

EFFECTIVENESS, QUALITY, QUALITY OF WORK  
LIFE AND INNOVATION AS PERFORMANCE  
MEASURES IN RESTAURANTS

By

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## CHAPTER I

### INTRODUCTION

The key to performance improvement is measurement. Lord Kelvin once said (Yale Management Guide to Productivity, 1979, p. 2): "When you can measure what you are speaking about and express it in numbers, you know something about it, but when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind." Most food service managers are unable to measure performance, due to their lack of understanding of performance and its seven criteria.

This situation was discovered by both Robertson (1982) and Shaw (1983), whose research were part of the Food, Nutrition and Institution Administration Department at Oklahoma State University's study into productivity in the food service industry. Robertson researched the various productivity measures used by dietitians and supervisors in hospitals, while Shaw researched members of the American Dietetic Association with management responsibilities in health care delivery systems.

As determined by Robertson (1982), productivity measures used in hospitals were actually indicators of other performance criteria, such as effectiveness and efficiency, or indices of quality of work life, such as absenteeism or turnover. These performance criteria were indicated by Shaw (1983) to be effectiveness, quality, quality of work life, innovation, productivity, profitability and efficiency (Figure

1). The relationship between these seven performance criteria is an interchangeable one, as explained in the review of literature.

#### Purpose of the Research

The purpose in this research was to discover what methods of measuring the seven performance criteria are currently being used by the restaurant industry. This research is a twin study; hence, four of the performance criteria will be emphasized by this researcher, while Lamb (1984) will concentrate on the study of productivity, profitability and efficiency. Effectiveness, quality, quality of work life and innovation will comprise the majority of information in this research report.

#### Objectives of the Study

The objectives in this research were:

1. Identification of the specific methods used by the Missouri Restaurant Association members for the measurement of performance.
2. Assessment of effectiveness, quality, quality of work life and innovation and their measurement in Missouri restaurants, so that standard measures may be developed which will aid in the development of improved strategies for restaurants.
3. Assessment of the relative importance and the time spent on each criteria.
4. Formulation of suggestions as to how standards may be used by restaurant managers.

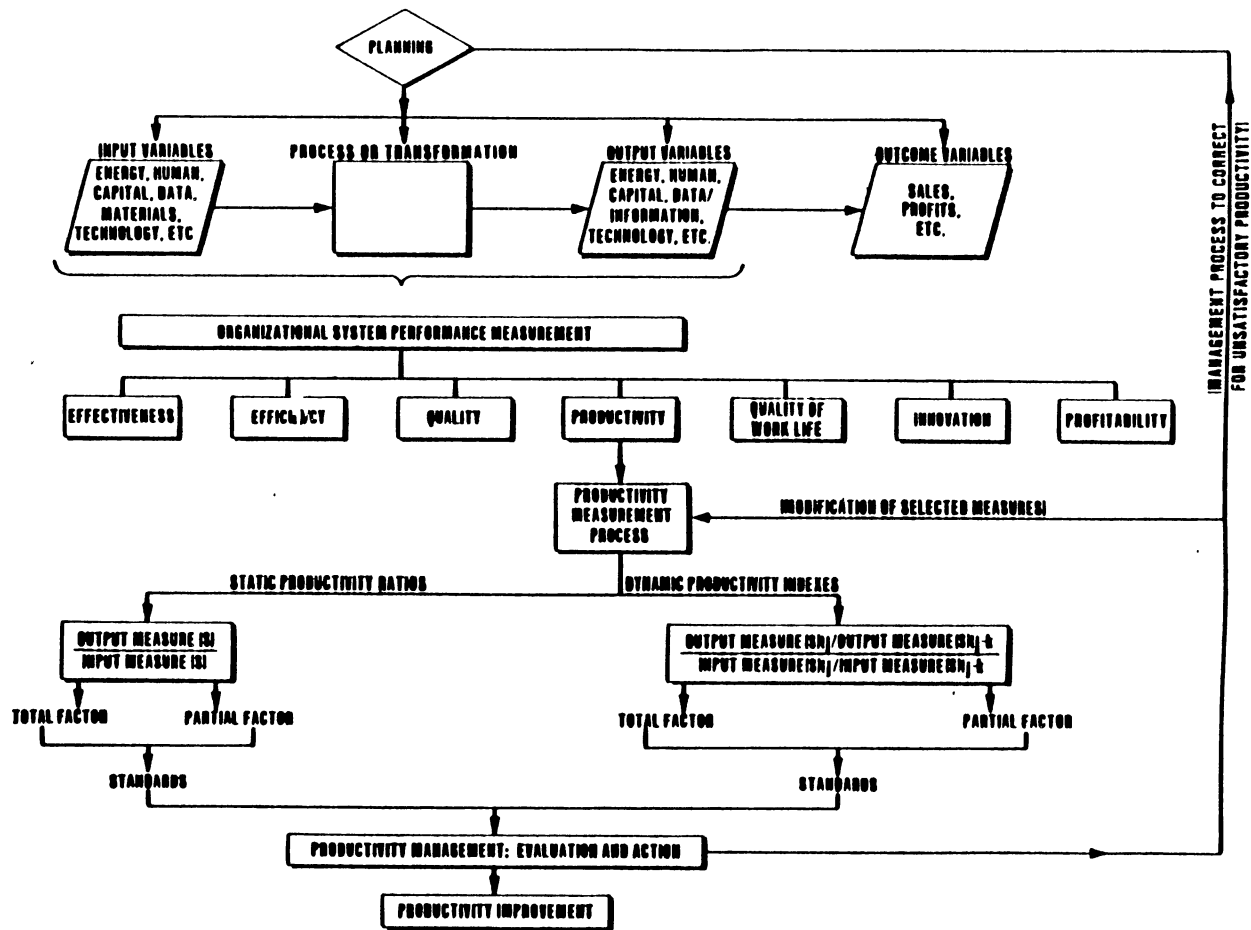


Figure 1. The Productivity Management Process

## Hypotheses of the Study

The hypotheses postulated for this study were:

H<sub>1</sub> - There will be no significant difference in the effectiveness measures used to evaluate goal attainment by restaurateurs based on selected personal variables of:

- a. age
- b. years of education
- c. position title
- d. number of years experience
- e. training in productivity measurement

H<sub>2</sub> - There will be no significant difference in the effectiveness measures used to evaluate goal attainment by restaurateurs based on the following selected restaurant variables:

- a. type of restaurant
- b. seating capacity
- c. average check charge/person
- d. average yearly income

H<sub>3</sub> - There will be no significant difference in the quality control measures used by restaurateurs based on personal variables as stated in H<sub>1</sub>.

H<sub>4</sub> - There will be no significant difference in the quality control measures used by restaurateurs based on restaurant variables as stated in H<sub>2</sub>.

H<sub>5</sub> - There will be no significant difference in the QWL measurements used by restaurateurs based on the personal variables as stated in H<sub>1</sub>.



H<sub>6</sub> - There will be no significant difference in the QWL measurements used by restaurateurs based on the restaurant variables as stated in H<sub>2</sub>.

H<sub>7</sub> - There will be no significant difference in the rewards linked with performance measures used by restaurateurs based on personal variables as stated in H<sub>1</sub>.

H<sub>8</sub> - There will be no significant difference in the rewards linked with performance measures used by restaurateurs based on restaurant variables as stated in H<sub>2</sub>.

H<sub>9</sub> - there will be no significant difference in the innovation techniques used by restaurateurs based on personal variables as stated in H<sub>1</sub>.

H<sub>10</sub> - There will be no significant difference in the innovation techniques used by restaurateurs based on restaurant variables as stated in H<sub>2</sub>.

H<sub>11</sub> - There will be no significant difference in the processes, methods, products or technology used within the last three years by restaurateurs based on personal variables as stated in H<sub>1</sub>.

H<sub>12</sub> - There will be no significant difference in the processes, methods, products or technology used within the last three years by restaurateurs based on restaurant variables as stated in H<sub>2</sub>.

#### Assumptions and Limitations of the Study

The following assumptions were made in this study:

1. Restaurant managers surveyed have adequate understanding of performance measures to objectively respond to the questionnaire.

2. Responses to the questionnaire will be based on fact, and not the perceived correct responses as assumed by the restaurant manager.

There was only one limitation accepted for the study: only members of the Missouri Restaurant Association will be surveyed. Results will only be generalized to this group.

#### Definition of Terms

The following definitions were accepted for this study:

Commercial Food Service. Those establishments which are open to the public, are operated for profit and which may operate facilities and/or supply meal service on a regular basis for others (West et al., 1977).

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

Efficiency. The relationship between achievement of objectives and consumption of resources (Smalley and Freeman, 1966).

Fast Food. Restaurants that follow a limited menu and highly standardized service, ranging from speciality houses offering only one or a few items, to drive-ins and other kinds of fast-food service (Stokes, 1974).

Family Restaurant. Sometimes referred to as coffee shops, offering waitress service and avoiding self-service in their operating format. They usually offer breakfast, lunch and dinner, and an extensive menu (Powers, 1984).

Franchise. Independent individuals are licensed by a parent company to operate its outlets, using its brand name, and dispensing

its products or services under approved methods. The franchisee must invest a certain amount of capital in his operation (Stokes, 1974).

Full Service. Refers to the style of service in the dining room, the menu and style of preparation. A traditional full service restaurant offers a wide variety of menu choices, and most full service restaurants prepare most of their food "from scratch" (that is, from fresh or raw ingredients) (Powers, 1984).

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

Performance. A combination of organizational functions of effectiveness, quality, quality of work life, innovation, productivity, profitability and efficiency (Sink, 1983a).

Productivity. A ratio of outputs to inputs (Adam, Hershauer and Ruch, 1978).

Profitability. The product of productivity and price recovery, or the difference between revenues and expenses (Midas, 1981).

Quality. Conformance to a standard (Scanlon and Hagan, 1983).

Quality of Work Life. The degree to which work provides 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 (Lippit, 1978).

## CHAPTER II

### REVIEW OF LITERATURE

According to Shaw and Capoor (1979), managerial control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives. Managerial control is necessary for all facets of performance. Sink (1983a) listed seven criteria of performance: effectiveness, quality, quality of work life, innovation, productivity, efficiency and profitability which must be controlled individually, even though they overlap and are interrelated. When studying one of the seven criteria, it is difficult to disengage it from the other six.

The term "performance," however, does encompass all areas of the organization, and to determine an organization's performance, each criteria must be examined (see Figure 1, Chapter I). This examination must begin with measurement. Drucker (1974) demanded that more attention be paid to measurement, claiming that few factors are as important to the performance of an organization, and every person in it, although measurement is the weakest area in management today. Measurements are needed for three very important reasons: (1) to determine where a business stands in relation to its standards, in order to identify and justify specific improvements, (2) to establish a baseline for measurement of progress, and (3) to help identify specific

problems for improvement action (Fitz-enz, 1980). Without measurements, management will not be able to identify performance problems and explore their causes.

This chapter is an attempt to define the seven performance criteria and to explore the methods of measurement, control and the improvement of each. Because this research is part of a twin study, four of the seven performance criteria (effectiveness, quality, quality of work life and innovation) will be covered in detail in this study, while productivity, efficiency and profitability will be covered briefly here and at length in the study conducted by Lamb (1984).

### Effectiveness

Traditionally, effectiveness has been viewed and operationalized in terms that encompass all seven criteria of performance, such as organizational productivity, net profit, accomplishment of mission, organizational expansion, morale, turnover/absenteeism, employee satisfaction and others. These surrogate measures, however, have failed to generate a single widely acceptable definition of effectiveness. According to Georgopoulos and Tannenbaum, (1957), organizational effectiveness is the extent to which an organization, as a social system, given certain resources and means, fulfills its objectives without incapacitating its means and resources, and without placing undue strain upon its members.

Similar to this concept is Friedlander and Pickle's (1968) belief that effectiveness must take into account the profitability of the organization, the degree to which it satisfies its members and the degree

to which it is of value to the larger society of which it is a part. This perspective includes system maintenance and growth, and both subsystem and environmental fulfillment. In this definition, internal system components are those within the organization's formal boundaries, while societal components are part of the larger environment in which the organization is located.

Bennis (1969) viewed effectiveness as a state which organizations strive to attain. Given this definition, once an organization acquires certain characteristics such as high productivity and low turnover, it becomes effective. Etzioni (1960) focused on a more dynamic conceptualization of effectiveness, this being how well an organization can acquire and utilize its resources efficiently in a constantly changing environment.

The definitions of effectiveness and efficiency are often interchangeable between experts, but Smalley and Freeman (1966) distinguished between the two by defining effectiveness as the degree to which an organization achieves its objectives, and efficiency as the relationship between achievement of objectives and consumption of resources. They expanded on this distinction, explaining that effectiveness and production relate to output alone, whereas efficiency and productivity relate to the ratio of output to input. Therefore, by this definition, it is possible to be effective without being efficient. Drucker (1974) distinguished between effectiveness and efficiency by describing efficiency as being concerned with doing things right, while effectiveness is doing the right things.

The many conceptualizations of effectiveness may be classified as belonging to one of the following three approaches: (1) the goal

achievement approach, (2) the open systems approach and (3) the structure and process approach. The goal achievement and the open systems approaches are widely researched theories on organizational effectiveness, while the structure and process approach is more a study of the assumed determinants of effectiveness than of effectiveness itself (Bluedorn, 1980).

Under the goal achievement theory, goals are defined as value premises which can serve as inputs to decisions (Simon, 1957). According to Etzioni (1960), effectiveness, in its simplest version, has been defined as the degree to which an organization realizes its goals, and the higher the degree of goal achievement, the greater the organization's effectiveness. Hall (1980) stated that complexity enters the picture with the realization that most organizations have multiple and frequently conflicting goals. Kochan, Cummings and Huber (1976) noted that structural differentiation in organizations is related to goal diversity and goal incompatibility. Hannan and Freeman (1977) analyzed the goal model and noted two problems beside goal multiplicity. One of these problems is the fact that organizational goals are usually general rather than specific, which makes analysis difficult. The second problem is that temporal dimensions are too seldom considered, causing disastrous long term problems if effectiveness is overly emphasized in the short run, and immediate problems if emphasis is placed on long range goals only.

Measuring effectiveness in the goal model is difficult, due to what Hall (1980, p. 583) terms the "bounding system," or the determination of which events occur outside and inside the organization. Despite these problems, the goal model has remained a dominant approach

to organizational effectiveness because organizations do utilize goals, which then become central keys to both theories of organizations and of organizational effectiveness.

According to Bluedorn (1980), in the open systems framework, the concept of organizational effectiveness is defined by a number of basic premises: (1) an organization is an identifiable social entity, (2) an organization is located in an environment from which it must obtain scarce and valued resources, usually in an exchange process, (3) the value of the resources is due to the facilitation of the organization's ability to act and function, (4) the organization is usually located in a competitive environment with similar organizations also needing the scarce and valued resources and thus (5) the effectiveness of the organization is reflected in its ability to secure scarce and valued resources from its environment. Seashore and Yuchtman (1977) defined the effectiveness of an organization as the ability to exploit its environment in the acquisition of scarce and valued resources to sustain its functioning. These resources can be in the form of raw materials, money, labor and customers, and their acquisition is based upon what the organization is attempting to achieve. The resource acquisition approach achieved popularity due to its clear linkage of the environment orientations.

Pennings and Goodman (1977) attempted to combine the goal and resource acquisition theories, defining resource acquisition as constraints that must be met before goals can be obtained. This theory neglected the fact, however, that many criticalities of organizations are beyond management's controls, such as energy crises or economic downturns. Also overlooked are those mandates which are externally



controlled, such as federal and state regulations, including affirmative action, minimum wage, OSHA and others. Refusing to deal with these mandates contains the threat of loss of funds, loss of personnel or loss of business. Much time and effort is required, then, for organizations to carry out goal attainment and resource acquisition in the face of these constraints.

The third approach, the structures and processes theory, includes such things as job satisfaction, absenteeism and turnover rates, the presence or absence of certain types of equipment and programs and others. These factors are really supposed to be determinants of some type of goal achievement rather than the ultimate goals themselves. (In this study, some of the aforementioned measures are in the realm of Quality of Work Life.)

These models of organizational effectiveness have taken a macro approach, but what is needed is a clear understanding of an organization's functional and environmental uniqueness. Attempts to measure effectiveness should be made with reference to the operative goals that an organization is pursuing. According to Steers (1975), it is more logical to view effectiveness as the capacity of an organization to use its resources successfully toward specific ends.

There is a lack of consensus as to what constitutes a useful and valid set of effectiveness measures. Steers (1975) reported that normative models lack a rational or empirical defense of why the criteria represent a true measure of effectiveness and why the model should be applied to other organizations. On the other hand, descriptive models take a more empirically based approach, describing characteristics

that emerged as a result of investigation. Such descriptions do not carry normative implications.

Fitz-enz (1980) argued that effectiveness will always be measured as a combination of subjective and objective data because it cannot be precisely quantified. Not only is the criterion difficult to quantify, it is also unstable. Evaluative criteria for effectiveness at one point in time may be inappropriate or misleading at a later time. Georgopoulos and Tannenbaum (1957) suggested, therefore, that flexibility in the face of change should or ought to be a defining characteristic of organizational effectiveness. A possible solution to this problem would be the development of contingency models capable of accounting for changes in environmental conditions or shifts in goal preferences as they relate to organizational effectiveness. These models would be flexible and could realistically be applied to a wider range of organizations.

### Quality

According to Scanlon and Hagan (1983), in terms of measured performance, quality can only mean conformance to a standard. That is, quality can only be achieved when the end product or service, as delivered to the customer, looks and performs exactly the way the instructions say it should. Adam, Hershauer, and Ruch (1978) described potential quality as essentially a design or planning concept, while achievement of potential quality depends upon techniques of management. An organized, scientific approach to quality management is required to maintain or develop a quality reputation. This approach applies to all areas of service work--the people who deliver

the service to the customer, and the people who provide support service to these frontline operations.

There is a close relationship between quality and productivity referred to by Deming (1982, p. 12), in his statement that "Nobody seems to understand except the Japanese that as you improve quality, you improve productivity." In Japan, quality and productivity are almost synonymous, while in the United States they are regarded as different issues with different meanings. All too often, quality is neither defined or measured in the United States.

This relationship has also been labeled as a give and take one. Smalley and Freeman (1966) stated that at any given high quality level, the quality-cost ratio is constant, and any increases in quality must be accompanied by corresponding increases in costs. At any given high quality level, one may reduce costs by improving productivity. The best solution here is to attain a specified quality level at a cost corresponding to the best possible productivity level.

The difference between most United States management and Japanese management in terms of quality, is the adverse relationship in United States' industries between production people whose goal is to meet production schedules and the people whose goal it is to insure production quality. A common goal to produce a product that meets specifications, with minimum waste and delays, would allow for a team approach and involvement. This passes the responsibility of quality on to everyone. Without this attitude of responsibility, there is little chance for achieving a smooth-flowing, functioning process with maximum productivity.

In service organizations, prosperity results from high quality customer service. A service enterprise will grow in direct proportion to its ability to maintain high levels of customer service while increasing the productivity of its own people. The key to high quality and high productivity lies in recognizing that service organizations compete primarily through management policies rather than through comparison of specific products. Because the products of restaurants tend to be homogenous, the difference between them lie in the policies built upon perceptions of customer demands and opportunities presented by the marketplace. Personal service to customers increases an organization's market-driven integration which, when increased, strengthens the connection between quality of service and productivity. According to Shaw and Capoor (1979), the closer people can be brought to the satisfaction of seeing the results of their efforts, the better their performance is apt to be.

In the restaurant industry, the major method of measuring quality has traditionally been testing of food by cooks, servers, or supervisors. This method lacks reliability, however, because individual sensory evaluation is influenced by external sources and by the possible difference between the quality standards of preparation personnel and those of the consumer of the food. According to Ruf and David (1975), characteristics of quality include appearance, taste, texture and temperature of the product, and such service measures as appearance and accuracy of items served. Sanitation quality can be measured by evaluating cleanliness and orderliness of the preparation and service areas.

Midas (1981), however, divides quality into two categories: (1) production quality which is the level of production efficiency in meeting the specification increased by eliminating waste, delays and poor workmanship, and (2) product quality, which is the level of relevance, uniformity and dependability satisfactory to the customer, increased by better design specifications. Enhancing the quality of a product will require improving the specification through the management, production and service people. Quality improvement can be achieved by "doing it right the first time, next time, and every time" (Scanlon and Hagan, 1983, p. 23). To improve quality, a program of ongoing quality measurements, analysis and corrective action is needed.

Midas (1981) proposed that to improve at anything, we must measure where we are today, set some goals and then track our performance. Quality must be measured and tracked, to ensure that it produces a positive effect on productivity, which is defined as output divided by input, where input includes labor, capital, material and energy. Quality, as defined by Adam, Hershauer and Ruch (1978), is the degree to which a product or service conforms to a set of predetermined standards related to the characteristics that determine its value in the marketplace and its performance of the function for which it was designed. In measuring quality, several requirements must be met. First, due to the nature of the productivity ratio, both inputs and outputs must be measured. A second requirement is that technology, group behavioral factors and economic variables must all be measured.

An ideal quality strategy is to do things right the first time, eliminate waste and delays and have a long-range defect-prevention attitude rather than a short-term, "find-it-and-fix-it" attitude. According to Shaw and Capoor (1979), implementation of management policies through organization planning, management and operational control can result in improvements in both quality of service and productivity. Quality is enhanced by:

- an organization being adaptive and responsive to demands of its marketplace
- key personnel who are motivated to develop and grow
- employee satisfaction which stems from performing complete jobs and being aware of the end result
- establishment of consistent priorities and measures of success
- consistent standards of quality and performance

Hetherington (1982) proclaimed that any quality assurance program requires a quality coordinator, whose job it is to note discrepancies from established standards. Quality assurance is defined by Snider (1983) as the management process by which customer expectations are met without error every time. This definition applies to quality in every foodservice operation. Quality is measured strictly through such tools as market research, public opinion polls, review of competitive activities or analysis of complaints and compliments. These customer expectations should be converted into well-defined specific requirements which serve as the target against which the entire service process must be designed. They can also be used to set acceptance criteria for all operations leading up to the end product or service. Establishing service quality standards means deciding upon the image projected by the organization; an image customers will remember,

return to and tell others about. It also means determining the exact standards of performance that each employee must meet so that the image can be achieved and a quality reputation can be established and maintained (Scanlon and Hagan, 1983).

