A comparison study of food facility inspection scores and consumer complaints

Debora Kim Leuer

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A COMPARISON STUDY OF FOOD FACILITY INSPECTION SCORES AND CONSUMER COMPLAINTS

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A Project
Presented to the
Faculty of
California State University,
San Bernardino

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In Partial Fulfillment
of the Requirements for the Degree
Master of Science
in
Health Services Administration

______________

by
Debora Kim Leuer
September 1999
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INSPECTION SCORES AND CONSUMER COMPLAINTS

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This study was performed to determine if there was a correlation between food facility inspection scores and consumer complaints. A record research study was performed on 484 Food Program Official Inspection Reports in the city of San Bernardino, California. This was a sample of 20% of all the food facilities in this city during a 1996 to 1998 time frame, utilizing 107 master food files. The results indicate the hypothesis was supported in that there is a correlation between inspection scores and consumer complaints, justifying the continued use of inspections and responses to complaints as a means of surveillance and improving food preparation procedures. The results also indicated that American-type food service facilities had a much higher mean inspection score than other types of food service, especially Asian-type food service.
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Savvy consumers of restaurant cuisine demand that their food supply be safe, wholesome, free from contamination, and unadulterated. To accomplish this, however, requires the coordinated effort of food producers, transports, suppliers, purchasers, and preparers. In order to ensure the public's safety in consuming the safest food possible, Public Health Departments around the world employ Environmental Health Specialists (titled Sanitarians in other areas) to ensure that their food components and the ultimate food products are produced, manufactured, prepared, stored, cooked, and served in a manner that results in a quality food product and dining experience. Surveillance of this coordinated effort by Environmental Health Specialists allegedly ensures such quality; however, the effectiveness of such surveillance as a means of monitoring and ensuring quality may be questionable due to the alleged unpredictability in receiving consumer complaints.
National Restaurant Association Statistics

According to the National Restaurant Association, more than 44 percent of the nation's food dollar was spent away from home in 1995 (NRA, 1998). The food industry reports national sales of food from commercial facilities such as restaurants, bars, hotels and other retail establishments, and from institutions such as schools, hospitals and nursing homes to be upwards of $336 billion in 1998 (NRA, 1998). Restaurants alone projected national food sales of $226 billion in 1998, which means on a typical day the restaurant industry would post average national sales in excess of $922 million (NRA, 1998). This means that almost 50 billion meals are eaten in restaurants, schools, and work cafeterias each year. The typical person (8 years and older) consumed an average of 4.1 meals prepared away from home per week (213 per year in 1996), with 46 percent of all adults being restaurant patrons on a typical day (NRA, 1998).

The food industry employs 9.5 million food workers each year, which makes restaurants the number one retail employer in this country. Considering the extensive amounts of money and food changing hands each and every
Foodborne Illness Statistics

Along with culinary delicacies come grave consequences. During the period of 1983-1987, the latest period for which surveillance data are available, 2,397 outbreaks of foodborne disease representing 91,678 cases were reported to the Centers for Disease Control and Prevention (CDC & P). Of these 2,397 outbreaks, 44% involved foods eaten at commercial establishments (Penman, Webb, Woernle, and Currier, 1996). The Food and Drug Administration (FDA) reports cases of foodborne illnesses ranging from 8 to 33 million cases of foodborne illnesses each year, with annual costs of foodborne illness estimated to be between $7.7 and $23 billion. The per case cost of salmonellosis was estimated in 1992 to be $500 to $1,350 per case, that of listeriosis $137,000 and the per case cost of botulism to be $322,000 (El-Gazzar and Marth, 1992). Foodborne illness results in both direct costs (treatment of victims, time lost from employment, recall of
product, destruction or reprocessing of product, litigation) and indirect costs (pain, grief, suffering, loss of productivity, loss of leisure time, and death) (El-Gazzar and Marth, 1992). The 1993 FDA Food Code estimates that foodborne illness is responsible for 10,000 deaths annually (Melnick and Harris, 1998). With this many people becoming ill or dying every year, it is imperative that we work diligently to reduce the number of foodborne illnesses. This can only be accomplished by educating and training the food service workers about proper food handling techniques, frequent handwashing, and the reduction of cross contamination to reduce microbiological factors. Consumer complaints are a key to learning of the errors that food facilities make, and provide an opportunity to investigate the facility and educate the food service workers as to why they must handle the food properly, in a clean environment, to reduce complaints and ultimately, foodborne illnesses.

