PRODUCTIVITY, PROFITABILITY, AND EFFICIENCY AS PERFORMANCE MEASURES IN RESTAURANTS

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Bachelor of Science in Home Economics

University of Nebraska-Lincoln

Lincoln, Nebraska

1982

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
MASTER OF SCIENCE
December, 1984

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ACKNOWLEDGMENTS

I wish to express my sincere appreciation to my adviser, Dr. Lea L. Ebro, and to the members of my thesis committee: Dr. Esther A. Winterfeldt, Dr. G. Baker Bokorney, and Dr. William D. Warde, for their guidance, assistance and support.

Appreciation also goes to Amy J. Pickerel, my co-researcher in this twin study. Thanks also to the Missouri Restaurant Association for their interest, cooperation, and financial aid in mailing the questionnaires to their members. Special appreciation is given to my parents, William and Ann Lamb, for their love and guidance.

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CHAPTER I

INTRODUCTION

Due to an increase in worker efficiency, technological advances, and a more experienced work force, the United States is undergoing a sustained rise in the long-term rate of productivity. Productivity growth in the United States had been decreasing gradually over the past several years. This is proven by the fact that productivity in the United States during the 1970's grew by only 20 percent while Japan's excelled by 145 percent. France and Germany also had an impressive growth rate of 77 percent and 75 percent, respectively.

The long-standing belief and assumption that business and industry in the United States was invincible and that no other country could ever approach us--much less surpass our technological superiority and leadership--was virtually taken for granted (Stanton, 1983). It was assumed that our standard of living would continue to increase due to this nation's industrial machine making continuous improvements. American employees are accustomed to demanding and generally receiving higher wages and benefits which enhance their standard of living while at the same time, however productivity has not been able to keep up with rising labor costs thus causing business and industry to lose its traditional competitive edge. According to the National Research Council (1979), a slowdown in productivity growth causes serious concern for three reasons: a slower rate of growth in real income per capita--in the standard of

living, the problem of current high and persistent rates of inflation, and to the imbalance of international payments.

Although there is an increasing awareness of the need for improving productivity, American business managers are seriously hampered in their efforts to do so by a lack of effective methods for determining how efficiently they use their productive resources (Brayton, 1983). A recent survey by Sumanth (1981) showed that less than three percent of the U.S. businesses have systems for measuring total productivity. In addition, many professionals in the business management field do not have the measurement tools needed to analyze accurately the results of productivity changes on profitability.

As the topic of productivity becomes more widespread so does concern for improving it. Many companies have been able to devise their own productivity measurement and improvement programs which have been very benificial to them. The restaurant industry however, is one such industry that has no standard productivity measurement system. Many food service establishments have suffered financial loss due to inadequate determination of optimum labor requirements and acceptable levels of performance (Freshwater and Bragg, 1975). Basically there are two main reasons which contribute to this problem. First, the majority of food service operators do not understand what a standard productivity measure is and how it can be used, and they misinterpret the implications of poor performance or superior performance. Secondly, the majority use labor cost ratios (dollars labor cost divided by dollars sales) as a productivity measure. Kotschevar (1972) reported that labor in the food service industry has a 47 percent productivity rate compared to an 80-85 percent productivity which is considered normal. With productivity rates

decreasing and labor and food costs steadily increasing in the food service industry, a definite need for the development of a productivity measurement system that would provide information for the effective utilization of labor resources necessary for an optimum balance between food and labor expenditures. Results of this study could be the first step toward the improvement of productivity in the restaurant industry.

Purpose and Objectives

In 1954, Drucker identified seven key result areas as components of a performance measurement system--customer satisfaction, innovation, internal productivity, operating budget, employee attitude and performance, management development and performance, and social responsibility. Sink (1983a) condensed this list to what he defines as seven performance criteria by which an organization may be evaluated and controlled which include effectiveness, efficiency, innovation, productivity, profitability, quality, and quality of work life. Generally these criteria are appropriate for most organizations (Figure 1). In Shaw's 1983 study of productivity measures being used by some members of the American Dietetic Association, and the pilot study of Oklahoma Restaurant Association Board Members, it was found that although dietitians and restaurant managers are controlling inputs and outputs, standardization is needed in the ratios being used to assess productivity. To work toward this goal of a standard productivity measure in restaurants, and to make sure that such measures are not actually measures of other performance criteria, it becomes necessary to assess how managers currently define and measure each of the seven performance criteria. This study will attempt to do so within the food service departments of restaurants.

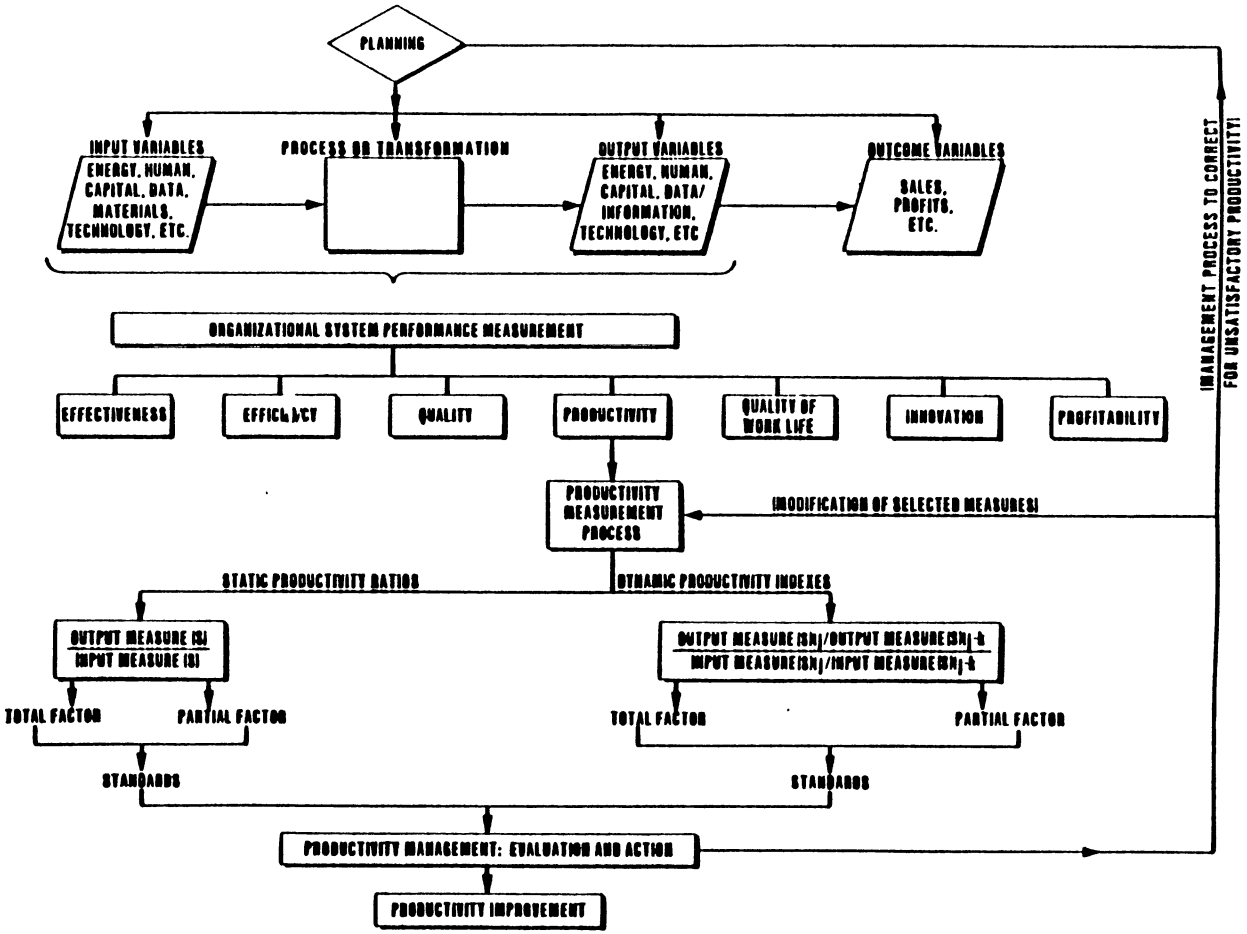


Figure 1. The Productivity Management Process

The measures currently used by the members of the Missouri Restaurant Association will be the major focus of this research. As a follow up to Shaw's (1983) research, ratios and indexes currently being used by these restaurants will be examined for their appropriateness in measuring productivity and possibly lay the ground work for a standard of productivity measurement. This project is part of a twin study. This research will focus on productivity, profitability, and efficiency as performance measures in restaurants, while Pickerel (1984) will concentrate on the other four performance measures which include: effectiveness, innovation, quality and quality of worklife.

The objectives in this research include:

1. To identify the current performance evaluation measures used in the restaurant industry.

2. To assess productivity, profitability, and efficiency and their measurement in the restaurant industry so that standard measures may be developed which will aid in the development of improvement strategies for restaurants.

3. To assess the relative importance of and the time spent on each criteria.

4. Make suggestions as to how standards can be used by restaurant managers.

Hypotheses of the Study

The hypotheses postulated for this study were:

H_1: There will be no significant difference in the control outputs and control inputs used by restaurateurs based on selected personal variables:

a. age

b. years of education

c. position title

d. number of years experience

e. training in productivity measures

H_2: There will be no significant difference in the control outputs and control inputs used by restaurateurs based on selected restaurant variables:

a. type

b. seating capacity

c. average food check charge/person

d. average yearly revenue

H_3: There will be no significant difference in the productivity ratios used by restaurateurs based on selected personal variables as stated in H_1.

H_4: There will be no significant difference in the productivity ratios used by restaurateurs based on selected restaurant variables as stated in H_2.

H_5: There is no significant difference in the type of resources controlled used to monitor efficiency by restaurateurs based on selected personal variables as stated in H_1.

H_6: There is no significant difference in the type of resources controlled used to monitor efficiency by restaurateurs based on selected restaurant variables as stated in H_2.

H_7: There is no significant difference in profitability control measures used by restaurateurs based on selected personal variables as stated in H_1.

H_8: There is no significant difference in profitability control measures used by restaurateurs based on selected restaurant variables as stated in H_2.

H_9: There is no significant difference in meal prices used by restaurateurs based on selected personal variables as stated in H_1.

H_{10}: There is no significant difference in meal prices used by restaurateurs based on selected restaurant variables as stated in H_2.

Assumptions and Limitations in the Study

The assumptions which had an effect on the results of this study were the following:

1. Restaurant managers surveyed had enough knowledge of partial factor productivity measures to objectively respond to the questionnaire.

2. The respondents provided honest answers, rather than ideal answers.

Restaurant managers surveyed were only those who were members of the Missouri Restaurant Association. Results of this research can only be generalized to this group.

Definition of Terms

Productivity. The ratio of quantities of outputs to quantities of inputs. These outputs and inputs must be for the same unit of time (APC, 1979).

Productivity Measurement. The selection of physical, temporal, and/or perceptual measures for input variables and output variables

and the development of a ratio of output measure(s) to input measure(s) (Shaw, 1983).

Productivity Index. A ratio divided by itself. A basic period is used and another period compared to it. The productivity index shows the change in productivity over time (Shaw, 1983).

Productivity Ratio. The comparison of two variables of single parameters (i.e., labor and labor, hours and hours), or of several parameters such as net outputs when several inputs are required (Mali, 1978).

Partial Factor Productivity Ratio. A productivity ratio which includes most, or all, of the outputs and some (generally on type) of inputs (Shaw, 1983).

Total Factor Productivity Measurement. Those measures which relate output to all input factors involving the weighting together of the quantities of separate factors. (Capital and labor may be aggregated using their unit costs in a base year as weights (Shaw, 1983).)

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

Efficiency. An input issue--resources expected to be consumed over resources actually consumed (Sink, 1983a).

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

Quality of Worklife. Work with meaning (Mali, 1978), or affective responses to working in and living in organizational systems (Sink, 1983a).

Profitability. The earned return of investment (owner equity) or the return on all things a business owns (Rausch, 1982), or the relationship of revenue to costs (Shaw, 1983).

Innovation. A deliberate, novel, specific change aimed as accomplishing the goals of the system more effectively (Mueller, 1971), or applied creativity (Shaw, 1983).

Performance. Is equal to the combined functions of productivity, profitability, efficiency, effectiveness, quality, quality of worklife, and innovation (Sink, 1983a).

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

Fast Food. Restaurants that follow a limited menu and highly standardized service, and range from speciality housed 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, offer waitress service and avoid 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).

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, 1977).

CHAPTER II

REVIEW OF LITERATURE

According to Goetz (1949), the purpose of managerial control is to compel events to conform to plans. Managerial control is necessary for an organization to perform work. Sink (1983a) lists seven criteria of performance: productivity, profitability, efficiency, effectiveness, innovation, quality, and quality of worklife which all must be considered when measuring organizational performance. All seven of these performance criteria are interrelated and equally important to one another.

To accurately determine an organization's performance, each criteria needs to be examined separately, however, before these can be examined some sort of measurement needs to be done. Drucker (1974) states that more attention be paid to measurement because 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. Management cannot identify performance problems and explore their causes without measurement.

This chapter defines and discusses each of the seven criteria. The measurement methods of each criteria along with control and improvement of each will be examined. Because this research is part of a twin study, three of the seven performance criteria, productivity, profitability, and efficiency will be covered in detail in this study while

effectiveness, quality, quality of worklife, and innovation will be covered briefly here and at length in the study conducted by Pickerel (1984).

Productivity

Productivity can be thought of as the relationship between the output of goods or services and the inputs of basic resources such as labor, capital, materials, and energy. In order to increase productivity, more effective use of resources needs to occur thus increasing output per unit of input.

According to Mark (1982), productivity is an expression of the physical or real quantities of inputs. Drucker (1974) states that a productivity measurement is the only yardstick that can actually engage the competence of management and allow comparison between managements of different units within the enterprise, and of different enterprises.

The quality of management on all levels is a major factor in differentiating one business from another. Measurement of productivity is one way to measure this important factor by determining how well resources are utilized and how much they yield. Management has a strong influence on productivity because it is management that selects, acquires, organizes, allocates and utilizes the resources required to create the outputs and services of the organizational operation.

In order to start a productivity improvement program, a corporation or business needs to be concerned with its strategic view of the marketplace and competition which means an in depth look at the economics and cost structure of the industry. As Wise (1980) states, there are three basic groups into which productivity improvement efforts can be categorized:

1. Work simplification refers to areas that include the active involvement of almost all employees. A function or unit meets the problem of cost effectiveness within its own boundaries. Every job has room for improvement. Employees abound with ideas on improvement and effective systems can harness and implement these ideas.

2. Identified opportunities represent cross-functional or other major functional possibilities that require more intensive investigation and result in significant financial returns. Information systems, functional reorganizations, and major procedural changes can be included in this group.

3. Major structural changes are a strategic response to fundamental business issues. By restructuring elements of the organization, the definition of market segments, or the location of manufacturing or distribution facilities, for example, dramatic improvements in cost effectiveness may be achieved.

Since there is no formalized measurement of productivity, a measurement system is still a matter of individual corporate judgment. This is also because there are different levels of measurement. A measurement that means something to a waiter/waitress may be far too detailed to interest a manager. It is easy to summarize sales and financial data since production units or dollars are readily understandable at each higher level. Productivity measures, however, require input and output elements that can vary a great deal from one area to another. Measurements need to be fitted to the activity concerned in order to prevent damaging the measurement's credibility by using an inappropriate measure. Involving all employees in the measurement process needs to be encouraged since the measures can function as a motivational device. The measures

selected need to be appropriate for the area of improvement, be meaningful to the people being measured, and be useful at a reasonable cost.

A serious productivity improvement program will require major investments and technological change--for example, changing production facilities, office design, physical layouts, or service tools. Substantial resource investments are needed for major productivity gains. Such investments may create a net loss in the first year of implementation.

The general problems concerning productivity, especially those related to measurements, are much more widespread in the service industry. The service sector encompasses the major industry groupings of trade, finance, insurance, communications, public utilities, transportation, and government, as well as business and personal services. It accounts for almost 3/4 of the Nation's employment and provides the greatest potential, as well as some of the greatest difficulties, for developing productivity measures (Mark, 1982).

Problems of measuring output in service industries are similar to those in goods-producing industries. This stems from the fact that the output indicator must be quantifiable and independent of the input measures. It is also important to define intermediate and final service, therefore, productivity measurement refers only to the final service and its relationship to input.

Many food service establishments have suffered financial collapse due to inadequate determination of optimum labor requirements and of acceptable levels of performance. According to Freshwater and Bragg (1975), the reasons for this are two-fold. First, the majority of

food service operators do not understand what a standard productivity measure is and how it can be used, and they misinterpret the implications of poor performance or superior performance. Second, the majority use labor cost ratios (dollars labor cost divided by dollars sales) as a productivity measure.

Most management techniques being used today are not new. They have been in use for the past 10 to 15 years. In some instances they have been adopted and implemented successfully. Management first needs to recognize that a problem exists then management needs to have the motivation to do something about it.