There are three obstacles to a quality management in a service business: (1) managers of service businesses are unfamiliar with the substance and value of quality control principles, (2) investments in control programs are often viewed as unnecessary expenses rather than programs with a payback, and (3) service personnel do not generally listen to customers--their complaints are irritants rather than opportunities.

Unsatisfactory quality, defined by Scanlon and Hagan (1983), is undesirable results due to unwanted and unnecessary variations in performance. The cause of the problem is almost always attributed to standards of performance being weak or nonexistent. The reason for the problems is usually that individuals--managers, supervisors and workers--are free to set their own standards of performance. The solution, then, is to establish a quality management system which means setting performance standards, measuring performance against the standards and then developing a quality improvement program.

#### Quality of Work Life

Lippitt (1978) defined quality of work life (QWL) as referring to 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 skills and knowledge. Lawler

and Mirvis (1981) viewed QWL as characteristics of the organization, the work place and the work which influence an employees' satisfaction, well-being and behavior both at work and off the job. This conception included economic, social and psychological aspects of work. According to Lissy (1982), QWL programs improve the utilization of human resources to be responsive to the concerns and needs of employees, and the improvement of work processes to assure the effectiveness and success of an organization.

According to Cummings, Molley and Glen (1975), few problems face practicing managers as persistently and few areas in management urgently require a unified treatment than the related issues of job satisfaction, productivity and organization design. Skrovan (1980) defined QWL as an organizational process enabling all members to actively participate in shaping the organization's environment, striving to improve the effectiveness of the organization.

Mai-Dalton, Latham and Fiedler (1978) stated that over five million persons are employed in the food service industry. This number may stay relatively stable, but food service managers are plagued with high rates of turnover, absenteeism and shortage of both skilled and unskilled personnel. These problems are due to worker dissatisfaction because of such problems as differences between what the worker perceives the job to be, and what it really is; knowledge of better jobs elsewhere; feelings of job inferiority; poor working conditions; boredom; poor communication within organizations; no recognition for performance and no visible ladder for promotion. Blaker (1973) reported that in the food service industry, employees are often poorly paid, productivity is frequently low, and there is little



incentive to do better. Food service workers also complain about being on their feet for long periods of time, lack of work and storage space, high kitchen temperature, erratic work shifts of long and irregular hours and the poor public image of their occupation.

These physical and psychological needs of food service workers are neglected by top management, and their supervisors are insensitive to workers' personal needs and attitudes. Given the above complaints and feelings, it is no wonder that few food service employees express pride in their work.

Food service managers are resigned to the fact that few well-educated individuals apply for positions in the industry, and those that do, only intend to stay temporarily. Managers are therefore forced to accept almost anyone to fill job openings. These uneducated, unskilled employees are seldom trained, their induction period is brief and they are asked to perform their duties immediately. These problems are compounded with a lack of clearly specified job descriptions, and teamwork. Once employed in food service, there are no promotion opportunities that could lead to a more rewarding job. Career progression systems are virtually nonexistent in commercial food services (Mai-Dalton et al., 1978).

Characteristics of the workforce has also changed in terms of their values, goals and attitudes, as well as timing and rewards. According to Miller (1980), comparison of the over 35-year olds and the under 35-year olds produced the following: older workers focus on long-term goals of upward mobility and material possessions, while younger workers strive for short-term goals of a duty to self, leisure time activities and meaningful work. The reward desired by older

workers is respectability, while for younger workers it is their leisure time activities and the money needed to pay for them.

Because worker attitudes are changing, their concern has switched from making ends meet to QWL. Today's work force is turning away from being grateful for mere employment in dull, meaningless work and toward resenting work that does not tap workers' full capabilities. The value of human dignity is increasing, and work organization and management must reflect this value. Recent studies in behavioral sciences (Cummings et al., 1975) show that when work is organized to satisfy people's needs as well as achieve organizational requirements, the result is greater productivity and the highest quality of work. The challenge to leaders of all types of organizations is to create conditions that mobilize human effort for achieving organizational objectives while making the work tasks meaningful and rewarding to provide personal satisfaction for workers' efforts.

To meet this challenge, many organizations have developed QWL programs. Although the individual programs may differ, according to Glaser (1976), the elements of QWL programs are the same. These elements are: (1) an open, nondefensive style of operation, (2) a work environment that encourages continuous learning and training, (3) jobs that allow individuals to self-manage and feel responsible for significant identifiable output, (4) opportunities for continued growth, (5) trained supervisors with a less direct, more collaborative style, (6) open communication and trust between management and the workforce, (7) the use of feedback recognition and financial incentives for good results, (8) selection of motivated personnel and (9)

evaluation and analysis of program results to allow for continual improvement.

The evaluation and analysis of the program requires measuring QWL. Terry and Dar-El (1980) stated that the first step toward developing an instrument for measuring any quantity should be to clearly specify the purpose for making the measurement. The purpose for measuring QWL is to provide a means for identifying behavioral problems which inhibit productivity. In this context, QWL represents the tendency of an individual worker to act in a certain way when confronted with a given set of stimuli from his environment. After determining the objectives, the method of collecting information about employee attitudes and beliefs must be chosen. Bowditch and Buono (1982) listed a number of different approaches to collecting this information. These approaches are explained as follows:

1. Questionnaires and instruments are the most widely used tool. The data generated can be statistically analyzed, but the questions must not be misleading, and there is a problem with nonresponse.
2. Direct questioning allows for clarity and depth of responses and greater flexibility and deviation of questioning, but requires highly skilled interviewers, as the data generated is difficult to compare.
3. Unstructured group interviews use a cross section of employees but requires a high level of trust between them and management.
4. Polling can be used to address a specific issue or problem, and increases an employee's sense of involvement, but it is difficult to do with large groups.

5. Observation of employees is flexible, but lends to perceptual bias and requires highly trained individuals.

6. Unobtrusive measures such as the use of turnover/absenteeism records or production statistics does not lend to bias, but the data must be refined, interpreted and coded.

7. The use of collages and drawings as nonverbal expressions of feelings is often perceived as childish by the participants and are difficult to interpret.

Hellriegel and Slocum (1974) believed that objective measures of organizational climate are more diverse than those relying on an individual's perception. This is due to the objective researcher's ability to pursue a micro-level strategy rather than the macro-level strategy pursued by perceptual climate researchers. For this reason, employee surveys are relied on more often than other methods. Marks (1982) listed the following important factors of employee surveys to aid in their use: the questionnaire must be scheduled in advance and administered by an involved individual; it must yield information that is desired; it must be easily understood by all levels of employees; if confidentiality is promised, it cannot be compromised, respondents must be given plenty of time to respond; it must have computable statistical results and the survey results must be accurately fed back to the respondents to inform and motivate employees.

The information generated from the employee surveys must be used by managers to improve organizational climate. According to Cummings et al. (1975), there are four major change categories used by QWL programs. These are:

1. Socio-technical or autonomous work groups which are self-regulating work groups, performing relatively whole tasks. This change orientation has the following options to improve QWL: (a) an increase in autonomy, which was defined by Hackman and Oldman (1980) as the degree to which the job provides substantial freedom, independence and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out; (b) making technical or physical changes such as new equipment or improvements in working conditions and (c) utilization of interpersonal small teams of employees instead of the group as a whole to generate ideas or monitor quality control.

2. Based on Herzberg, Mausner and Snyderman's (1959) motivation-hygiene theory in which factors that provide job satisfaction are differentiated from factors that motivate employees is the change orientation of job restructuring or job redesign. This involves expanding jobs horizontally and vertically by adding on tasks previously completed by someone at the same or higher hierarchical level. Job satisfaction occurs when the work is intrinsically interesting, when there is opportunity for advancement, growth of employee competence and a chance to exercise responsibility. Job dissatisfaction occurs when the hygiene factors (pay, company policies, supervision, working condition, job security and job status) fall below employee standards. Loading a job with satisfiers leads to increased positive motivation which Herzberg et al. terms job enrichment. Job restructuring involves job enrichment through increased autonomy and improving the quality and amount of information/feedback given to employees.

3. Participative management is simply allowing workers to join in making the decisions which have a direct affect on their work lives. Kurt Lewin (as cited by Cummings et al., 1975) has conducted studies on the affects of leadership styles on group behavior and found that increased productivity, decreased resistance to change and decreased conflicts with management occur with greater employee participation.

4. The fourth change orientation, structural changes, are carried out as part of the longer-term process of planned change, and demonstrated through changes in the hierarchical levels, the span of control and role relationships. This type of change orientation, because it disrupts everyone in the organization, should be limited to technical, environmental or major policy changes.

These four change orientations are not mutually exclusive. On the contrary, useful elements from all four can be grafted together to suit the individual organization. Improvements in productivity result in changes in information/feedback, technical/physical, task variety and interpersonal group process, while improvements in employee attitudes result from increases in autonomy/discretion.

In implementing any change program aimed at improving QWL and/or productivity, the restaurant manager should plan for ripple effects of even the slightest change. The first steps of the change program should be small and evolutionary. Long-term improvements in attitudes depend on a gradual process of establishing trust and confidence.

Finally, according to Glaser (1976):

The absolutely essential component of any QWL program is real and ever-present opportunity for individuals or task groups at any level to influence their working environments, to have some say over what goes on in connection with their work (p. 39).

## Innovation

According to Gee and Tyler (1976, p. 5), innovation is ". . . the step where information is analyzed and rearranged in a new and novel way to produce a unique and useful result." Mueller (1971) defined innovation as a deliberate, novel, specific change aimed at accomplishing the goals of the system more effectively. Szilagyi (1981) stated that innovation should be a major organizational goal, because its continual growth and survival may depend on development of new products, processes or services. He also stated that innovation refers to the efforts in the basic sciences to develop new technologies, processes, methods and products.

In a different perspective, Gee and Tyler (1976) viewed the innovation process as more than either a discovery or an invention, but as a process with many interdependent steps ending with success in the marketplace, benefiting both the innovator and society. This innovator, as described by Morton (1971), is a person who accepts cultural goals but rejects institutionalized methods of attaining them. The innovator differs, then, from the conformist who accepts both the goals and methods, and from the rebel who rejects both. Mintzberg (1983) parallels this conceptualization when describing the process as breaking away from established patterns. He contended that the innovative organization cannot rely on standardization for coordination and must avoid bureaucratic structures such as division of labor, extensive unit differentiation, highly formalized behaviors, and an emphasis on planning and control systems. Above all, an innovative organization must remain flexible. Mueller (1971) stated that

the great barrier to major entrepreneurial innovations in organizations is the organization hierarchy itself, which operates to protect the status quo and fend off attempts at innovative change.

According to Eaton (1982), in order to be innovative, management must be excited about, interested in and dedicated to the operation. The key to innovation, then, is top management's role in understanding the innovation ethic and making a commitment toward innovation. Levitt (1962) proposed that top management must see that the entire company becomes saturated with the idea of creativity. Top management must also develop and transmit some guiding philosophy of the organization's creative function. This is not an easy task, due to such managerial problems as the lack of understanding of the innovation process itself, and the difficulty with creating groups of people to perform the process (Morton, 1971). Both problems are complex and related, because they are people problems.

Bellas and Olsen (1978) identified four characteristics of the organizations which will enable them to tackle problems and thus become successful innovators: a managerial commitment to innovation; a means of directing research to achieve organizational goals; a system for testing alternatives and making decisions and a means of implementation, including an organizational climate conducive to change. These four characteristics form the basis of a systematic approach to innovation within an organization.

Successful firms are innovators, and innovation has been essential in the growth of the food service industry. Innovative efforts in food service have not been solely in products and services, but many organizations have enjoyed success--ranging from fast-food



merchandisers to institutional feeders--and are all characterized by a commitment to continuous innovation and effective organization.

According to Bellas and Olsen (1978), the typical food service firm, however, has not spent much of its sales dollar on organized innovation or research and development, but limits its spending to short-term development efforts. Good ideas and product refinements are therefore quickly copied, and the competitive advantage is lost. Successful food service organizations have emphasized the hiring, training and development of individuals who are able to obtain and apply information on products, recipes, cost projections and market studies to derive new concepts. These concepts are then tested for commercial potential. If the idea is promising, requirements for the developed product, its marketing, advertisement and financial requirements are determined. If the fully developed product or process satisfies the needs of potential users, it is termed a success. A major cause of failure for some organizations has made others aggressively innovation-minded. Most progressive companies have a vast apparatus of organized invention and innovation which is confidently expected to create a profit-building newness (Levitt, 1962). These organizations ensure that research and development groups regenerate themselves through leadership rotation or by brainstorming to avoid a cessation of innovation (Butler, 1981). According to Eaton (1982), these innovative solutions can be found with a "what if" attitude approach. To maintain profitability, organizations must develop innovative solutions to any problems encountered.

This innovation is not a single action, but a total process of interrelated subprocesses. Innovation, then, leads to change, which

leads to the necessity for further innovation, which again leads to change--a continuing cycle. Any organization not confronting change, or believes that it need not innovate, stagnates, decays and dies (Mueller, 1971).

The innovation process requires planning, and planning's purpose is to reduce situations of uncertainty to risk situations which can be probabilistically assessed for future operators. Even with planning and forecasting, innovations are accepted slowly at first, and then accelerated over time. This implementation, however, according to Kaluzny (1982), does not guarantee acceptance of the innovation by individuals. Responsiveness of the new ideas, though, does pay off in increased productivity, better product quality, greater profitability and a competitive advantage (Bellas and Olsen, 1978).

### Productivity

According to Adam et al. (1978), productivity in its most general sense refers to a ratio of outputs to inputs. Theoretically, it should refer to the ratio of all outputs of an organization, to all inputs employed to obtain that output. Most operational definitions of productivity, however, are really partial definitions of the basic output to input ratio. Burley (1981) took this operational viewpoint when explaining productivity as a measure of effectiveness calculated by counting the goods and services resulting from one hour of paid work time. This measures the combined contributions of all factors affecting production, including managerial and worker attitudes and skills, and the use of machines and equipment.

Stewart (1981) took a system's view of productivity by describing any task within an organization as a mixture of labor, capital and materials combined to create a desired output. With this work center orientation, productivity is defined as outputs divided by inputs, where inputs can be either a partial factor or a combination of various relevant inputs to create a total factor definition of productivity. Productivity improvement activities then, are those which cause this ratio to improve through an improved blending of labor, capital, raw materials or through increased motivation or skill of the worker.

The food service industry has been spectacularly unsuccessful in increasing productivity. According to Burley (1981), from 1969 to 1980, sales per labor hour decreased from \$6.15 to \$4.80 in constant dollars. Productivity has declined by approximately 20%. Causes for low productivity in food service organizations are described by Magill (1973) as being employee downtime, insufficient kitchen design, poor motivation, inadequate incentives and sloppy hiring practices.

Responsibility for the decline in productivity can be shared by three parties: business, organized labor and government. Focusing on short-range profit planning rather than on long-term market planning has put part of the blame on business. Labor unions are guilty for increasing their demands on management, and the government follows suit for imposing tax laws, monetary policies and regulations that stunt economic growth.

This decline in productivity is also caused in a more direct sense by poor managerial performance. Drucker (1974) claimed that productivity is the first test of management's competence (Yale

Management Guide to Productivity, 1979). Surveys indicate that about 35% of the productivity loss results from poor planning and scheduling of work; 25% from unclear and untimely instructions to employees; and 15% through the inability to adjust staff size and duties during peak and valley periods.

From a management viewpoint, productivity improvement means not only increased profit, but also using scarce resources wisely, working smarter, investing in labor saving technology, doing the right things and doing them right, improved management control, increased operating efficiency and caring about the performance of people. These improvements are possible only through productivity measurement.

Productivity measurement is the process by which the outputs and inputs are selected, ratios are developed and standards are set. This entails the development of methods and techniques by which to accurately, validly, effectively and efficiently generate quantitative data relative to outputs and inputs. A number of productivity measures are available to the food service industry, including meals served per employee, man hours per dollar of sales, food cost ratios (food costs per dollar of sales) and absenteeism turnover rates. A broad ratio, such as meals per employee, may be subdivided into categories of preparation, distribution, services and sanitation. These measures enable managers to gauge the movement of materials handling costs to see if they are increasing or decreasing. Although these measures are available, according to Robertson (1982) and Shaw (1983), the restaurant industry is not utilizing them. Most food service operators do not understand what a standard productivity measure is, or how it can be used; they misinterpret the implications of poor or

superior performance, and use labor cost ratios (dollar labor cost divided by dollar sales) as productivity measures (Freshwater and Bragg, 1975).

According to Peck (Yale Management Guide to Productivity, 1979), once productivity is measured, it can be improved. Midas (1981) listed six barriers to productivity improvement:

1. Productivity has not been a discipline in the business world.
2. Many top leaders lack hands-on experience with the leverage points for productivity improvement.
3. Many leaders push forward with a short-term earnings perspective.
4. If work is done on productivity improvement, top management often tries to attain too much too soon, disregarding the planning and assessment phases required.
5. Too many times the responsibility for productivity improvement is delegated to an individual or unit without the involvement of the top leader.
6. Productivity is implemented as just another program.

Young (1980) viewed the problem with productivity improvement as the fact that the effort is focused on the problem's symptoms, not the problem itself. Areas in the food service organization that can be manipulated to improve productivity are simplification of work processes through improvements in materials handling, standardization of menu items, the off-premise preparation of food which permits the reduction in on-premise preparation time and employee hours, and cooking devices and innovations in food preservation methods and equipment (Carnes and Brand, 1977).

According to Sadler (1982), the most critical decisions when selecting a productivity measurement system are those related to a true appraisal of the financial and personal resources used to operate the system, and an equally realistic appraisal of the extent to which the company records yield the data required for productivity measurement and analysis. Young (1980) viewed productivity as the end result of management activities, as an attitude of effectiveness, not solely efficiency. Productivity is a long-term investment with concentration on the bottom line, and those items which impact on it. For additional information on productivity, see Lamb (1984).

#### Profitability

Profitability is the business owner's goal. It is also an indirect goal of all members of an organization, because individual goals are met through profits. Profitability is also an evaluation of a business' success in meeting the goals of its customers, employees, creditors and the general public. Although it is an imperfect measure, the long-run profitability of a business is one measure of its overall effectiveness.

Midas (1981) viewed profitability as the product of productivity and price recovery. Through this relationship, the cause of profitability improvement or decline can be determined. Levings (1975) stated that the idea of profitability relates the absolute amount of profitability to an investment base, or any other base. Profitability, therefore, is measured in terms of a ratio of dollar income to dollar investment.

Measures of profitability typically used by organizations are net profits or net sales, net profits on tangible net worth, net profits on net working capital, constant dollar sales, or weighted units such as each product type multiplied by labor hours used (Hongreen, 1972). According to Rausch (1982), profitability can be measured as percentage of sales or in absolute dollars (net income). This ratio analysis is more meaningful than dollar profits. Agreeing with this statement, Dudick (1972) viewed dollar figures as not always being significant indicators. Profitability indicators, however, act as compasses, pointing management in the direction from which more detailed judgments must be made.

Shaw and Capoor (1979) listed three policies for management to create a climate that increases profitability. These policies are:

1. Organization of the operation around the objective of providing services to a distinct market segment.
2. Implementation of a top-down management control system that defines and manages standards for quality and productivity.
3. Establishment of operational controls that are responsive to the management control system and linking with the organizational structure of the enterprise.

Dukas (1976) explained operational methods for the food service industry to improve profits as expense reduction, expense manipulation, and increasing sales volume. He also advised food service organizations not to use one single mark-up factor, because it yields an unfair pricing schedule. Not only is it unfair to the customer, it also creates such managerial problems as increasing competition and concealing the menu items that are sold at a loss, and it also lowers

sales volume and reduces profits. Instead of a single mark-up factor, direct expenses should be charged to the product creating the expense, and the remaining expenses should be allocated equally among two or more products. Food should be divided into two groups: those requiring a sizable amount of preparation labor, and those that require very little or no preparation labor.

Because food preparation labor is a major expense of food service organizations, Levings (1975) listed several ways of controlling payroll: (1) efficient production and service in the kitchen through scheduling and proper use of equipment, (2) elimination of hazards and bottlenecks in the dining room, (3) provision of varied menu items and staff trained in sales procedures that increase the average check, (4) trained personnel and (5) development of consistent hiring practices.

Efforts such as these will aid in increasing profitability, which will always be the main reason a business exists. Managers will always be responsible for the bottom line on the profit and loss statement, simply because profits are the ultimate source of funds for the survival and growth of a business. For a further exploration into profitability, see Lamb (1984).

### Efficiency

According to Johnson (1981), efficiency is defined in management books by the following ideas:

- progress toward organizational objectives at the least possible cost
- personal efficiency in individual performance
- work output above normal expectations



- doing work correctly
- satisfaction of individual motives while jointly operating toward a common goal
- productivity
- reduction in unit cost of output

Smalley and Freeman (1966) defined efficiency as the relationship between achievement of objectives and consumption of resources. This is opposed to inefficiency, which they defined as attempts to achieve goals not appreciated by those who lack organizational orientation. The same authors stated that efficiency and productivity referred to a ratio of outputs to inputs, but Johnson (1981) stated that productivity is related to the total outputs of an organization.

The varying conceptualizations mirror the lack of a true definition of efficiency. Many managers believe their operations are well run and efficient. Such feelings, however, are rarely based on fact, because statements about efficiency are often value judgments. These statements are usually based on whether or not the company is earning a satisfactory profit. In American business, an operation may be highly efficient, but if consumers do not buy its products, the business will fail.

Technical problems in measuring efficiency lead to a lack of organizational performance measures. Major problems in measuring efficiency are the cost of data collection procedures and a lack of experience with the usefulness of the information (Hatry, 1980). Recent progress has been made, however, through availability of data processing equipment which is able to use company records, development of trained observer procedures and the use of customer feedback devices.

Takeda (1980) stated that the basic concept for future increased in personnel efficiency is to allow employees to display their full capabilities, which encourages continual development of their skill and abilities. For additional information on efficiency, see Lamb (1984).

### Summary

The interrelatedness of the seven performance criteria is obvious in this study. This is caused primarily by the lack of and misuse of the definitions of the criteria. In this study, literature was reviewed to more accurately define each of the seven criteria, and a survey was conducted to discover the methods of measuring and controlling organizational performance criteria relative to the food service industry.

Effectiveness is how well an organization can acquire and utilize its resources efficiently in a constantly changing environment (Etzioni, 1960). The criterion, quality, means conformance to a standard (Scanlon and Hagan, 1983). The term "quality of work life" refers to 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 skill and knowledge (Lippitt, 1978). Innovation, as one of the performance criteria, is deliberate, novel, specific change aimed at accomplishing the goals of the system more effectively (Mueller, 1971), while productivity is a ratio of outputs to inputs (Adam et al., 1978). Profitability, which is commonly used by business or manufacturing organizations as a performance measure,

is the product of productivity and price recovery, or the differences between revenue and expenses (Midas, 1981). Efficiency is the relationship between achievement of objectives and consumption of resources (Smalley and Freeman, 1966).