Consumer Complaints

It is important to investigate the reasons why consumers complain about a food facility. Restaurant
patrons have expectations when they enter a food facility to order from the menu. They first expect it to be a positive experience and leave fulfilled, otherwise they would stay at home to cook and eat the meal there instead of choosing the experience of dining out. They expect to open the restaurant door and observe a clean environment. They expect to be seated in a reasonable time frame, and seated where they asked to be, not near a noisy swinging kitchen door, but down by the bay window as they requested when they reserved the table two weeks ago. The patrons want the food to be fresh and flavorful, to be able to receive the food they ordered in a timely fashion, and cooked the method they requested, not well done if they asked for a rare steak. They have expectations of being treated in a personal and professional way, and served in a pleasant manner from the willing wait staff, free from the hassles they encounter in the rest of their world.

They expect the food that they order will be the food they receive, and not a substitution, such as ordering crab legs, and getting a cheaper product formed by processed Pollock white fish with crab juice. This substitution would be in violation of the Sherman Food and Drug Laws encompassing “Truth in Menu” regulations, which will be
addressed later in this article. And after the dining is through, they expect a check that is calculated correctly.

Complaints Regarding Employees

Patrons complain extensively about employee habits. Patrons complain about the lack of hairnets on food servers, especially if they found a hair in their food. They notice and complain if employees have long nails, have dirty hands, or an open wound or bandage on their hands, especially if they found a Band-Aid in their sandwich, or blood smeared on their burrito wrapper. They notice if the employee was eating behind the counter, or picking his nose before the customer was served. They notice if small children are behind the counter, exposed to sharp slicers and vats of hot oil. Patrons notice and complain if food handlers take their money, then don't wash their hands before making their food. They also complain if food handlers don't wear gloves, although they are not required to wear them in every case.

Complaints originate from many varied sources, however, all complaints are considered confidential. The Freedom of Information Act allows for inspection reports to
be released to the public, however, information regarding the complainant has been upheld in court as confidential, and the food facility is not able to obtain this specific information regarding the complaint. Employees often complain about other employees, calling in a confidential report of a co-worker suspected of an illness or a communicable disease. Employees who have been recently fired from their place of employment will often call about filthy conditions in the kitchen, poor food handling practices, and how the owner or manager permits the re-use of food to try and get back at the food facility. These reasons for complaining about food facilities have been gathered from numerous food facilities master files in the County of San Bernardino, Department of Public Health, Division of Environmental Health, to show just a few of the types of complaints that are filed and investigated on a regular basis with this department.

Purpose and Significance of Study

Due to the startling statistics of foodborne illness, deaths, and associated costs, it would be important to investigate the problem of consumer complaints in
restaurants by addressing why consumers complain, their expectations of a food facility in terms of several aspects of aesthetics, employee hygiene, food facility sanitation, and reasons why food facilities do not meet the consumers’ expectations. Most important is the efficacy of utilizing consumer complaints as a determinant of which food facilities are likely to score low on food inspections.

The processes that occur when a consumer complains to rectify the situation include which agency is responsible for follow-up on certain types of complaints, and related inspectional issues when an environmental health specialist inspects and scores a food facility must be examined. The complaint process itself may be too vague or unpredictable to act as an accurate measure of food quality in the county.