Sumanth (1981) believes that there is a need for educating the industrial companies of the United States in productivity measurement. Food service operations also need to be included in this category. Shaw (1983) states that food service operations need to begin by measuring, then applying that measurement data to improvement efforts.

Extensive study of productivity in the food service industry is needed. By gathering more information on factors affecting productivity and continuing the education of food service management employees, overall productivity improvement in the food service industry can occur.

Profitability

One idea which is firmly embedded in the minds of Americans today is that businesses exist for the sole purpose of making as much money as they possibly can. Profitability may be the "name of the game" in most businesses but it is not the entire game. It is also essential that a business obey laws, pay competitive wages, offer working conditions accepted by the community, pay bills, and provide management incentives.

The statement that profitability is essential is applicable to all types of organizations. In the long run, income must be greater than expenditures, regardless of the funding source, therefore, there is no such thing as a nonprofit organization.

As defined by Sink (1983b), profitability is a measure or set of measures of the relationship between financial resources and used for those financial resources. An example of this is the ratio of revenues to costs.

Although many different methods of profitability analysis have been used in general industry, perhaps the most widely used and best understood method is simple: cost/volume analysis. In this method, the profitability of additional volume is equated with the marginal revenue minus the marginal cost associated with the volume change (Cleverly, 1978).

Profitability can also be measured as the percentage return on sales, percentage return on the owner's equity, or percentage return on assets (Villano, 1977), or in absolute dollars (net income) (Rausch, 1982).

The income statement, balance sheet, and profit and loss statement are examples of financial reports which are important when evaluating profitability. Profit-oriented businesses generally use two methods of planning for profitability. Return on investment (ROI), associates profits produced by a particular capital investment to the amount of money needed to acquire it. This method is by far the best available tool for deciding between several proposed capital investments (Rausch, 1982). This method is easy to explain, and define, and is also capable of measuring management's performance. Break even analysis is another method used in planning for profitability. This method can be used to

test a flexible budget, determine sales volume necessary to acquire a desired profit, comparing various products profitability, or determining how a range of sales values affects profitability.

Profitability is a monetary measure which does not measure all aspects of output and input, nor are the standards against which profits are judged always accurate (Anthony and Herzlinger, 1980). Profitability and productivity are two terms which are generally related to one another. When businesses can improve productivity, that is when output becomes greater with less amounts of input than would normally be used, the organization's unit costs are reduced while at the same time the organization's strength, viability, and profitability are enhanced.

In order for a business to profit from productivity improvements, management needs to monitor productivity performance through the use of measurement procedures. These procedures must be accurate and clearly link the organization's overall productivity performance to changes in its profits.

Axler (1979) feels that profit is an indicator of business performance, only when it is compared with expected profits, a standard or past performance. Anthony and Herzlinger (1980) also feel that it is important to compare profitability against a standard or expected figure rather than against past years. Simply because profits have risen in an organization is no indication if they have risen enough, or if they could have risen more.

Dudick (1972) states that the following are important keys to the improvement of profitability.

1. Proper product pricing practices
2. Equipment utilization

3. Control of inventories

4. Knowledge of results

5. More realistic planning

It is inaccurate to refer to profitability as the goal, or the primary goal, of the organization. It is actually a goal of only one group associated with the organization. The owner's goal is not necessarily the firms goal. Profits can also serve as a measure of the organization's success through meeting the goals of customers, employees, creditors and the general public. In the long run, the profitability of an organization can be thought of as an imperfect measure of the organization's overall effectiveness.

Efficiency

Several different definitions of efficiency exist in management books. According to Johnson (1981), a few examples of these are:

1. Progress toward organizational objectives at the least possible cost

2. Personal efficiency in individual performance

3. Work output above normal expectations

4. Doing work right

5. Satisfaction of individual motives when operating jointly toward a common goal

6. Productivity

7. Reduction in unit cost of output

Smally and Freeman (1966) define efficiency as the relation between achievement of objectives and the consumption of resources.

Both productivity and efficiency refer to the ratio of the output of a system to its input. In this research the term efficiency will be defined as: Resources expected to be consumed/Resources actually consumed (Sink, 1983a).

Efficiency commonly refers to a ratio of output to input. Managers are thought to be efficient if they are able to produce more and better output with less labor, decreased materials and machine time, and in a shorted period of time. Efficiency connotes the idea of doing well whatever is being done and without waste. How the work is done is what efficiency focuses the most on.

In 1900, Taylor and Glibreth were confronted with the question "How to raise the efficiency of the individual laborer?" Taylor felt that a "fair day's work for a fair day's pay" by the use of a time study, was the best way. Gilbreth searched for "the one best way" through motion study techniques. Both these techniques are now widely used in industrial engineering work measurement practices. In the early 1900's and today, the approach to efficiency is to develop techniques for measuring the output of goods and services as related to the manpower effort. Since there was no practical or precise method by which the input and output of the human body and brain could be measured, as is true with the machine, the actual time to produce a product, compared to a standard time became the accepted method of measuring and evaluating human effort. Because of this, the term "efficiency" was thought to mean the output of human exertion (DeWitt, 1976).

The measurement of efficiency is straightforward, at least on a conceptual level. It is made by summing the outputs and inputs of an

activity and expressing the two as a ratio. The ratio is generally expressed as output to input.

Efficiency in itself, is a neutral concept. The efficiency level of an activity can be expressed without knowing or implying that the activity is in fact, efficient. If an activity is pronounced to be efficient, it is implied that its efficiency level is acceptable compared with some standards, which could be derived from experience or by more scientific means.

In order to determine if an organization is performing efficiently, the manager must quantify both the resources which are used to make outputs and the outputs themselves. Management needs to create and continue to maintain an up-to-date, accurate and comprehensive data record which covers the inputs and major outputs of the organization. Larger organizations which have many diverse outputs will require an in-depth and detailed understanding of their systems.

In order to identify the critical outputs of an organization, the following guidelines should be followed:

1. Indicators should be comprehensive; that is, all major workloads of your organization should be covered by the output indicators.

2. Each output indicator should represent a final output of your organization.

3. The output should be countable. Ideally the outputs should be counted and recorded as part of the processing cycle. The closer the situation is to the ideal, the more accurate and less costly the efficiency measurement system will be.

4. The output indicators should be directly workload-related. Output should be a direct result of an activity rather than a second order effect.

5. The outputs should be repetitive. They should reflect ongoing organization activities, which are expected to be sustained over time.

6. Each output indicator should be homogeneous. That is, the employee time required to produce an output should not vary systematically from one output to the next.

Many factors can affect the values calculated for efficiency measures, even though the work force itself has not changed its pace or procedures. Significant increases or decreases in the oncoming workload can by themselves affect efficiency values. When examining efficiency measures, conclusions should not be jumped to or based on only the gross efficiency data without first carefully considering the likely causes.

The number of efficiency measures used by an organization also needs to be carefully considered. The number of efficiency measures which could be undertaken in an organization seems almost endless. Excessive data collection leads to knowing more and more about less and less, and should be avoided.

Efficiency and effectiveness are two terms which are very closely related as illustrated in the previous sections. Many experts view efficiency to be a criterion of effectiveness. In Drucker's (1974) viewpoint, however, efficiency is a minimum condition for survival after success has been achieved.

Effectiveness

The meaning of the terms effectiveness and efficiency are often confused with one another. Effectiveness is often defined as the degree of the achievement of objectives. As defined by Sink (1983a)

and as used in this research, effectiveness is defined as: Accomplishing the "right" things; on time (timeliness), right (quality), all the right things (quantity), where "things" means goals, objectives, activities, etc. Most organizations follow the idea that effectiveness may be evaluated using multiple criteria. As stated by Cambell (1976) examples of such criteria include: absenteeism, accidents, growth, productivity, quality, overall effectiveness, efficiency, morale, turnover, motivation, goal consensus, etc.

Organizational effectiveness is a major consideration in any form of organizational analysis. There are two basic approaches to organizational effectiveness: the goal model (Hall, 1980) and the resource acquisition model (Goodman and Pennings, 1977). The goal model is a rational model of organizations that can be quite simple or very complex. In its simple version, effectiveness has been defined as "the degree to which (an organization) realizes its goals" (Etzioni, 1910). The model becomes complex in organizations that have multiple and frequently conflicting goals. Since most organizations are structually complex, it is common for them to have multiple and incompatible goals. According to Hannan and Freeman (1977), the goal model is plagued with three basic problems. The first problem is multiplicity of goals. They feel that the "imagination is boggled" by the multiplicity and diversity of goals in large organizations. Secondly, organizational goals are usually general rather than specific, making analysis difficult. Thirdly, the temporal dimension is too seldom considered. Effectiveness in the short run could lead to disaster in the long run, while an emphasis on the longer term could cause more immediate problems.

The goal model also makes the measurement of effectiveness difficult. A major problem occurs in disentangling events that happen within and outside the organization. The qualities of organizational inputs may or may not be controlled by the organization. On the other hand, it is also difficult to determine how internal activities contribute to organizational effectiveness. In other words, organizational analysts are not yet in a position to specify the contributions of organizational components to organizational actions.

Another major difficulty of measuring effectiveness using the goal model involves the question of whose party's views are to be utilized. Different groups of people have different viewpoints. For example, organizational participants, members of other organizations, and organizational clients can each have a different outlook on the situation. Pennings and Goodman (1977) feel that the "dominant coalition" of an organization is the key in the determination of effectiveness.

Setting aside all the problems associated with the goal model, it continues to remain as a dominant perspective on effectiveness. It remains dominant because essentially all organization utilize goals. Goals tend to become a central component of most theories of organizations and of organizational effectiveness.

An alternative approach to the study of organizational effectiveness has been developed through the resource acquisition model. Seashore and Yuchtman (1977) define the effectiveness of an organization as "the ability to explore its environment in the acquisition of scarce and valued resources to sustain its functioning." Such resources can take many forms, including raw materials, money, clients, personnel, and so on. This model incorporates the use of the "penultimate" criteria of

effectiveness, claiming that the ultimate criteria of survival or death of an organization should only be considered over very long time periods. Penultimate criteria include such things as growth in business volume and the youthfulness of organizational members.

There has been some debate as to whether or not resource acquisition is an appropriate model for analyzing effectiveness. Hall (1980) suggests that resource acquisition does not just happen, but rather it is based upon what the organization is trying to achieve. Decisions are based on goals as well as resource acquisition. These acquisitions are deemed as a necessary prerequisite for goal attainment. Resources are sought on the basis of the patterns or goals established by the dominant coalition of the organization. The identification of effectiveness criteria must be done on the basis of some understanding of where the organization is attempting to go (Scott, 1977).

The resource acquisition approach has not generated any coherent line of research, however, this approach still remains to be the dominant theoretical perspective in the study of organizational effectiveness. Pennings and Goodman (1977) feel that the goal and resource acquisition models should be brought together, with resource acquisition being termed constraints that must be met before goals can be attained.

Both these traditional effectiveness models assume that organizational management decisions are guided by goal or resource acquisition considerations. This may be true, but there are many other crucial factors which do not appear in these theories. Management is not able to control many of the critical contingencies of organizations. Energy shortages and economic upswings and downswings are uncontrollable

realities of most organizations. Businesses and organizations have to learn to cope with these externally derived forces.

Organizations also must deal with externally mandated contingencies which deal with economic and regulatory issues. A good example of an economic issue is energy costs which may or may not be related to energy shortages. Regulatory issues deal with the wide variety of federal and state regulations which are imposed on organizations. Examples of these include: occupational health and safety regulations, minimum wage provisions, etc.

Another important consideration of organizations which can affect overall effectiveness are the internally generated norms which decrease the range of options open to organizational decision makers or dominant coalitions. Examples of these include: union contracts, tenure rules, and the force of tradition.

These examples of internal and external forces which control organizations are realities which organizational decision makers must face every day. These contingencies form a framework upon which the goal and resource acquisition models rest. Organizational contingencies and mandates are a certainty but the methods of coping with them are not.

Traditionally, in industrial organizations, effectiveness has been thought of mainly in terms of productivity. Practically all variables used as criteria of organizational effectiveness, with the exception of productivity, have been found to be inadequate and unsatisfactory. Previous studies regarding "morale" and member satisfaction in relation to effectiveness (effectiveness measured on the basis of productivity) have frequently been inconsistent, nonsignificant, or difficult to evaluate and interpret (Georgopoulos and Tannenbaum, 1957). Employee

turnover and absenteeism have similar problems of evaluation. These two variables cause problems due to their differential sensitivity to "third" considerations such as the nature and volume of work to be processed, organizational level affected, and season of occurrence.

From a theoretical standpoint, it is preferred to look at the concept of organizational effectiveness from the point of view of the system itself, of a total organization rather than some of its parts. Criteria used in measuring effectiveness should be system-relevant and also applicable across organizations. Such criteria should stem from a common framework to which the concept of organizational effectiveness can be meaningfully associated.

Quality

Until recently, American firms generally have not given product quality the high priority they reserve for other considerations such as cost reductions, prompt delivery, and production efficiency (Cole, 1981).

The popular term for fitness for use and as is used in this research is quality. The concept of fitness for use is universal and applies to all goods and services. According to Szilagyi (1981), quality is comprised of the following dimensions:

1. Function--performing the purpose for which it was intended.
2. Reliability and Durability--length of time the product will perform its function.
3. Aesthetic Characteristics--physical appearance of the product.
4. Safety--whether the product performs its function without unnecessary danger to the user.

A variety of uses are applicable to the term fitness for use. One example may be a manufacturer who purchases a product and then performs additional processing operations. Fitness for use for the manufacturer may mean the ability to do processing with high productivity, low waste, etc. Also the products which result from the processing process should be fit for use by the manufacturing clients. Another example may be a merchant who divides the bulk and resells the products. Proper labeling and identity, protection from damage during shipment and storage, ease of handling and display, etc., are examples of fitness for use to the merchant. Due to the wide variety of uses these products must possess many elements of fitness for use. Each of these elements can be thought of as a quality characteristic which are the building blocks in the construction of quality.

According to Juran and Gryna (1980), quality characteristics can be grouped into five different categories which include:

1. Structural--length, frequency, viscosity
2. Sensory--taste, beauty
3. Time-Oriented--reliability, maintainability
4. Commercial--warranty
5. Ethical--courtesy, honesty

The service industry employs a large number of people in the United States. Unfortunately, however, most of these people are not familiar with the meaning of quality. An organized, scientific approach to quality management is required to maintain or develop a quality reputation. This will usually require an investment in the study and application of quality control principles to all aspects of service work.

According to Scanlon and Hagan (1983), there are three obstacles to the straight-forward fulfillment of quality management programs in service industries. The first is that the managers of service businesses are, generally speaking, almost entirely unfamiliar with the substance and business value of quality control principles. The second is that investments in control programs are viewed as unnecessary expenses rather than programs with a payback; they are seen as having a negative rather than a positive effect on productivity. The third problem is that service personnel do not genuinely listen to customers; their complaints are seen as irritants rather than opportunities.

Unsatisfactory quality can be thought of as undesirable results due to unwanted and unnecessary variations in performance. The reason for problems occurring is almost always attributed to standards of performance being weak or nonexistent. A solution to this problem is to establish a quality management system which sets performance standards, measures performance against the standards, and then develops a quality improvement program. A quality management system is the key to preventing unsatisfactory service through improvement of performance. A quality improvement program can bring many benefits to an organization. Some of these benefits include: improved image, improved productivity, reduced expenses, improved marketability, management of quality and quality of costs, improved employee environment, and improved profitability.

To the restaurant industry the term quality generally refers to the quality of food and service. The American Dietetic Association (ADA Journal, 1974, p. 665) defines quality food as that "which has been selected, prepared, and served in such a manner as to retain or enhance

natural flavor and identity; to conserve nutrients; and to be acceptable, attractive, and microbiologically and chemically safe."

More indepth studies are needed which focus on experimental design of programs which evaluate the effectiveness of quality assurance activities, conditions under which these activities have an impact, and the most effective strategies for their implementation in various organizational types (Kaluzny, 1982; Hetherington, 1982). Quality assessment practices relating to food service are generally in the form of the feedback type which evaluate the final product.

In general, the main purpose of a quality control program is to develop a method to guarantee that the end products of services are being produced or carried out correctly. A quality improvement program is based on past history. In other words, it analyzes what has been done and investigates the errors to ensure that the errors will not happen as often in the future.

As stated by Scanlon and Hagan (1983), quality improvement can be achieved by "doing it right the first time, next time, and every time." To improve quality, an ongoing quality measurement program is needed which analyzes the problem and takes corrective action.

Quality of Worklife

The dissatisfaction of workers was given a large amount of attention during the 1970's. Most curveys done on job satisfaction show an increasing trend of job dissatisfaction during the 1980's.

One response to the problem (and to the country's related need for greater productivity) has been an approach called "quality of working life" (Herric, 1981). An increasing number of private and public

establishments have started programs which give individual employees more autonomy in doing their own jobs and gives groups of employees control over their working environment.

Taylor (1911) was responsible for a method of management called "Taylorism" which occurred shortly after the turn of the century. "Taylorism" treated workers like robots by programming each job down to its smallest detail. Norway was responsible for the rush away from Taylorism in the 1960's with its push toward "autonomous work groups" which participate in or actually make shop-floor decisions. It is now estimated that Japan has several million workers organized in small problem-solving teams called quality control circles. In this day and age there are many informal quality of working life programs being launched in organizations nation wide.

