITLE EXCBUD10

FREQUENCY	0	1	TOTAL
1	22	65	87
2	26	22	48
TOTAL	48	87	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	11.259	0.001

TABLE OF CONGMLS BY EXCBUD10

CONGMLS EXCBUD10

FREQUENCY	0	1	TOTAL
0	43	86	129
1	5	1	6
TOTAL	48	87	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.255	0.012

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF AGE BY EXCBUD11

AGE EXCBUD11

FREQUENCY	0	1	TOTAL
1	27	20	47
2	34	54	88
TOTAL	61	74	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.377	0.036

TABLE OF TITLE BY EXCBUD11

TITLE EXCBUD11

FREQUENCY |	0 |	1 |	TOTAL
1 |	31 |	56 |	87
2 |	30 |	18 |	48
TOTAL	61	74	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	9.016	0.003

TABLE OF TRNPRDM BY EXCBUD11

TRNPRDM EXCBUD11

FREQUENCY |	0 |	1 |	TOTAL
1 |	37 |	31 |	68
2 |	24 |	41 |	65
TOTAL	61	72	133

FREQUENCY MISSING = 3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.094	0.043

TABLE OF SALARY BY EXCBUD12

SALARY EXCBUD12

FREQUENCY |	0 |	1 |	TOTAL
1 |	16 |	5 |	21
2 |	41 |	11 |	52
3 |	43 |	2 |	45
4 |	16 |	1 |	17
TOTAL	116	19	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	8.195	0.042

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF AGE BY EXCBUD13

AGE EXCBUD13

FREQUENCY	0	1	TOTAL
1	33	14	47
2	42	46	88
TOTAL	75	60	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.273	0.012

TABLE OF TITLE BY EXCBUD13

TITLE EXCBUD13

FREQUENCY	0	1	TOTAL
1	41	46	87
2	34	14	48
TOTAL	75	60	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.041	0.008

TABLE OF TITLE BY EXCBUD14

TITLE EXCBUD14

FREQUENCY	0	1	TOTAL
1	44	43	87
2	33	15	48
TOTAL	77	58	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.170	0.041

TABLE OF TRNPRDM BY EXCBUD16

TRNPRDM	EXCBUD16		
FREQUENCY	0	1	TOTAL
1	58	10	68
2	62	3	65
TOTAL	120	13	133

FREQUENCY MISSING = 3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.837	0.050

TABLE OF DEGREE BY EXCBUD18

DEGREE	EXCBUD18		
FREQUENCY	0	1	TOTAL
1	51	15	66
2	39	30	69
TOTAL	90	45	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.537	0.011

TABLE OF SALARY BY EXCBUD18

SALARY	EXCBUD18		
FREQUENCY	0	1	TOTAL
1	14	7	21
2	43	9	52
3	23	22	45
4	10	7	17
TOTAL	90	45	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	3	11.380	0.010

TABLE OF TRNPRDM BY EXCBUD19

TRNPRDM	EXCBUD19		
FREQUENCY	0	1	TOTAL
1	64	4	68
2	54	11	65
TOTAL	118	15	133

FREQUENCY MISSING = 3

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.049	0.044

TABLE OF AGE BY EXCBUD20

AGE	EXCBUD20		
FREQUENCY	0	1	TOTAL
1	47	0	47
2	80	8	88
TOTAL	127	8	135

FREQUENCY MISSING = 1

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.542	0.033

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

VITA 2

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