The purpose of this research is to determine if there is a correlation between food facility health inspection scores and consumer complaints. Does a food facility that receives consumer complaints score lower than other food facilities, thus indicating that the sanitation or food handling is poorer than other food facilities? Is the complaint process an effective determinant of food quality in the county?
It is possible that it may be difficult to determine this relationship, as food facility inspections only see one point in time. Environmental Health Specialists are in food facilities for only a couple of hours at a time, and only approximately two times a year. Also, complaints are cause to trigger a food facility inspection to see if the content of the consumer complaint is possibly valid. However, by the time a consumer calls in their complaint, a sufficient number of days, maybe weeks, may have elapsed, so that it may be difficult to determine if the complaint was valid at the time it occurred. If the complaint was a foodborne illness, often times the implicated food has all been served to customers, or disposed of. If the complaint addresses vectors or vermin, the food facility may have had a pest control operator perform extermination measures to irradiate the cockroaches, mice, or rats that infested, or temporarily inhabited the food facility. If the complaint addresses an aesthetic or sanitation problem, the situation may have changed by the time an environmental health specialist is called to visit the food facility. Numerous factors are involved in the investigation of consumer complaints.
The findings will be significant because if this were found to be the case, more inspectional attention may be necessary on these food facilities to improve the sanitation levels or food handling techniques of these facilities. It would be a significant contribution to the profession to determine if environmental health specialists actually make a difference in relation to inspection scores and complaints. If this were the case, the results might influence health departments to increase the food handler education at food facilities with complaints.
Customer service is number one, and patrons expect satisfaction in every aspect. According to the Technical Assistance Research Programs Institute, a staggering 91% of unhappy customers will never again purchase goods from a company with which it has an unresolved complaint. The same research shows that up to 70% of complainers will return to a business if the complaint is resolved, and is resolved quickly (Klara, 1998). Nearly half of all complaints from patrons relate to service, while only 15% concern food related problems (Doherty, 1996). The American Society for Quality Control (ASQC) surveyed the users of 3,900 products and services and found that the fast food industry scored 27th out of 31 categories in customer satisfaction, finishing ahead of only airlines, newspapers, mail-delivery services and public administrators (Coeyman, 1996). Michael Ramundo, a marketing consultant specializing in customer service states that research shows that a happy customer, if he talks to anyone, will talk to three to five people. But an unhappy customer, if he talks to anyone, will talk to ten to fifteen people (Coeyman, 1996). Customer satisfaction
is replacing customer service as the buzzword for the '90's, according to management consultant Bruce Matza (Nation's Restaurant News, 1996). "Complaint handling" refers to the strategies firms use to resolve and learn from service failures in order to re-establish the organization's reliability in the eyes of the customer (Tax, 1998). Customers evaluate complaint incidents in terms of the outcomes they receive, the procedures used to arrive at the outcome, and the nature of the interpersonal treatment during the process (Tax, 1998). Customers must feel they are treated fairly and with empathy to their problem in order to effectively resolve the situation if they are ever to return for repeat business. Research indicates that aspects of communication between customers and employees or managers, as well as the effort expended to resolve a conflict, affect customer satisfaction. Fair interpersonal treatment reflects aspects of politeness, concern, and honesty in the complaint process, as well as the provision of an explanation and meaningful effort in resolving a conflict (Tax, 1998). If the customer perceives that the employee is making excuses or delivering the outcome in a rude or insincere manner, it will affect the value of the outcome.
The impact of providing a reasonable explanation for the food or service failing the customer’s satisfaction is enhanced if the explanation is accompanied by a coupon or other reimbursement, such as a discounted meal. There are five elements collectively that suggest that a fair complaint procedure is easy to access, provides the complainant with some control over the disposition, is flexible, and is concluded in a convenient and timely manner (Tax, 1998). Effective resolution of customer problems are linked closely in terms of customer satisfaction, trust in your staff and operation, managing quality of service and product, and commitment to provide the best service by competent staff.

**Reasons Why Consumers Complain**

In the restaurant business, there will always be times when a customer doesn't enjoy the food – yet most people are hesitant to complain, reluctant to make a scene (Goldstein, 1995). Most won’t complain until finally someone pushes their button. But poor service, without a gracious apology, rates high on the list to score a gripe. It was found that 75% of respondents were highly likely to
tell others of a situation in which their complaint was not effectively resolved, and, on the average, respondents told 12 people of their bad experience (Manickas and Shea, 1997).

Patrons complain about aesthetics of a facility primarily, such as a dirty bathroom, an empty soap dispenser, or used paper towels strewn on the floor. Patrons also complain if they don't have access to a restroom. San Bernardino County Code requires restrooms to be available to the public if the food facility has sit-down seating to eat your meal (San Bernardino County Code, 1998).

Patrons complain if the dining room or the kitchen doesn't seem clean or appears greasy in some way. Patrons complain about dirty plates or utensils, about children eating food from the salad bar or picking at other "bulk food" containers. Customers complain about a "funny" or "musty" smell in a restaurant which could be plumbing backing up with sewage overflowing. Patrons complain about smoking in a restaurant which is no longer legal in California and other states (Thompson, Frost, & Paskett, 1990).
Patrons complain about dogs in a dining room, and in the kitchen. The only dogs that are permitted in a food facility are guide dogs or service dogs, but only in the dining room (CURFFL, 1999). Patrons also complain about other "animals" that don't belong in a food facility. The sight of a cockroach crawling up a wall, flies droning around a service counter, or a mouse (worse yet, a rat) scurrying around a restaurant will certainly warrant a complaint about these vermin.