An organizational performance measurement system encompasses all seven of these criteria, none of which is more important or more critical than the others. This relationship between the seven performance criteria was illustrated in the productivity management process shown in Figure 1.

## CHAPTER III

### METHODS

The purpose of this study was to identify the methods of measuring performance used by a sample of the food service industry, the Missouri Restaurant Association (MRA) members. Information gathered on the seven performance criteria is necessary to develop a proposed method of measuring performance useful to all restaurant food services.

#### Research Design

Because descriptive status surveys describe a specific set of phenomena at one point in time (Fox, 1969), and the purpose of this study was to gather information on current methods of performance measurements by the restaurant industry, this research design was viewed as the most appropriate method for the study. Through the descriptive survey, data from a variety of styles and sizes of restaurants may be collected.

#### Population

Through the Educational Director of the MRA, the researcher had access to the population of MRA members. Approximately 1,900 surveys were sent to the Educational Director of the MRA for mailing out to the individual members.

## Data Collection

### The Instrument

The survey instrument was developed based on findings from a pilot open-ended questionnaire sent to the Board members of the Oklahoma Restaurant Association (ORA) in the summer of 1983 (Appendix A). Results of the pilot study (Appendix B), obtained in the fall of 1983, were used in the development of the closed-ended questionnaire for this research study.

These ORA board members, graduate faculty members of the departments of Food, Nutrition and Institution Administration; Hotel and Restaurant Administration and Statistics at Oklahoma State University examined the instrument for content, validity, clarity, and format. The Educational Director of the MRA was also consulted on the same criteria relative to the research instrument. Suggestions were incorporated into the instrument, and a copy is in Appendix C.

The questionnaire contained two main sections: Demographic Data and Performance Criteria. There are seven subsections in the performance criteria section. In addition, the instrument required that respondents rank the seven performance criteria, not only in terms of their perceived importance, but also on the amount of time actually spent on each of them. Space was provided for comments by the participants at the end of the instrument.

There were three types of questions in the instrument--a Likert type scale ranging from 1 (always) to 5 (never) was used in the productivity section where respondents circled the scale number corresponding with how often they use the control measures listed. Most

of the questions in the instrument were the "yes" or "no" type where respondents placed a check in the box beside their answers. A scale of 1 to 7 was used in the rank questions, where 1 was to be given to the criteria managers spent the most time with, or felt was most important, and 7 was given to the criteria on which the least amount of time was spent, or which was deemed the least important. Space was provided at the end of each section for additional comments.

#### Distribution Procedure

The instrument was printed on both sides of three sheets of beige paper and mailed along with two cover letters--one explaining the project and instructing the respondents on how to complete and return the questionnaire, and a second one from the MRA president encouraging participation. Mailing information and codes were printed on the back of the last sheet so that the instrument could be mailed without being placed in an envelope, and could be refolded, stapled and mailed back in the same manner. Return postage was provided.

#### Data Analysis

Coded information from the quantifiable data on the survey were key punched into cards for computer processing. Four cards were required per respondent. The coded data were analyzed using the Statistical Analysis System (SAS) (Barr, 1976). Because this is a twin study, results of the questionnaire were analyzed in two parts. This researcher analyzed the sections on effectiveness, quality, quality of work life and innovation, while Lamb (1984) analyzed the sections of productivity, profitability and efficiency. A joint effort

was expended on ranking the perceived importance of the seven criteria and ranking the amount of time spent on each of the seven performance criteria.

Each ranking was arbitrarily awarded its corresponding number of points, from 1 to 7. For example, if 10 respondents ranked Quality as 1, it received 10 points, if 15 ranked it 2 it received 30 points, etc. This procedure was continued until each criterion received a subtotal of points. The seven subtotals were summed up to arrive at the grand total. The grand total was then divided by each subtotal to yield a percentage of total points that each criterion received.

Frequency distributions were used to show the occurrence of each method of performance evaluation and control. The relationship between selected demographic variables and the methods of evaluation and importance to the restaurant managers was through the use of chi square. The level of significance for this study was set at  $p \leq .05$ .

## CHAPTER IV

### RESULTS AND DISCUSSION

Data for the study were obtained via the instrument described in Chapter III, "Methods." The questionnaires were mailed in bulk to the Educational Director of the MRA. They were then attached to the MRA's regular newsletters, and sent to all 1,900 members. The response rate was 3% (N=57). Fifty-five (2.9%) of the returned questionnaires were usable for analysis purposes. Two questionnaires were not usable due to nonresponse to one or more pages. A possible reason for the low response rate was that the questionnaires were not sent separately to the restaurateurs. Because they were attached to a newsletter, the questionnaires could have been discarded or misplaced.

#### Characteristics of Survey Respondents

##### Age and Education

Twenty percent (N=11) of the respondents were between 20 to 29 years of age, 37% (N=20) were between the ages of 30 to 39, 30% (N=16) were between 40 to 49 years of age, and 15% (N=7) were 50 years of age or older. Twenty-two percent (N=12) of the respondents listed a high school diploma as the highest level of education attained, 54% (N=30) had attained a bachelor of science degree and 24% (N=13) received education beyond a bachelor's degree.



### Years of Experience

Experience in the restaurant industry ranged from 1 to over 16 years. Twenty-seven percent (N=15) of the respondents had accumulated one to five years of experience in the restaurant industry, while 33% (N=18) of the respondents had 11 to 15 years of experience (Figure 2).

### Position Title and Productivity Training

Thirty-seven percent of the respondents (N=16) had the title of restaurant owner, while the majority of the respondents (54%, N=23) were titled restaurant manager. The remaining 9% (N=4) described their position as assistant manager. Only 30% (N=16) of the respondents had received any training in productivity measurement, while 70% (N=37) indicated that they had not received any such training.

## Characteristics of the Restaurants

### Type of Restaurant

As illustrated in Figure 3, 53% (N=29) of the respondents operated full service restaurants. Twenty-nine percent (N=16) of the respondents were family-owned establishments, and 13% (N=7) were hotel or motel restaurants. Eleven percent (N=6) of the respondents described their operation under "other," which included such titles as in-plant feeder, eight month resort, delicatessen and a low calorie bakery and retail operation.

### Seating Capacity and Average Check Charge

The majority of the respondents (53%, N=28) have establishments

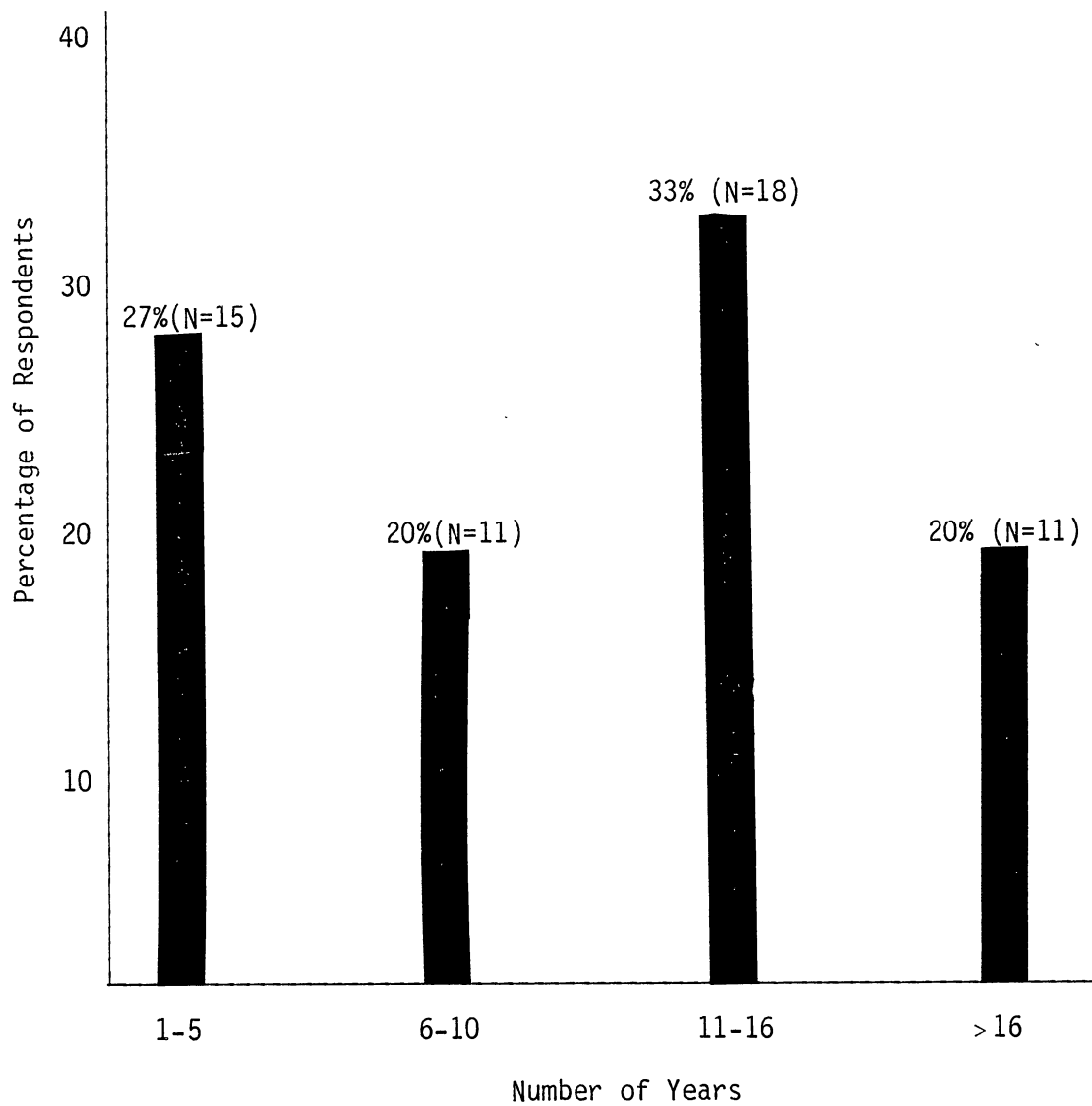


Figure 2. Years of Experience of Restaurateurs

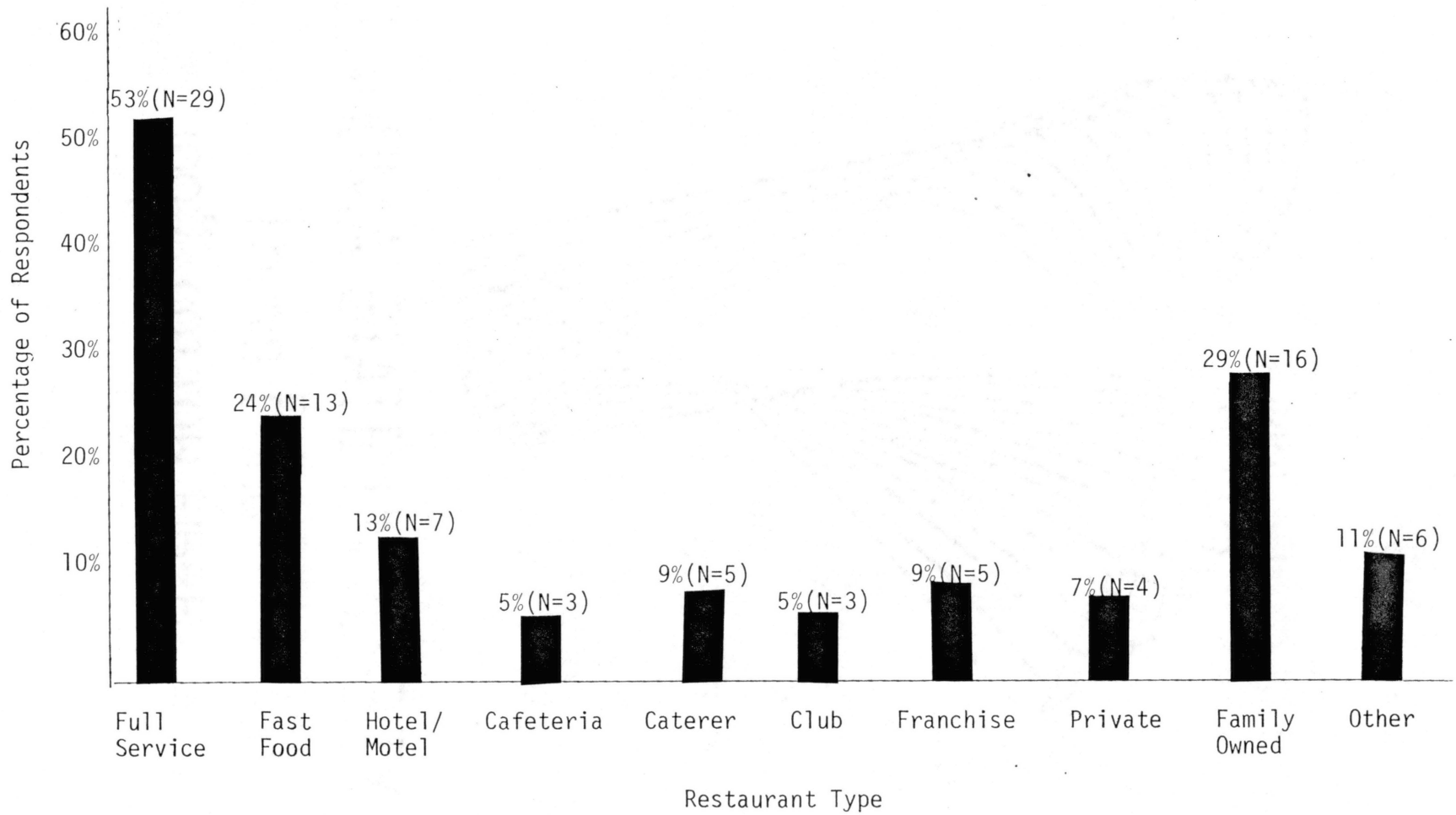


Figure 3. Type of Restaurant

seating between 100 and 299 people, 32% (N=17) seat less than 100 people, and 15% (N=8) seat over 300 people. The average check charge for 38% (N=21) of the respondents was between \$3.00 and \$4.99; for 36% (N=20), the check charge averaged \$5.00 to \$9.99 (Figure 4).

### Revenue

The average yearly revenue was split three ways. Thirty-six percent (N=19) had an average yearly revenue of between \$500,000 and \$999,999; 34% (N=18) had below \$499,999; and 30% (N=16) had one million dollars or more in average yearly revenue.

### Performance Criteria

#### Effectiveness

On the questionnaire, effectiveness was defined as the degree of achievement of objectives. Under this performance criteria, respondents were asked whether or not they set specific goals for their operation. Forty-five of the 55 respondents indicated that they do set specific goals, while the remaining 10 respondents indicated that specific goals were not set for their operations. There was a greater tendency ( $p=0.0885$ ,  $\chi^2=4.850$ ,  $df=2$ ) for those with a bachelor's degree to set goals than for those with under 12 years or over 16 years of education. Goal setting is widely covered in college courses, which would explain this correlation. In contrast, respondents with over 16 years of education did not set goals. There was also a positive association ( $p=0.0435$ ,  $\chi^2=4.074$ ,  $df=1$ ) between restaurateurs who had received some training in productivity measurement and goal setting.

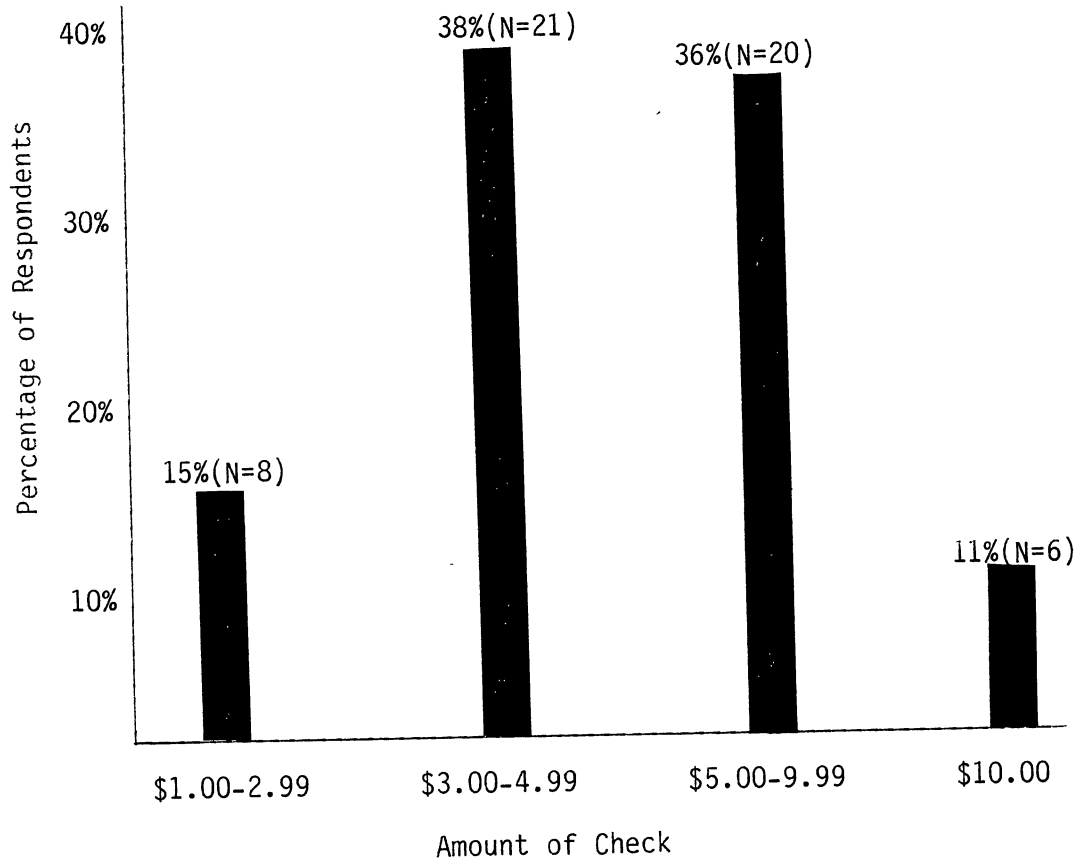


Figure 4. Average Check Charge of Respondents

One hundred percent of those with training (N=16) and 78% of those without training (N=29) set goals.

Three of the methods of evaluating goal attainment listed on the survey were affected by the number of years of experience the respondent had. The use of costs and profit (profit and loss statement) to evaluate goal attainment was positively affected by the restaurateur's experience with a significant association ( $p=0.0136$ ,  $\chi^2=10.683$ ,  $df=3$ ). The two methods inversely affected by experience were: the use of personnel audits ( $p=0.0138$ ,  $\chi^2=10.652$ ,  $df=3$ ) and the breakdown of goals into small, measurable goals ( $p=0.0323$ ,  $\chi^2=8.784$ ,  $df=3$ ). The more experience the respondents had, the less likely they were to use personnel audits or to break down goals into measurable units. Perhaps restaurateurs with more education or experience take goal setting and personnel audits for granted.

Four effectiveness measures were strongly associated with the respondent having received training in productivity measurement. Seventy-five percent (N=12) of the respondents with productivity measurement training compared actual performance with forecasted performance, while only 35% (N=13) of those without training used this method ( $p=0.0076$ ,  $\chi^2=7.123$ ,  $df=1$ ). The use and nonuse of personnel audits and management by objectives (MBO) programs were split 50-50 between the respondents with productivity measurement training, while for those without training, 86% ( $p=0.0046$ ,  $\chi^2=8.033$ ,  $df=1$ ) did not use personnel audits, and 78% did not use an MBO program ( $p=0.0388$ ,  $\chi^2=4.268$ ,  $df=1$ ). Dividing goals into small, measurable subgoals to evaluate goal attainment was used by 56% of those with training and only by 16% of those without training ( $p=0.0030$ ,  $\chi^2=8.822$ ,  $df=1$ ).

This positive association between training and the use of subgoals was also found by Shaw (1983) ( $p=0.0588$ ,  $\chi^2=3.571$ ,  $df=1$ ).

Six of the nine types of restaurants listed on the questionnaire were affected by seven of the effectiveness measures. Full service restaurants were strongly associated with the use of an increase in current year's sales over the previous year's to measure effectiveness ( $p=0.0219$ ,  $\chi^2=5.252$ ,  $df=1$ ), with 93% using this method, while 69% of the other (non-fast food) restaurants used sales comparisons. There was an inverse association between fast food restaurants and the use of evaluation meetings. Only 31% of the fast food establishments utilized this method, yet 67% of the other restaurant types conducted evaluation meetings ( $p=0.0218$ ,  $\chi^2=5.258$ ,  $df=1$ ). One hundred percent of hotel/motel restaurants held evaluation meetings, whereas only 52% of the other types of restaurants used this method ( $p=0.0163$ ,  $\chi^2=5.765$ ,  $df=1$ ). Again, an inverse relationship was found between cafeterias and the practice of setting goals. Thirty-three percent of cafeterias indicated that they set goals, while on the other hand, 85% of the other types of restaurants set goals ( $p=0.0251$ ,  $\chi^2=5.014$ ,  $df=1$ ).

Cafeterias were also found to be inversely associated with the effectiveness measures of costs and profit, sales volume and increases in sales over previous year's sales to evaluate goal attainment. All three methods were used by only one-third of the cafeterias ( $p=0.0039$ ,  $\chi^2=8.311$ ,  $df=1$ ;  $p=0.0085$ ,  $\chi^2=6.935$ ,  $df=1$ ;  $p=0.0251$ ,  $\chi^2=5.014$ ,  $df=1$ , respectively). The findings on cafeteria restaurants are significant because only 3 of the 55 respondents classified themselves as cafeterias.

Three respondents worked in club restaurants, and only one of them indicated that he/she utilized costs and profit and sales increases to evaluate effectiveness. In contrast, 90% of the other types of restaurants (non-club) relied on costs and profit ( $p=0.0039$ ,  $\chi^2=8.311$ ,  $df=1$ ), and 85% used sales increases ( $p=0.0251$ ,  $\chi^2=5.014$ ,  $df=1$ ).