Improving the quality of working life is humanistic as well as productive. Managers today have many different ideas about what the term quality of worklife means to them. A few of these include:

1. Bringing the democratic values of society at large into the plant by giving the worker greater control over his destiny in the workplace, over his job, and over his workplace.

2. Extending adulthood to the workplace.

3. Mutual labor/management exercise to create a wholesome working relationship between employer and employee.

4. An awareness of the dignity of work and the potential contribution of every employee regardless of his job or position in the company.

Quality of worklife has been defined by Terry and Dar-El (1980) as the tendency of an individual worker to act in a certain way when

confronted with a given set of stimuli from his work environment. Sink (1983a) defines it as the affective responses of participants in a system to socio-technical aspects of the system.

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 (Glaser, 1976). This requires an organizational climate and structure which is set up in a way that will encourage and reward questions, challenges, or suggestions related to improving organizational operations.

Before beginning any quality of worklife evaluation program, the purpose for its measurement needs to be defined. Marks (1982) feels that there is proactive and reactive quality of worklife measurement. Reactive measurement is usually done in response to a particular problem. Proactive measurement is done before problems occur. Assesseing quality of worklife can be accomplished through a personal interview, questionnaire, or by recording surrogate measures such as tardiness, absenteeism, and turnover. Different organizations may use different methods of measurement depending upon the economic situation and degree of decentralization.

There are several popular generic instruments which are used for the measurement of the quality of worklife and its related parameters. Hackman and Oldham (1975) have developed the Job Diagnostic Survey (JDS) to evaluate current jobs to determine how they might be redesigned to increase employee output and motivation and to study the effects of these changes on employees. Smith (1969) developed the Job Description Index (JDI) which measures the five variables of: opportunities for

promotion, pay, relationship with co-workers, supervision, and the work itself.

As stated by Terry and Dar-El (1980) the purpose of quality of worklife assessment is to provide means for identifying behavioral problems which are inhibiting performance. These authors also feel that productivity is highest in organizations in which groups are able to use their own creative potential to solve problems.

Innovation

The perceived decline in industrial innovation in the United States has been a subject of concern to the nation's leaders for over 20 years. In the late 1950's, 82 percent of the world's major innovations were produced in the United States. The 1960's showed a drop in that figure to 55 percent.

Carney (1981) states the following reasons for the United States decline in creativity and innovation:

1. Government regulations have made it so difficult that it is now impossible for businesses to finance the research necessary to develop products and still fulfill their obligations to stockholders.

2. Business leaders are not able to evaluate risk, so they take the easy way out and avoid anything they cannot prove to be safe.

3. The image of what a successful business is has changed and the requirements for success do not permit creative research.

4. The self-image of business leaders has changed; they must operate a business to fulfill their own ambition and there is no room for creative research or creativity of any kind.

5. Lack of appreciation in industry for any idea originating outside its own research prevents industry from taking advantage of a great source of creativity.

The United States' leadership position in world commerce is mainly due to innovation and organization. Due to this nation's investment in research and development of innovation, we have advanced in areas such as space exploration, computers, microelectronics, and agriculture. Although the United States is most often thought of as a leader in manufactured products, we are also the world's leader in the growth and efficiency of the service sector of our economy.

According to Szilazyi (1981) innovation is that which refers to the efforts in the basic sciences to develop new technologies, processes, methods, and products. Zaltmen and Lin (1971) define innovation as "any idea, practice or material artifact perceived to be new by the relevant unit of adoption" and voices 13 dimensions of an innovation that make it more likely to be adopted, for example, low cost, high commerciability or high reversibility. Lawrence and Lorsch (1967) feel that the actual theme in innovation is change and newness in ideas, methods or products. Innovation differs from change in that innovation is a deliberate, novel, specific change aimed at accomplishing the goals of the system more effectively (Mueller, 1971).

Myers and Marquis (1969) believe that in order for an innovation to be successful it must go through three steps of adoption which are: idea development (enactment), problem solving (selection), and retention (implementation).

In spite of this nation's current leadership in technology, competition from abroad is starting to be a major concern to United States'

manufacturers. Other nations are capitalizing upon basic technology developed here and using it to design better or equal products at a lower cost.

The average foodservice establishment has not spent much of its sales follar on organized innovation (research and development); its spencing is typically limited to short-term developmental efforts (Bellas and Olsen, 1978). Successful foodservice establishments are those which emphasize the hiring, training, and development of individuals who are able to obtain and apply basic information.

Studies dealing with research and development activities have identified four organizational characteristics associated with consistently successful product and process innovation. These include:

1. A commitment to innovation by the management of the organization.
2. A means of directing the research to achieve organizational goals.
3. A system for testing alternatives and making decisions.
4. A means of implementation, including an organizational climate conducive to change (Bellas and Olsen, 1978).

According to Quinn (1982) the following act as blocks to the optimum production and use of technology in American companies: short term management incentives, lack of urgency in research, entrenched ideas and vested interests, aging of key management and operating personnel, and overly long lines of formal authority.

Every member of an organization is concerned with the search for better products and processes. By showing employees that the organization is open and responsive to new ideas and willing to innovate,

that organization can take full advantage of its resources which enable it to improve profits and its competitive position.

Summary

The use of the seven performance criteria varies from one organization to another. Although these criteria are very interrelated, different organizations tend to place more emphasis on certain criteria.

Productivity is the relationship of quantities of outputs to quantities of inputs for the same period of time. Effectiveness and efficiency are also involved in productivity where effectiveness is doing the right thing and efficiency is doing things right (Drucker, 1974). Profitability is the difference between revenue and expenses while innovation is specific change aimed at accomplishing the goals of the system more effectively (Mueller, 1971). Quality is the degree to which a product or service conforms to predetermined standards Adam, Hershquer, and Ruch, 1981), and quality of worklife involves the affective responses of participants to living and working in an organizational system (Sink, 1983a).

Many businesses see profitability as being the most important criteria, however, it is possible to be profitable without being productive. According to Shaw (1983), a new much-desired product may provide profit; however, the product is unique only as long as it takes for it to be copied. Once competition steps in and challenges the quality or price of that service or product, the operation must be productive in order to remain profitable. Quality is also important to a productivity program. A business which produces low quality products will not remain profitable for long. The remaining criteria

are also important, however, their particular relationship to the other performance criteria is unclear.

Low productivity is a problem not only in the foodservice industry but in other industries as well. For that reason this study places a stronger emphasis on productivity and hopes to better understand its role in foodservice operations by examining current measurement and control practices for all seven organizational performance criteria.

CHAPTER III

METHOD

Productivity, profitability, and efficiency are the three performance criteria which seem to have the most direct effect on the dollar value of inputs and outputs of business and industry today. Shaw's (1983) findings indicated that although restaurant managers are controlling inputs and outputs in their organization, a standardization is needed in the ratios being used to assess these performance criteria, especially that of productivity. The purpose of this study was to further explore what ratios existed in resaurant productivity measures and to form recommendations for a productivity standard based upon these ratios. The research design, sample, data collection (which includes the preliminary study, instrumentation, and procedure) and data analysis will be included in this chapter.

Research Design

A descriptive status survey was the most appropriate method of data collection in this research. According to Fox (1969), a descriptive survey is intended to describe a specific set of phenomena in and of themselves. Descriptive survey was used for this research in order to reach a wide array of restaurant operators working in various types and sizes of restaurants.

Sample

The criteria for participants in the survey were membership in the Missouri Restaurant Association and current employment in a management position in a restaurant in Missouri. There are approximately 1900 members in the Missouri Restaurant Association, all of whom received a questionnaire and were asked to participate in the study. Members receiving the questionnaire were asked to forward it on to management personnel if they were not familiar with management practices in that restaurant. Results can only be generalized to this group.

Data Collection

Preliminary Study

A pilot study on productivity measurement was mailed to Oklahoma Restaurant Association's Board of Directors in the Summer of 1983. A six page questionnaire was used which included one page of demographic type data questions and five pages pertaining to evaluation and control of organizational performance. The questionnaire required considerable time and thought with open-ended questions being used in order to obtain as much information as possible. Results from this study were tabulated and a new instrument which incorporated results and suggestions was developed in the Fall of 1983.

The Instrument

A newly developed instrument which was based on the results of the pilot study mentioned earlier, was used in this study to explore productivity measurement practices in restaurants (Appendix B). This

instrument consisted of two main sections: Demographic Data (entitled "General Information") and Performance Criteria. Performance Criteria consisted of seven sections (one for each criteria). At the end of the questionnaire, participants were asked to rate the criteria according to how much time they spent evaluating each, and according to how important they felt evaluation of each is to the successful operation of their restaurants. Comments concerning the definitions used or the survey in general were encouraged at the end of the questionnaire. A panel of Oklahoma State University graduate faculty members from the departments of Food, Nutrition, and Institution Administration; Hotel and Restaurant Administration; and Statistics, and the Educational Director of the Missouri Restaurant Association, reviewed the instrument for content validity, clarity and format.

The instrument consisted of three types of questions. Under "Productivity", respondents were asked to circle the number which corresponded with how often they used the control measures listed. A Likert-type scale was used, ranging in values, from 1 (always) to 5 (never). The majority of questions used in the rest of the questionnaire and which also pertained to efficiency and profitability, required the respondent to simply check "yes" or "no" or to place a check in the box beside an evaluation or control measure he or she uses. The rating questions required a response using a scale of 1-7. "One" was the number to be given to the criteria on which he or she spends the most time, or feels is most important, and "seven" was to be given to the criteria on which they spend the least time, or feels is least important.

Procedure

The instrument was printed on four sheets of gold paper and mailed along with two cover letters. One letter was from the President of the Missouri Restaurant Association requesting the cooperation of its members, and the other letter explained the project and instructed the respondents how to complete and return the questionnaire. The questionnaires were mailed in bulk to MRA's headquarters in Kansas City, Missouri. The MRA Educational Director mailed the questionnaires along with their monthly newsletter, to each of their members. This procedure was performed in order to cut costs of the two-way mailing process. Mailing information and codes were printed on the back of the last sheet so that the instrument could be returned without being placed in an envelope. Return postage was provided.

Data Analysis

Data obtained from the survey were keypunched on computer cards, four cards per respondents, and were analyzed using the Statistical Analysis System (SAS) (Barr, 1976). Frequency distributions showed the occurrence of each method of performance evaluation or control. Chi-square was used to study the relationship between selected demographic variables and the methods of evaluation and importance to the various types of restaurant operations. 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 second, 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. A five percent level of significance was used for the purposes in this study.

CHAPTER IV

RESULTS AND DISCUSSION

Data for the study were obtained via the instrument described in Chapter III, "Research Design". The research questionnaires were sent to the Educational Director of the Missouri Restaurant Association by Federal Express Mail. The questionnaires were then attached to the MRA's monthly newsletters and mailed to all 1900 members. The response rate was only three percent (N=57). Two questionnaires were unusuable due to missing data hence only 2.9 percent (N=55) were analyzed.

Characteristics of Survey Respondents

Age and Years of Education

Twenty percent (N=11) of the respondents were between 20 to 29 years of age, 37 persons (N=20) were between the ages of 30 to 39, 30 percent (N=16) were between 40 to 49 years of age, and 15 percent (N=7) were 50 years of age or older. A high school diploma was the highest level of education attained by 22 percent (N=12) of the respondents. A little over one-half (N=30, 54 percent) had attained a bachelor of science degree, while 24 percent (N=13) received education beyond a bachelor's degree.

Years of Experience

Experience in the restaurant industry ranged from one to over

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

Position Title and Productivity Training

Restaurant owner was the title held by 37 percent (N=16) of the respondents. A little over one-half of the respondents (54 percent, N=23) were titled restaurant manager. The nine percent remaining (N=4), described their position as that of assistant manager. Only about 30 percent (N=16) of the respondents had received any training in productivity measurement. The remaining 70 percent (N=37) indicated that they had not received any such training.

Characteristics of the Restaurants

Type of Restaurant

As shown in Figure 3, 53 percent (N=27) of the respondents operated full service restaurants. Twenty-nine percent (N=16) of the respondents were family-owned establishments, while 13 percent (N=7) were Hotel or Motel restaurants. Eleven percent (N=6) of the respondents described their operation as "other" which included in-plant feeding, eight-month resort, "deli", and a low-calorie bakery and retail operation.

Seating Capacity and Average Check Charge

Fifty-three percent (N=28) of the respondents have facilities seating between 100 and 299, 32 percent (N=17) seat less than 100 people