Patrons complain if the food tastes "funny" or "old", smells "greasy" or just didn't look "right" to them. They especially remember that meal if they were unfortunate enough to get a foodborne illness. The customer always assumes that the last meal they ate got them sick, but microbiology of foodborne pathogens reveals that many organisms incubate in the gastrointestinal tract for 12 to 36 hours, and even much longer, before symptoms appear (IAMFES, 1987).

Chemically Induced Foodborne Illness

However, some foodborne illnesses caused by chemicals are quick to produce symptoms. "Chinese food syndrome" is
a common name for Mono Sodium Glutamate (MSG) poisoning. If one is unfortunate enough to be sensitive to this "flavor-enhancing" salt-like substance, one may exhibit symptoms of flushed face, dizziness, headache, dry and burning throat, and nausea (Educational Foundation of the NRA, 1995). Sulfites, a preservative, can also cause lethal allergic reactions among sensitive individuals, particularly asthmatics. The reactions include nausea; diarrhea, asthma attacks, and is not permitted in a retail food facility, and only in manufactured food with proper labeling (Educational Foundation of the NRA, 1995).

**Elements of Quality**

Customer service doesn't start with a promise; it starts with a company-wide commitment followed by an in-house structure that makes the promise achievable. It is a simple equation, say customer service gurus. Vision + structure + commitment = happy customers (Rowe, 1995). There are six strategies for achieving service excellence that affects the bottom line. They are:

(1) Establish a company focus, and make sure everyone in the company is enthusiastic about promoting it;
(2) Take the trouble to get out and meet your customers and find out what they need and want;
(3) Find a way of monitoring every employee’s attitude to customers, and then reward them;
(4) Provide training to teach everyone how to handle customers;
(5) Keep company morale high with consistent personal feedback and rewards for performance, and
(6) Harmonize your company’s internal processes to meet the needs of your customers (Rowe, 1995).

Both product and service quality must be founded on building quality into the operation. Maintaining quality is concerned with how the operation is managed to ensure the quality of conformance and the reliability of the operation to provide that level of service, right first time every time (Lockwood, 1994). Customer preference may change and operational problems may emerge which could not be foreseen, but procedures must be in place to pursue continual quality improvement throughout the operation (Lockwood, 1994).

Placing the emphasis on the key elements of a quality provision should provide three main benefits for the hospitality industry:
(1) Customer satisfaction means repeat business that reduces the invisible loss of customers who do not complain, but never return;

(2) Productivity/profitability is concerned with reducing the waste associated with providing quality and results in significant cost savings and improving the bottom line; and

(3) Human Resources with employees who can consistently deliver quality service and have a positive approach to the customers and his work environment (Lockwood, 1994).

The National Restaurant Association/Gallup Survey identified five points of major concern that lead to elements of excellence:

(1) Delivering an accurate guest check,

(2) Answering questions about menu items,

(3) Providing timely service,

(4) Recommending appropriate menu items, and

(5) Handling complaints (Bellamy, 1991).

There have been some significant research studies reviewing characteristics that contribute to service quality (Lockwood, 1994). The seminal study by Parasuraman, et al. (1979), using focus groups of service
customers identified key variables which with further development were refined to five: tangibles, reliability, responsiveness, assurance and empathy (Lockwood, 1994). These five variables directly relate to how a consumer complaint is handled, and how the consumer perceives the outcome, and whether they will return to the restaurant ever again.

**Complaint Resolution**

Often the complaint relates to slow service. How the complaint is handled usually determines the outcome of the event. Restaurant Business magazine performed a survey by calling the customer service lines of twenty chain restaurants with a complaint of slow service to determine the kind of treatment they would receive (Coeyman, 1996). The survey found remarkable differences in how easy it was to voice a complaint, the attitude of the person fielding the gripe, how the situation was handled, and what kind of follow-up was provided (Coeyman, 1996). One of the common pitfalls is lack of training, states Michael Ramundo, of MCR Marketing, Inc., a Cincinnati-based consulting firm specializing in customer service (Coeyman, 1996). At a
minimum, the company representative should provide a basic empathy statement that they are sorry the problem occurred. But without proper training, often times this does not occur, and the situation escalates.