Three effectiveness measures, actual vs. forecasted performance, MBO programs and subgoals were found to be inversely associated with family-owned establishments. Only 25% used performance comparisons, and 6% used both MBO and subgoal methods, while in other restaurant types these percentages were 59, 41 and 41, respectively ( $p=0.0221$ ,  $\chi^2=5.240$ ,  $df=1$ ;  $p=0.0113$ ,  $\chi^2=6.425$ ,  $df=1$ ;  $p=0.0113$ ,  $\chi^2=6.425$ ,  $df=1$ ). Of the six restaurants classified as "other," one-third indicated the use of sales increases to evaluate goal attainment, while 88% of those that identified their type utilized this method ( $p=0.0011$ ,  $\chi^2=10.642$ ,  $df=1$ ).

The amount of average yearly revenue was associated with two effective measures: MBO programs and evaluation meetings. Only 5% of the restaurants having an average yearly revenue below \$499,000 used MBO programs, and 33% of this revenue category used evaluation meetings. Of respondents in the revenue category of between \$500,000 and \$999,999, 32% used MBO's, while 63% used evaluation meetings. Of the restaurants with over \$1,000,000 average yearly revenue, 56% used MBO's and 75% used evaluation meetings ( $p=0.0056$ ,  $\chi^2=10.356$ ,  $df=2$ ;  $p=0.0387$ ,  $\chi^2=6.505$ ,  $df=2$ ).

### Discussion of Effectiveness

In general, the effectiveness evaluation methods most often used



by the respondents were: the use of sales increases over last year's sales, personnel audits, MBO programs, dividing goals into measurable subgoals and evaluation meetings. As the researcher expected, a greater number of respondents with training in productivity measurement utilized one or more of the effectiveness measures. There was also a strong tendency for those restaurateurs with over five years of experience to utilize effectiveness measures than for less experienced restaurateurs. These correlations reflect the benefits of knowledge and experience on management performance. The more familiar the respondents were with effectiveness measures as well as the restaurant business itself (experience), the greater was their tendency to measure the effectiveness of their operation.

The tendency of family owned restaurants not to utilize effectiveness measures could perhaps be explained by the operators' feeling that there is no purpose for small, family operated establishments to incorporate MBO programs, use subgoals or to forecast their performance. Because these are informal organizations, everyone understands their own responsibilities as well as who is in charge of each organizational aspect. A possible reason that cafeteria-type restaurant respondents indicated they did not set specific goals, is that not all establishments have written formal organizational goals, although they do have their operation's goals and objectives set in their minds.

An explanation for the nonuse of profit and loss statements or sales comparisons in club restaurants could be that these are private operations viewed as a special service to members, not necessarily as a profit-oriented business. The correlation between revenue and MBO programs and evaluation meetings could be due to small operations with

lower average yearly revenue not needing such programs or not viewing them as practical. These correlations and all other significant correlations are illustrated in Table I.

### Quality

When asked if specific quality standards were set in their operation, 96% (N=53) of the respondents answered in the affirmative. This parallels Shaw's (1983) finding of 98% of administrative dietitians having set specific quality standards in their operation. The practice of setting quality standards was significantly affected by the amount of experience the respondent had ( $p=0.0402$ ,  $\chi^2=8.302$ ,  $df=3$ ). All respondents with 1 to 15 years of experience set quality standards, while 18% (N=11) of the respondents with over 16 years of experience did not set such standards. Perhaps these more experienced restaurateurs relied on verbal explanations of quality standards or assumed that standards were being met rather than having formal written standards.

Compared to the other types of restaurants, caterers did not rely on specific quality standards for their operations ( $p=0.0404$ ,  $\chi^2=4.203$ ,  $df=1$ ). Eighty percent (N=4) of caterers set standards, while 98% (N=49) of other (non-catering) operations had such standards. This tendency could be a result of the constantly changing styles and types of service of catering operations. Caterers offer a wide variety of services, thus informal quality standards may be more practical than specific quality standards.

When asked who these quality standards were set by, respondents' answers were dependent upon six personal and restaurant variables.

TABLE I  
SIGNIFICANT ASSOCIATIONS FOUND IN EFFECTIVENESS CONTROLS

Effectiveness Control	Factor Showing Correlation	Total % and Number of Respondents Using	
Setting Specific Goals	*Cafeteria restaurants (p=0.0251, X <sup>2</sup> =5.014, df=1)	82	N=45
	Training in productivity measurement (p=0.0435, X <sup>2</sup> =4.074, df=1)	85	N=45
Costs and Profit (profit and loss statement)	*Cafeteria restaurants (p=0.00039, X <sup>2</sup> =8.311, df=1)	87	N=48
	*Club restaurants (p=0.0039, X <sup>2</sup> =8.311, df=1)	87	N=48
Sales Volume	*Cafeteria restaurants (p=0.0085, X <sup>2</sup> =6.935, df=1)	85	N=47
Percent Profit	Years of restaurant experience (p=0.0136, X <sup>2</sup> =10.683, df=3)	78	N=43
Sales Comparison	Full service restaurants (p=0.0219, X <sup>2</sup> =8.252, df=1)	82	N=45
	*Cafeteria restaurants (p=0.0251, X <sup>2</sup> =5.014, df=1)	82	N=45
	*Club restaurants (p=0.0251, X <sup>2</sup> =5.014, df=1)	82	N=45

TABLE I (Continued)

Effectiveness Control	Factor Showing Correlation	Total % and Number of Respondents Using	
Sales Comparison (cont.)	*"Other" restaurants (p=0.0011, $\chi^2=10.642$ , df=1)	82	N=45
Actual vs. Forecaster Performance	Training in productivity measurement (p=0.0076, $\chi^2=7.123$ , df=1)	47	N=25
	*Family-owned restaurants (p=0.221, $\chi^2=5.240$ , df=1)	49	N=27
Personnel Audit	*Years of experience (p=0.0138, $\chi^2=10.652$ , df=3)	25	N=14
	Training in productivity measurement (p=0.0046, $\chi^2=8.033$ , df=1)	25	N=13
MBO for Management Staff	Training in productivity measurement (p=0.0388, $\chi^2=4.268$ , df=1)	30	N=16
	*Family-owned restaurants (p=0.0113, $\chi^2=6.425$ , df=1)	31	N=17
	Average yearly revenue (p=0.0056, $\chi^2=10.356$ , df=2)	30	N=16
Goals divided into small measurable units	*Years of restaurant experience (p=0.0323, $\chi^2=8.784$ , df=3)	31	N=17
	Training in productivity measurement (p=0.0038, $\chi^2=8.822$ , df=1)	28	N=15

TABLE I (Continued)

Effectiveness Control	Factor Showing Correlation	Total % and Number of Respondents Using	
Goals divided into small measurable units (cont.)	*Family-owned restaurants (p=0.0113, X <sup>2</sup> =6.425, df=2)	31	N=17
Evaluation Meetings	*Fast food restaurants (p=0.0218, X <sup>2</sup> =5.258, df=1)	58	N=32
	Hotel/motel restaurants (p=0.0163, X <sup>2</sup> =5.765, df=1)	58	N=32
	Average yearly revenue (p=0.0387, X <sup>2</sup> =6.505, df=2)	57	N=30

\*Inverse relationships

Seventy-four (N=17) percent of restaurant managers stated that they set the quality standards, while six of these same managers indicated that the standards were set by the owner. One respondent replied that an assistant manager was responsible for quality standards ( $p=0.0339$ ,  $\chi^2=6.771$ ,  $df=2$ ).

The amount of yearly revenue earned by the restaurants was also related to who set quality standards. For 87% of the respondents ( $p=0.0078$ ,  $\chi^2=9.697$ ,  $df=2$ ) of operations with an average yearly revenue over \$1,000,000, these standards were set by a management team. Assistant managers were also listed as responsible for quality standards for 14 of the restaurants with over \$1,000,000 in yearly revenue ( $p=0.0022$ ,  $\chi^2=12.245$ ,  $df=2$ ). The more revenue a restaurant earned, the more likely the responsibility for quality standards was delegated to either a management team or the assistant manager.

Seating capacity also influenced who set the quality standards of the restaurants. For restaurants seating over 300 persons, 87% (N=7) ( $p=0.0160$ ,  $\chi^2=8.270$ ,  $df=2$ ) indicated that the manager was responsible for quality standards, while five ( $p=0.0410$ ,  $\chi^2=6.390$ ,  $df=2$ ) acknowledged that the assistant manager was in charge of quality standards. Fifty-seven percent (N=4) of the hotel/motel respondents stated that the assistant manager set quality standards ( $p=0.0394$ ,  $\chi^2=4.245$ ,  $df=1$ ), while 40% of franchise operations ( $p=0.0286$ ,  $\chi^2=4.258$ ,  $df=1$ ) had delegated the setting of quality standards to the production manager.

One hundred percent of the respondents from both caterer and franchise operations checked the quality of their food through temperature checks. Five caterers ( $p=0.0391$ ,  $\chi^2=4.258$ ,  $df=1$ ) and five

franchise establishments ( $p=0.0391$ ,  $\chi^2=4.258$ ,  $df=1$ ) checked food quality by checking food temperatures. Restaurants with over \$500,000 in average yearly revenue indicated the use of food temperature checks for quality assurance ( $p=0.0496$ ,  $\chi^2=6.009$ ,  $df=2$ ).

Eighty-seven percent ( $N=14$ ) of the respondents with training in productivity measurement conducted regular unannounced sanitation inspections, while 57 ( $N=21$ ) of those without such training held sanitation inspections ( $p=0.0300$ ,  $\chi^2=4.707$ ,  $df=1$ ). Only one private restaurant utilized can cutting or taste testing of food to control quality in their operation ( $p=0.0120$ ,  $\chi^2=6.305$ ,  $df=1$ ), as compared to the other types of restaurants, where 80% utilized these methods of quality control.

The use of written food quality standards was dependent upon both personal and restaurant variables. Younger restaurateurs (age 20-30) were more apt to use written food quality standards than were their older counterparts ( $p=0.0422$ ,  $\chi^2=8.190$ ,  $df=3$ ). Restaurateurs with training in productivity measurement were also more likely to use written food quality standards. Seventy-five ( $N=12$ ) percent of those with training used this method, while 14 of those without training used quality food standards ( $p=0.0130$ ,  $\chi^2=6.173$ ,  $df=1$ ). In addition, restaurants with an average yearly revenue over \$1,000,000 utilized written food quality standards to control quality ( $p=0.0059$ ,  $\chi^2=10.264$ ,  $df=2$ ).

Eighty-seven percent ( $N=14$ ) of restaurateurs with productivity measurement training used written service quality standards, as compared with 16 of those without training ( $p=0.0028$ ,  $\chi^2=8.907$ ,  $df=1$ ). One hundred percent ( $N=8$ ) of the respondents whose restaurants seat

over 300 patrons utilize written quality of food standards. In contrast, only 41% (N=7) of the restaurants' seating under 100 rely on such standards ( $p=0.0194$ ,  $\chi^2=7.885$ ,  $df=2$ ). Likewise, 94% (N=15) of restaurants earning over \$1,000,000 in average yearly revenue used quality service standards, whereas only five of those earning under \$500,000 used these standards ( $p=0.0005$ ,  $\chi^2=15.199$ ,  $df=2$ ).

In full service restaurants, only 12 of the respondents indicated that the manager personally inspects all food deliveries. On the other hand, 85% (N=22) of the non-full service restaurants used this method to control quality in their operation ( $p=0.0010$ ,  $\chi^2=10.857$ ,  $df=1$ ). For respondents operating "other" types of restaurants (unspecified), 100% (N=6) indicated that the manager personally inspected food deliveries ( $p=0.0414$ ,  $\chi^2=4.160$ ,  $df=1$ ).

The personal variables of position title and years of experience affected whether or not the manager personally tested the food served. Seventy-five percent (N=12) of restaurant owners utilized this method of quality control, while 16 managers complied ( $p=0.0153$ ,  $\chi^2=8.355$ ,  $df=2$ ). Managers with less than 16 years of experience were more likely to use this method than were managers with over 16 years of experience. Only 36 (N=4) percent of the more experienced managers personally tasted the food, while 83% (N=15) of those with 11-15 years of experience used this method. Seventy-nine percent (N=23) of full service restaurateurs personally tasted the food served, while only 14 of the managers of other restaurant types used this form of quality control ( $p=0.0028$ ,  $\chi^2=8.907$ ,  $df=1$ ). One hundred percent (N=6) of the managers of restaurants with an average check charge over \$10.00 personally tasted food, while only 25% (N=2) of managers with an



average check charge of \$1.00-2.99 used this method ( $p=0.0189$ ,  $\chi^2=9.958$ ,  $df=3$ ).

Forty-four percent ( $N=7$ ) of the family-owned restaurants set purchasing specifications to control quality standards, while 31 (79%) of the other types of restaurants had purchasing specifications ( $p=0.0092$ ,  $\chi^2=6.782$ ,  $df=2$ ). Similarly, 94% ( $N=15$ ) of restaurants earning over \$1,000,000 in average yearly revenue had purchasing specifications, as compared to 50% ( $N=9$ ) of those below \$500,000 in average yearly revenue ( $p=0.0211$ ,  $\chi^2=7.720$ ,  $df=2$ ).

The age of the restaurateur also affected the use of purchasing specifications as a quality control method. Seventy-three percent ( $N=8$ ) of respondents between 20 and 29 years of age used this method, while 90% ( $N=18$ ) of those between 30 and 39 years of age used purchasing specifications. Use of this method decreased with age, as only 44% ( $N=7$ ) of restaurateurs between the ages of 40 and 49, and 57% ( $N=4$ ) of those over 50 years of age used purchasing specifications ( $p=0.0251$ ,  $\chi^2=9.339$ ,  $df=3$ ).

Giving detailed instructions to employees as a quality control method was dependent upon the amount of experience the respondent had. One hundred percent ( $N=11$ ) of those with 6 to 10 years of experience gave detailed instructions to employees, while only 45% ( $N=5$ ) of those with over 16 years of experience used this method to control quality ( $p=0.0196$ ,  $\chi^2=9.339$ ,  $df=3$ ).

In like manner, the amount of the average check charge of the restaurant was associated with the use of detailed instructions to employees ( $p=0.0412$ ,  $\chi^2=8.247$ ,  $df=3$ ). One hundred percent ( $N=8$ ) of the respondents charging \$1.00-2.99 used this quality control method,

whereas only 50% (N=3) of those with an average check charge over \$10.00 gave detailed instructions to employees.

The use of menus, charts and production schedules to control quality was related to both the seating capacity and average yearly revenue of the restaurant. Eighty-seven percent of the respondents (N=7) with operations seating over 300 patrons relied on such tools, while six (35%) of those seating under 100 patrons used menus, charts and production schedules. In much the same way, 81% (N=13) of restaurants earning over \$1,000,000 in average yearly revenue used these techniques, while only 39% (N=7) of the establishments with a yearly revenue under \$500,000 used this method of quality control ( $p=0.0436$ ,  $\chi^2=6.365$ ,  $df=2$ ).

One hundred percent (N=11) of restaurateurs between the ages of 20 and 29 years of age controlled product quality by using fresh food, while 85 (N=17) and 86 (N=6) percent of the restaurateurs between the ages of 30 and 39 and those over 50, respectively, used this method. Despite this fact, only 56% (N=9) of the restaurateurs between the ages of 40 and 49 purchased fresh food to control quality ( $p=0.0332$ ,  $\chi^2=8.721$ ,  $df=3$ ).

Of the three club owners responding to the questionnaire, two (67%) discussed quality standards with employees, while 98% (N=49) of the other restaurant (non-club) types used this method of quality control ( $p=0.0057$ ,  $\chi^2=7.652$ ,  $df=1$ ). There was a significant difference between the age of the respondent and whether quality standards were discussed with employees beyond their initial training. One hundred percent (N=46) of all respondents under 50 years of age used

this quality control method, while 83% (N=5) of the respondents over 50 discussed quality standards with employees.

According to 83% (N=19) of the managers responding, they themselves were in charge of quality control in their operation, as opposed to the owner or assistant manager ( $p=0.0141$ ,  $\chi^2=8.572$ ,  $df=2$ ). At the same time, 62% (N=10) of the owners responding viewed themselves as being responsible for quality control ( $p=0.0044$ ,  $\chi^2=10.873$ ,  $df=2$ ). In contrast, 71% of hotel/motel restaurants had chefs who were responsible for quality control in their operation ( $p=0.0083$ ,  $\chi^2=6.970$ ,  $df=1$ ). Private restaurants, however, had an employee other than a management member in charge of quality control in three out of four of these establishments ( $p=0.0075$ ,  $\chi^2=7.152$ ,  $df=1$ ), and for 60% of the franchise operations, the contract company governed their quality standards ( $p=0.0302$ ,  $\chi^2=4.702$ ,  $df=1$ ). Of the respondents with fast food establishments, 31% (N=29) indicated that the manager was in charge of quality control, while 69 of the non-fast food managers were responsible of quality control ( $p=0.0138$ ,  $\chi^2=6.061$ ,  $df=1$ ). Eighty-one percent (N=13) of family-owned restaurants indicated that the owner was in charge of quality control ( $p=0.0006$ ,  $\chi^2=11.661$ ,  $df=1$ ). In franchise operations, however, 60% (N=3) of the respondents delegated this responsibility to the production manager ( $p=0.0002$ ,  $\chi^2=13.638$ ,  $df=1$ ).

Managers of restaurants seating over 300 patrons were more often in charge of quality control than for smaller restaurants ( $p=0.0366$ ,  $\chi^2=6.061$ ,  $df=2$ ). Once again, managers of restaurants with an average yearly revenue over \$1,000,000 were also more likely to be in charge of quality control than were the managers of restaurants with a lower

average yearly revenue ( $p=0.0265$ ,  $\chi^2=7.260$ ,  $df=2$ ). On the contrary, managers of restaurants with an average check charge of over \$10.00 were less often in charge of quality control than were managers of restaurants with an average check charge of \$5.00-9.99 or \$3.00-4.99 ( $p=0.0110$ ,  $\chi^2=11.136$ ,  $df=3$ ). At the same time, 55% ( $N=11$ ) of the restaurants with an average check charge of \$5.00-9.99 indicated that a chef was in charge of quality control in their operation ( $p=0.0071$ ,  $\chi^2=12.074$ ,  $df=3$ ).

### Discussion of Quality

In general, for larger restaurants with a high average yearly revenue, quality standards were set by a management team or the assistant manager. This tendency is possibly due to the fact that in these restaurants, more emphasis is placed on quality, and the responsibility is delegated downward closer to production and service. Another possible reason for the delegation of setting quality standards in larger restaurants is that these operations employ more management members, thus each one could be responsible for a certain aspect of the organization.

The use of quality control measures, such as the use of food temperature checks, varied with the type of restaurant the respondent operated. Franchise operations relied on food temperature checks, perhaps because of company-wide policies to promote standardized quality. Catering establishments, possibly because they offer varied services, utilized food temperature checks. Another possible cause of this relationship is the type of service offered by caterers. A small

number of people serve many patrons at one time, requiring the food to be plated and served quicker than in other types of service.

Written food quality standards were used by younger managers more often than older managers for quality standards. Restaurateurs with training in productivity measurement were also more likely to have written quality standards than their colleagues without such training. Perhaps productivity training stressed the importance of written rules or guidelines.

Less experienced managers tasted food prior to service to control quality more often than managers with more experience. It is possible that with experience comes the reliance on trained cooks to taste their own food for quality. This reliance on employees was also present in older managers when they did not use purchasing specifications as often as younger managers used them. Managers of both full service operations and operations with an average check charge over \$10,000 tasted the food produced as a form of quality control. In both types, managers were more often in charge of quality control; therefore, they probably viewed taste testing as part of their responsibility.

The use of detailed instructions for employees beyond their initial training was used more often by less experienced managers than for restaurateurs with more experience. It is possible that more experienced managers assume that once employees are trained they accept and follow all quality standards. Detailed instructions were also given more often to employees of restaurants with a check charge of less than \$10.00. This may be due in part to the large number of temporary and part time workers in the less expensive restaurants. In contrast, the employees in more expensive restaurants are possibly

trained better and remain in their jobs longer. Finally, perhaps the managers of more expensive restaurants demonstrate quality techniques rather than explain them, since more dollars are invested in the food products.

Larger restaurants with greater yearly revenues utilize menus, charts and production schedules to a greater extent than do smaller operations, probably to cope with a larger number of employees, as well as more customers. Fresh food was used as a quality control method by the younger and older respondents more frequently than by those from 40 to 49 years of age. This tendency could stem from the fact that restaurateurs of this age span (40 to 49 years) were brought up on canned goods, and therefore may not be as comfortable with fresh foods as the younger managers, who grew up in a wellness-oriented society. The older managers (over 50) may be delegating the purchasing function to younger assistants who, again, would rely on fresh food as feasible.

The younger restaurateurs differed from the over 50 age group, however, in the use of discussing quality standards with employees beyond employees beyond their initial training. Younger managers appear to communicate with employees, while older restaurateurs may take their employees' understanding of product quality for granted.

Depending on who answered the questionnaire, the respondents usually viewed themselves as responsible for quality control; however, hotel/motel restaurateurs with chefs delegated this responsibility, as did managers of private restaurants. Franchise operations were controlled by their governing contract company. These tendencies could be related to the number of management employees in the operation.

The more managers or assistant managers available, the more likely the quality control responsibility was delegated (Table II).

### Quality of Work Life

On the research instrument, respondents were asked if they measured the QWL in their operation. Operators of fast food establishments tended not to measure QWL as compared to the other types (non-fast food) of restaurants ( $p=0.0415$ ,  $\chi^2=4.154$ ,  $df=1$ ). Seventy percent ( $N=28$ ) of the other types of restaurants measured QWL, as compared to only 38% ( $N=5$ ) of fast food restaurants.

The use of written job satisfaction questionnaires was influenced by the position title of the respondent ( $p=0.0415$ ,  $\chi^2=4.154$ ,  $df=1$ ). Fifty percent ( $N=2$ ) of the respondents with the title of assistant manager used these questionnaires, while only one (6%) owner and two (9%) managers indicated that they circulated job satisfaction questionnaires. Employee participation through suggestions, goal setting, problem solving, and others was influenced by both fast food operations and the average check charge of the restaurant. Sixty-nine ( $N=9$ ) percent of fast food establishments encouraged participation, compared to 90% compliance of the other types of restaurants ( $p=0.0255$ ,  $\chi^2=4.989$ ,  $df=1$ ). Restaurants with an average check charge over \$5.00 used this QWL tool, according to all of the respondents ( $N=26$ ) in this category. On the contrary, only 87% ( $N=7$ ) of the restaurants with an average check charge of \$1.00 to \$2.99 and 71% ( $N=15$ ) of those with an average check of \$3.00 to \$4.99 utilized employee participation ( $p=0.0361$ ,  $\chi^2=8.538$ ,  $df=3$ ).