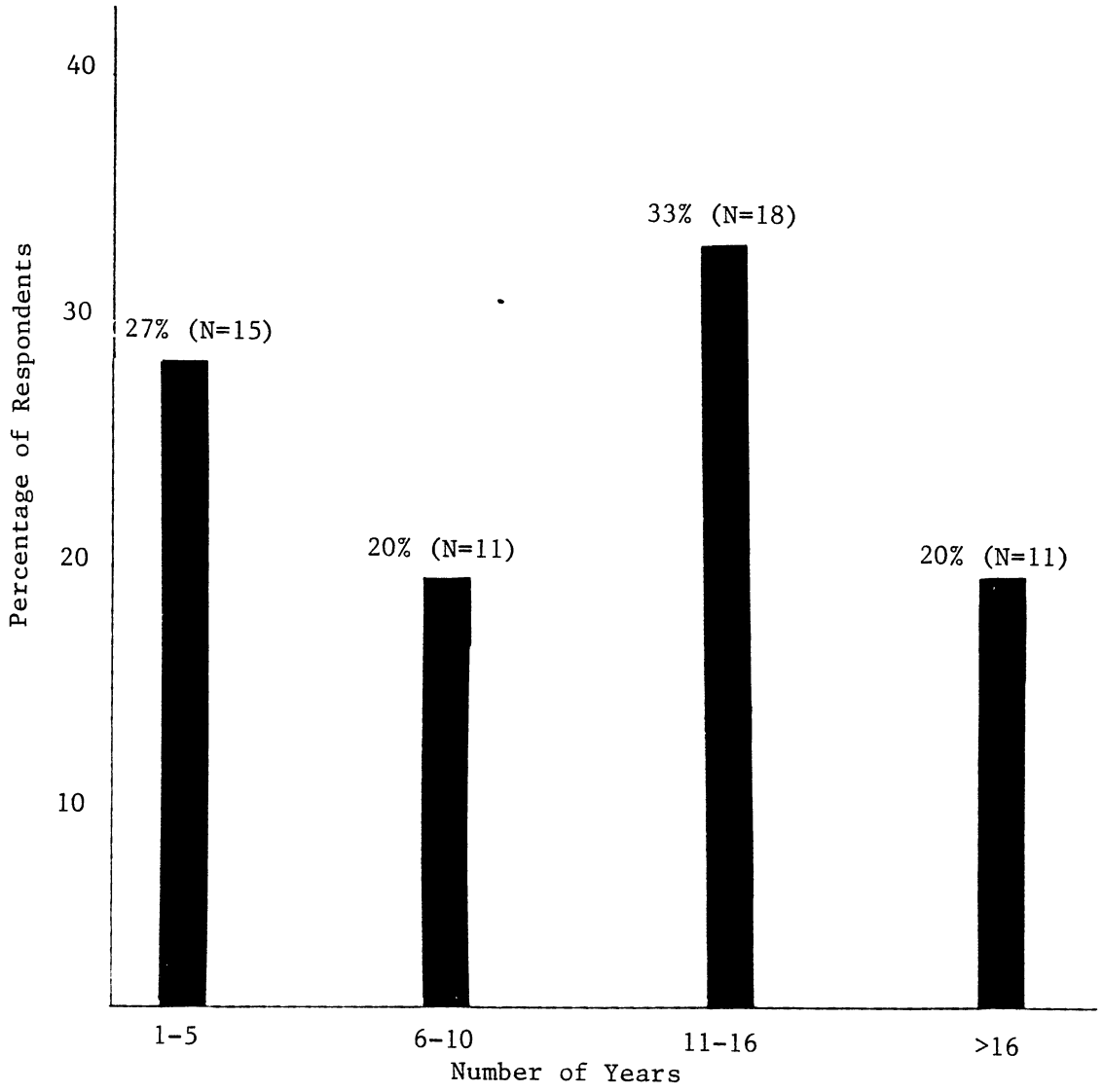


Figure 2. Years of Experience of Restaurateurs

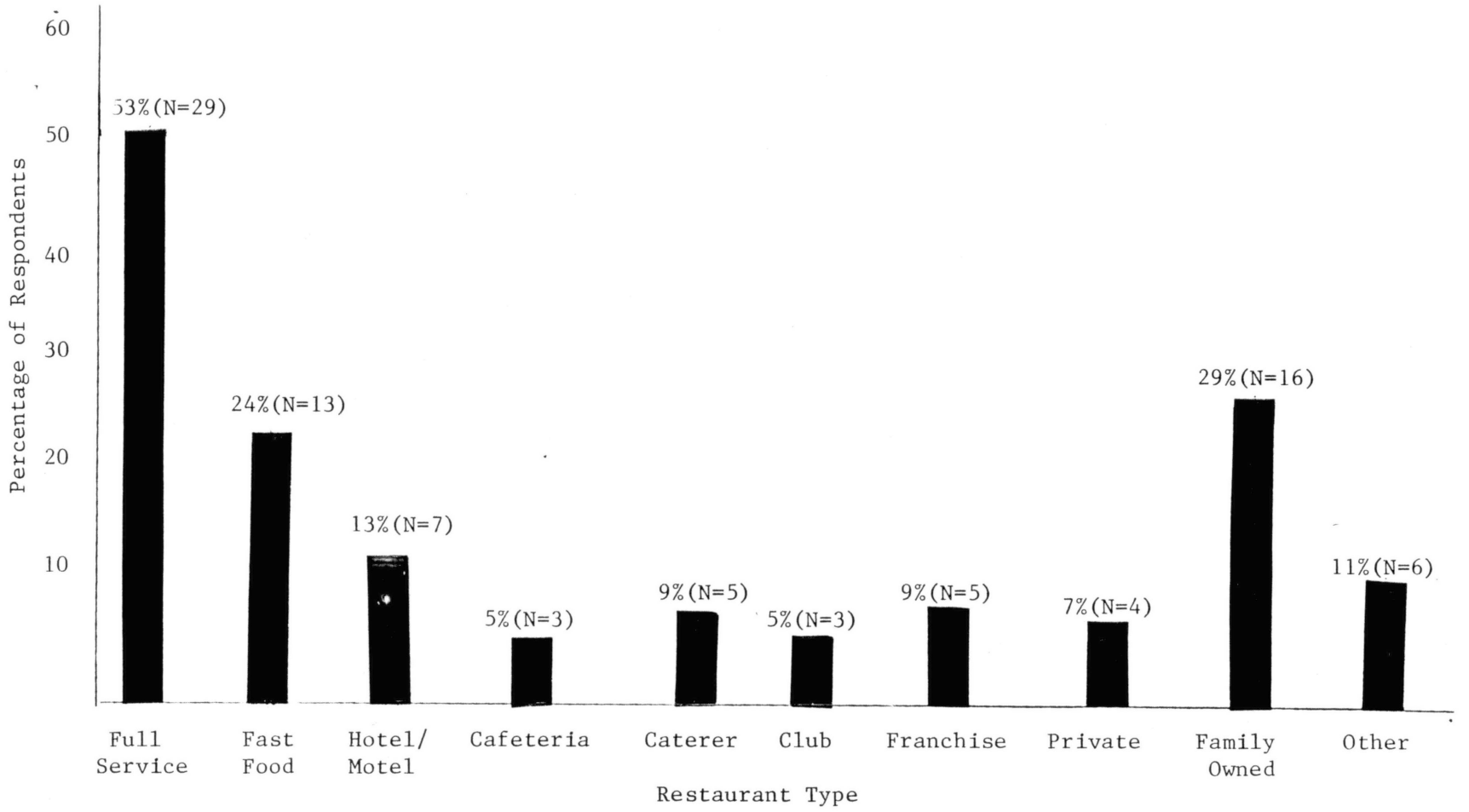


Figure 3. Type of Restaurant

and 15 percent (N=8) seat over 300 people. The average check charge for 38 percent (N=21) of the respondents was between $3.00 and $4.99; however, for 36 percent (N=20), the average check charge was $5.00 to $9.99 (Figure 4).

Revenue

A three-way split occurred for the average yearly revenue. Thirty-six percent (N=17) had an average yearly revenue of between $500,000 and $999,000, 34 percent (N=18) had below $499,000, and 30 percent (N=16) had one million dollars or more in average yearly revenue. According to Powers (1979), cafeterias, bars, and taverns make 65 percent of total restaurant sales. Hotel/Motel types make up 5.7 percent and contractors and cafeterias make up only 2.2 percent of total sales.

Performance Criteria

Productivity

Inputs. Productivity was defined as the relationship of outputs to inputs in the questionnaire. Restaurateurs were asked how often they used certain input and output control measures in their operation. Answer selections were given using a five-point, Likert-type scale ranging from "Never" to "Always" (Appendix B). The first input control measure listed was the use of detailed specifications in purchasing supplies and equipment (Table I). Almost all (N=51) of the respondents answered either "Always", "Usually", or "Sometimes".

An association ($p=0.0239$, $x^2=0.447$, $df=3$) existed between age of respondent and this control measure. One hundred percent of the

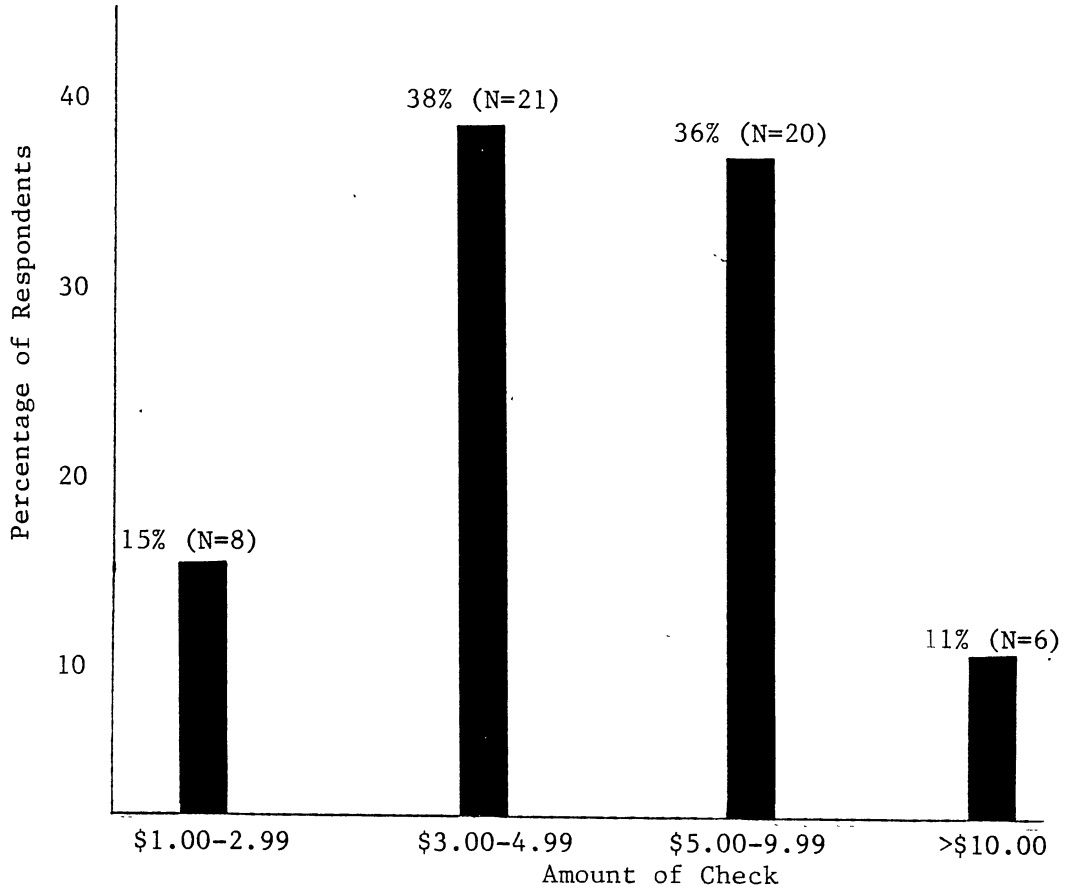


Figure 4. Average Check Charge of Respondents

TABLE I

SIGNIFICANT ASSOCIATIONS FOUND IN PRODUCTIVITY CONTROLS

Productivity Controls	Factors Showing Correlation	Frequency and % of Respondents Using Control Measures	
Inputs			
Detailed specifications in purchasing supplies and equipment (1)	Age of Respondent ($p=0.0239$, $x^2=9.447$, $df=3$)	N=51	94
Labor usage is checked and adjusted quarterly (2)	Cafeterias ($p=0.0047$, $x^2=.986$, $df=1$)	N=53	96
Comparison shopping for food and supplies (3)	Hotel/Motel Restaurants ($p=0.0202$, $x^2=5.395$, $df=1$)	N=51	93
Use of standardized recipes (5)	"Other" type restaurants ($p=0.0039$, $x^2=8.318$, $df=1$)	N=54	98
Evaluate kitchen energy costs quarterly (6)	Fast food operations* ($p=0.0488$, $x^2=3.882$, $df=1$)	N=30	55
	Seating capacity ($p=0.0494$, $x^2=6.018$, $df=2$)	N=28	53
	Caterers ($p=0.0323$, $x^2=4.583$, $df=1$)	N=30	55
Monitor energy usage of specific pieces of equipment (7)	Franchise restaurants ($p=0.0334$, $x^2=4.526$, $df=1$)	N=20	36

TABLE I (Continued)

Productivity Controls	Factors Showing Correlation	Frequency and % of Respondents Using Control Measures	
Monitor breakage and pilferage (9)	Years of Experience ($p=0.0374$, $x^2=8.462$, $df=3$)	N=52	95
	Average yearly revenue ($p=0.0454$, $x^2=6.183$, $df=2$)	N=50	90
Routinely follow bar cost if applicable (12)	Franchise restaurant ($p=0.0286$, $x^2=4.789$, $df=1$)	N=49	89
Outputs			
Production sheets checked at least quarterly for amount of demand (14)	Average yearly revenue ($p=0.0073$, $x^2=9.841$, $df=1$)	N=46	87
Have system for utilizing bulk leftover food (15)	Fast food operation ($p=0.0057$, $x^2=7.834$, $df=1$)	N=47	85
Outputs as meals served daily (16)	Position title of respondent ($p=0.0194$, $x^2=7.882$, $df=2$)	N=38	88
Daily check average (17)	Position title of respondent ($p=0.0129$, $x^2=8.698$, $df=2$)	N=39	91
Amount prepared vs. amount served (18)	Training in productivity management ($p=0.0435$, $x^2=4.074$, $df=1$)	N=45	85
Daily operations control sheets (22)	Position title of respondent ($p=0.0455$, $x^2=6.178$, $df=2$)	N=35	81

TABLE I (Continued)

Productivity Controls	Factors Showing Correlation	Frequency and % of Respondents Using Control Measures	
Daily operation controls sheets (22)	Fast food operation ($p=0.300$, $x^2=4.706$, df=)	N=45	82
	Seating capacity ($p=0.0135$, $x^2=8.603$, df=2)	N=43	81
	Average check charge ($p=0.0472$, $x^2=7.944$, df=3)	N=45	82
	Average yearly revenue ($p=0.0002$, $x^2=17.415$, df=2)	N=43	81
Ratios			
Use of ratio: Meals/labor hours worked (28)	Training in productivity management* ($p=0.0481$, $x^2=3.907$, df=1)	N=21	11
	Fast food operation* ($p=0.0391$, $x^2=4.256$, df=1)	N=11	20
	Club restaurant ($p=0.0377$, $x^2=4.319$, df=1)	N=11	20
Use of ratio: Sales/labor hours worked (29)	Caterer ($p=0.0169$, $x^2=5.704$, df=1)	N=27	49
Use of ratio: Meals/labor hours paid (30)	Full service restaurant* ($p=0.0410$, $x^2=4.017$, df=1)	N=9	16

TABLE I (Continued)

Productivity Controls	Factors Showing Correlation	Frequency and % of Respondents Using Control Measures	
Use of ratio: Customers/labor hour (33)	Full service restaurant* ($p=0.0410$, $x^2=4.176$, $df=1$)	N=16	29
	Club restaurant ($p=0.0054$, $x^2=7.734$, $df=1$)	N=16	29
Use of ratio: Meals served/actual man-minuts (35)	Private restaurant ($p=0.004$, $x^2=12.684$, $df=1$)	N=8	15
Use of ratio: FTE's/specific tasks (36)	Private restaurant ($p=0.0001$, $x^2=15.929$, $df=1$)	N=3	6
Use of ratio: Meals/total food costs (37)	Hotel/Motel restaurants ($p=0.0280$, $x^2=8.785$, $df=3$)	N=19	35
	Average check charge ($p=0.0323$, $x^2=8.785$, $df=3$)	N=19	35

*Inverse relationship.

respondents in the 30-39 years age bracket (N=20) and 40-49 year age bracket (N=16) used this type of control measure, compared with 91 percent of those in the 20-29 year age bracket and 71 percent of those in the 50-69 year age bracket.

Checking the use of labor and adjusting it quarterly (input control #2) was used by 96 percent (N=53) of the respondents. This control measure was associated with cafeterias ($p=0.0047$, $x^2=7.986$, $df=1$). Only two of the three cafeterias (67 percent) responding used this control measure, whereas 98 percent (N=51) of those that were not cafeterias used this measure.

The third input control measure (comparison shopping for food and supplies) was used by 93 percent (N=51) of the total respondents. This measure was associated ($p=0.0202$, $x^2=5.395$, $df=1$) with hotel/motel type of restaurants. Five out of the seven hotel/motel restaurant types used this measure while 46 out of 48 non-hotel/motel types used this measure. The fourth input control measure was not significantly associated with any of the variables.

Use of standardized recipes was the fifth input control measure listed in the questionnaire. Almost all respondents (98 percent, N=54) used this control measure. An association ($p=0.0039$, $x^2=5.395$, $df=1$) existed for "Other" type restaurants. Five out of six of those restaurants that were in the "Other" category used this control measure. In contrast, 100 percent (N=49) of the remaining restaurants responded positively to this measure.

Evaluation of kitchen energy costs at least quarterly (input control #6) was used by 55 percent (N=30) of the respondents. Three different factors showed correlation to this productivity control measure. An

inverse correlation ($p=0.0488$, $x^2=3.882$, $df=1$) existed for fast food type operations in that only four out of 13 fast food type operations used type control measure, whereas 62 percent (N=26) of the remaining restaurants used this control measure. The second factor showing correlation ($p=0.0494$, $x^2=6.018$, $df=2$) with evaluating kitchen energy costs was that of seating capacity. The majority of those responding (N=17) seated between 100-299 people. Six out of eight restaurants which seated between 300-599 people also used this measure, while only five out of 17 restaurants in the less than 100 category utilized this measure. The final factor associated with this input control measure ($p=0.0323$, $x^2=4.583$, $df=1$) was the catering type of establishment. All of the catering establishments (N=5) used this control measure, whereas only 50 percent (N=25) of the non-catering establishments did the same.

Monitoring energy usage of specific pieces of equipment (input control #7) was used by only 36 percent (N=20) of all respondents. An association ($p=0.0034$, $x^2=4.526$, $df=1$) existed between this measure and franchise type of restaurants. Four out of the five franchise type restaurants used this control measure, while only 16 out of the other 50 non-franchise types used this measure. Years of experience was the second factor associated ($p=0.0487$, $x^2=7.875$, $df=3$) with the use of this control measure. Respondents with 11=15 years of experience (N=8) used this control measure more so than those in other experience categories. The 6-10 year category had the next highest response with 7 out of 11 using this measure.

Monitoring breakage and pilferage of supplies was the ninth input control measure listed. Ninety-five percent (N-52) of all respondents used this control measure. Years of experience was associated ($p=0.0374$,

x^2=8.462, df=3) with this control meassure. All 18 restauranteurs (100 percent) in the 11-15 years of experience bracket used this control measure. In addition, all those in the 6-10 year category (N=11) and greater than 16 years category (N=11) also used this measure, however, only 12 out of 15 in the 1-5 year category responded to the use of this measure. Average yearly revenue was also associated (p=0.0454, x^2=6.183, df=2) with this control measure. All those in the $500,000-$999,000 (N=19) and $1,000,000 and above (N=16) categories used this measure. In the less than $499,000 category, however, only 15 out of 18 used it.

Routinely following bar costs (input control measure #12) was used by 89 percent (N=49) of the total respondents. An association (p=0.0286, x^2=4.789, df=1) existed between this measure and franchise type restaurants. Three out of the five franchise type restaurants used this type input control measure in comparison to 46 out of 50 non-franchise which also claimed to use this measure. An association (p=0.0086, x^2=6.909, df=1) also existed between this measure and fast food types of restaurants. Although nine out of 13 fast food restaurants monitored this control measure, 40 out of 42 non-fast food restaurants also did the same.

Outputs. Checking production sheets at least quarterly to see that production was appropriate for demand was the first output control (#14 in questionnaire, p. 2) measure which was used by 87 percent (N=46) of the total respondents. Average yearly revenue was related (p=0.0073, x^2=9.841, df=1) to this control measure. Eighteen out of 19 respondents in the $500,000-$999,000 revenue bracket responded to using this measure. Also, all 16 (100 percent) of the respondents in the

$1,000,000 and up category used this control measure. In contrast, only 12 out of 18 respondents in the less than $499,000 category utilized this output measure.

Having a system for utilizing leftover bulk foods (control measure #15 in the questionnaire) was utilized by 85 percent (N=47) of the respondents. An association ($p=0.0057$, $x^2=7.834$, $df=1$) existed for fast food type restaurants utilizing this control measure. Eight out of the 13 fast food restaurants respondend that they used this measure. A large percentage (93 percent, N=39) of the non-fast food types, however, also used this measure.