For example, the surveyor had a difficult time obtaining the service-line number at International House of Pancakes (IHOP), and when they finally got through, were greeted with a bored yawn from a customer representative who never had anyone return the call. California Pizza Kitchen had a friendly recording that promised that it would direct the call to the department with the greatest assistance in the least amount of time, but never came through. The person answering Hamburger Hamlet’s calls said she didn’t deal with customer problems, and transferred the call to a voice mail that never returned the message. Subway’s recording promised a return call in two days, but instead a letter was sent in seven days thanking them for the call but without bothering to address the problem. Ramundo states an irate customer should always get a human being and never a recording in an attempt to resolve their problems. (Coeyman, 1996).

The survey did, however, find a warm, friendly customer service representative from Jack in the Box. She
immediately expressed regret and demonstrated what seemed like real interest in all the details of the unhappy experience. The representative was clearly trained, and immediately defused the situation with an easy, sympathetic ear. She concluded the conversation by thanking the customer for the call and explaining specifically what kind of follow up could be expected. A letter of apology and free meal vouchers arrived in the mail the next day from Jack In The Box (Coeyman, 1996). Dr. David Theno, vice president of quality assurance and product safety, realizes that the negative publicity generated by the E. coli hamburger poisonings in 1993 has caused Jack In The Box to rise above the rest in dealing with the public in order to survive (Coeyman, 1996). Dr. Theno says the new “guest support” system includes hiring the right personnel with “a certain mindset”, and providing their four full-time customer service representatives with a full month’s training consisting of behind the counter work, food safety regulations and seminars and videotapes (Coeyman, 1996).

The customer service responses at Wendy’s and McDonald’s also demonstrated a real sense of warmth and concern, but paled in comparison to Jack In The Box. Helpful, professional customer-service reps also included
Carl's Jr., Denny's, In-n-Out Burger, Fridays, Pizza Hut, Rally's, Chevy's, and Burger King. Denny's and TGI Friday's did a good job at appeasing customers, but could not provide their toll free phone number, while McDonald's and Burger King didn't even have toll-free numbers (Coeyman, 1996).

How Employees Fit into the Picture

How did these service failures proliferate? Employees provide the first impression that a patron gets of the restaurant that their needs are being met. The Disney Corporation feels it is impossible to provide exquisite customer service unless the people providing the service are able to feel good about themselves (a high self concept), and are receiving the right sort of attitudinal/expectancy support from their leaders (Rowe, 1995). In customer service one is working with moods, tempers, expectations, misunderstandings and dealing with personalities...human beings. One has to cope with headaches, hormones, and personal hang-ups. Customers tell of the waitress who disappears for 30 minutes, and when the customer comes looking for her, the manager does nothing to
make up for being ignored - no discount, free dessert, not even an apology. Others tell of overhearing service staff at a restaurant placing bets on how long a suffering patron would wait before he complained to the maitre d’ (Ruggless, 1994).

There are numerous reasons why food service employees are not meeting customers needs. It may be a lack of motivation, or a poor attitude to work in the foodservice industry or work with the public, or having to remember multiple customer orders, or having to hustle to keep everyone happy and their needs met. It may be the poor pay, as most foodservice workers start out at minimum wage, and usually work on a low salary scale. The foodservice industry operates with a high turnover rate, dealing with a young, untrained, inexperienced workforce (The Educational Foundation of the NRA, 1995). There may be ethnic differences, cultural barriers, and poor language skills that cause employees to think that the food handling practices from their previous country are acceptable in the United States. If the manager cannot convey the company philosophy to a dishwasher, and then the dishwasher may not realize the importance of sanitizing the dishes after they are washed (The Educational Foundation of the NRA). Also,
many immigrants from other countries come to here to start their own business, and can't understand why we don't allow them to chop chicken on the floor, because it was acceptable in their cultural practices. Proper public health education is extremely important in altering their practices to provide safe and healthful food handling procedures to prepare wholesome food to the public (The Educational Foundation of the NRA, 1995).