TABLE II  
SIGNIFICANT ASSOCIATIONS FOUND IN QUALITY CONTROLS

Controls	Factors Showing Correlations	Total % and Number of Respondents Using	
Quality standards specific to operation	Years of experience (p=0.0402, $\chi^2=8.302$ , df=3)	96	N=53
	Caterers (p=0.0402, $\chi^2=8.302$ , df=3)	96	N=53
Standards developed by management team	Average yearly revenue (p=0.0078, $\chi^2=9.697$ , df=2)	66	N=35
Standards developed by manager	Position title of respondent (p=0.0339, $\chi^2=6.771$ , df=2)	56	N=24
	Seating capacity (p=0.0160, $\chi^2=8.270$ , df=2)	55	N=29
	Average yearly revenue (p=0.0022, $\chi^2=12.245$ , df=2)	55	N=29
Standards developed by assistant manager	Hotel/motel restaurants (p=0.0394, $\chi^2=4.245$ , df=1)	25	N=14
	Seating capacity (p=0.0410, $\chi^2=6.390$ , df=2)	26	N=14
Standards developed by production manager	*Franchise restaurants (p=0.0286, $\chi^2=4.789$ , df=1)	11	N=6
	Seating capacity (p=0.0219, $\chi^2=7.642$ , df=2)	11	N=6



TABLE II (Continued)

Controls	Factors Showing Correlations	Total % and Number of Respondents Using	
Temperature checks of food	Caterers ( $p=0.0134$ , $\chi^2=4.258$ , $df=1$ )	56	N=31
	Franchise restaurants ( $p=0.0391$ , $\chi^2=4.258$ , $df=1$ )	56	N=31
	Average yearly revenue ( $p=0.0496$ , $\chi^2=6.009$ , $df=2$ )	57	N=30
Regular sanitation inspections	Training in productivity measurement ( $p=0.0300$ , $\chi^2=4.707$ , $df=1$ )	66	N=35
Taste testing/can cutting	*Private restaurants ( $p=0.0120$ , $\chi^2=6.305$ , $df=1$ )	76	N=42
Written food quality standards	Age of respondent ( $p=0.0422$ , $\chi^2=8.190$ , $df=3$ )	50	N=27
	Training in productivity ( $p=0.0130$ , $\chi^2=6.173$ , $df=1$ )	49	N=26
	Average yearly revenue ( $p=0.0059$ , $\chi^2=10.264$ , $df=2$ )	49	N=26
Written service quality standards	Training in productivity ( $p=0.0028$ , $\chi^2=8.907$ , $df=1$ )	56	N=30

TABLE II (Continued)

Controls	Factors Showing Correlations	Total % and Number of Respondents Using	
Written service quality standards (cont.)	Seating capacity (p=0.0194, X <sup>2</sup> =7.885, df=2)	57	N=30
	Average yearly revenue (p=0.005, X <sup>2</sup> =15.199, df=2)	57	N=30
Managers personally inspects food deliveries	*Full service restaurants (p=0.0010, X <sup>2</sup> =10.857, df=1)	62	N=34
	"Other" restaurant types (p=0.0414, X <sup>2</sup> =4.160, df=1)	62	N=34
Managers personally tastes food	Position title (p=0.0153, X <sup>2</sup> =8.355, df=2)	67	N=37
	Years of experience (p=0.0042, X <sup>2</sup> =8.300, df=3)	67	N=37
	Full service restaurants (p=0.0445, X <sup>2</sup> =4.038, df=1)	67	N=37
	Average check charge (p=0.0189, X <sup>2</sup> =9.950, df=3)	67	N=37
Purchasing specifications	Age of respondent (p=0.0251, X <sup>2</sup> =9.339, df=3)	69	N=38
	*Family owned restaurants (p=0.0092, X <sup>2</sup> =6.785, df=1)	69	N=38

TABLE II (Continued)

Controls	Factors Showing Correlations	Total % and Number of Respondents Using	
Purchasing specifications (cont.)	Seating capacity ( $p=0.0153$ , $\chi^2=8.364$ , $df=2$ )	68	N=36
	Average yearly revenue ( $p=0.0211$ , $\chi^2=7.720$ , $df=2$ )	70	N=37
Detailed instructions to employees	Years of experience ( $p=0.0196$ , $\chi^2=9.885$ , $df=3$ )	75	N=41
	Average check charge ( $p=0.0211$ , $\chi^2=7.720$ , $df=2$ )	75	N=41
Use of menus, charts, production schedules	Seating capacity ( $p=0.0225$ , $\chi^2=7.586$ , $df=2$ )	60	N=32
	Average yearly revenues ( $p=0.0436$ , $\chi^2=6.265$ , $df=2$ )	58	N=31
Use of fresh foods when available	Age of respondents ( $p=0.0332$ , $\chi^2=8.721$ , $df=3$ )	80	N=43
Quality standards discussed with employees	Club restaurants ( $p=0.0057$ , $\chi^2=7.652$ , $df=1$ )	96	N=51
	Age of respondent ( $p=0.0499$ , $\chi^2=7.817$ , $df=3$ )	98	N=51

TABLE II (Continued)

Controls	Factors Showing Correlations	Total % and Number of Respondents Using	
Manager responsible for setting quality standards	Position title ( $p=0.0141$ , $\chi^2=8.527$ , $df=2$ )	63	N=27
	*Fast food restaurants ( $p=0.0138$ , $\chi^2=6.061$ , $df=1$ )	60	N=33
	Seating capacity ( $p=0.0366$ , $\chi^2=6.615$ , $df=2$ )	60	N=32
	Average check charge ( $p=0.0110$ , $\chi^2=6.061$ , $df=3$ )	60	N=33
	Average yearly revenue ( $p=0.0265$ , $\chi^2=7.260$ , $df=1$ )	58	N=31
Assistant manager in charge of setting quality standards	Position title ( $p=0.0141$ , $\chi^2=8.527$ , $df=2$ )	40	N=21
	Seating capacity ( $p=0.0366$ , $\chi^2=6.615$ , $df=2$ )	40	N=21
	Average check charge ( $p=0.0110$ , $\chi^2=11.136$ , $df=3$ )	38	N=21
Production manager in charge of setting quality standards	Franchise restaurants ( $p=0.0002$ , $\chi^2=13.638$ , $df=1$ )	11	N=6

TABLE II (Continued)

Controls	Factors Showing Correlations	Total % and Number of Respondents Using	
Owner in charge of quality control	Position title ( $p=0.0044$ , $\chi^2=10.873$ , $df=2$ )	33	N=14
	Family owned restaurant ( $p=0.0006$ , $\chi^2=11.661$ , $df=1$ )	45	N=25
Chef is in charge of quality control:	Hotel/motel restaurants ( $p=0.0083$ , $\chi^2=6.970$ , $df=1$ )	29	N=16
	Average check charge ( $p=0.0071$ , $\chi^2=12.074$ , $df=3$ )	29	N=16
"Other" person in charge of quality control	Private restaurants ( $p=0.0075$ , $\chi^2=7.152$ , $df=1$ )	22	N=12
Contract company governs quality control	Franchise restaurants ( $p=0.0302$ , $\chi^2=4.701$ , $df=1$ )	22	N=12

\*Inverse relationships

All of the restaurateurs (N=16) with training in productivity measurement monitored turnover, absenteeism and tardiness; however, only 70% (N=26) of the restaurateurs without such training monitored these employee practices ( $p=0.0390$ ,  $\chi^2=4.262$ ,  $df=1$ ). Respondents operating restaurants in hotels/motels were more apt to use job redesign, enlargement or task identification than were the other types of restaurants ( $p=0.0390$ ,  $\chi^2=4.262$ ,  $df=1$ ). Seventy-one percent (N=5) of the hotel/motel operations used this method of measuring QWL as compared to 31% (N=15) of the other restaurant types.

Promotion opportunities were provided more often in restaurants earning over \$1,000,000 in average yearly revenue as well as by restaurateurs with productivity measurement training than by less profitable restaurants or by managers without such training. Ninety-four percent (N=15) of restaurants earning over \$1,000,000 provided promotion opportunities as compared with 74% and 39% of restaurants earning \$500,000-999,999 or under \$499,000, respectively ( $p=0.0023$ ,  $\chi^2=12.153$ ,  $df=2$ ). Restaurateurs with training provided promotion opportunities in 94% (N=15) of the cases as compared to 57% of managers without such training ( $p=0.0081$ ,  $\chi^2=7.016$ ,  $df=1$ ). Respondents of unspecified "other" restaurants were much less likely to provide promotion opportunities than were their categorized counterparts ( $p=0.0433$ ,  $\chi^2=8.667$ ,  $df=1$ ). Supplies, materials and assistance necessary for employees to complete their jobs were provided more often by restaurants earning over \$1,000,000 than by less profitable restaurants. All of these respondents (N=16) provided help to their employees, while only 29% of restaurants with an average yearly revenue under \$499,000 provided these forms of assistance ( $p=0.0433$ ,  $\chi^2=6.273$ ,  $df=2$ ). Full service

and club restaurants did not link performance to rewards as often as did the other types of restaurants, although full service did utilize this method. Sixty-nine percent (N=20) of full service restaurants and only 33% (N=1) of club restaurants used this type of QWL program in contrast to 96% and 84% of the other types of restaurants, respectively ( $p=0.0108$ ,  $\chi^2=6.503$ ,  $df=1$ ;  $p=0.0272$ ,  $\chi^2=4.880$ ,  $df=1$ ).

Training in productivity measurement affected whether or not the manager used commendation letters for their employees. Forty-four percent (N=7) of the managers with training used these letters as compared with 8% (N=3) of managers without such training ( $p=0.0023$ ,  $\chi^2=9.269$ ,  $df=1$ ). In Shaw's (1983) study, there was virtually no difference in the use of commendation letters and whether the respondent had received productivity training. Restaurateurs of hotel/motel operations were also more likely to write commendation letters (57%, N=4), whereas 17% (N=8) of non-hotel/motel restaurants used these letters. Verbal recognition was given less often by club restaurateurs than by managers of other types of restaurants ( $p=0.0085$ ,  $\chi^2=6.935$ ,  $df=1$ ). Eighty-eight percent (N=46) of nonclub restaurants used this QWL method, while only 33% (N=1) of club restaurateurs gave their employees verbal recognition.

Restaurateurs with one to five years of experience were almost twice or more times as often likely to use merit pay for their management staff than were more experienced operators ( $p=0.0024$ ,  $\chi^2=14.449$ ,  $df=3$ ). All (N=15) of the less experienced managers provided merit pay for their managerial staff, while 45% (N=5) of the managers with over 16 years of experience used this form of QWL. One hundred percent (N=3) of the club restaurant operators used merit pay for management

staff, but only 12% (N=2) of the family owned restaurants used this incentive system ( $p=0.0291$ ,  $\chi^2=4.760$ ,  $df=1$ ;  $p=0.0077$ ,  $\chi^2=7.110$ ,  $df=1$ ).

Seating capacity and average yearly revenue also affected the decision to use merit pay. For 50% (N=18) of restaurants seating over 100 patrons, this method was used, while only 12% (N=2) of restaurants seating under 100 had merit pay for management staff ( $p=0.0275$ ,  $\chi^2=7.185$ ,  $df=2$ ). Sixty-two percent (N=10) of restaurants earning an average yearly revenue of \$1,000,000 or more used merit pay, as compared to 6% (N=1) of those operations with a revenue under \$499,000 ( $p=0.0011$ ,  $\chi^2=13.577$ ,  $df=2$ ).

The greater the average yearly revenue, the more likely the restaurateurs were to use both monetary and non-monetary performance awards. Fifty-six percent (N=9) of the respondents with an average yearly revenue over \$1,000,000 used non-monetary awards, while 50% (N=8) used monetary awards ( $p=0.0150$ ,  $\chi^2=8.400$ ,  $df=2$ ;  $p=0.0414$ ,  $\chi^2=6.371$ ,  $df=2$ ). This is in contrast to restaurants earning under \$499,000 in average yearly revenue, of which 11% (N=2) in both cases provided managers with either monetary or non-monetary awards. Fifty percent (N=6) of respondents with productivity measurement training used performance awards, while only 16% of those without training complied ( $p=0.0104$ ,  $\chi^2=6.559$ ,  $df=1$ ). Shaw's (1983) finding of the training performance award relationship was that 33% of the respondents used these awards, while 27% without training gave employees performance awards. Fifty percent (N=8) of the restaurants with an average yearly revenue of over \$1,000,000 gave plaques and certificates to employees, while only 11% of restaurants earning under \$499,000 in revenue (N=2) used this form of employee recognition



( $p=0.0414$ ,  $\chi^2=6.371$ ,  $df=2$ ). Twenty-five percent ( $N=4$ ) of the operations with a high average yearly revenue used newsletter or newspaper articles to recognize employee performance, while none of the respondents earning under \$499,000 in average yearly revenue used this method to reward employees. Hotel/motel restaurants were more likely to recognize their employees in newsletters or newspapers than were other types of restaurants ( $p=0.0037$ ,  $\chi^2=8.423$ ,  $df=1$ ).

Bonuses were used by 75% ( $N=12$ ) of the restaurants with training in productivity measurement, but only 35% ( $N=13$ ) of those without such training awarded bonuses ( $p=0.0076$ ,  $\chi^2=7.123$ ,  $df=1$ ). Bonuses were also used by 100% ( $N=4$ ) of the private restaurants; however, only 45% of the nonprivate type restaurateurs ( $p=0.0344$ ,  $\chi^2=4.473$ ,  $df=1$ ) did the same. Sixty-two percent of the operations with an average check charge between \$1.00 and \$2.99 gave employees scheduling preferences as compared to 0% of those with an average check charge of over \$10.00 ( $p=0.0419$ ,  $\chi^2=8.208$ ,  $df=3$ ). Fifty percent ( $N=8$ ) of the restaurants earning over \$1,000,000 allow employees preference in their work schedules, in contrast to 28% of those earning under \$499,000 in average yearly revenue ( $p=0.0075$ ,  $\chi^2=9.786$ ,  $df=2$ ).

Sixty percent ( $N=3$ ) of the caterers responding utilized "other" performance awards such as Christmas bonuses or retirement programs, while none ( $N=50$ ) of the other types of restaurants indicated the use of other programs ( $p=0.0001$ ,  $\chi^2=31.731$ ,  $df=1$ ). Twenty-five percent ( $N=2$ ) of the restaurants seating over 300 patrons used these "other" types of QWL programs, while those seating under 100 patrons ( $p=0.0325$ ,  $\chi^2=6.852$ ,  $df=2$ ) did not avail themselves of these "other" QWL types. Nine (56%) of the respondents with productivity measurement training

had a suggestion system of participative management, while 10 (27%) of those without training provided this system to employees ( $p=0.0417$ ,  $\chi^2=4.148$ ,  $df=1$ ).

Quality circle programs were used by 57% ( $N=4$ ) of the hotel/motel restaurants and by 75% ( $N=3$ ) of the private type restaurants, as compared to 15 and 16% of the other styles, respectively ( $p=0.0085$ ,  $\chi^2=6.916$ ,  $df=1$ ;  $p=0.0043$ ,  $\chi^2=8.156$ ,  $df=1$ ). Quality circles were utilized by 37% ( $N=6$ ) of the family owned restaurants. In much the same way, these programs were only used by 13% ( $N=5$ ) of the other types of restaurants ( $p=0.0377$ ,  $\chi^2=4.319$ ,  $df=1$ ). Quality circles were more prevalent in restaurants seating under 100 patrons ( $p=0.0397$ ,  $\chi^2=6.454$ ,  $df=2$ ), and were used more often also by restaurants with an average check charge between \$5.00 and \$9.99 than by restaurants with either a greater or lesser average check charge ( $p=0.0389$ ,  $\chi^2=8.371$ ,  $df=3$ ).

Incentive systems were utilized more frequently by restaurants seating over 300 patrons, as well as by those with an average yearly revenue over \$1,000,000 than by smaller establishments with lower revenues. Fifty percent ( $N=4$ ) of the larger restaurants had incentive programs ( $p=0.0081$ ,  $\chi^2=9.638$ ,  $df=2$ ), while restaurants seating under 100 patrons did not. Forty-four percent ( $N=7$ ) of the respondents earning over \$1,000,000 in average yearly revenue used this program, yet none of the respondents with under \$499,000 in yearly revenue had incentive systems ( $p=0.0046$ ,  $\chi^2=10.771$ ,  $df=2$ ).

#### Discussion of QWL

QWL was not measured in fast food restaurants, perhaps due to the

type of employees in these operations. Younger, temporary part time workers are employed in fast food establishments more often than in other types of restaurants; hence, QWL programs may not be viewed as necessary by fast food managers. This could also explain why employee participation through suggestion was not used by fast food restaurants. In contrast, restaurants with a more expensive average check charge utilized suggestion systems, perhaps because their employees are more highly trained, stable, full time workers who are perceived to have more useful suggestions than employees of fast food restaurants.

The use of formal job satisfaction questionnaires was reported more often by assistant managers than by owners or managers. Perhaps assistant managers assumed that this is being performed by top management. In contrast, managers and owners not realizing that this is being done by middle managers, may have indicated the negative reply on this questionnaire. The measurement of turnover, absenteeism and tardiness was performed more often by restaurateurs with training in productivity measurement. This could be due to the training itself, emphasizing the importance of measuring all inputs, especially the true labor used to produce the outputs.

Promotion opportunities were used in restaurants with a higher average yearly revenue, perhaps because more positions or career ladders in both management and production are available for advancement. Incentive programs, commendation letters and bonuses were present in restaurants in which the managers had received some form of training in productivity measurement. It could be that productivity

training stressed the importance of employee attitude and involvement to increase productivity, thus suggesting the use of such programs.

Restaurants with an average yearly revenue over \$1,000,000 provided employees with supplies, materials and assistance more often than did restaurants with a lower revenue. Larger operations with diversified menus may function with less reliance on standardized, or computerized preparation methods and equipment and use more intensive labor to produce gourmet or culinary food. In other words, a "hands-on" approach requiring some flair which requires more time and assistance may be used rather than the high technology methods used by other operations.

Merit pay as an incentive system was more often used by younger managers, reflecting a current trend, popular with new companies and perhaps learned in more recent college courses. Family owned operations tended not to use merit pay or incentives, possibly because they are small, informal organizations without a great need for these programs. This idea is supported by the fact that restaurants with large yearly revenues used these two methods of QWL. These same types of restaurants (larger, more profitable) also use both monetary and non-monetary awards for their employees. Larger, more formal organizations have support systems such as personnel departments or public relations departments which can incorporate such QWL programs more easily than can smaller, informal operations. The less expensive restaurants were more flexible schedule-wise in that their employees had scheduling preference. Employees in these operations are more often part time students who need to work around their academic and extracurricular schedules; hence, flexible schedules are more

appropriate. Also, the more formal operations have certain core hours in which a set number of employees are required (Table III).

### Innovation

Innovation was defined on the survey instrument as the applied creativity in processes, methods, products or technology. The use of brainstorming as an innovation technique was more prevalent in restaurants in which the manager had some training in productivity measurement. Seventy-five percent (N=12) of the managers with training used brainstorming sessions, as compared to only 35% (N=13) of those without such training ( $p=0.0076$ ,  $\chi^2=7.123$ ,  $df=1$ ). This significant finding was also discovered by Shaw (1983) ( $p=0.0017$ ,  $\chi^2=9.815$ ,  $df=1$ ). Hotel/motel restaurateurs were more apt to use brainstorming innovation techniques than were any other type of restaurant. Eighty-six percent (N=6) of hotel/motel restaurants utilized these sessions, while only 42% (N=20) of the other types of restaurants conducted brainstorming sessions ( $p=0.0184$ ,  $\chi^2=4.755$ ,  $df=1$ ). Brainstorming sessions were also used more often by restaurants seating over 300 patrons than smaller restaurants, although those seating under 100 patrons also tended to use this innovation technique. Eighty-seven percent (N=7) of the larger restaurants and 53% (N=9) of the restaurants seating under 100 patrons relied on brainstorming sessions. In contrast; only 32% (N=9) of restaurants with a seating capacity of between 100 and 300 patrons utilized brainstorming sessions ( $p=0.0184$ ,  $\chi^2=7.986$ ,  $df=2$ ).