Keeping track of the number of meals served daily (output control measure #3 or #16 in the questionnaire) was a method used by 88 percent (N=38) of the total respondents. An association ($p=0.0194$, $x^2=7.882$, $df=2$) existed in relating the position title of the respondent to this control measure. Of those using this measure, 20 out of 23 managers, and all 16 that were owners responded to using this output control measure. In contrast, only 50 percent (2 out of 4) of the assistant managers responded positively to this.

The fourth output control measure (#17 in the questionnaire) of averaging the daily checks was used by 91 percent (N=39) of the respondents. Again, a positive correlation ($p=0.0129$, $x^2=8.698$, $df=2$) existed between position title of the respondent and this control measure. Twenty-two out of 23 managers and 15 out of 16 owners responded to its use. Once again, only 50 percent (2 out of 4) of the assistant managers responded positively to this.

The fifth output control measure (#18 in questionnaire) used was keeping track of amounts prepared versus amounts actually served.

Eighty-five percent (N=52) of all respondents utilized this output control measure. An association ($p=0.0435$, $x^2=4.074$, $df=1$) existed between training in productivity management and this output control measure. All 16 of the restaurateurs who had received productivity training used this measure, whereas only 29 out of 37 of those who had not received training did the same.

The sixth output control measure (#22 in questionnaire) used was daily operations control sheets. This measure was associated with five separate factors. First, the position title of the respondent was related ($p=0.0455$, $x^2=6.178$, $df=2$) to this measure. All of the assistant managers (N=4) and 21 out of 23 managers used this measure. In contrast, only about two-thirds of the owners (10 out of 16) used this. Fast food operations showed an association ($p=0.0300$, $x^2=4.706$, $df=1$) with this measure. Of those responding, eight out of 13 were fast food type establishments. Thirty-seven out of 42 who were non-fast food type establishments also used this measure. Seating capacity of the restaurant was associated ($p=0.0135$, $x^2=8.603$, $df=2$) with this measure, 35 of the 55 respondents seating between 100-299 people. Ten out of 17 of those seating less than 100 responded positively and 100 percent (N=8) of those seating between 300-599 responded to its use. The average check charge was also associated ($p=0.0472$, $x^2=7.944$, $df=3$) with this measure. One hundred percent (N=20) of those in the \$5.00=\$9.99 category used this measure which 5 out of 6 in the greater than \$10.00 category utilized the same. The fifth and last factor showing association ($p=0.0002$, $x^2=17.415$, $df=2$) with the use of daily operations control sheets was that of average yearly revenue. The establishments (N=18) utilizing this control measure had an average yearly revenue which ranged between

$500,000-$999,000. All 16 (100 percent) of those in the $1,000,000 and up category used daily operations control sheets, whereas only 9 of the 18 in the less than $499,000 utilized the same measure.

Ratios and Indexes Used to Assess Productivity. The second section under "Productivity" asked if the respondent was developing ratios and/or indexes by which to assess productivity and if so, which ones. Sixty-five percent (N=36) stated that they were using ratios and indexes.

Meals/labor hours worked was the first ratio listed. Twenty percent (N=11) of the respondents were using this ratio. This ratio showed significant association with three other factors. The first factor showing an inverse correlation ($p=0.0481$, $x^2=3.907$, $df=1$) was training in productivity management. Only six out of 16 who had received training in productivity management used this measure. Five out of 37 who had not received training also used this measure. The second factor showing an inverse relationship ($p=0.0391$, $x^2=4.256$, $df=1$) was that of fast food restaurants. None of the fast food restaurants (0 out of 13) utilized this productivity ratio, while 11 of the 42 non-fast food types used it. The third and final factor which showed an association ($p=0.0377$, $x^2=4.319$, $df=1$) with this productivity ratio was that of club type restaurants. Two out of three club type restaurants used this productivity ratio while only 9 out of 52 of the non-club types responded positively to this measure.

Sales/labor hours worked was the second ratio listed which has a significant amount of response. Forty-nine percent (N=27) of the total respondents made use of this ratio. A strong association ($p=0.0169$, $x^2=5.704$, $df=1$) was found to exist for catering establishments. All of

the respondents that were catering operations (N=5) used this ratio. In contrast, 22 of the non-catering establishments also use this ratio.

The next ratio listed which showed a significant amount of response was the use of meals/labor hours paid. Nine out of the total respondnets (N=55) used this ratio. An inverse association ($p=0.0450$, $x^2=4.176$, $df=1$) was found to exist for full service restaurants. Only two out of 29 of the full service restaurants used this ratio. Of the non-full service types, seven out of 26 used this ratio.

Customers/labor hour was another ratio used by 29 percent of the respondents (N=16). This ratio had two factors showing association. Full service restaurants showed an inverse relationship ($p=0.0410$, $x^2=4.176$, $df=1$) to the use of this ratio. Only five of the 29 full service restaurants used this ratio whereas 11 out of 26 of the non-full service used this measure. Club type restaurants had a significant association ($p=0.0054$, $x^2=7.734$, $df=1$) with this ratio in that all of the club types (n=3) used this ratio. In contrast, only 13 out of 52 non-club types responded to using the same.

Meals served/actual man-minutes was the next ratio which showed a significant amount of response. Fifteen percent of all respondents used this ratio. Private restaurants were associated ($p=0.0001$, $x^2=15.929$, $df=1$) with this ratio. Three of the four private restaurants used this ratio, as compared to only 5 out of 51 of the non-private restaurants which used this also.

Use of the ratio of FTR's/specific tasks was responded to by only 6 percent of the respondents. Again, private restaurants showed an association ($p=0.0001$, $x^2=15.929$, $df=1$) to this ratio. Two of the four

private restaurants responding used this ratio, as compared to only one out of 49 of the remaining non-private types.

Meals/total food costs was the last ratio that showed a significant amount of response (35 percent). Hotel/motel type restaurants were associated ($p=0.0280$, $x^2=4.826$, $df=1$) with this ratio. Five out of seven of the hotel/motel restaurants used this ratio, while 14 of the 48 non-hotel/motel types made use of the same. The average check charge was associated ($p=0.0323$, $x^2=8.785$, $df=3$) also with this ratio. Of those who responded to the use of this ratio, the majority (N=11) had an average check charge of $5.00-$9.99. None of those in the $1.00-$2.99 category responded and only 7 out of 21 in the $3.00-$4.99 category used this. Only one respondent had an average charge of $10.00 or more in his/her operation.

Respondents were then asked if they made use of any other ratios other than those given on the questionnaire. Sales/food cost, and cost of goods/sales were two ratios utilized by the respondents. These ratios were not true productivity ratios. Respondents were also asked if they used the inverse of any of the ratios suggested in the questionnaire. No response was received to this question.

Discussion of Productivity

Inputs. The first four input control measures were used quite often by greater than 90 percent of the participants. These findings were similar to Shaw's (1983) results which also had a greater than 90 percent response to these control measures. Cafeterias were positively associated with the second control measure of checking the use of labor and adjusting it quarterly. This could be due to the fact that cafeterias

have a more stringent labor schedule and have a much better idea of precisely how many employees they will need at certain hours than a full service restaurant would.

Evaluation of kitchen energy costs and monitoring energy usage of particular pieces of equipment (input controls 6 and 7) were not as commonly practiced as the first four measures. Again, these findings were similar to Shaw's (1983) results. The majority of fast food operations did not evaluate kitchen energy costs, perhaps, because most of these were part of a franchise and evaluations such as these may be done by higher level personnel in the management hierarchy. All catering establishments used this control measure because perhaps they were smaller operations, operation is sporadic in nature, and controlling costs such as these could mean a lot of money saved.

Monitoring energy usage of specific pieces of equipment was used most often by franchise restaurants. In franchise restaurants, most of the equipment will be the same from one restaurant to another. Monitoring the equipment may be done to compare one operation to other franchises to make sure it is operating as efficiently as it should.

The ninth input control measure of monitoring breakage and pilferage of supplies was done by the majority of the respondents. Years of experience showed a strong association in that all those with more than six years of experience followed this measure.

Routinely following bar costs (the last input control measure) was used mainly by franchise and fast food type restaurants. One explanation could be possible for this. Franchise restaurants especially may find that bar costs make up a large percentage of their business. It is not

clear if fast food type restaurants responding to this qeustion were thinking of their pop bar or salad bar and not beer, wine and distilled spirits bar.

Outputs. Checking of production sheets to see that production was appropriate for demand was the first output control measure responded to by most of the restaurants in the $500,000-$999,000 revenue bracket. Larger restaurants could very well do this from time to time since it is much easier to over produce and not notice the waste as much as you would in a smaller restaurant. Most of the restaurants have a system for utilizing leftover bulk foods. Fast food restaurants responded positively to this measure perhaps because the majority of their leftver bulk food would be in the form or frozen hamburger patties, sandwich trimmings, etc., which could be reused without a high risk of microbiological safety. Also restaurants with varied menus can incorporate their leftovers in other forms of food products.

An interesting association existed for the output control measure of keeping track of amounts prepared versus amounts actually served. All restaurant managers who had received productivity training used this measure. This was easy to understand since the basics of a productivity program dealt with inputs and outputs of an organization.

The use of daily operations control sheets was used quite often by the majority of respondents. Fast food operations made use of this control measure quite often. A reasonable explanation for this could be that fast food operations have many more pre-determined standards which need to be measured and compared daily. Also, the larger restaurants (those with higher average check charges, yearly revenue,

and increased seating) had a higher percentage of responses to this measure.

Ratios and Indexes. The majority of participants responded that they were using ratios and indexes to assess productivity. Sales/labor hours worked was the most popular ratio used. This was different from Shaw's (1983) findings which found meals/total food cost as the most popular ratio used. Catering establishments had a strong association with this ratio. Labor hours were very important to catering establishments because perhaps it was easy to waste labor time in a catering operation which do not have employees on regular duty.

Meals/total food cost was the next most popular ratio used by the participants. Hotel/motel type restaurants had a strong association with this ratio. Hotel/motel type restaurants were similar to full service restaurants in that they generally have a conventional type of food service operation. The majority of the meals are prepared from raw food instead of convenience type products, therefore, total food cost which covers all functions (purchasing, storage, pre-prep, preparation, etc.) becomes an important consideration needing much attention.

All significant associations to the use of productivity inputs, outputs and ratios, are summarized in Table I. Frequency and percent of respondents using control measures are based on the total number that responded to that particular question.

Profitability

Profitability was defined on the questionnaire as the earned

return on investment or the relationship of revenue to costs. Respondents were asked to give their own formulas on how they measured profitability. Responses included total sales less total costs = profit, standard return on investment (ROI) on a unit-by-unit basis, percentages developed by profit and loss, and net income (profit was measured by dollars).

The next section in the profitability category asked the respondents what happens when the budget was exceeded in their restaurant. Response to this question included the following in descending order: labor control, inventory control, sales analysis, submission of written justification, volume increases, price increases, performance audits, review of funds, nothing in particular, cut-off of funds, and demerits (Table II).

TABLE II

FREQUENCY OF CORRECTIVE MEASURES UTILIZED WHEN BUDGET IS EXCEEDED IN RESTAURANTS

Corrective Measures	Frequency
Labor Control	33
Inventory Control	33
Sales Analysis	27
Written Justification	19
Volume Increases	15
Price Increases	14
Performance Audits	14
Review of Funds	9
Nothing in Particular	7
Cut-Off of Funds	2
Demerits	1

Exceeding the budget resulting in "nothing in particular" was associated with years of education ($p=0.0401$, $x^2=6.434$, $df=2$) and average check charge ($p=0.0025$, $x^2=14.348$, $df=2$). Four out of 12 managers that had more than 16 years of education responded most often to this statement, whereas only three out of 30 in the 13-16 year bracket and none in the 1-12 year bracket responded to this statement. Restaurants with an average check charge of $1.00-$2.99 also responded most often to this statement (N=4). Only two out of 21 in the $3.00-$4.99 category, one out of 20 in the $5.00-$9.99 category and none in the $10.00 and up category responded.

Exceeding the budget resulted in submission of written justification was inversely associated ($p=0.0014$, $x^2=19.216$, $df=1$) with the variable productivity training, and positively associated ($p=0.0486$, $x^2=6.050$, $df=1$) to seating capacity. Seven out of 15 of those who had received productivity training responded to this statement, whereas a lower percentage of those who had not received training (three out of 37) responded affirmatively to the use of this measure. Restaurants seating 300-599 people responded more often (four out of eight) to this statement. Three out of 17 of those seating less than 100, and three out of 27 of those seating 100-299 also used this measure.

Franchise restaurants were inversely associated ($p=0.0016$, $x^2=9.985$, $df=1$) with the statement that exceeding the budget resulted in demerits. Only one out of five franchise restaurants responded to this statement, while none of the remaining restaurants used this measure.

The next control measure of exceeding the budget resulted in a cutt-off of funds was inversely associated to private restaurants ($p=0.0191$, $x^2=5.439$, $df=1$). Of the respondents that were in private

restaurants, only one out of four responded to this statement and only one out of the remaining 50 that were non-private used this measure.

Exceeding the budget resulted in price increases was related to three factors which were: position title, restaurant type (cafeteria) and average yearly revenue. An association ($p=0.0356$, $x^2=6.673$, $df=2$) existed with position title of respondent with this profitability control measure. Nine out of 16 of those responding to this statement were owners of the restaurant. Only five out of 23 managers responded positively and none of the assistant managers used this measure. Cafeterias were also associated ($p=0.0355$, $x^2=4.520$, $df=3$) with this control measure. All cafeterias (N=2) used this measure, while only 15 of the remaining non-cafeterias used this measure. The majority of those responding (11 out of 17) to this statement had an average yearly revenue of less than $499,000. The $1,000,000 and up category had the next highest response (five out of 16) while only one out of 19 in the $500,000-$999,000 category responded positively. Exceeding the budget resulted in sales analysis had three different associations. First, age of the respondent was related ($p=0.0403$, $x^2=8.295$, $df=2$) to this control measure. All (N=10) of those responding to this statement were in the 40-49 year age group. Six out of seven in the 50-69 category, eight of 20 in the 30-39 category, and three of 11 in the 20-29 category also responded. Position title of the respondent was positively associated ($p=0.0205$, $x^2=3.981$, $df=2$) in that the majority (12 of 16) of the respondents were owners of the restaurant. One of the three assistant managers in the survey and seven of the 23 managers also utilized this measure. Training in productivity management was also associated ($p=0.0491$, $x^2=3.871$, $df=1$) to this profit control measure.

Eleven of the 15 who had received training responded to this statement. In contrast, only 16 out of 37 of those who had not received training used this control measure.

The next profit control measure which showed a significant amount of response (N=14) was the use of performance audits. Full service restaurants showed an inverse relationship ($p=0.0301$, $x^2=4.701$, $df=1$) in that only 11 out of the full service restaurants used this control measure. A very small percentage (three of 25) of the remaining non-full service used this also. Fast food restaurants also had an inverse relationship ($p=0.0144$, $x^2=5.993$, $df=1$) in that none of the 13 fast food restaurants responding used this measure, in comparison to 14 of the remaining 41 non-fast food types who did use the measure. The use of performance audits was associated ($p=0.0094$, $x^2=9.388$, $df=2$) with 11 out of 27 restaurants seating between 100-299 people. None of those seating less than 100 responded in the affirmative while three out of eight of those seating 300-599 utilized performance audits.

Reviewing funds when the budget was exceeded was positively associated to age ($p=0.0092$, $x^2=11.520$, $df=3$) and education ($p=0.0308$, $x^2=6.960$, $df=2$) of the respondnet. In the 30-39 year bracket, four out of 20 responded, and in the 50-69 year age group, four out of seven responded most often to this statement. None of those in the 20-29 year category used this and only one out of 15 in the 40-49 year category reviewed funds. Five who had an education which exceeded 16 years, used this measure. The 13-16 years of education category had three out of 30 responding and only one out of 12 in the 1-12 year category responded.

Training in productivity was again related ($p=0.0269$, $x^2=4.896$, $df=1$) to two more profit control measures. Of those who responded to labor control as a profit control measure, 13 out of 15 responding had received productivity training, however, 20 out of 37 of those responding to this had not received any productivity training. Inventory control was the next profit control measure which was associated ($p=0.0269$, $x^2=4.896$, $df=1$) with training in productivity management. Of those who had received productivity training, 13 out of 15 used this profit control measure. Twenty out of 37 of those who had not received training, however, also used this measure.

The last profit control measure which had a significant amount of response (28 percent, N=15) was that of volume increases. Fast food restaurants showed an inverse relation ($p=0.0103$, $x^2=6.585$, $df=1$) with this profit control method. None of the fast food restaurants responded to this method whereas 15 out of the 41 non-fast food types did use this method. This result is contrary to the researcher's expectations. The average check charge for the eight respondents was \$5.00-\$9.99. Three out of 21 of those in the \$3.00-\$4.99 average check charge category responded, whereas four out of six of those in the \$10.00 and up category used this measure. Seating capacity was also related to this measure ($p=0.0303$, $x^2=6.994$, $df=2$). Ten out of 27 responding had an average seating capacity of 100-299 people. Four out of eight restaurants seating between 300-599 people, however, used this measure. In contrast, only one out of 17 of those in the less than 100 category responded. Private restaurants were associated ($p=0.0284$, $x^2=4.802$, $df=1$) with the use of volume increases to control profitability. Three out of the four private restaurants that responded were using this

control measure, however, 12 out of the 50 remaining non-private types also used the same measure.