Managers agree that good servers are the most difficult people to get, and effort must be put into their training programs. Glenn Cockburn of the Cooker Restaurant Corporation states they spent a great deal of time coaching the bottom 20% and praising the top 20% of staff (Walkup, 1996). The Rock Bottom Brewery president Tom Moxcey stresses that empowerment is an integral part of service, and that "good service starts with good hiring". Ruby's Restaurant president Doug Cavanaugh states that "you've got to try to find the right kind of clay to mold, your odds of creating the person just through training are limited" (Walkup, 1996). The Hungry Hunter looks for maturity when hiring hosts and hostesses. Tarun Kapoor, hospitality professor at California State Polytechnic University, Pomona feels that restaurant operators need to beef up
cross training of personnel, especially those that greet, seat, and serve guests. When a lull occurs at a hostess stand, greeters can be trained to pitch in and clear tables, and wait staff can greet incoming patrons if they are idle waiting for food orders to arrive. Michael O'Donnell, president of the Ale House, likes to cross train with "strategic overstaffing" to keep the momentum flowing at the front door (Walkup, 1996). Managers must provide the initiative for a climate for quality and exquisite customer service with ongoing role modeling and tangible support (Rowe, 1995).

So, if employees make or break a restaurant in service or food related problems, how do we nurture them? Communication between management and the staff is vital to a restaurant eliminating costly errors that result in complaints. Restaurant Hospitality magazine responded with a list of ten common food service employee complaints that could lead to frustration, poor morale, and lower productivity. They are:

1. Give us the supplies we need to do our jobs,
2. Ask us for input when there are major changes,
3. Let us try new food and beverage items before we serve them,
(4) Give an orientation the first day on the job,
(5) Tell us when we do something wrong,
(6) Tell us when we do something right, praise drives hard,
(7) Give us thorough training, tell and show us how you want the job done,
(8) Be consistent in the rules,
(9) Work the floor from time to time to show your support when needed, and
(10) Understand that we're here to make money and have fun, information helps us to accomplish our goals and work as a team (Gunderson, 1996).

"To ensure customer satisfaction, treat your employees well", states Mike Scanlon of Applebee’s Neighborhood Bar and Restaurants. The byword of the 1990’s is service, and the first step for ensuring that service exceeds customer expectations is to treat employee managers well, and the resulting good feelings will spill over to guests (Bellamy, 1991). No program for improvement would be complete without incentives and recognition, both verbally and physically, with prizes and rewards of bonuses, health plans, special parties, free gifts, perks, benefits or paid
vacations as special time off (Bellamy, 1991). Managers must give employees the respect and support they deserve and reduce stress whenever possible, to keep them well adjusted in providing quality service. When employees are good at their jobs, everyone benefits.

Good body language is an important ingredient for success. Happy and enthusiastic servers know that eye contact and smiles are important when the customer arrives, in seating the guest, giving them time to order from the menu, and acknowledging them in between ordering and when the food is delivered. Bad body language can be perceived as turning away from patrons and talking with other servers while leaning against a wall, touching hair, face, other body parts, or scratching, all sure to make customers feel they are not getting the attention they deserve (Bellamy, 1991).

Good service goes beyond order-taking and food-bringing. It includes answering hard questions dealing with awkward moments, such as late arriving guests, fielding complaints, and dealing with disappointments and transgressions.
Service Failures

It has been found that improving a company's customer retention rate by 20 percent has the same effect on profits as cutting costs by 10 percent, so it is imperative that managers carefully consider failure and recovery issues and have an established service recovery plan to overcome failures when they occur (Hoffman, et al., 1995). A study investigating consumer responses to service failures found that when consumers are offered an apology or are provided with the opportunity to express their concerns to a service representative that perceptions of satisfaction, service quality, and fairness are enhanced, particularly when recovery outcomes are favorable (Hoffman, et al., 1995).