Franchise operations were overwhelming less likely to have an active suggestion system than any other type of restaurant. None of

TABLE III  
SIGNIFICANT ASSOCIATIONS FOUND IN QUALITY OF  
WORK LIFE CONTROLS

QWL Control	Factors Showing Correlations	Total % and Number of Respondents Using	
Measuring QWL	*Fast food restaurants (p=0.04115, $X^2=4.254$ , df=1)	38	N=20
Written Job Satisfaction Questionnaire	Position title of respondent (p=0.0255, $X^2=4.989$ , df=1)	12	N=5
Employee Participation Through Suggestion	*Fast food restaurants (p=0.0255, $X^2=4.989$ , df=1)	87	N=48
	Average check charge (p=0.0361, $X^2=8.538$ , df=3)	87	N=48
Monitor Turnover, Absenteeism, Tardiness	Training in productivity measurement (p=0.0143, $X^2=6.003$ , df=1)	79	N=42
Job Redesign, Enrichment, Task Identification	Hotel/motel restaurants (p=0.0390, $X^2=4.262$ , df=1)	36	N=20
Provide Promotion Opportunities	Training in productivity measurement (p=0.0081, $X^2=7.016$ , df=1)	68	N=36
	*"Other" restaurant types (p=0.0032, $X^2=8.667$ , df=1)	69	N=38
	Average yearly revenue (p=0.0028, $X^2=12.153$ , df=2)	68	N=36

TABLE III (Continued)

QWL Control	Factors Showing Correlation	Total % and Number of Respondents Using	
Provision of Supplies, Materials, Assistance to Employees	Average yearly revenue ( $p=0.0438$ , $X^2=6.279$ , $df=2$ )	79	N=42
Link Performance to Reward	Full service restaurants ( $p=0.0108$ , $X^2=6.503$ , $df=1$ )	81	N=44
	*Club restaurants ( $p=0.0272$ , $X^2=4.880$ , $df=1$ )	81	N=44
Commendation Letters	Training in productivity measurement ( $p=0.0023$ , $X^2=9.269$ , $df=1$ )	19	N=10
	Hotel/motel restaurants ( $p=0.0154$ , $X^2=5.867$ , $df=1$ )	22	N=12
Verbal Recognition	*Club restaurants ( $p=0.0085$ , $X^2=6.935$ , $df=1$ )	85	N=47
Merit Pay for Management Staff	Years experience ( $p=0.0024$ , $X^2=14.499$ , $df=1$ )	40	N=22
	Club restaurants ( $p=0.0291$ , $X^2=4.760$ , $df=1$ )	40	N=22
	*Family owned restaurants ( $p=0.0077$ , $X^2=7.110$ , $df=1$ )	40	N=22
	Seating capacity ( $p=0.0275$ , $X^2=7.185$ , $df=2$ )	38	N=20

TABLE III (Continued)

QWL Control	Factor Showing Correlation	Total % and Number of Respondents Using	
Merit Pay for Management Staff (cont.)	Average yearly revenue ( $p=0.0011$ , $X^2=13.577$ , $df=2$ )	40	N=21
Non-Monetary Performance Awards	Average yearly revenue ( $p=0.0150$ , $X^2=8.400$ , $df=2$ )	30	N=16
Monetary Performance Awards	Training in productivity measurement ( $p=0.0104$ , $X^2=6.559$ , $df=1$ )	26	N=14
	Average yearly revenue ( $p=0.0414$ , $X^2=6.371$ , $df=2$ )	28	N=15
Plaques and Certificates	Average yearly revenue ( $p=0.0414$ , $X^2=6.371$ , $df=2$ )	28	N=15
Recognition in Newsletters, Newspapers	Hotel/motel restaurants ( $p=0.0037$ , $X^2=8.423$ , $df=1$ )	11	N=6
	Average yearly revenue ( $p=0.0334$ , $X^2=6.799$ , $df=2$ )	9	N=5
Bonuses (Time, Pay)	Training in productivity measurement ( $p=0.0076$ , $X^2=7.123$ , $df=1$ )	47	N=25
	Private restaurants ( $p=0.0344$ , $X^2=4.473$ , $df=1$ )	49	N=27
Scheduling Preferences	Average check charge ( $p=0.0419$ , $X^2=8.208$ , $df=3$ )	53	N=29



TABLE III (Continued)

QWL Control	Factor Showing Correlation	Total % and Number of Respondents Using	
Scheduling Preferences (cont.)	Average yearly revenue ( $p=0.0075$ , $X^2=9.786$ , $df=2$ )	53	N=28
"Other" Performance Awards	Caterers ( $p=0.0001$ , $X^2=31.731$ , $df=1$ )	5	N=3
	Seating capacity ( $p=0.0325$ , $X^2=6.852$ , $df=1$ )	6	N=3
Suggestion System	Training in productivity measurement ( $p=0.0417$ , $X^2=4.148$ , $df=1$ )	36	N=19
Quality Circles	Hotel/motel restaurants ( $p=0.0085$ , $X^2=8.561$ , $df=1$ )	20	N=11
	Private restaurants ( $p=0.0043$ , $X^2=8.156$ , $df=1$ )	20	N=11
	*Family owned restaurants ( $p=0.0377$ , $X^2=4.319$ , $df=1$ )	20	N=11
	Seating capacity ( $p=0.0397$ , $X^2=6.454$ , $df=2$ )	21	N=11
	Average check charge ( $p=0.0389$ , $X^2=8.371$ , $df=3$ )	20	N=11

TABLE III (Continued)

QWL Control	Factor Showing Correlation	Total % and Number of Respondents Using	
Incentive Systems	Seating capacity (p=0.0081, $\chi^2=9.638$ , df=2)	26	N=14
	Average yearly revenue (p=0.0046, $\chi^2=10.771$ , df=2)	28	N=15

\*Inverse relationship

the five franchise respondents used a suggestion system, while 46% (N=23) of other restaurants had such a system ( $p=0.0468$ ,  $\chi^2=3.953$ ,  $df=1$ ). Employee participation at meetings was present in 87% (N=14) of restaurants earning over \$1,000,000 in average yearly revenue, as compared to 50% (N=9) of restaurants with a revenue under \$499,000 ( $p=0.0291$ ,  $\chi^2=7.074$ ,  $df=2$ ). All of the respondents (N=7) over 50 years of age allowed employees to attend restaurant association meetings, while only three (27%) of the restaurateurs under 30 years of age gave their employees this opportunity ( $p=0.0001$ ,  $\chi^2=20.677$ ,  $df=3$ ).

Sixty-eight percent (N=11) of restaurateurs with training productivity measurement conducted employee training seminars, as compared to only 32% (N=12) of those without training ( $p=0.0143$ ,  $\chi^2=5.998$ ,  $df=1$ ). Fast food restaurants were much less likely to conduct such seminars than other types of restaurants. Only 15% (N=2) of fast food operations provide employee training seminars, as compared to 52% (N=22) of other types of restaurants ( $p=0.0188$ ,  $\chi^2=5.252$ ,  $df=1$ ). Eighty-seven percent (N=7) of restaurants seating over 300 patrons conducted training seminars for their employees, as compared to only 12% (N=2) of restaurants with a seating capacity under 100 patrons ( $p=0.0010$ ,  $\chi^2=13.757$ ,  $df=2$ ). More expensive restaurants with large revenues also conducted employee training seminars more often than less expensive operations with smaller yearly revenues. Every restaurant with an average check charge over \$10.00 had such programs, in comparison with 25% (N=2) of those with an average check charge of \$1.00 to \$2.99 ( $p=0.0234$ ,  $\chi^2=9.491$ ,  $df=3$ ). Seventy-five percent (N=12) of restaurants earning an average yearly revenue over

\$1,000,000 provided employees with training seminars, while only 22% (N=4) of restaurants earning under \$499,000 in revenue used this innovation technique ( $p=0.0063$ ,  $\chi^2=10.123$ ,  $df=2$ ).

The addition of a computer or word processor occurred more often in larger restaurants than in smaller establishments, as expected. Sixty-two percent (N=5) of operations seating over 300 patrons added such new technology ( $p=0.0086$ ,  $\chi^2=6.909$ ,  $df=1$ ), in comparison to restaurants seating less than 100 patrons. All respondents (N=16) with training in productivity measurement added new equipment within the last three years, as compared to 76% (N=28) of respondents without such training ( $p=0.0304$ ,  $\chi^2=4.688$ ,  $df=1$ ). "Other" (uncategorized) restaurants did not add new equipment as often as categorized restaurant types. Fifty percent (N=3) of the "other" restaurants added new equipment, as compared to 86% of the categorized restaurants ( $p=0.0323$ ,  $\chi^2=4.583$ ,  $df=1$ ).

New benefits plans were added by 75% (N=3) of private restaurants, which is a substantially higher percentage than the 20% (N=10) of nonprivate operations ( $p=0.0120$ ,  $\chi^2=6.305$ ,  $df=1$ ). Watt mizer light bulbs were added more often by restaurants seating over 300 patrons than by smaller establishments. Fifty percent (N=4) of the large establishments added these innovative tools in contrast to only 6% (N=1) of the restaurants with a seating capacity under 100 patrons ( $p=0.0309$ ,  $\chi^2=6.956$ ,  $df=2$ ). Thirty-two percent of restaurants earning between \$500,000 and \$999,000, and 25% (N=4) of restaurants earning over \$1,000,000 in yearly revenue purchased watt mizer light bulbs, while none (N=18) of the respondents earning less in yearly revenue made such a purchase ( $p=0.0372$ ,  $\chi^2=6.584$ ,  $df=2$ ). New cleaning agents

were purchased by only 38% (N=11) of full service restaurants, while 61% (N=17) of other types of restaurants purchased new cleaning agents ( $p=0.0420$ ,  $\chi^2=4.134$ ,  $df=1$ ).

### Discussion of Innovation

Brainstorming sessions were more often used by restaurateurs with productivity training, perhaps because employee involvement was stressed in the training. This innovation technique was used in hotel/motels, possibly because of the diversity of departments and functions involved in these operations. Employees from all positions may add input to tasks in other types of positions. Larger restaurants rely on brainstorming, perhaps for the same reason.

Franchise operations with formal, company-wide policies tended not to encourage employee suggestions as often as other types of restaurants. Employee participation was more commonly practiced in more profitable restaurants. Perhaps employees in larger operations are cross-labor trained, can function in a variety of labor-intensive positions and hence are considered credible.

Older restaurateurs allowed their employees to attend restaurant association meetings more often than younger managers, possibly because the older managers have attended many such meetings themselves. The younger managers tended to go the meetings themselves. The older managers could be burned out on going to such meetings and therefore may pass the privilege on to employees who could benefit from new ideas generated from these meetings. Employee training seminars are not used in fast food restaurants, perhaps because a majority of their employees are temporary and their jobs are more standardized or

computerized than in other types of restaurants, and initial training may be all they need. In contrast, larger restaurants with a large revenue require labor-intensive preparation methods and complex functions through increasing the need, as well as the desire, for employee training seminars.

Restaurants with a larger seating capacity implemented computers or word processors more often than smaller establishments, since more record keeping and reports may be required in these establishments. Fast food operations did not implement new menus or recipes as often as other restaurants did. This may be due to the restraints of possible products in fast food service, as well as the limited customer demand. Fast food operations seem to adhere to a stereotyped image regarding product lines; for example, hamburgers at McDonalds, beef sandwiches at Arby's, and so on. Watt mizer light bulbs were implemented in larger, more profitable restaurants with high yearly revenues where accountability for perhaps all resources is more attended to than in smaller operations (Table IV).

#### Performance Criteria Ranking by Time Spent and Importance

As illustrated in Figure 5, the seven performance criteria were ranked identically on the basis of time spent in evaluation and in importance to the successful operation of the restaurant. In agreement with the study conducted by Shaw (1983), quality was clearly viewed by the respondents as both the most important as well as the most time consuming performance criteria. Profitability was ranked the second-most important performance criteria. This contradicts

TABLE IV  
SIGNIFICANT ASSOCIATIONS FOUND IN INNOVATION TECHNIQUES

Innovation Technique	Factors Showing Correlation	Total % and Number of Respondents Using	
Brainstorming Sessions	Training in productivity measurement (p=0.0076, X <sup>2</sup> =7.123, df=1)	47	N=25
	Hotel/motel restaurants (p=0.0292, X <sup>2</sup> =4.755, df=1)	47	N=26
	Seating capacity (p=0.0184, X <sup>2</sup> =7.986, df=2)	47	N=25
Active Suggestion System	*Franchise restaurants (p=0.0468, X <sup>2</sup> =3.953, df=1)	42	N=23
Employee Participation	Average yearly revenue (p=0.0291, X <sup>2</sup> =7.074, df=2)	60	N=38
Restaurant Association Meetings and Seminars	Age of respondent (p=0.0001, X <sup>2</sup> =20.677, df=3)	39	N=21
Employee Training Seminars	Training in productivity measurement (p=0.0143, X <sup>2</sup> =5.998, df=1)	43	N=23
	*Fast food restaurants (p=0.0188, X <sup>2</sup> =5.525, df=1)	44	N=24
	Seating capacity (p=0.0010, X <sup>2</sup> =13.757, df=2)	43	N=23

TABLE IV (Continued)

Innovation Technique	Factors Showing Correlation	Total % and Number of Respondents Using	
Employee Training Seminars (cont.)	Average check charge (p=0.0234, X <sup>2</sup> =9.491, df=3)	44	N=24
	Average yearly revenue (p=0.0063, X <sup>2</sup> =10.123, df=3).	43	N=23
Purchase of Computer, Word Processor	Seating capacity (p=0.0390, X <sup>2</sup> =6.487, df=2)	26	N=14
Use of New Menu, New Recipes	Fast food restaurants (p=0.0086, X <sup>2</sup> =6.909, df=1)	89	N=49
Implementation of New Equipment	Training in productivity measurement (p=0.0304, X <sup>2</sup> =4.688, df=1)	83	N=44
	"Other" restaurants (p=0.0323, X <sup>2</sup> =4.583, df=1)	82	N=45
New Benefits Plan	Private restaurants (p=0.0120, X <sup>2</sup> =6.305, df=2)	24	N=13
Watt Miser Light Bulbs	Seating capacity (p=0.0309, X <sup>2</sup> =6.956, df=2)	19	N=10
	Average yearly revenue (p=0.0372, X <sup>2</sup> =6.584, df=2).	19	N=10
Purchase of New Cleaning Agents	Full service restaurants (p=0.0420, X <sup>2</sup> =4.134, df=1)	51	N=28

\*Inverse relationships



Quality \* \* \* \* \* 6.75  
 @ @ @ @ @ @ @ @ @ @ 6.81

Profitability \* \* \* \* \* 11.31  
 @ @ @ @ @ @ @ @ @ @ @ 11.86

Productivity\* \* \* \* \* 12.17  
 @ @ @ @ @ @ @ @ @ @ @ @ 12.26

Efficiency\* \* \* \* \* 12.50  
 @ @ @ @ @ @ @ @ @ @ @ @ @ @ 12.86

Effectiveness \* \* \* \* \* 17.20  
 @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ 16.37

Innovation\* \* \* \* \* 19.18  
 @ 19.20

QWL \* \* \* \* \* 20.90  
 @ 20.62

Percentage Points for Each Individual Criteria

Ranking ( see page 43) on the basis of:

\* - Time spent in evaluation

@ - Importance to the operation

Figure 5. Performance Criteria Ranking

Shaw's finding of productivity as the second-ranked performance criteria. The reader is reminded, however, that Shaw's sample worked in health care facilities, while the samples in the present study are in profit-oriented organizations. The only other performance criteria ranked in the same order was innovation. This performance criteria was perceived in both studies as the sixth most time-consuming performance criterion. QWL was ranked the least important of the performance criteria, and the one for which restaurateurs spent the least amount of time, also. Although the literature links job satisfaction, a surrogate measure of QWL, to productivity, obviously restaurateurs in this study have not looked to QWL programs as a means to improve the performance and morale of their personnel.

#### Hypotheses Testing

In  $H_1$ , the number of years of experience and training in productivity measurement significantly affected effectiveness (Table I; Figure 5). The age, years of education and position title of the respondent, however, did not significantly affect effectiveness. Based on two of the five personal variables, the researcher rejected  $H_1$ .

Although the type of restaurant and the average yearly revenue did not have a significant affect on effectiveness, the restaurants' seating capacity, and its average check charge per person did significantly affect effectiveness. Based on these results, the researcher rejected  $H_2$ .

Quality was significantly affected by four of the five personal variables in  $H_3$ . The respondents' age, position title, number of years of experience and whether or not they had productivity training

affected quality, while the years of education did not significantly affect this performance criteria. Based on these results, the researcher rejected  $H_3$ .

In  $H_4$ , the type of restaurant, its seating capacity, average check charge and average yearly revenue affected quality. Because all four restaurant variables had a significant affect on quality, the researcher rejected  $H_4$ .

The position title and productivity training of the respondent had a significant affect on QWL. The other personal variables (age, years of education and number of years experience), however, did not affect QWL. Based on two of the five personal variables, the researcher rejected  $H_5$ .

Based on the results discussed in the previous section, the researcher rejected  $H_6$ . QWL was significantly affected by the type of restaurant, its average check charge and average yearly revenue. Since three of the four restaurant variables had a significant affect on QWL, the researcher rejected  $H_6$ .

In  $H_7$ , two of the five personal variables significantly affected QWL. The respondents' experience and productivity measurement training affected QWL, while the respondents' age, years of education and position title did not affect QWL. Based on these results, the researcher rejected  $H_7$ .

The type of restaurant, its seating capacity, average check charge and average yearly revenue significantly affected QWL. Because all of the restaurant variables were significantly affected, the researcher rejected  $H_8$ .

Innovation was significantly affected by age and productivity training, not by the years of experience, position or the number of years of experience of the respondent. Three of the five personal variables were not affected; however, two were. Therefore, the researcher rejected  $H_9$ .

In  $H_{10}$ , the type of restaurant, its seating capacity, average check charge and average yearly revenue significantly affected innovation. Based on these three variables,  $H_{10}$  was rejected by the researcher.

In  $H_{11}$ , productivity measurement training significantly affected whether the listed processes, methods, products or technologies were implemented within the last three years. Based on this personal variable, the researcher rejected  $H_{11}$ .

The type of restaurant, its seating capacity and average yearly revenue affected the process, methods, procedures or technologies used within the last three years. Because three of the four restaurant variables had a significant affect on this innovation criteria, the researcher rejected  $H_{12}$ .

## CHAPTER V

### SUMMARY, RECOMMENDATIONS AND IMPLICATIONS

This study was guided by the following objectives: to identify the specific methods of performance measurement used by the Missouri Restaurant Association (MRA); to assess the measurement of effectiveness, quality, quality of work life and innovation so that standards measures may be developed to improve strategies for restaurants; to assess the relative importance and the time spent on each criteria; and to formulate suggestions as to how standards may be used by restaurant managers.

To accomplish these objectives, a closed-question instrument was attached to a newsletter and mailed to the members of the MRA. Approximately 1,900 questionnaires were distributed, and 55 usable responses were analyzed using frequency distribution and chi square.

#### Demographic Description of the Sample

Fifty-seven percent of the 55 respondents were below 40 years of age and 43% were older than 40. Fifty-three percent of the respondents had accumulated over 11 years of experience, while 47% had less than 11 years of experience. More than half (54%) of the respondents held the title of restaurant manager, 37% were restaurant owners and 9% were titled assistant manager. Thirty percent of the respondents

had received training in productivity measurement, while 70% had no such training.

Fifty-three percent of the restaurants were full service operations, 29% were family owned and 24% were fast food operations. Over half (53%) of the restaurants sat between 100 and 299 patrons, while 32% had a seating capacity of under 100 patrons. Thirty-eight percent of the average check charge was between \$3.00 and \$4.99, whereas 36% of the respondents had an average check charge of between \$5.00 and \$9.99. The average yearly revenue was split evenly between the three categories: below \$500,000, between \$500,000 and \$999,000 and over \$1,000,000.

#### Performance Criteria

The effectiveness measures used most often by the respondents were: the use of sales increases over last year's sales, personnel audits, MBO programs, dividing goals into subgoals and evaluation meetings. These effectiveness measures were used more often by managers with training in productivity, and by those with more than five years of experience. The experience and training of the restaurateur therefore affected the use of performance measures in the restaurant industry.

Family owned restaurants tended not to use effectiveness measures, perhaps because they are small, informal operations in which each member has specific responsibilities. Club restaurants did not utilize profit and loss statements to evaluate effectiveness, possibly because there are private businesses which are service-oriented rather than profit-oriented. Restaurants with lower average yearly revenues

did not utilize MBO programs or evaluation meetings due, perhaps, to their small, informal mode of operation. (Significant effectiveness associations were illustrated in Table I.)

In larger restaurants with higher yearly revenues, quality standards were set by either a management team or the assistant manager, possibly since these operations employ more management members to delegate this responsibility to. Food temperature checks were used by franchise operations and caterers more so than the other types of restaurants. Perhaps this is due to company policies or the length of time between plating and service, respectively, which are common functions in these types of operations, especially in catering.

Younger managers as well as those with productivity measurement training used written food quality standards. This could be explained, perhaps, by older managers delegating this responsibility to the cooks themselves and the productivity training itself, stressing the importance of written quality standards. Older and more experienced managers did not personally taste the food for quality or use purchasing specifications as often as younger managers did. Again, the art of delegating such responsibilities may be learned with age and experience. In full service and more expensive restaurants where the manager was in charge of quality control, the manager personally taste tested the food for quality. Perhaps this task was viewed as part of their quality control responsibilities.

Detailed instructions were given to employees of less experienced managers of the less expensive restaurants. These managers may rely on detailed explanations and demonstrations because they employ younger, temporary part time workers who are not well trained and who

may require explanations beyond their initial training period. Menus, charts and production schedules were used by larger, more profitable restaurants, possibly to cope with both a greater number of employees and customers. Younger and older managers used fresh food more often than did those managers in the 40-49 year old age group. This may reflect society's current wellness trend or the fact that the middle aged managers were brought up on canned goods.

Younger managers appear to communicate with employees more often than their older counterparts, as is demonstrated by the fact that younger managers discussed quality standards with employees beyond their initial training, while older managers did not. Responsibility for quality was generally claimed by the respondent, whether their title was owner, manager or assistant manager. This tendency may reflect the attitude that quality is everyone's responsibility, or that, if possible, it is delegated to the lower management levels, as was the participation in this questionnaire. (Table II depicted these significant quality factors as related to the personal and restaurant variables of the respondent.)

Fast food restaurants did not measure QWL or encourage employee participation through a suggestion system. This could well be due to the type of employees employed by fast food establishments. Younger, temporary part time employees may not be viewed as credible sources of information, as are the highly trained, full time employees of the more expensive restaurants. Assistant managers reported the use of formal job satisfaction questionnaires more often than did their



This could be due to the employees of such operations being part time students requiring flexible schedules, while the more expensive, formal restaurants require certain core hours that must be covered by their employees. (These significant associations between both personal and restaurant variables and QWL were illustrated in Table III.)

Brainstorming sessions as innovation techniques were used more often by larger restaurants. This could be due to the training itself stressing employee involvement, and by the diverse departments and functions involved in both hotels/motels and large restaurants. Employee suggestions were encouraged in large restaurants, but not by franchise operations. This could be due to company policies and guidelines not allowing employee participation, while large restaurants may have cross-trained labor and thus rely on input from trained, credible employees.

Older restaurateurs allow their employees to attend restaurant association meetings, while younger restaurateurs attend such events themselves. Larger, more profitable restaurants utilize employee training seminars, perhaps because they required labor-intensive production and service. Fast food operations, however, do not use employee training seminars because the preparation methods are more standardized or computerized than in other types of restaurants. Restaurants with larger seating capacities have implemented computers or word processors more often than smaller establishments, since more record keeping may be required in these establishments.

Fast food operations did not implement new menus or recipes as often as did other types of restaurants, due perhaps to the stereotyped image of their menus. Watt mizer light bulbs were implemented

in larger, more profitable restaurants where accountability for resources is more attended to than in smaller operations. (The significant associations were displayed in Table IV.)

## Recommendations

### Questionnaire

Because the instrument was examined by a number of research professionals for validity, reliability, objectivity and applicability, no problems surfaced during data analysis. A major limitation of this study was the low response rate. One possible solution to this problem would have been to mail the survey instrument directly to the restaurateurs and without the accompanying MRA newsletter. Due to both time and financial constraints, a follow-up mailing was not possible.

### Recommendations Based on the Results of the Study

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

1. Performance measures were used more often by restaurateurs with some type of productivity measurement training. Additional training via seminars or educational material on performance/productivity measurement need to be promoted within the food service industry.

2. A wide variety of performance measures are used in each of the four performance criteria covered in this study. Information on the use of such measures should be identified as performance measures to call restaurateurs' attention to their evaluation.