Respondents were also asked how they determined meal prices in their establishments. Twenty-seven percent (N=14) of the 55 respondents stated that food cost plus percent markup was used. Average yearly revenue of the restaurant was associated ($p=0.0127$, $x^2=8.738$, $df=1$) with this measure. Nine respondents using this measure had an average yearly revenue of less than $499,000. Only three out of 19 in the $500,000-$999,000 category, and two out of 16 in the $1,000,000-$2,499,000 used this measure. Nine percent (N=5) responded to the use of food cost plus labor cost, and 19 percent (N=10) responded that meal prices were determined by sales mix. Cafeterias were significantly related ($p=0.0428$, $x^2=4.103$, $df=1$) to the use of food plus labor costs. One out of the two cafeterias used this, while a smaller percentage (four out of 52) of the non-cafeterias used the same measure.

Meal prices being determined by sales mix was associated with three factors. Both club ($p=0.0272$, $x^2=4.880$, $df=1$) and franchise ($p=0.0122$, $x^2=6.284$, $df=1$) restaurants were associated with sales mix. Two of the three club types used this measure. In comparison, only eight out of 51 of the non-club types responded. Three out of five franchise restaurants also used sales mix. The average seating capacity of the majority (N=5) responding to this method was 100-299 seats. Four out of eight seating 300-599 responded also, while only one out of 17 seating less than 100 utilized sales mix to determine meal prices.

Twenty-two percent (N=12) responded to determining meal prices by the cost of the meal and popularity of the item. This method was associated with cafeterias ($p=0.0070$, $x^2=7.269$, $df=1$). Both cafeterias

(N=2) participating in the survey used this method, while only 10 of the remaining 52 non-cafeterias did the same. Thirty-one percent (N=17) of the respondents used the formula of food cost plus overhead, plus labor plus percent markup as a method for determining meal prices. This was related to family owned restaurants ($p=0.0100$, $x^2=6.466$, $df=1$). Nine out of the 16 family owned restaurants used this, while only eight out of 38 of the non-family owned used this measure. Twenty percent (N=11) of the total respondents used the formula of raw food costs plus labor plus traffic analysis as a method for determining meal prices. This method was inversely related ($p=0.0364$, $x^2=4.380$, $df=1$) to fast food operation. None of the fast food operations responded to using this method, whereas 11 out of 41 non-fast food operations did use this measure.

Discussion of Profitability

When respondents were asked what happened when their budget was exceeded in their restaurant, the two most popular responses were labor control and inventory control. Both of these responses were positively associated with training in productivity. These were expected by the researcher because labor and inventory control have always been very important components of a productivity control program as part of input data.

Exceeding the budget resulted in sales analysis was the third most popular profit control item used. Most of those responding to this statement were owners of the restaurant who were from 40 to 49 years of age. Owners in general would be more concerned when their budgets were exceeded and therefore a sales analysis would be an appropriate response. Those with more experience and perhaps older restaurateurs

would know more about sales analysis as a procedure hence this response. Productivity training was tied with the use of sales analysis as a corrective measure when the budget was exceeded. Productivity training would require getting down to the basics, and an analysis procedure would be called for as in sales analysis.

When asked how meal prices were determined, the majority responded to using the formula of food cost plus overhead plus labor, plus percent markup. In Shaw's (1983) study which involved management dietitians in health care, the majority responded to just using food cost plus markup. Food cost plus markup was the second most popular response in the present study. Restaurants which were in the lowest average yearly revenue bracket responded the most to this formula. Smaller establishments do not have as many considerations when determining the price of a meal as compared to a larger establishment which would need a more conplex formula.

Another popular method used was that of cost of meal and popularity of item. Cafeterias were positively correlated to this measure perhaps because in most instances, cafeterias have a "captive" audience (or a variable audience) which will pay a higher price for popular menu items.

All significant associations between profitability control measures and meal price determinations are summarized in Table III. Frequency and percent of respondents using control measures are based on the total number that responded to that particular question.

Efficiency

This section of the questionnaire sought to determine how closely the four resource categories (materials, labor, capital, and energy)

TABLE III

SIGNIFICANT ASSOCIATIONS FOUND IN PROFITABILITY CONTROLS

Profitability Controls	Factors Showing Correlations	Frequency and % of Respondents Using Control Measures	
Exceeding budget results in nothing in particular (2)	Years of education ($p=0.0401$, $x^2=6.434$, $df=2$)	N= 7	13
	Average check charge ($p=0.0025$, $x^2=14.348$, $df=2$)	N= 7	13
Exceeding budget results in submission of written justification (4)	Training in productivity management* ($p=0.0014$, $x^2=10.216$, $df=1$)	N=10	19
	Seating capacity ($p=0.0486$, $x^2=6.050$, $df=1$)	N=10	19
Exceeding budget results in demerits (5)	Franchise restaurants* ($p=0.0016$, $x^2=9.985$, $df=1$)	N =1	2
Exceeding budget results in cut-off of funds (6)	Private restaurants* ($p=0.0191$, $x^2=5.493$, $df=1$)	N= 2	4
	"Other" type of restaurant** ($p=0.0428$, $x^2=4.103$, $df=1$)	N= 2	4
Exceeding budget results in price increases (7)	Position title of respondents ($p=0.0355$, $x^2=6.673$, $df=2$)	N=14	33

TABLE III (Continued)

Profitability Controls	Factors Showing Correlations	Frequency and % of Respondents Using Control Measures	
	Cafeterias ($p=0.0355$, $x^2=4.520$, $df=3$)	N=17	31
	Average yearly revenue ($p=0.0007$, $x^2=14.429$, $df=2$)	N=17	33
Exceeding budget results in sales analysis (8)	Age of respondent ($p=0.0403$, $x^2=8.295$, $df=2$)	N=27	51
	Position title of respondents ($p=0.0205$, $x^2=3.871$, $df=2$)	N=20	48
	Training in productivity management ($p=0.0491$, $x^2=3.871$, $df=1$)	N=27	52
Exceeding budget results in performance audits (9)	Full service restaurants* ($p=0.0301$, $x^2=4.701$, $df=1$)	N=14	26
	Fast food operations* $P=0.0144$, $x^2=5.993$, $df=1$)	N=14	26
	Seating capacity ($p=0.0094$, $x^2=9.388$, $df=2$)	N=14	27
Exceeding budget results in review of funds (10)	Age of respondent ($p=0.0092$, $x^2=11.520$, $df=3$)	N= 9	17

TABLE III (Continued)

Profitability Controls	Factors Showing Correlations	Frequency and % of Respondents Using Control Measures	
	Education of respondent ($p=0.0308$, $x^2=6.960$, $df=2$)	N= 9	17
	Club restaurant ($p=0.0168$, $x^2=5.718$, $df=1$)	N= 9	17
Exceeding budger results in labor control (11)	Training in productivity management ($p=0.0269$, $x^2=4.896$, $df=1$)	N=33	63
Exceeding budget results in inventory control (12)	Training in productivity management ($p=0.0269$, $x^2=4.896$, $df=1$)	N=33	63
Exceeding budget results in volume increases (13)	Fast food operations* ($p=0.0103$, $x^2=6.585$, $df=1$)	N=15	28
	Average check charge ($p=0.0140$, $x^2=10.610$, $df=3$)	N=15	28
	Seating capacity ($p=0.0303$, $x^2=6.994$, $df=2$)	N=15	28
	Private restaurants ($p=0.0284$, $x^2=4.802$, $df=2$)	N=15	28

TABLE III (Continued)

Profitability Controls	Factors Showing Correlations	Frequency and % of Respondents Using Control Measures	
Meal Prices			
Meal prices determined by food cost + & markup (18)	Average yearly revenue ($p=0.0127$, $x^2=8.738$, $df=2$)	N=14	27
Meal prices determined by food cost + labor cost (19)	Cafeterias ($p=0.0272$, $x^2=4.103$, $df=1$)	N= 5	9
Meal prices determined by sales mix (20)	Club restaurants ($p=0.0272$, $x^2=4.8880$, $df=1$)	N=10	19
	Franchise restaurants ($p=0.0122$, $x^2=6.284$, $df=1$)	N=10	19
	Seating capacity ($p=0.0328$, $x^2=6.835$, $df=2$)	N=10	19
Meal prices determined by cost of meal, and popularity of item (22)	Cafeterias ($p=0.0070$, $x^2=7.269$, $df=1$)	N=12	22
Meal prices determined by food cost + overhead + labor + & markup (24)	Family-owned restaurant ($p=0.0126$, $x^2=6.466$, $df=1$)	N=17	31
Meal prices determined by raw food costs + labor + traffic analysis (25)	Fast food operations* ($p=0.0364$, $x^2=4.380$, $df=1$)	N=11	20

*Inverse relationships.

were being followed in restaurants. Labor usage records were kept by 94 percent (N=49) of the total respondents. The average yearly revenue was associated ($p=0.0377$, $x^2=6.555$, $df=2$) with this measure. The majority (N-19) of those responding to this method had a revenue of between $500,000-$999,000 and all of those (N=16) in the $1,000,000 and up category used this. Fourteen out of 17 in the less than $499,000 category responded also. Cafeterias were associated ($p=0.0307$, $x^2=4.671$, $df=1$) with labor control usage. Two out of three cafeterias participating, used this measure. Forty-nine out of the 51 non-cafeterias, however, also utilized this measure.

Keeping records of materials usage was responded to by almost all (N=50, 93 percent) of the total respondents. A positive association ($p=0.0083$, $x^2=6.962$, $df=1$) with fast food restaurants existed in the use of this efficiency measure. Nine of the 12 fast food restaurants were using this measure. This measure was also used quite often by 41 of the remaining 43 non-fast food types.

Capital usage records were kept by 71 percent (N=30) of the total respondents. Twelve of the 13 restaurateurs who had received productivity training used this measure ($p=0.0449$, $x^2=4.022$, $df=1$). In contrast, only 18 out of the 29 remaining restaurateurs without training used this measure.

Sixty-four percent (N=28) of the total respondents kept records of energy usage. Most of the restaurants (N=16) which used this method seated between 100-299. All seven of those seating 300-599 also used this measure, whereas only five out of 14 seating less than 100 responded.

Participants were then asked if "other" records were kept for efficiency control. Six percent (N=3) of the total respondents were

using other methods such as keeping track of china, glass and silver, keeping track of everything, and advertising. Caterers showed an inverse relation ($p=0.0004$, $x^2=12.460$, $df=1$) with this measure. Two of the five catering establishments responded to the "other" category, while the average seating capacity of the two catering restaurants responding to the "other category was 300-599 seats.

The last part of the efficiency section asked the respondents if they compared resources with resource utilization targets. Forty-one percent (N=20) of the total respondents responded in the affirmative. Training in productivity was associated ($p=0.0318$, $x^2=4.624$, $df=1$) with this measure. Ten of the 16 who had received productivity training were comparing resources used with resource utilization targets. In comparison, only 10 of the 33 who had not received training utilized this measure.

Discussion of Efficiency

The majority of the restaurants responded to keeping track of labor and materials usage, while approximately half of them kept track of capital and energy usage. Once again, cafeterias were significantly associated with keeping track of labor usage, whereas keeping records of materials usage was associated with fast food restaurants. Recording materials usage was deemed very important by fast food restaurants because of the enormous quantities of materials such as paper goods, food items, etc., that were used daily.

An interesting correlation existed for those who responded to keeping records of capital usage. The majority of those who had received productivity training responded to this measure. Capital usage may not necessarily have to be kept track of to achieve optimum productivity,

however, in most cases it could be a very important component of organizational inputs.

Keeping track of energy usage was the least utilized of the four efficiency control measures included in the questionnaire. This finding supported the results of Shaw (1983). The researcher cannot report with certainty if the monitoring of energy expenditure was delegated to a maintenance person or owner of the operation. Hopefully, someone had the responsibility of tracking energy usage which can be quite an expensive input. Monitoring of energy expenditure needs to be attended to in relation to type, age and number of major pieces of equipment as well as training of personnel on energy conservation. All significant associations between efficiency control measures are summarized in Table IV. Frequency and percent of respondents using control measures are based on the total number that responded to that particular question.

Performance Criteria Ranking by Time Spent and Importance

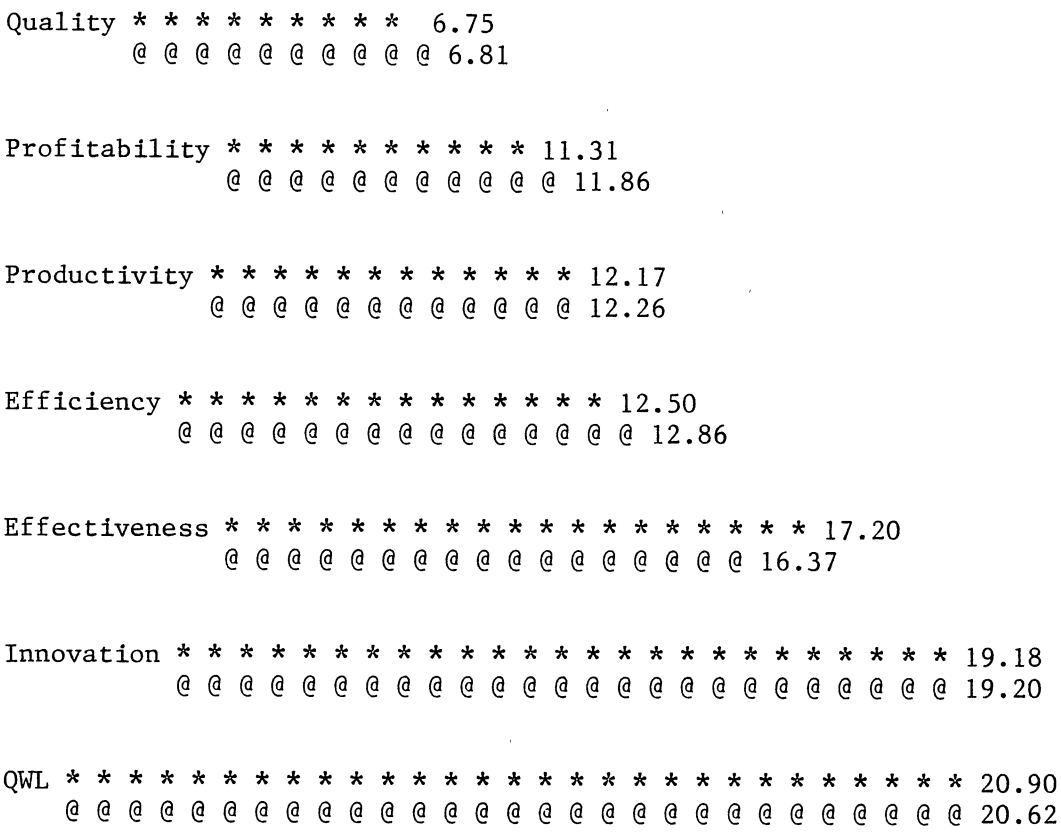
As illustrated in Figure 5, the seven performance criteria were ranked according to the amount of time spent in evaluation and in the importance to the successful operation of the restaurant. Similar to the results found by Shaw (1983), quality was clearly viewed by the respondents as both the most important as well as the most time consuming of the seven performance criteria analyzed in this study. The second most important performance criteria used was profitability. This contradicted Shaw's findings, where productivity was the second-ranked performance criteria. Shaw's sample worked in health care facilities, where the orientation may not necessarily be profit-oriented, while the

TABLE IV

SIGNIFICANT ASSOCIATIONS FOUND IN EFFICIENCY CONTROLS

Efficiency Controls	Factors Showing Correlations	Frequency and % of Respondents Using Control Measures	
Records kept of labor usage (1)	Average yearly revenue ($p=0.0377$, $x^2=6.555$, $df=2$)	N=49	94
	Cafeterias ($p=0.0307$, $x^2=4.671$, $df=1$)	N=51	94
Records kept of materials usage (2)	Fast food operations ($p=0.0083$, $x^2=6.962$, $df=1$)	N=50	93
Records kept of capital usage (3)	Training productivity management ($p=0.0449$, $x^2=4.022$, $df=1$)	N=30	71
Records kept of energy usage (4)	Seating capacity ($p=0.0107$, $x^2=9.066$, $df=2$)	N=28	64
"Other" records kept (5)	Caterer* ($p=0.0004$, $x^2=12.460$, $df=1$)	N= 3	6
	Seating capacity ($p=0.0356$, $x^2=6.671$, $df=2$)	N= 3	6
Resources used compared with forecasted resource utilization (6)	Training in productivity management ($p=0.0318$, $x^2=4.624$, $df=1$)	N=20	41

*Inverse relationships.