A marketing study was conducted in which service and product defect failures were categorized into three subgroups. Group 1 accounted for 44.4% of the total failures involving employee responses to service delivery system failures such as cold, soggy, raw, burnt, or spoiled food, and also inanimate objects such as hair, glass, Band-Aids, bag ties, and cardboard found in customers' food. These food-related failures accounted for 20.9% of the total 44.4%, while slow or unavailable service made up
17.9% of the incidences collected, and facility issues dealing with cleanliness such as bad smells, dirty silverware, and animate objects, such as bugs, accounted for 3.2%. Group 2 failures accounted for 18.4% of the total failures involving implicit/explicit customer requests such as food not cooked to order correctly, or not prepared in a specific manner (i.e. medium-rare, no mustard). These incorrect orders accounted for 15% of the 18.4%, while the remaining 3.4% involved seating problems, such as seating smokers in nonsmoking sections, lost reservation, denied requests for special tables, and unruly customers. Group 3 failures involved unprompted or unsolicited employee actions and accounted for 37.2% of the total failures. 15.2% of these failures involved incidents of rudeness, inappropriate verbal exchanges, and poor attitudes associated with unpleasant behaviors. Incidents of delivery of an incorrect food item to the table, or a wrong order at a fast food drive-thru window accounted for 12.6%, lost customer’s orders accounted for 7.5%, and mischarging the customer for items never ordered, charged incorrect prices, or receiving incorrect change accounted for the smallest percentage of 1.9% (Hoffman, et al, 1995). All of these service failures are a nightmare for
management and should cause them to consider recovery strategies such as a sincere apology, free food, and replacement of the affected food, discounts, and coupons.

Mishandled service failures can result in litigation from consumer lawsuits. Slip-and-fall incidents, chipped teeth, and failed bridgework are among the most common complaints sparking threats of legal action from wary restaurant operators (Martin, 1995). Other costly court battles include:

- A Muslim family in Houston that sued On the Border Cafes for $600,000 in 1994 after learning from a cook that the beef tacos they had eaten contained pork, a food strictly forbidden by Muslim dietary laws.

- An HIV-positive Southern California man sued a popular regional drive-thru chain over allegations that food poisoning he claimed to have contracted from eating a hamburger caused him to develop full-blown AIDS.

- A New York woman sued Burger King in 1995 over a burn to her that she blamed on hot tea, and her husband sued for $250,000 over the alleged loss of his wife’s “services, comfort, and society of companionship”.

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- A man sued an Oakland café for injuries caused by a bone fragment in an enchilada in 1993, causing the Supreme Court to overturn a 56-year-old "chicken bone" doctrine.

- An Orange County jury levied a $175,000 verdict against a McDonald's supplier in 1994 in the case of a man injured by a bone lurking in a chicken sandwich.

- Domino's Pizza dropped its famous 30-minute delivery guarantee after a jury awarded nearly $79 million to a St. Louis woman who suffered severe injuries when a Domino's driver ran a red light and broadsided her car.

- The family of a New Hampshire woman sued Bertucci's Brick Oven Pizzeria for $10.4 million in 1995, alleging that she died from an allergic reaction to its pesto sauce after being assured erroneously that it contained no nuts (Martin, 1995).

- A New Mexico jury awarded a severely burned elderly woman $160,000, and levied an additional $2.7 million punitive damage judgment against McDonald's Corporation (later reduced to $480,000) after learning it had settled more than 700 other hot-beverage injury claims, never considering to lower a standardized coffee-holding temperature of 180 °F. known to cause third-degree burns.
Foodmaker Inc. in 1993 began tapping a $100 million liability policy to pay wrongful-death lawsuits filed after four children on the West Coast died from bacteria-laden, undercooked Jack in the Box hamburgers. They also settled about 25 personal-injury cases, and several class-action lawsuits, whose crises precipitated losses of $137.7 million over two years and an excruciating national debate over food safety.

How does one attempt to minimize these lawsuits? "Just be humble, and make sure the guest knows that you care," advised Robert Spivak, president of Concepts, Inc. in Los Angeles, whose restaurants give away scores of free meals and dish out copious servings of sympathy to mollify disgruntled patrons and discourage legal saber-rattling. He also states, "At all costs, avoid arguing with litigiously inclined customers, and just let them have their day; just don’t try to make them wrong" (Martin, 1995).

State Laws and Local Codes Enforced

Registered Environmental Health Specialists utilize and enforce many state laws, codes, and local ordinances to
perform their job on a daily basis. The most commonly used are: the California Uniform Retail Food Facility Law, the State of California Sherman Food and Drug Law, and the County of San Bernardino County Code, as well as the Uniform Mechanical Code, the Uniform Plumbing Code, among others, along with a wealth of reference materials supplied from the State Health Food and Drug Branch, and the Food and Drug Administration.