3. Younger managers appear to communicate with their employees, as well as implement QWL programs more often than their older colleagues. Because QWL is a relatively new issue covered in college courses, younger managers would have had exposure to the topic, whereas older managers may not have. Education materials, seminars and short courses need to be promoted in the food service industry to familiarize restaurateurs with this vital performance criteria.

4. Because of the low response rate, additional studies are needed on the performance measures used in restaurants. Additional state restaurant associations need to be surveyed to gather a wider data source on the food service industry. These restaurants should be surveyed separately according to the type of restaurant, e.g., full service restaurants vs. franchise vs. family owned establishments.

#### Implications

This study serves as the first of many investigations into the restaurant industry's understanding of, and use of, organizational performance measures. Additional state restaurant associations or a random sample of the NRA need to be surveyed so that valid indices may be developed for use nationwide. These indices could then be promoted within the food service industry to increase the managers' measurement, evaluation and control of performance in their operations.

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APPENDIXES

APPENDIX A

CORRESPONDENCE

OREGON STATE UNIVERSITY  
1000 NE Oregon Street  
Corvallis, Oregon 97331



Oklahoma State University

Department of Food, Nutrition and Institution Administration

STILLWATER, OKLAHOMA 74078  
(405) 624-5039

February 17, 1984

Dear Colleague:

As a restaurant operator, 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 midwest restaurants. 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 a pilot study conducted with the Oklahoma Restaurant Association Board Members on July 1983.

If you are not involved in the evaluation of organizational performance in your restaurant, 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 restaurant at any time. After completing the questionnaire please fold, staple and return it to us. We would appreciate hearing from you by March 9th, 1984. If you have any questions call us at (405) 624-5039.

Sincerely,

*Suzanne Lamb*  
Suzanne Lamb  
Grad. Research Asst.

*Amy Pickereel*  
Amy Pickereel  
Grad. Research Asst.

*Lea L. Ebro*  
Lea L. Ebro, Ph.D.  
Associate Professor



## MISSOURI RESTAURANT ASSOCIATION

PO BOX 10210/KANSAS CITY, MISSOURI 64114-3331 MADISON, MISSOURI 64501 (816) 531-5222

February 17, 1984

Dear Member:

Enclosed is a survey questionnaire by a Central Missouri State Alum who is now doing research at Oklahoma State University involving the measurement and eventually improvement of productivity in the foodservice industry. This questionnaire is to explore the current measurement practices in restaurants and several other midwest states are participating in this study.

From this study will involve ratios and indices which can be used by the foodservice industry to monitor productivity as well as other organizational performance criteria each manager wishes to follow in his/her establishment. I urge you to take a few minutes of your time to complete this questionnaire. Results of this study as well as those from other midwest states will be shared with members of the Missouri Restaurant Association.

Thank you for your cooperation.

Cordially,

A handwritten signature in cursive script that reads "Dick Walls".

Dick Walls  
MRA President



APPENDIX B

RESEARCH INSTRUMENT



II. Performance Criteria

1. PRODUCTIVITY - is defined as the relationship of outputs to inputs, or reaching the highest level of performance with the least expenditure of resources.

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 store-room	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) Routinely follow bar costs, if applicable	1	2	3	4	5
(13) Other (please specify):	1	2	3	4	5

Which of the following do you use to control outputs?

(14) Check production records at least quarterly to see that production is appropriate for demand	1	2	3	4	5
(15) Have a system for utilizing leftover bulk foods	1	2	3	4	5

(Continued on page 3)

Which of the following do you use to control outputs? (cont.)

Methods	Always	Usually	Sometimes	Rarely	Never
(16) Meals served daily	1	2	3	4	5
(17) Daily check average	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

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

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

(RATIO)

(26) Yes

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

$$\frac{\text{Meals produced, 1982}}{\text{Labor hours used, 1982}}$$

(INDEX)

(27) No

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

(28) Meals/labor hours worked

(29) Sales/labor hours worked

(30) Meals/labor hours paid

(31) Sales/labor hours paid

(32) Sales per equivalent employee

(33) Customers/labor hour

(34) Order copy of ticket/  
payroll hours

(35) Meals served/actual  
man-minutes

(36) FTE's/specific task

(37) Meals/total food cost

(38) 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 EF1  (2) No EF2

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

- (3) Costs and profit (profit and loss statement) EF3  
 (4) Sales volume EF4  
 (5) % profit EF5  
 (6) Increase in sales over previous year EF6  
 (7) Daily review EF7  
 (8) Control overhead EF8  
 (9) Actual performance compared with forecasted performance EF9  
 (10) Operational audit EF10  
 (11) Personnel audit EF11  
 (12) MBO for management staff EF12  
 (13) Break goals into small measurable sub-goals EF13  
 (14) Evaluation meetings EF14  
 (15) Administration evaluates goal attainment EF15

3. QUALITY - is defined as conformance to standards or specifications. Example: Meeting health department regulations.

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

(1) Yes Q1  (2) No Q2

By whom are these standards developed? (please check all that apply):

- (3) Management team Q3  (6) Personnel Manager Q6  
 (4) Manager Q4  (7) Production Manager Q7  
 (5) Assist. Manager Q5  (8) Consultant Q8  
 (9) Other (please specify): Q9

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

- (10) Temperature check of food in steamtable Q10  
 (11) Periodic survey of customers as to quality of food service Q11  
 (12) Regular (unannounced) sanitation inspections Q12  
 (13) Taste testing/can cutting of new food items by management Q13  
 (14) Written standards for quality of food Q14  
 (15) Written standards for quality of service Q15  
 (16) Manager personally inspecting all food deliveries Q16  
 (17) Manager personally tasting all cooked foods for quality Q17  
 (18) Purchasing specifications Q18  
 (19) Detailed instructions to employees Q19  
 (20) Menus and charts, production schedules Q20  
 (21) Use of fresh food, if available and economical Q21

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

(22) Yes Q22  (23) No Q23

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

- (24) A management team Q 24
- (25) Manager Q 25
- (26) Asst. Manager Q 26
- (27) Production Manager Q 27
- (28) Owner Q 28
- (29) Chef Q 29
- (30) Other (please specify): Q 30

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

- (31) State health codes Q 31
- (32) County health codes Q 32
- (33) City health codes Q 33
- (34) Contract company standards Q 34
- (35) Other (please specify): Q 35

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

Example: \$ budgeted for food, 1983  
\$ actually spent on food, 1983

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

- |                             | Yes                      | No                       |
|-----------------------------|--------------------------|--------------------------|
| (1) Labor                   | <input type="checkbox"/> | <input type="checkbox"/> |
| (2) Materials               | <input type="checkbox"/> | <input type="checkbox"/> |
| (3) Capital                 | <input type="checkbox"/> | <input type="checkbox"/> |
| (4) Energy                  | <input type="checkbox"/> | <input type="checkbox"/> |
| (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 the affective responses of participants to working in a system. Example: job satisfaction, motivation, pay satisfaction . . .

Do you measure the quality of worklife in your operation?

- (1) Yes QW1
- (2) No QW2

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

- (3) Use written job satisfaction questionnaires QW3
- (4) Encourage employees to make suggestions, participate and cooperate with management on new projects, problem solving, goal setting, etc. QW4
- (5) Monitor turnover, absenteeism, and tardiness QW5
- (6) Communicate with employees verbally and via memos, newsletters, etc. regularly QW6
- (7) Hold unit or department meetings regularly QW7
- (8) Make the job more interesting by redesigning, job enlargement, task, identification, etc. QW8
- (9) Provide opportunities for promotion QW9
- (10) Provide supplies, materials, and assistance to employees as needed QW10
- (11) Provide physical environment that facilitates rather than interferes with work (appropriate work areas, temperature, light, etc.) QW11

Do you link performance to rewards?

- (12) Yes QW12
- (13) No QW13

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

- (14) Raises based upon performance appraisals QW14
- (15) Commendation letters QW15
- (16) Verbal recognition QW16
- (17) Merit pay for management staff QW17
- (18) Performance awards (non-monetary) QW18
- (19) Performance awards (monetary) QW19
- (20) A formal incentive system QW20
- (21) Plaque and Certificate or other forms of recognition QW21
- (22) Recognition in newsletter, newspaper QW22
- (23) Bonuses (time, pay) QW23
- (24) Scheduling preferences QW24
- (25) Complimentary meals QW25
- (26) Other (please specify): \_\_\_\_\_ QW26

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

- (27) Suggestion system (if yes, please tell approximately how many suggestions have been accepted in the last year and what type of reward is given) \_\_\_\_\_ QW27
- (28) 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: \_\_\_\_\_ QW28
- (29) 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 relatively objective indices of individual, group, or sometimes organizational performance. Please describe: \_\_\_\_\_ QW29

6. INNOVATION - is defined as applied creativity in processes, methods, product, or technology.

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

- (1) Brainstorming sessions IN1
- (2) Active suggestion system IN2
- (3) Employee participation at meetings IN3
- (4) Reward employee input IN4
- (5) Allowing employees to attend restaurant association meetings and seminars IN5
- (6) Employee training seminars IN6
- (7) Try new recipes and discuss them with employees IN7
- (8) Other (please specify): \_\_\_\_\_ IN8

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

- (9) Computer, word processor IN9
- (10) New menus and recipes IN10
- (11) Layout changes IN11
- (12) Revised job descriptions IN12
- (13) New equipment (cooking, catering, etc.) IN13
- (14) New scheduling procedures IN14
- (15) New sandwich prep ideas IN15
- (16) New food products used in recipes IN16

- (17) New benefits plan JR 17
- (18) Watt miser light bulbs IN 18
- (19) New cleaning agents IN 19
- (20) Other (please specify): \_\_\_\_\_ JR 20

7. PROFITABILITY - is defined as the earned return on investment or the relationship of revenue to costs. If your operation is for profit, how do you measure profitability? (please give formulas):

Exceeding the budget in your restaurant(s) results in:

- (1) Has never happened
- (2) Nothing in particular
- (3) Investigation of causes and budget readjustment
- (4) Submission of written justification to those in charge
- (5) Demerits
- (6) Cut-off of funds
- (7) Price increases
- (8) Sales analysis
- (9) Performance audit
- (10) Review of funds
- (11) Control labor
- (12) Control inventory
- (13) Volume increase
- (14) Cut costs
- (15) Portion controls
- (16) Increase line speed
- (17) Other (please specify): \_\_\_\_\_

How do you determine meal prices?

- (18) Food cost + % markup
- (19) Food + labor costs
- (20) Sales mix
- (21) Item by item food cost
- (22) Cost of meal, popularity of item
- (23) Volume sold and cost
- (24) Food cost + overhead + labor + % markup
- (25) Raw food cost + labor + what traffic will bear and what we think the customer can afford
- (26) Other (please specify): \_\_\_\_\_

8. Please rate the 7 performance criteria according to how much time you spend evaluating each of them in your restaurant. 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                       Effectiveness                       Profitability
- Quality                                       Efficiency                                       Quality of worklife
- Innovation

9. Please rate the 7 performance criteria according to how important they are to the successful operation of your restaurant. 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 least important. Do not use a number twice.

- Productivity                       Effectiveness                       Profitability
- Quality                                       Efficiency                                       Quality of worklife
- Innovation

10. We welcome your comments on this study, the questionnaire, or the definitions used. Do you have alternative definitions for the performance criteria which you would prefer to see used?

Please check to see if you have completed seven pages. THANK YOU FOR YOUR PARTICIPATION!



APPENDIX C  
CHI SQUARE TABLES

See questionnaire in Appendix B for specific control mechanisms listed numerically in each performance criteria.

Key to Chi Square Tables:

EF = Effectiveness

Q = Quality

QW = Quality of Worklife

IN = Innovation

TABLE OF YRS BY EF5

YRS	EF5		TOTAL
	0	1	
1	1	14	15
2	3	8	11
3	8	10	18
4	0	11	11
TOTAL	12	43	55

DF= 3 PROB=0.0136

\* CHI-SQUARE 10.683

TABLE OF YRS BY EF11

YRS	EF11		TOTAL
	0	1	
1	13	2	15
2	8	3	11
3	9	9	18
4	11	0	11
TOTAL	41	14	55

DF= 3 PROB=0.0138

\* CHI-SQUARE 10.652

TABLE OF YRS BY EF13

YRS	EF13		TOTAL
	0	1	
1	13	2	15
2	6	5	11
3	9	9	18
4	10	1	11
TOTAL	38	17	55

DF= 3 PROB=0.0323

\* CHI-SQUARE 8.784

TABLE OF TR BY EF2

TR	EF2		TOTAL
	0	1	
.	0	2	.
1	16	0	16
2	29	8	37
TOTAL	45	8	53

DF= 1 PROB=0.0435

\* CHI-SQUARE 4.074

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

TABLE OF TR BY EF9

TR	EF9		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	4	12	16
2	24	13	37
TOTAL	28	25	53

DF= 1 PROB=0.0076

CHI-SQUARE 7.123

TABLE OF TR BY EF11

TR	EF11		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	8	8	16
2	32	5	37
TOTAL	40	13	53

DF= 1 PROB=0.0046

\* CHI-SQUARE 8.033

TABLE OF TR BY EF12

TR	EF12		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	8	8	16
2	29	8	37
TOTAL	37	16	53

DF= 1 PROB=0.0388

\* CHI-SQUARE 4.268

TABLE OF TR BY EF13

TR	EF13		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	7	9	16
2	31	6	37
TOTAL	38	15	53

DF= 1 PROB=0.0030

\* CHI-SQUARE 8.822

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

TABLE OF TYP1 BY EF6

TYP1	EF6		TOTAL
FREQUENCY	0	1	
0	8	18	26
1	2	27	29
TOTAL	10	45	55

DF= 1 PROB=0.0219

X CHI-SQUARE 5.252

TABLE OF TYP2 BY EF14

TYP2	EF14		TOTAL
FREQUENCY	0	1	
0	14	28	42
1	9	4	13
TOTAL	23	32	55

DF= 1 PROB=0.0218

CHI-SQUARE 5.258

TABLE OF TYP3 BY EF14

TYP3	EF14		TOTAL
FREQUENCY	0	1	
0	23	25	48
1	0	7	7
TOTAL	23	32	55

DF= 1 PROB=0.0163

CHI-SQUARE 5.765

TABLE OF TYP4 BY EF2

TYP4	EF2		TOTAL
FREQUENCY	0	1	
0	44	8	52
1	1	2	3
TOTAL	45	10	55

DF= 1 PROB=0.0251

CHI-SQUARE 5.014

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

TABLE OF TYP4 BY EF3

TYP4	EF3		TOTAL
FREQUENCY	0	1	
0	5	47	52
1	2	1	3
TOTAL	7	48	55

DF= 1 PROB=0.0039

\* CHI-SQUARE 8.311

TABLE OF TYP4 BY EF4

TYP4	EF4		TOTAL
FREQUENCY	0	1	
0	6	46	52
1	2	1	3
TOTAL	8	47	55

DF= 1 PROB=0.0085

\* CHI-SQUARE 6.935

TABLE OF TYP4 BY EF6

TYP4	EF6		TOTAL
FREQUENCY	0	1	
0	8	44	52
1	2	1	3
TOTAL	10	45	55

DF= 1 PROB=0.0251

\* CHI-SQUARE 5.014

TABLE OF TYP6 BY EF3

TYP6	EF3		TOTAL
FREQUENCY	0	1	
0	5	47	52
1	2	1	3
TOTAL	7	48	55

DF= 1 PROB=0.0039

\* CHI-SQUARE 8.311

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

TABLE OF TYP6 BY EF6

TYP6	EF6		TOTAL
FREQUENCY	0	1	
0	8	44	52
1	2	1	3
TOTAL	10	45	55

DF= 1 PROB=0.0251

\* CHI-SQUARE 5.014

TABLE OF TYP9 BY EF9

TYP9	EF9		TOTAL
FREQUENCY	0	1	
0	16	23	39
1	12	4	16
TOTAL	28	27	55

DF= 1 PROB=0.0221

\* CHI-SQUARE 5.240

TABLE OF TYP9 BY EF12

TYP9	EF12		TOTAL
FREQUENCY	0	1	
0	23	16	39
1	15	1	16
TOTAL	38	17	55

DF= 1 PROB=0.0113

\* CHI-SQUARE 6.425

TABLE OF TYP9 BY EF13

TYP9	EF13		TOTAL
FREQUENCY	0	1	
0	23	16	39
1	15	1	16
TOTAL	38	17	55

DF= 1 PROB=0.0113

\* CHI-SQUARE 6.425

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

TABLE OF TYP10 BY EF6

TYP10	EF6		TOTAL
FREQUENCY	0	1	
0	6	43	49
1	4	2	6
TOTAL	10	45	55

DF= 1 PROB=0.0011

X CHI-SQUARE 10.642

TABLE OF REV BY EF12

REV	EF12		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	17	1	18
2	13	6	19
3	7	9	16
TOTAL	37	16	53

DF= 2 PROB=0.0056

CHI-SQUARE 10.356

TABLE OF REV BY EF14

REV	EF14		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	12	6	18
2	7	12	19
3	4	12	16
TOTAL	23	30	53

DF= 2 PROB=0.0387

CHI-SQUARE 6.505

TABLE OF YRS BY Q2

YRS	Q2		TOTAL
FREQUENCY	0	1	
1	15	0	15
2	11	0	11
3	18	0	18
4	9	2	11
TOTAL	53	2	55

DF= 3 PROB=0.0402

X CHI-SQUARE 8.302

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



TABLE OF TYP5 BY Q2

TYP5	Q2		TOTAL
FREQUENCY	0	1	
0	49	1	50
1	4	1	5
TOTAL	53	2	55

DF= 1 PROB=0.0404

\* CHI-SQUARE 4.203

TABLE OF REV BY Q3

REV	Q3		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	11	7	18
2	5	14	19
3	2	14	16
TOTAL	18	35	53

DF= 2 PROB=0.0078

\* CHI-SQUARE 9.697

TABLE OF POS BY Q4

POS	Q4		TOTAL
FREQUENCY	0	1	
.	6	6	.
1	10	6	16
2	6	17	23
3	3	1	4
TOTAL	19	24	43

DF= 2 PROB=0.0339

\* CHI-SQUARE 6.771

TABLE OF SEAT BY Q4

SEAT	Q4		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	12	5	17
2	11	17	28
3	1	7	8
TOTAL	24	29	53

DF= 2 PROB=0.0160

\* CHI-SQUARE 8.270

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

TABLE OF REV BY Q4

REV	Q4		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	13	5	18
2	9	10	19
3	2	14	16
TOTAL	24	29	53

DF= 2 PROB=0.0022

CHI-SQUARE 12.245

TABLE OF TYP3 BY Q5

TYP3	Q5		TOTAL
FREQUENCY	0	1	
0	38	10	48
1	3	4	7
TOTAL	41	14	55

DF= 1 PROB=0.0394

X CHI-SQUARE 4.245

TABLE OF SEAT BY Q5

SEAT	Q5		TOTAL
FREQUENCY	0	1	
.	2	0	.
1	14	3	17
2	22	6	28
3	3	5	8
TOTAL	39	14	53

DF= 2 PROB=0.0410

X CHI-SQUARE 6.390

TABLE OF TYP7 BY Q7

TYP7	Q7		TOTAL
FREQUENCY	0	1	
0	46	4	50
1	3	2	5
TOTAL	49	6	55

DF= 1 PROB=0.0286

X CHI-SQUARE 4.789

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

TABLE OF SEAT BY Q7

SEAT	Q7		TOTAL
FREQUENCY	0	1	
.	2	0	.
1	17	0	17
2	25	3	28
3	5	3	8
TOTAL	47	6	53

DF= 2 PROB=0.0219

\* CHI-SQUARE 7.642

TABLE OF TYP5 BY Q10

TYP5	Q10		TOTAL
FREQUENCY	0	1	
0	24	26	50
1	0	5	5
TOTAL	24	31	55

DF= 1 PROB=0.0391

\*

CHI-SQUARE 4.258

TABLE OF TYP7 BY Q10

TYP7	Q10		TOTAL
FREQUENCY	0	1	
0	24	26	50
1	0	5	5
TOTAL	24	31	55

DF= 1 PROB=0.0391

\* CHI-SQUARE 4.258

TABLE OF REV BY Q10

REV	Q10		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	12	6	18
2	6	13	19
3	5	11	16
TOTAL	23	30	53

DF= 2 PROB=0.0496

CHI-SQUARE 6.009

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

TABLE OF TR BY Q12

TR	Q12		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	2	14	16
2	16	21	37
TOTAL	18	35	53

DF= 1 PROB=0.0300

CHI-SQUARE . 4.707

TABLE OF TYP8 BY Q13

TYP8	Q13		TOTAL
FREQUENCY	0	1	
0	10	41	51
1	3	1	4
TOTAL	13	42	55

DF= 1 PROB=0.0120

\* CHI-SQUARE 6.305

TABLE OF AGE BY Q14

AGE	Q14		TOTAL
FREQUENCY	0	1	
.	0	1	.
1	2	9	11
2	9	11	20
3	11	5	16
4	5	2	7
TOTAL	27	27	54

DF= 3 PROB=0.0422

\* CHI-SQUARE 8.190

TABLE OF TYP8 BY Q30

TYP8	Q30		TOTAL
FREQUENCY	0	1	
0	42	9	51
1	1	3	4
TOTAL	43	12	55

DF= 1 PROB=0.0075

CHI-SQUARE 7.152

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

TABLE OF TR BY Q14

TR	Q14		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	4	12	16
2	23	14	37
TOTAL	27	26	53

DF= 1 PROB=0 0130

CHI-SQUARE 6.173

TABLE OF REV BY Q14

REV	Q14		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	13	5	18
2	11	8	19
3	3	13	16
TOTAL	27	26	53

DF= 2 PROB=0 0059

CHI-SQUARE 10.264

TABLE OF TR BY Q15

TR	Q15		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	2	14	16
2	21	16	37
TOTAL	23	30	53

DF= 1 PROB=0 0028

CHI-SQUARE 8.907

TABLE OF SEAT BY Q15

SEAT	Q15		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	10	7	17
2	13	15	28
3	0	8	8
TOTAL	23	30	53

DF= 2 PROB=0 0194

\* CHI-SQUARE 7.885

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

TABLE OF REV BY Q15

REV	Q15		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	13	5	18
2	9	10	19
3	1	15	16
TOTAL	23	30	53