Percentage points for each individual criteria

Ranking (see p. 39) on the basis of:

* = Time spent in evaluation

@ = Importance to the operation

Figure 5. Performance Criteria Ranking

sample in this study were in profit-oriented organizations. Productivity, efficiency and effectiveness were the third, fourth and fifth ranked criteria in this study. The only other performance criteria ranked in the same order was innovation. In the present study and Shaw's (1983), this performance criteria was the sixth most time-consuming performance criterion. Quality of work-life was ranked the least important of the performance criteria, and the one for which restaurateurs spent the least amount of time also. Although many research investigations reported in the literature positively linked job satisfaction, a surrogate measure of QWL, to productivity, obviously, restaurateurs in this study have not looked at QWL programs as a means to improve the performance and morale of their personnel.

Hypotheses Testing

In H_1, the respondents age and number of years of experience affected the use of inputs, while position title and training in productivity management affected the use of outputs (Table I). Based on these results, the researcher rejected H_1.

In H_2, the average food check charge/person affected the use of outputs. In contrast, restaurant type, seating capacity, and average yearly revenue affected the use of both outputs and inputs, therefore H_2 was rejected (Table I).

In H_3, training in productivity management significantly affected productivity ratios. Age, years of education, position title, and years of experience had no effect on these ratios. Based on these results, the researcher rejected H_3 (Table I).

Restaurant variables significantly affecting productivity ratios in H_4 were restaurant type and average food check charge per person. Seating capacity and average yearly revenue had no effect on these ratios. Because of the two variables which had an effect, the researcher rejected H_4 (Table I).

Training in productivity was the only personal variable which had a significant effect on efficiency monitoring in H_5. The other four personal variables had no significant effect on this measure. Due to the effect of productivity training, however, the researcher rejected H_5 (Table IV).

Three of the five restaurant variables had a significant effect on efficiency monitoring in H_6. These variables included type, seating capacity, and average yearly revenue. The researcher rejected H_6 due to these results (Table IV).

Four out of five personal variables had a significant effect on profitability control measures in H_7. The only variable which did not have an effect was number of years of experience. The researcher therefore rejected H_7 (Table III).

All four restaurant variables significantly affected profitability control measures in H_8. Based on these results, the researcher rejected H_8 (Table III).

In H_9, personal variables of the respondents had no significant effect on how meal prices were determined by restaurateurs. Because there was no significant effect from these variables the researcher failed to reject H_9 (Table III).

Three of the four restaurant variables in H_{10} had no effect on the determination of meal prices. These included restaurant type,

seating capacity, and average yearly revenue. Average food check charge per person did not have a significant effect. Based on these results, the researcher rejected H_{10} (Table III).

CHAPTER V

SUMMARY, RECOMMENDATIONS AND IMPLICATIONS

The objectives which guided this study were: to identify the current performance evaluation methods used by the Missouri Restaurant Association (MRA). Specifically, objectives were to assess the measurement of productivity, profitability, and efficiency, so that standard measures may be developed to improve performance of restaurants; to assess the relative importance and amount of time spent on each criteria; and to compile suggestions as to how standards may be put to use 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 1900 questionnaires were distributed, and 55 usable responses were analysed using frequency distribution and chi square.

Description of the Sample

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

Thirty percent of the respondents had received training in productivity measurement, while 70 percent had no such training.

Fifty-three percent of the restaurants were full-service operations, 29 percent were family-owned and 24 percent were fast food operations. More than one-half (53 percent) of the restaurants seated between 100 and 299 patrons, while 32 percent had a seating capacity of under 100 patrons. The average check charge for 38 percent of the respondents was 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 input control measures being used most often (greater than 90 percent) by the restaurateurs were: detailed specifications in purchasing supplies and equipment, adjusting labor usage, comparison shopping for food and supplies, use of standardized recipes, and monitoring breakage and pilferage of supplies. These measures were associated with age of the respondent, restaurant type, years of experience and average yearly revenue.

A significant number of respondents were controlling inputs the majority of the time. Energy costs were being evaluated by 30 of the 55 respondents, a greater percentage than were found by Shaw (1983). Twenty of the respondents were monitoring energy usage of specific pieces of equipment. Franchise restaurants were strongly associated with the monitoring of energy usage of specific pieces of equipment. A plausible explanation for this could be that most franchise types are very similar to each other, and their energy costs could also be similar. Therefore,

by monitoring and comparing themselves to their own franchises they are better able to control and evaluate energy costs.

Years of experience was related to the monitoring of breakage and pilferage of supplies. Those with 11-15 years of experience made use of this control measure most often. Nearly all of the respondents were using detailed specifications in purchasing supplies and equipment. This measure was strongly associated with age of the respondent with the majority of those answering in the 30-39 year age category. Significant associations between productivity input control measures and demographic variables can be seen in Table I.

Outputs were also being followed quite closely. The most popular output control measures used included: checking production sheets for amount of demand, meals served daily, daily check average, system for utilizing leftover bulk food and keeping track of amount prepared versus amount served. Factors showing an association to these measures included average yearly revenue, restaurant type, position title of respondent, and productivity training. Checking of production sheets to see that production was appropriate for demand was associated with restaurants in the highest revenue bracket. A reasonable explanation for this would be that restaurants with higher revenue would generally have a much higher amount of production. Because of this, these restaurants would need to have an organized system to check up on production as compared to smaller revenue restaurants. For significant associations, refer to Table I.

Managers and owners of the restaurants responded most often to keeping track of meals served daily and averaging daily checks. Keeping track of amounts prepared versus amounts actually served was the only

output measure which had productivity training associated with it. Some restaurateurs may think of this as a way of measuring outputs and inputs which would explain the relationship to productivity training.

The use of ratios and indexes by the restaurateurs was not nearly utilized as the input and output control measures. Of those that were used, the most popular included: sales/labor hours worked, meals/total food costs, and customers/labor hour. Catering establishments were strongly associated with the use of sales/labor hours worked. Scheduling of labor can be very important to catering operations because of the uneven demand for workers. This could be a possible explanation why the use of this ratio was important to catering establishments. Club type restaurants made use of the customers/labor hour ratio while hotel/motel restaurants favored the meals/total food costs ratios. For significant associations, refer to Table I.

Profitability control measures were not as widely used by the restaurateurs as the productivity controls. Of those that were used, sales analysis, labor control, and inventory control were the most popular.

Restaurateurs who responded to the use of sales analysis when the budget was exceeded were most often owners of the restaurants who had received productivity management training. For a productivity program to be successful a detailed analysis of all aspects of the organization would be necessary. This perhaps would explain the association of productivity training with sales analysis.

Productivity training was also strongly associated with the use of labor and inventory control as profitability control measures. Labor and inventory were both considered as inputs in an organization.

Because any productivity program was concerned with inputs and outputs of a system it was reasonable to assume that an association existed for these two measures.

Respondents were also asked how meal prices were determined in their establishment. The formula with the most response was that of food cost plus overhead plus labor plus percent markup. The use of this formula was associated with family-owned restaurants. The next most popular formula for determining meal prices was that of food cost plus percent markup. The majority of those who utilized this formula had an average yearly revenue of under $500,000. Smaller restaurants with a lower yearly revenue would tend to use a less complex formula to determine meal prices. Significant associations can be seen in Table III.

A large percentage of the participants responded to the use of efficiency controls. Records of labor and material usage were kept most often with capital and energy usage being the third and fourth most used respectively. Cafeterias were associated with the use of keeping labor records while fast food establishments kept records of materials usage. Capital usage records were used most often by those restaurateurs who had received productivity training. Keeping records of energy usage was associated with the medium and larger size restaurants. Very few of the smaller restaurants (seating less than 100) used this efficiency control measure. Participants were asked if other methods for efficiency control were used. Responses included: keeping track of china, glass and silver, and advertising costs. A little less than half of the participants responded positively to the comparing of resources used with resource utilization targets.

Productivity training was also associated to the use of this measure. Refer to Table IV for significant associations.

Recommendations

Questionnaire

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 without the accompanying MRA newsletter. Due to time and financial constraints, a follow-up mailing was not possible.

Recommendations Based on the Results of the Study

1. Those restaurateurs who had received some type of productivity measurement training responded more often to the use of performance measures. Additional training via seminars or educational material on performance/productivity measurement need to be promoted within the food service industry. Productivity measurement and improvement could also be a required course in the degree requirements for the food service management component of the dietetics curricula.

2. Although the majority of the respondents were controlling inputs and outputs, more standardization is needed in the ratios being used to assess productivity. The restaurant industry needs to collaborate to develop the same accepted definitions of all the terms used in these ratios. By standardizing these ratios, a data base can be accumulated so that comparisons can be made between similar restaurant sizes and types.

3. The monitoring of energy usage and/or conservation were not apparent from results of this study, which was similar to results reported by Shaw (1983). Perhaps restaurateurs need to be more cognizent of rising energy costs. Instead of focusing on labor productivity, the industry needs to utilize a total factor productivity ratio involving all four resource categories (labor, materials, capital, and energy) as inputs in the denominator of the ratio.

4. Based on the results of this study the following are suggested productivity ratios which could be used for productivity measurement in restaurants: sales/labor hours worked, meals/labor hours worked, and meals/total food costs. Recommended profitability controls include: sales analysis, labor control and inventory control. Efficiency can most often be measured by keeping track of labor, materials and capital usage.

5. Because of the low response rate, further 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 could perhaps be curveyed separately by types, e.g., full-service restaurants versus franchise versus family-owned establishments.

Implications

Very limited research had been conducted involving restaurants regarding their understanding of, and use of organizational performance measures. All restaurant associations or perhaps a random sample of the National Restaurant Association members need to be surveyed so that valid indices may be developed for use nationwide. These indices could then be promoted and utilized within the foodservice industry to increase

the measurement, evaluation and control of organizational performance skills of restaurateurs thereby strengthening their efficiency in monitoring foodservice operations.

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APPENDIXES

APPENDIX A

CORRESPONDENCE

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
Grad. Research Asst.

Amy Pickerel
Grad. Research Asst.

Lea L. Ebro, Ph.D.
Associate Professor

MISSOURI RESTAURANT ASSOCIATION

P.O. BOX 10210/KANSAS CITY MISSOURI • 1111/4333 MADISON AVE. SUITE 1[illegible] (816) 753-5222

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 envolve 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,

Dick Walls

Dick Walls
MRA President

APPENDIX B

RESEARCH INSTRUMENT

FOODSERVICE PRODUCTIVITY STUDY

I. General Information

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

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

2. Years of education:
___1-12 years
___13-16 years
___More than 16 years

Highest degree attained: _____

Major(s): _____

3. Position title (please check all that apply):
___Owner
___Manager
___Assistant Manager
___Other (please specify): _____

4. Type of restaurant in which employed (please check all that apply):
___Full Service ___Caterer ___Family Owned
___Fast-Food ___Club ___Other (please specify): _____
___Hotel/Motel ___Franchise
___Cafeteria ___Private

5. Seating capacity:
___Fewer than 100 ___300-599
___100-299 ___600 and up

6. Average food check charge/person:
___$1.00-2.99 ___$5.00-9.99 ___$20.00 and up
___$3.00-4.99 ___$10.00 and up ___$30.00 and up

7. Average yearly revenue:
___ < $499,000
___$500,000-999,999
___$1,000,000-2,499,000
___$2,500,000-4,999,000
___$5,000,000-7,499,000
___$7,500,000-9,999,000
___$10,000,000-12,499,000
___$12,500,000-14,999,000
___$15,000,000 and up

8. Number of years in the restaurant business:
___(1) 1-5 ___(3) 11-15
___(2) 6-10 ___(4) 16 or more

9. Number of employees:
_____Full-time _____Part-time

10. Have you ever received any training in productivity measurement?
___(1) Yes (please specify): _____
___(2) No

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 storeroom	1	2	3	4	5
(9) Monitor breakage and pilferage of supplies	1	2	3	4	5
(10) Periodically review and revise job descriptions in order to prevent duplication of tasks	1	2	3	4	5
(11) Routinely follow food costs	1	2	3	4	5
(12) 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)

$$\frac{\dfrac{\text{Meals produced, 1983}}{\text{Labor hours used, 1983}}}{\dfrac{\text{Meals produced, 1982}}{\text{Labor hours used, 1982}}}$$

(INDEX)

___(26) Yes ___(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 ___(2) No

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

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

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 ___(2) No

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

___(3) Management team
___(4) Manager
___(5) Assist. Manager
___(6) Personnel Manager
___(7) Production Manager
___(8) Consultant
___(9) Other (please specify):
_____

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

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

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

___(22) Yes ___(23) No

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

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

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

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

4. EFFICIENCY - is defined as $\frac{\text{resources expected to be consumed}}{\text{resources actually consumed}}$

Example: $\frac{\text{\$ budgeted for food, 1983}}{\text{\$ actually spent on food, 1983}}$

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

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

(5) Other (please specify):_____

Do you compare resources used with resource utilization targets?

___(6) Yes ___(7) No

5. QUALITY OF WORKLIFE (QWL) - is defined as 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 ___(2) No

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

___(3) Use written job satisfaction questionnaires

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

___(5) Monitor turnover, absenteeism, and tardiness

___(6) Communicate with employees verbally and via memos, newsletters, etc. regularly

___(7) Hold unit or department meetings regularly

___(8) Make the job more interesting by redesigning, job enlargement, task, identification, etc.

___(9) Provide opportunities for promotion

___(10) Provide supplies, materials, and assistance to employees as needed

___(11) Provide physical environment that facilitates rather than interferes with work (appropriate work areas, temperature, light, etc.)

Do you link performance to rewards?

___(12) Yes ___(13) No

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

___(14) Raises based upon performance appraisals

___(15) Commendation letters

___(16) Verbal recognition

___(17) Merit pay for management staff

___(18) Performance awards (non-monetary)

___(19) Performance awards (monetary)

___(20) A formal incentive system

___(21) Plaque and Certificate or other forms of recognition

___(22) Recognition in newsletter, newspaper

___(23) Bonuses (time, pay)

___(24) Scheduling preferences

___(25) Complimentary meals

___(26) Other (please specify):_____

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) _____

_____

___(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:_____

_____

___(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:_____

_____

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

___(2) Active suggestion system

___(3) Employee participation at meetings

___(4) Reward employee input

___(5) Allowing employees to attend restaurant association meetings and seminars

___(6) Employee training seminars

___(7) Try new recipes and discuss them with employees

___(8) Other (please specify):_____

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

___(9) Computer, word processor

___(10) New menus and recipes

___(11) Layout changes

___(12) Revised job descriptions

___(13) New equipment (cooking, catering, etc.)

___(14) New scheduling procedures

___(15) New sandwich prep ideas

___(16) New food products used in recipes

Continued on page 7

___(17) New benefits plan
___(18) Watt mizer light bulbs
___(19) New cleaning agents
___(20) Other (please specify):_____

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

TABLE OF ED BY PF2

ED PF2

FREQUENCY	.	0	1	TOTAL
1	0	12	0	12
2	0	27	3	30
3	1	8	4	12
TOTAL	.	47	7	54

DF= 2 PROB=0.0401

* CHI-SQUARE 6.434

TABLE OF CHG BY PF2

CHG PF2

FREQUENCY	.	0	1	TOTAL
1	1	3	4	7
2	0	19	2	21
3	0	19	1	20
4	0	6	0	6
TOTAL	.	47	7	54

DF= 3 PROB=0.0025

* CHI-SQUARE 14.348

TABLE OF TR BY PF4

TR PF4

FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	1	8	7	15
2	0	34	3	37
TOTAL	.	42	10	52

DF= 1 PROB=0.0014

* CHI-SQUARE 10.216

TABLE OF SEAT BY PF4

SEAT PF4

FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	0	14	3	17
2	1	24	3	27
3	0	4	4	8
TOTAL	.	42	10	52

DF= 2 PROB=0.0486

* CHI-SQUARE 6.050

* 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 TYP7 BY PF5

TYP7	PF5			
FREQUENCY	.	0	1	TOTAL
0	1	49	0	49
1	0	4	1	5
TOTAL	.	53	1	54

DF= 1 PROB=0.0016

* CHI-SQUARE 9.985

TABLE OF TYP8 BY PF6

TYP8	PF6			
FREQUENCY	.	0	1	TOTAL
0	1	49	1	50
1	0	3	1	4
TOTAL	.	52	2	54

DF= 1 PROB=0.0191

* CHI-SQUARE 5.493

TABLE OF TYP10 BY PF6

TYP10	PF6			
FREQUENCY	.	0	1	TOTAL
0	0	48	1	49
1	1	4	1	5
TOTAL	.	52	2	54

DF= 1 PROB=0.0428

* CHI-SQUARE 4.103

TABLE OF POS BY PF7

POS	PF7			
FREQUENCY	.	0	1	TOTAL
.	0	9	3	.
1	0	7	9	16
2	0	18	5	23
3	1	3	0	3
TOTAL	.	28	14	42

DF= 2 PROB=0.0356

* CHI-SQUARE 6.673

* 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 PF7

TYP4 PF7

FREQUENCY	.	0	1	TOTAL
0	0	37	15	52
1	1	0	2	2
TOTAL	.	37	17	54

DF= 1 PROB=0.0335

* CHI-SQUARE 4.520

TABLE OF AGE BY PF8

AGE PF8

FREQUENCY	.	0	1	TOTAL
.	0	1	0	.
1	0	8	3	11
2	0	12	8	20
3	1	5	10	15
4	0	1	6	7
TOTAL	.	26	27	53

DF= 3 PROB=0.0403

* CHI-SQUARE 8.295

TABLE OF POS BY PF8

POS PF8

FREQUENCY	.	0	1	TOTAL
.	0	5	7	.
1	0	4	12	16
2	0	16	7	23
3	1	2	1	3
TOTAL	.	22	20	42

DF= 2 PROB=0.0205

* CHI-SQUARE 7.777

TABLE OF TR BY PF8

TR PF8

FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	1	4	11	15
2	0	21	16	37
TOTAL	.	25	27	52

DF= 1 PROB=0.0491

CHI-SQUARE 3.871

* 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 PF9

TYP1	PF9			
FREQUENCY	.	0	1	TOTAL
0	1	22	3	25
1	0	18	11	29
TOTAL	.	40	14	54

DF= 1 PROB=0.0301
CHI-SQUARE 4.701

TABLE OF TYP2 BY PF9

TYP2	PF9			
FREQUENCY	.	0	1	TOTAL
0	1	27	14	41
1	0	13	0	13
TOTAL	.	40	14	54

DF= 1 PROB=0.0144
CHI-SQUARE 5.993

TABLE OF SEAT BY PF9

SEAT	PF9			
FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	0	17	0	17
2	1	16	11	27
3	0	5	3	8
TOTAL	.	38	14	52

DF= 2 PROB=0.0094
CHI-SQUARE 9.338

TABLE OF AGE BY PF10

AGE	PF10			
FREQUENCY	.	0	1	TOTAL
.	0	1	0	.
1	0	11	0	11
2	0	16	4	20
3	1	14	1	15
4	0	3	4	7
TOTAL	.	44	9	53

DF= 3 PROB=0.0092
CHI-SQUARE 11.520

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 ED BY PF10

ED	PF10		
FREQUENCY	.	0	1	TOTAL
1	0	11	1	12
2	0	27	3	30
3	1	7	5	12
TOTAL	.	45	9	54

DF= 2 PROB=0.0308
* CHI-SQUARE 6.960

TABLE OF TYP6 BY PF10

TYP6	PF10		
FREQUENCY	.	0	1	TOTAL
0	1	44	7	51
1	0	1	2	3
TOTAL	.	45	9	54

DF= 1 PROB=0.0168
* CHI-SQUARE 5.718

TABLE OF TR BY PF11

TR	PF11		
FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	1	2	13	15
2	0	17	20	37
TOTAL	.	19	33	52

DF= 1 PROB=0.0269
CHI-SQUARE 4.896

TABLE OF TR BY PF12

TR	PF12		
FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	1	2	13	15
2	0	17	20	37
TOTAL	.	19	33	52

DF= 1 PROB=0.0269
CHI-SQUARE 4.896

* 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 PF13

TYP2	PF13			
FREQUENCY	.	0	1	TOTAL
0	1	26	15	41
1	0	13	0	13
TOTAL	.	39	15	54

DF= 1 PROB=0.0103
CHI-SQUARE 6.585

TABLE OF CHG BY PF13

CHG	PF13			
FREQUENCY	.	0	1	TOTAL
1	1	7	0	7
2	0	18	3	21
3	0	12	8	20
4	0	2	4	6
TOTAL	.	39	15	54

DF= 3 PROB=0.0140
CHI-SQUARE 10.610

TABLE OF SEAT BY PF13

SEAT	PF13			
FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	0	16	1	17
2	1	17	10	27
3	0	4	4	8
TOTAL	.	37	15	52

DF= 2 PROB=0.0303
CHI-SQUARE 6.994

TABLE OF TYP8 BY PF13

TYP8	PF13			
FREQUENCY	.	0	1	TOTAL
0	1	38	12	50
1	0	1	3	4
TOTAL	.	39	15	54

DF= 1 PROB=0.0284
CHI-SQUARE 4.802

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 PF19

TYP4	PF19			
FREQUENCY	.	0	1	TOTAL
0	0	48	4	52
1	1	1	1	2
TOTAL	.	49	5	54

DF= 1 PROB=0.0428
CHI-SQUARE 4.103

TABLE OF REV BY PF18

REV	PF18			
FREQUENCY	.	0	1	TOTAL
.	0	1	1	.
1	1	8	9	17
2	0	16	3	19
3	0	14	2	16
TOTAL	.	38	14	52

DF= 2 PROB=0.0127
CHI-SQUARE 8.738

TABLE OF TYP6 BY PF20

TYP6	PF20			
FREQUENCY	.	0	1	TOTAL
0	1	43	8	51
1	0	1	2	3
TOTAL	.	44	10	54

DF= 1 PROB=0.0272
CHI-SQUARE 4.880

TABLE OF TYP7 BY PF20

TYP7	PF20			
FREQUENCY	.	0	1	TOTAL
0	1	42	7	49
1	0	2	3	5
TOTAL	.	44	10	54

DF= 1 PROB=0.0122
CHI-SQUARE 6.284

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 PF22

TYP4	PF22		
FREQUENCY	.	0	1	TOTAL
0	0	42	10	52
1	1	0	2	2
TOTAL	.	42	12	54

DF= 1 PROB=0.0070

CHI-SQUARE 7.269

TABLE OF SEAT BY PF20

SEAT	PF20		
FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	0	16	1	17
2	1	22	5	27
3	0	4	4	8
TOTAL	.	42	10	52

DF= 2 PROB=0.0328

CHI-SQUARE 6.835

TABLE OF TYP9 BY PF24

TYP9	PF24		
FREQUENCY	.	0	1	TOTAL
0	1	30	8	38
1	0	7	9	16
TOTAL	.	37	17	54

DF= 1 PROB=0.0110

CHI-SQUARE 6 466

TABLE OF TYP2 BY PF25

TYP2	PF25		
FREQUENCY	.	0	1	TOTAL
0	1	30	11	41
1	0	13	0	13
TOTAL	.	43	11	54

DF= 1 PROB=0.0364

CHI-SQUARE 4.380

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 PR1

AGE PR1

FREQUENCY	3	4	TOTAL
.	1	0	.
1	10	1	11
2	20	0	20
3	16	0	16
4	5	2	7
TOTAL	51	3	54

DF= 3 PROB=0.0239
CHI-SQUARE 9.447

TABLE OF TYP4 BY PR2

TYP4 PR2

FREQUENCY	3	4	TOTAL
0	51	1	52
1	2	1	3
TOTAL	53	2	55

DF= 1 PROB=0.0047
CHI-SQUARE 7.986

TABLE OF TYP3 BY PR3

TYP3 PR3

FREQUENCY	3	4	TOTAL
0	46	2	48
1	5	2	7
TOTAL	51	4	55

DF= 1 PROB=0.0202
CHI-SQUARE 5.395

TABLE OF TYP10 BY PR5

TYP10 PR5

FREQUENCY	3	4	TOTAL
0	49	0	49
1	5	1	6
TOTAL	54	1	55

DF= 1 PROB=0.0039
CHI-SQUARE 8.318

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 PR6

TYP2	PR6		
FREQUENCY	3	4	TOTAL
0	26	16	42
1	4	9	13
TOTAL	30	25	55

DF= 1 PROB=0.0488
* CHI-SQUARE 3.882

TABLE OF TYP5 BY PR6

TYP5	PR6		
FREQUENCY	3	4	TOTAL
0	25	25	50
1	5	0	5
TOTAL	30	25	55

DF= 1 PROB=0.0323
* CHI-SQUARE 4.583

TABLE OF SEAT BY PR6

SEAT	PR6		
FREQUENCY	3	4	TOTAL
.	2	0	.
1	5	12	17
2	17	11	28
3	6	2	8
TOTAL	28	25	53

DF= 2 PROB=0.0494
* CHI-SQUARE 6.018

TABLE OF TYP7 BY PR7

TYP7	PR7		
FREQUENCY	3	4	TOTAL
0	16	34	50
1	4	1	5
TOTAL	20	35	55

DF= 1 PROB=0.0334
* CHI-SQUARE 4.526

* 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 PR7

YRS \ PR7	3	4	TOTAL
1	2	13	15
2	7	4	11
3	8	10	18
4	3	8	11
TOTAL	20	35	55

DF= 3 PROB=0.0487

X CHI-SQUARE 7.875

TABLE OF YRS BY PR9

YRS \ PR9	3	4	TOTAL
1	12	3	15
2	11	0	11
3	18	0	18
4	11	0	11
TOTAL	52	3	55

DF= 3 PROB=0.0374

X CHI-SQUARE 8.462

TABLE OF REV BY PR9

REV \ PR9	3	4	TOTAL
.	2	0	.
1	15	3	18
2	19	0	19
3	16	0	16
TOTAL	50	3	53

DF= 2 PROB=0.0454

X CHI-SQUARE 6.183

TABLE OF TYP2 BY PR12

TYP2 \ PR12	3	4	TOTAL
0	40	2	42
1	9	4	13
TOTAL	49	6	55

DF= 1 PROB=0.0086

X CHI-SQUARE 6.909

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 TYP7 BY PR12

TYP7 / FREQUENCY	PR12 = 3	PR12 = 4	TOTAL
0	46	4	50
1	3	2	5
TOTAL	49	6	55

DF= 1 PROB=0.0286

* CHI-SQUARE 4.789

TABLE OF REV BY PR14

REV / FREQUENCY	PR14 = 3	PR14 = 4	TOTAL
.	2	0	.
1	12	6	18
2	18	1	19
3	16	0	16
TOTAL	46	7	53

DF= 2 PROB=0.0073

* CHI-SQUARE 9.841

TABLE OF TYP2 BY PR15

TYP2 / FREQUENCY	PR15 = 3	PR15 = 4	TOTAL
0	39	3	42
1	8	5	13
TOTAL	47	8	55

DF= 1 PROB=0.0051

* CHI-SQUARE 7.834

TABLE OF POS BY PR16

POS / FREQUENCY	PR16 = 3	PR16 = 4	TOTAL
.	10	2	.
1	16	0	16
2	20	3	23
3	2	2	4
TOTAL	38	5	43

DF= 2 PROB=0.0194

* CHI-SQUARE 7.882

* 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 PR17

POS	PR17		
FREQUENCY	3	4	TOTAL
.	9	3	.
1	15	1	16
2	22	1	23
3	2	2	4
TOTAL	39	4	43

DF= 2 PROB=0.0129

* CHI-SQUARE 8.698

TABLE OF TR BY PR18

TR	PR18		
FREQUENCY	3	4	TOTAL
.	1	1	.
1	16	0	16
2	29	8	37
TOTAL	45	8	53

DF= 1 PROB=0.0435

* CHI-SQUARE 4.074

TABLE OF POS BY PR22

POS	PR22		
FREQUENCY	3	4	TOTAL
.	10	2	.
1	10	6	16
2	21	2	23
3	4	0	4
TOTAL	35	8	43

DF= 2 PROB=0.0455

* CHI-SQUARE 6.178

TABLE OF TYP2 BY PR22

TYP2	PR22		
FREQUENCY	3	4	TOTAL
0	37	5	42
1	8	5	13
TOTAL	45	10	55

DF= 1 PROB=0.0300

* CHI-SQUARE 4.706

* 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 PR22

SEAT / FREQUENCY	PR22 = 3	PR22 = 4	TOTAL
.	2	0	.
1	10	7	17
2	25	3	28
3	8	0	8
TOTAL	43	10	53

DF= 2 PROB=0.0135
* CHI-SQUARE 8.603

TABLE OF CHG BY PR22

CHG / FREQUENCY	PR22 = 3	PR22 = 4	TOTAL
1	6	2	8
2	14	7	21
3	20	0	20
4	5	1	6
TOTAL	45	10	55

DF= 3 PROB=0.0472
\ CHI-SQUARE 7.944

TABLE OF REV BY PR22

REV / FREQUENCY	PR22 = 3	PR22 = 4	TOTAL
.	2	0	.
1	9	9	18
2	18	1	19
3	16	0	16
TOTAL	43	10	53

DF= 2 PROB=0.0002
* CHI-SQUARE 17.415

TABLE OF TR BY PR28

TR / FREQUENCY	PR28 = 0	PR28 = 1	TOTAL
.	2	0	.
1	10	6	16
2	32	5	37
TOTAL	42	11	53

DF= 1 PROB=0.0481
\ CHI-SQUARE 3.907

\ 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 PR28

TYP2	PR28		
FREQUENCY	0	1	TOTAL
0	31	11	42
1	13	0	13
TOTAL	44	11	55

DF= 1 PROB=0.0391
CHI-SQUARE 4.256

TABLE OF TYP6 BY PR28

TYP6	PR28		
FREQUENCY	0	1	TOTAL
0	43	9	52
1	1	2	3
TOTAL	44	11	55

DF= 1 PROB=0.0377
CHI-SQUARE 4.319

TABLE OF TYP5 BY PR29

TYP5	PR29		
FREQUENCY	0	1	TOTAL
0	28	22	50
1	0	5	5
TOTAL	28	27	55

DF= 1 PROB=0.0169
CHI-SQUARE 5.704

TABLE OF TYP1 BY PR30

TYP1	PR30		
FREQUENCY	0	1	TOTAL
0	19	7	26
1	27	2	29
TOTAL	46	9	55

DF= 1 PROB=0.0450
CHI-SQUARE 4.017

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 PR33

TYP1	PR33		
FREQUENCY	0	1	TOTAL
0	15	11	26
1	24	5	29
TOTAL	39	16	55

DF= 1 PROB=0.0410
CHI-SQUARE 4.176

TABLE OF TYP6 BY PR33

TYP6	PR33		
FREQUENCY	0	1	TOTAL
0	39	13	52
1	0	3	3
TOTAL	39	16	55

DF= 1 PROB=0.0054
CHI-SQUARE 7.734

TABLE OF TYP8 BY PR35

TYP8	PR35		
FREQUENCY	0	1	TOTAL
0	46	5	51
1	1	3	4
TOTAL	47	8	55

DF= 1 PROB=0.0004
CHI-SQUARE 12.684

TABLE OF TYP8 BY PR36

TYP8	PR36			
FREQUENCY	.	0	1	TOTAL
0	2	48	1	49
1	0	2	2	4
TOTAL	.	50	3	53

DF= 1 PROB=0.0001
CHI-SQUARE 15.929

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 PR37

TYP3	PR37		
FREQUENCY	0	1	TOTAL
0	34	14	48
1	2	5	7
TOTAL	36	19	55

DF= 1 PROB=0.0280

* CHI-SQUARE 4.826

TABLE OF CHG BY PR37

CHG	PR37		
FREQUENCY	0	1	TOTAL
1	8	0	8
2	14	7	21
3	9	11	20
4	5	1	6
TOTAL	36	19	55

DF= 3 PROB=0.0323

* CHI-SQUARE 8.785

TABLE OF TYP4 BY EC1

TYP4	EC1			
FREQUENCY	.	0	1	TOTAL
0	1	2	49	51
1	0	1	2	3
TOTAL	.	3	51	54

DF= 1 PROB=0.0307

* CHI-SQUARE 4.671

TABLE OF REV BY EC1

REV	EC1			
FREQUENCY	.	0	1	TOTAL
.	0	0	2	.
1	1	3	14	17
2	0	0	19	19
3	0	0	16	16
TOTAL	.	3	49	52

DF= 2 PROB=0.0377

* CHI-SQUARE 6.555

* 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 EC2

TYP2	EC2			
FREQUENCY	.	0	1	TOTAL
0	0	1	41	42
1	1	3	9	12
TOTAL	.	4	50	54

DF= 1 PROB=0.0083
CHI-SQUARE 6.962

TABLE OF TR BY EC3

TR	EC3			
FREQUENCY	.	0	1	TOTAL
.	0	0	2	.
1	3	1	12	13
2	8	11	18	29
TOTAL	.	12	30	42

DF= 1 PROB=0.0449
CHI-SQUARE 4.022

TABLE OF SEAT BY EC4

SEAT	EC4			
FREQUENCY	.	0	1	TOTAL
.	0	0	2	.
1	3	9	5	14
2	5	7	16	23
3	1	0	7	7
TOTAL	.	16	28	44

DF= 2 PROB=0.0107
CHI-SQUARE 9.066

TABLE OF TYP5 BY EC5

TYP5	EC5			
FREQUENCY	.	0	1	TOTAL
0	1	48	1	49
1	0	3	2	5
TOTAL	.	51	3	54

DF= 1 PROB=0.0004
CHI-SQUARE 12.460

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 EC5

SEAT / FREQUENCY	.	0	1	TOTAL
.	0	2	0	.
1	1	16	0	16
2	0	27	1	28
3	0	6	2	8
TOTAL	.	49	3	52

DF= 2 PROB=0.0356
CHI-SQUARE 6.671

TABLE OF TR BY EC6

TR / FREQUENCY	.	0	1	TOTAL
.	0	0	2	.
1	0	6	10	16
2	4	23	10	33
TOTAL	.	29	20	49

DF= 1 PROB=0.0315
CHI-SQUARE 4.624

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 2

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