DF= 2 PROB=0.0005  
CHI-SQUARE 15.199

TABLE OF TYP1 BY Q16

TYP1	Q16		TOTAL
FREQUENCY	0	1	
0	4	22	26
1	17	12	29
TOTAL	21	34	55

DF= 1 PROB=0.0010  
CHI-SQUARE 10.857

TABLE OF POS BY Q17

POS	Q17		TOTAL
FREQUENCY	0	1	
.	3	9	.
1	4	12	16
2	7	16	23
3	4	0	4
TOTAL	15	28	43

DF= 2 PROB=0.0153  
X CHI-SQUARE 8.355

TABLE OF TYP10 BY Q16

TYP10	Q16		TOTAL
FREQUENCY	0	1	
0	21	28	49
1	0	6	6
TOTAL	21	34	55

DF= 1 PROB=0.0414  
X CHI-SQUARE 4.160

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

TABLE OF YRS BY Q17

YRS	Q17		TOTAL
FREQUENCY	0	1	
1	6	9	15
2	2	9	11
3	3	15	18
4	7	4	11
TOTAL	18	37	55

DF= 3 PROB=0.0402

\* CHI-SQUARE 8.300

TABLE OF TYP1 BY Q17

TYP1	Q17		TOTAL
FREQUENCY	0	1	
0	12	14	26
1	6	23	29
TOTAL	18	37	55

DF= 1 PROB=0.0445

\* CHI-SQUARE 4.038

TABLE OF CHG BY Q17

CHG	Q17		TOTAL
FREQUENCY	0	1	
1	6	2	8
2	7	14	21
3	5	15	20
4	0	6	6
TOTAL	18	37	55

DF= 3 PROB=0.0189

\* CHI-SQUARE 9.958

TABLE OF AGE BY Q18

AGE	Q18		TOTAL
FREQUENCY	0	1	
	0	1	.
1	3	8	11
2	2	18	20
3	9	7	16
4	3	4	7
TOTAL	17	37	54

DF= 3 PROB=0.0251

\* CHI-SQUARE 9.339

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

TABLE OF TYP9 BY Q18

TYP9	Q18		TOTAL
FREQUENCY	0	1	
0	8	31	39
1	9	7	16
TOTAL	17	38	55

DF= 1 PROB=0.0092  
 \* CHI-SQUARE 6.785

TABLE OF SEAT BY Q18

SEAT	Q18		TOTAL
FREQUENCY	0	1	
	0	2	.
1	10	7	17
2	5	23	28
3	2	6	8
TOTAL	17	36	53

DF= 2 PROB=0.0153  
 CHI-SQUARE 8.364

TABLE OF REV BY Q18

REV	Q18		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	9	9	18
2	6	13	19
3	1	15	16
TOTAL	16	37	53

DF= 2 PROB=0.0211  
 CHI-SQUARE 7.720

TABLE OF YRS BY Q19

YRS	Q19		TOTAL
FREQUENCY	0	1	
1	5	10	15
2	0	11	11
3	3	15	18
4	6	5	11
TOTAL	14	41	55

DF= 3 PROB=0.0196  
 \* CHI-SQUARE 9.885

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



TABLE OF CHG BY Q19

CHG	Q19		TOTAL
FREQUENCY	0	1	
1	0	8	8
2	3	18	21
3	8	12	20
4	3	3	6
TOTAL	14	41	55

STATISTICS FOR 2-WAY TABLES

DF= 3 PROB=0.0412

CHI-SQUARE 8.247

TABLE OF SEAT BY Q20

SEAT	Q20		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	11	6	17
2	9	19	28
3	1	7	8
TOTAL	21	32	53

DF= 2 PROB=0.0225

X CHI-SQUARE 7.586

TABLE OF REV BY Q20

REV	Q20		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	11	7	18
2	8	11	19
3	3	13	16
TOTAL	22	31	53

DF= 2 PROB=0.0436

CHI-SQUARE 6.265

TABLE OF AGE BY Q21

AGE	Q21		TOTAL
FREQUENCY	0	1	
.	0	1	.
1	0	11	11
2	3	17	20
3	7	9	16
4	1	6	7
TOTAL	11	43	54

DF= 3 PROB=0.0332

CHI-SQUARE 8.721

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

TABLE OF AGE BY Q23

AGE	Q23		TOTAL
FREQUENCY	0	1	
.	0	1	0
1	0	11	0
2	0	20	0
3	1	15	0
4	1	5	1
TOTAL	51	1	52

DF= 3 PROB=0.0499

\* CHI-SQUARE 7.817

TABLE OF POS BY Q25

POS	Q25		TOTAL
FREQUENCY	0	1	
.	6	6	.
1	10	6	16
2	4	19	23
3	2	2	4
TOTAL	16	27	43

DF= 2 PROB=0.0141

\* CHI-SQUARE 8.527

TABLE OF TYP6 BY Q22

TYP6	Q22		TOTAL
FREQUENCY	0	1	
0	2	1	49
1	0	1	2
TOTAL	2	51	53

DF= 1 PROB=0.0057

\* CHI-SQUARE 7.652

TABLE OF SEAT BY Q25

SEAT	Q25		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	11	6	17
2	8	20	28
3	2	6	8
TOTAL	21	32	53

DF= 2 PROB=0.0366

\* CHI-SQUARE 6.615

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

TABLE OF TYP2 BY Q25

TYP2	Q25		TOTAL
FREQUENCY	0	1	
0	13	29	42
1	9	4	13
TOTAL	22	33	55

DF= 1 PROB=0.0138

CHI-SQUARE 6.061

TABLE OF CHG BY Q25

CHG	Q25		TOTAL
FREQUENCY	0	1	
1	7	1	8
2	8	13	21
3	4	16	20
4	3	3	6
TOTAL	22	33	55

DF= 3 PROB=0.0110

X CHI-SQUARE 11.136

TABLE OF REV BY Q25

REV	Q25		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	12	6	18
2	6	13	19
3	4	12	16
TOTAL	22	31	53

DF= 2 PROB=0.0265

CHI-SQUARE 7.260

TABLE OF POS BY Q26

POS	Q26		TOTAL
FREQUENCY	0	1	
.	6	6	.
1	16	0	16
2	9	14	23
3	3	1	4
TOTAL	28	15	43

DF= 2 PROB=0.0004

X CHI-SQUARE 15.581

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

TABLE OF SEAT BY Q26

SEAT	Q26		TOTAL
FREQUENCY	0	1	
.	2	0	.
1	15	2	17
2	13	15	28
3	4	4	8
TOTAL	32	21	53

DF= 2 PROB=0.0170

\* CHI-SQUARE 8.152

TABLE OF CHG BY Q26

CHG	Q26		TOTAL
FREQUENCY	0	1	
1	8	0	8
2	14	7	21
3	8	12	20
4	4	2	6
TOTAL	34	21	55

DF= 3 PROB=0.0262

\* CHI-SQUARE 9.244

TABLE OF TYP7 BY Q27

TYP7	Q27		TOTAL
FREQUENCY	0	1	
0	47	3	50
1	2	3	5
TOTAL	49	6	55

DF= 1 PROB=0.0002

\* CHI-SQUARE 13.638

TABLE OF TYP7 BY Q34

TYP7	Q34		TOTAL
FREQUENCY	0	1	
0	41	9	50
1	2	3	5
TOTAL	43	12	55

DF= 1 PROB=0.0302

\* CHI-SQUARE 8.426

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

TABLE OF POS BY Q28

POS	Q28		TOTAL
FREQUENCY	0	1	
.	1	11	.
1	6	10	16
2	19	4	23
3	4	0	4
TOTAL	29	14	43

DF= 2 PROB=0 0044

\* CHI-SQUARE 10.873

TABLE OF TYP9 BY Q28

TYP9	Q28		TOTAL
FREQUENCY	0	1	
0	27	12	39
1	3	13	16
TOTAL	30	25	55

DF= 1 PROB=0 0006

CHI-SQUARE 11.661

TABLE OF TYP3 BY Q29

TYP3	Q29		TOTAL
FREQUENCY	0	1	
0	37	11	48
1	2	5	7
TOTAL	39	16	55

DF= 1 PROB=0.0083

\* CHI-SQUARE 6.970

TABLE OF CHG BY Q29

CHG	Q29		TOTAL
FREQUENCY	0	1	
1	8	0	8
2	18	3	21
3	9	11	20
4	4	2	6
TOTAL	39	16	55

DF= 3 PROB=0 0071

\* CHI-SQUARE 12.074

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

TABLE OF TYP2 BY QW2

TYP2	QW2		TOTAL
FREQUENCY	0	1	
0	2	28	40
1	0	5	13
TOTAL	33	20	53

DF= 1 PROB=0.0415  
\* CHI-SQUARE 4.154

TABLE OF POS BY QW3

POS	QW3		TOTAL
FREQUENCY	0	1	
.	12	0	.
1	15	1	16
2	21	2	23
3	2	2	4
TOTAL	38	5	43

DF= 2 PROB=0.0413  
\* CHI-SQUARE 6.374

TABLE OF TYP2 BY QW4

TYP2	QW4		TOTAL
FREQUENCY	0	1	
0	3	39	42
1	4	9	13
TOTAL	7	48	55

DF= 1 PROB=0.0255  
\* CHI-SQUARE 4.989

TABLE OF CHG BY QW4

CHG	QW4		TOTAL
FREQUENCY	0	1	
1	1	7	8
2	6	15	21
3	0	20	20
4	0	6	6
TOTAL	7	48	55

DF= 3 PROB=0.0361  
CHI-SQUARE 8.538

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

TABLE OF TR BY QW5

TR	QW5		TOTAL
FREQUENCY	0	1	
.	0	2	
1	0	16	16
2	11	26	37
TOTAL	11	42	53

DF= 1 PROB=0.0143

X CHI-SQUARE 6.003

TABLE OF TR BY QW27

TR	QW27		TOTAL
FREQUENCY	0	1	
.	1	1	
1	7	9	16
2	27	10	37
TOTAL	34	19	53

DF= 1 PROB=0.0417

CHI-SQUARE 4.148

TABLE OF TYP3 BY QW8

TYP3	QW8		TOTAL
FREQUENCY	0	1	
0	33	15	48
1	2	5	7
TOTAL	35	20	55

DF= 1 PROB=0.0390

X CHI-SQUARE 4.262

TABLE OF TR BY QW9

TR	QW9		TOTAL
FREQUENCY	0	1	
.	0	2	
1	1	15	16
2	16	21	37
TOTAL	17	36	53

DF= 1 PROB=0.0081

CHI-SQUARE 7.016

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

TABLE OF TYP10 BY QW9

TYP10	QW9		TOTAL
FREQUENCY	0	1	
0	12	37	49
1	5	1	6
TOTAL	17	38	55

DF = 1 PROB = 0.0032

CHI-SQUARE 8.667

TABLE OF REV BY QW9

REV	QW9		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	11	7	18
2	5	14	19
3	1	15	16
TOTAL	17	36	53

DF = 2 PROB = 0.0023

CHI-SQUARE 12.153

TABLE OF REV BY QW10

REV	QW10		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	6	12	18
2	5	14	19
3	0	16	16
TOTAL	11	42	53

DF = 2 PROB = 0.0433

CHI-SQUARE 6.279

TABLE OF REV BY QW18

REV	QW18		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	16	2	18
2	14	5	19
3	7	9	16
TOTAL	37	16	53

DF = 2 PROB = 0.0150

CHI-SQUARE 8.400

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



TABLE OF REV BY QW21

REV	QW21		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	16	2	18
2	14	5	19
3	8	8	16
TOTAL	38	15	53

DF= 2 PROB=0.0414  
CHI-SQUARE 6.371

TABLE OF TYP1 BY QW13

TYP1	QW13		TOTAL
FREQUENCY	0	1	
0	24	1	25
1	20	9	29
TOTAL	44	10	54

DF= 1 PROB=0.0108  
X CHI-SQUARE 6.503

TABLE OF TYP6 BY QW13

TYP6	QW13		TOTAL
FREQUENCY	0	1	
0	43	8	51
1	1	2	3
TOTAL	44	10	54

DF= 1 PROB=0.0272  
X CHI-SQUARE 4.880

TABLE OF TR BY QW15

TR	QW15		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	9	7	16
2	34	3	37
TOTAL	43	10	53

DF= 1 PROB=0.0023  
X CHI-SQUARE 9.269

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

TABLE OF TYP3 BY QW15

TYP3	QW15		TOTAL
FREQUENCY	0	1	
0	40	8	48
1	3	4	7
TOTAL	43	12	55

DF= 1 PROB=0.0154

X CHI-SQUARE 5.867

TABLE OF TYP6 BY QW16

TYP6	QW16		TOTAL
FREQUENCY	0	1	
0	6	46	52
1	2	1	3
TOTAL	8	47	55

DF= 1 PROB=0.0085

CHI-SQUARE 6.935

TABLE OF YRS BY QW17

YRS	QW17		TOTAL
FREQUENCY	0	1	
1	15	0	15
2	5	6	11
3	7	11	18
4	6	5	11
TOTAL	33	22	55

DF= 3 PROB=0.0024

X CHI-SQUARE 14.449

TABLE OF TYP6 BY QW17

TYP6	QW17		TOTAL
FREQUENCY	0	1	
0	33	19	52
1	0	3	3
TOTAL	33	22	55

DF= 1 PROB=0.0291

X CHI-SQUARE 4.760

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

TABLE OF TYP9 BY QW17

TYP9	QW17		TOTAL
FREQUENCY	0	1	
0	19	20	39
1	14	2	16
TOTAL	33	22	55

DF= 1 PROB=0.0077

CHI-SQUARE 7.110

TABLE OF SEAT BY QW17

SEAT	QW17		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	15	2	17
2	14	14	28
3	4	4	8
TOTAL	33	20	53

DF= 2 PROB=0.0275

X CHI-SQUARE 7.185

TABLE OF REV BY QW17

REV	QW17		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	17	1	18
2	9	10	19
3	6	10	16
TOTAL	32	21	53

DF= 2 PROB=0.0011

CHI-SQUARE 13.577

TABLE OF TR BY QW19

TR	QW19		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	8	8	16
2	31	6	37
TOTAL	39	14	53

DF= 1 PROB=0.0104

X CHI-SQUARE 6.559

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

TABLE OF REV BY QW19

REV	QW19		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	16	2	18
2	14	5	19
3	8	8	16
TOTAL	38	15	53

DF= 2 PROB=0.0414

CHI-SQUARE 6.371

TABLE OF TYP3 BY QW22

TYP3	QW22		TOTAL
FREQUENCY	0	1	
0	45	3	48
1	4	3	7
TOTAL	49	6	55

DF= 1 PROB=0.0037

X CHI-SQUARE 8.423

TABLE OF REV BY QW22

REV	QW22		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	18	0	18
2	18	1	19
3	12	4	16
TOTAL	48	5	53

DF= 2 PROB=0.0334

X CHI-SQUARE 6.799

TABLE OF TR BY QW23

TR	QW23		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	4	12	16
2	24	13	37
TOTAL	28	25	53

DF= 1 PROB=0.0076

CHI-SQUARE 7.123

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

TABLE OF TYP8 BY QW23

TYP8	QW23		TOTAL
FREQUENCY	0	1	
0	28	23	51
1	0	4	4
TOTAL	28	27	55

DF= 1 PROB=0.0344

X CHI-SQUARE 4.473

TABLE OF CHG BY QW24

CHG	QW24		TOTAL
FREQUENCY	0	1	
1	3	5	8
2	10	11	21
3	7	13	20
4	6	0	6
TOTAL	26	29	55

DF= 3 PROB=0.0419

X CHI-SQUARE 8.208

TABLE OF REV BY QW24

REV	QW24		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	13	5	18
2	4	15	19
3	8	8	16
TOTAL	25	28	53

DF= 2 PROB=0.0075

CHI-SQUARE 9.786

TABLE OF TYP5 BY QW26

TYP5	QW26		TOTAL
FREQUENCY	0	1	
0	50	0	50
1	2	3	5
TOTAL	52	3	55

DF= 1 PROB=0.0001

X CHI-SQUARE 31.731

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

TABLE OF SEAT BY QW26

SEAT	QW26		TOTAL
FREQUENCY	0	1	
.	2	0	.
1	17	0	17
2	27	1	28
3	6	2	8
TOTAL	50	3	53

DF= 2 PROB=0.0325

X CHI-SQUARE 6.852

TABLE OF TYP3 BY QW28

TYP3	QW28		TOTAL
FREQUENCY	0	1	
0	41	7	48
1	3	4	7
TOTAL	44	11	55

DF= 1 PROB=0.0085

X CHI-SQUARE 6.916

TABLE OF TYP8 BY QW28

TYP8	QW28		TOTAL
FREQUENCY	0	1	
0	43	8	51
1	1	3	4
TOTAL	44	11	55

DF= 1 PROB=0.0043

X CHI-SQUARE 8.156

TABLE OF TYP9 BY QW28

TYP9	QW28		TOTAL
FREQUENCY	0	1	
0	34	5	39
1	10	6	16
TOTAL	44	11	55

DF= 1 PROB=0.0377

X CHI-SQUARE 4.319

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

TABLE OF SEAT BY QW28

SEAT	QW28		TOTAL
FREQUENCY	0	1	
.	2	0	.
1	16	1	17
2	22	6	28
3	4	4	8
TOTAL	42	11	53

DF= 2 PROB=0.0397

\* CHI-SQUARE 6.454

TABLE OF CHG BY QW28

CHG	QW28		TOTAL
FREQUENCY	0	1	
1	7	1	8
2	20	1	21
3	12	8	20
4	5	1	6
TOTAL	44	11	55

DF= 3 PROB=0.0389

\* CHI-SQUARE 8.371

TABLE OF SEAT BY QW29

SEAT	QW29		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	17	0	17
2	18	10	28
3	4	4	8
TOTAL	39	14	53

DF= 2 PROB=0.0081

\* CHI-SQUARE 9.638

TABLE OF REV BY QW29

REV	QW29		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	18	0	18
2	11	8	19
3	9	7	16
TOTAL	38	15	53

DF= 2 PROB=0.0046

CHI-SQUARE 10.771

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

TABLE OF TR BY IN1

TR	IN1		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	4	12	16
2	24	13	37
TOTAL	28	25	53

DF= 1 PROB=0.0076  
CHI-SQUARE 7.123

TABLE OF TYP3 BY IN1

TYP3	IN1		TOTAL
FREQUENCY	0	1	
0	28	20	48
1	1	6	7
TOTAL	29	26	55

DF= 1 PROB=0.0292  
CHI-SQUARE 4.755

TABLE OF SEAT BY IN1

SEAT	IN1		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	8	9	17
2	19	9	28
3	1	7	8
TOTAL	28	25	53

DF= 2 PROB=0.0184  
CHI-SQUARE 7.986

TABLE OF TYP7 BY IN2

TYP7	IN2		TOTAL
FREQUENCY	0	1	
0	27	23	50
1	5	0	5
TOTAL	32	23	55

DF= 1 PROB=0.0468  
CHI-SQUARE 3.953

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



TABLE OF REV BY IN3

REV	IN3		TOTAL
FREQUENCY	0	1	
.	0	2	.
1	9	9	18
2	10	9	19
3	2	14	16
TOTAL	21	32	53

DF= 2 PROB=0.0291  
CHI-SQUARE 7.074

TABLE OF AGE BY IN5

AGE	IN5		TOTAL
FREQUENCY	0	1	
.	0	1	.
1	8	3	11
2	18	2	20
3	7	9	16
4	0	7	7
TOTAL	33	21	54

DF= 3 PROB=0.0001  
\* CHI-SQUARE 20.677

TABLE OF TR BY IN6

TR	IN6		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	5	11	16
2	25	12	37
TOTAL	30	23	53

DF= 1 PROB=0.0143  
CHI-SQUARE 5.998

TABLE OF TYP2 BY IN6

TYP2	IN6		TOTAL
FREQUENCY	0	1	
0	20	22	42
1	11	2	13
TOTAL	31	24	55

DF= 1 PROB=0.0188  
CHI-SQUARE 5.525

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

TABLE OF SEAT BY IN6

SEAT	IN6		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	15	2	17
2	14	14	28
3	1	7	8
TOTAL	30	23	53

DF= 2 PROB=0 0010  
 X CHI-SQUARE 13.757

TABLE OF CHG BY IN6

CHG	IN6		TOTAL
FREQUENCY	0	1	
1	6	2	8
2	12	9	21
3	13	7	20
4	0	6	6
TOTAL	31	24	55

DF= 3 PROB=0 0234  
 CHI-SQUARE 9.491

TABLE OF REV BY IN6

REV	IN6		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	14	4	18
2	12	7	19
3	4	12	16
TOTAL	30	23	53

DF= 2 PROB=0 0063  
 CHI-SQUARE 10.123

TABLE OF SEAT BY IN9

SEAT	IN9		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	13	4	17
2	23	5	28
3	3	5	8
TOTAL	39	14	53

DF= 2 PROB=0 0390  
 X CHI-SQUARE 6.487

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

TABLE OF TYP2 BY IN10

TYP2	IN10		TOTAL
FREQUENCY	0	1	
0	2	40	42
1	4	9	13
TOTAL	6	49	55

DF= 1 PROB=0.0086  
 \* CHI-SQUARE 6.909

TABLE OF TR BY IN13

TR	IN13		TOTAL
FREQUENCY	0	1	
.	1	1	
1	0	16	16
2	9	28	37
TOTAL	9	44	53

DF= 1 PROB=0.0304

\* CHI-SQUARE 4.688

TABLE OF TYP10 BY IN13

TYP10	IN13		TOTAL
FREQUENCY	0	1	
0	7	42	49
1	3	3	6
TOTAL	10	45	55

DF= 1 PROB=0.0323

\* CHI-SQUARE 4.583

TABLE OF TYP8 BY IN17

TYP8	IN17		TOTAL
FREQUENCY	0	1	
0	41	10	51
1	1	3	4
TOTAL	42	13	55

DF= 1 PROB=0.0120

\* CHI-SQUARE 6.305

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

TABLE OF SEAT BY IN18

SEAT	IN18		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	16	1	17
2	23	5	28
3	4	4	8
TOTAL	43	10	53

DF= 2 PROB=0.0309

X CHI-SQUARE 6.956

TABLE OF REV BY IN18

REV	IN18		TOTAL
FREQUENCY	0	1	
.	1	1	.
1	18	0	18
2	13	6	19
3	12	4	16
TOTAL	43	10	53

DF= 2 PROB=0.0372

X CHI-SQUARE 6.584

TABLE OF TYP1 BY IN19

TYP1	IN19		TOTAL
FREQUENCY	0	1	
0	9	17	26
1	18	11	29
TOTAL	27	28	55

DF= 1 PROB=0.0420

CHI-SQUARE 4.134

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

VITA

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AS PERFORMANCE MEASURES IN RESTAURANTS

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