The State of California excerpts of the Health and Safety Code titled the California Uniform Retail Food Facility Law (CURFFL) Division 104, Environmental Health, Part 7, Retail Food, Chapter 1, Definitions, Chapter 2, Enforcement and Penalties, and Chapter 4, Retail Food Practices requires food facilities to be inspected by an enforcement officer such as the Director of Health Services, and all local health officers, directors of environmental health, and the duly authorized registered environmental health specialists (CURFFL, 1999). Armed with the authority to enter, inspect, issue citations, and secure any sample, photographs, or other evidence from any food facility, the R.E.H.S. investigates all retail food facilities. Food facilities are defined in CURFFL as any food establishment, mobile food facility, vending machine,
produce stand, swap meet, prepackaged food stand, temporary food facility, satellite food distribution facility, stationary mobile food preparation unit, and mobile food preparation unit (CURFFL, 1999). For the purposes of this study, we will focus on restaurants which prepare open food as food establishments; which is any room, or building, operated for the purpose of storing, preparing, serving, manufacturing, packaging, transporting, salvaging, or otherwise handling food at the retail level (CURFFL, 1999).

The County of San Bernardino, Department of Public Health, Division of Environmental Health also enforces food-related provisions of the State of California Sherman Food, Drug, and Cosmetic Law via a Memo of Understanding (MOU) with the State Health Department. This county is only one of four counties throughout the entire state authorized to enforce and uphold these regulations relating to pure food regulations, wholesale manufacturing and distribution of food products, embargo and impound of food, utensils, and equipment, and other specifics such as to hamburger only containing striated beef muscle, and the alcohol content in hard liquors. The Sherman Food and Drug Law requires all food to be manufactured, produced, prepared, compounded, packed, stored, transported, kept for
sale, and served so as to be pure, free from contamination, adulteration, and spoilage; shall have be obtained from approved sources; and shall otherwise be fully fit for human consumption. The Sherman Food and Drug Law enables R.E.H.S.'s to have food facility operators voluntarily condemn and destruct (VC&D) food products that may be adulterated or contaminated with deleterious substances that could cause a foodborne illness, whether it be a foreign physical substance, a chemical, or possible microbiological organisms capable of supporting and growth of pathogens.

**Investigation Procedures**

With the knowledge of CURFFL and the Sherman Food and Drug Law in hand, the district inspector prepares to investigate the consumer complaint. They bring many tools of the trade, such as a posse box to hold all the forms and health codes necessary to document the written inspection, a flashlight, chemical test strips to determine the concentration of chlorine or quaternary ammonium compound residuals, a camera, and food testing thermometers, such as
a digital probe and thermocouples to test food for proper temperatures (McKemie, 1995).

Once properly equipped, the district inspector proceeds to the restaurant to perform an investigation. Depending on whether the food facility has recently been inspected, the inspector may either address the complaint alone, or perform a complete routine inspection. The County of San Bernardino has a policy of inspecting open-food facilities such as restaurants two times a year as complete official inspections, and one follow-up inspection to check on compliance with the CURFFL violations set forth in previous inspection reports. Food facilities may be inspected more often as complaints arise.

Once the inspector is at the restaurant, the first order of business is an introduction to the manager of the food facility to explain the nature of the visit. The nature of the complaint is addressed, but never who made the complaint, as this is strictly confidential information. It is important to be courteous and professional; to establish a good rapport when working with the manager and food worker staff, as the inspector needs honest and candid answers to the questions to determine if the alleged complaint could possibly have occurred.
(McKemie, 1995). Begin the inspection by washing your hands, which starts the education process (McKemie, 1995). If the inspector starts the investigation with an "abrasive" attitude, it may not be possible to reveal the true events that occurred, and the inspector will certainly have difficulty gaining compliance with the facility operator. The inspector should show good interview skills in establishing the facts, but not ask questions in such a way as to solicit the "correct" answer by asking leading questions, such as, "Do you sanitize your dishes?" "Of course, we do" (McKemie, 1995). Listening skills are a must, let the manager or kitchen staff tell what they know of the day or incident in question, as they may offer other clues as to what occurred to contribute to the complaint being filed (Herman, 1983, McKemie, 1996). A manager may not know that the chef saw a mouse run through the dining room that night, and only the server may hear a patron speak of a cockroach that crawled up the back of his dining room booth.

Depending on the type of complaint being investigated, the REHS tries to find evidence either to prove or disprove the case. If the complaint addressed cockroaches, a well-seasoned and knowledgeable inspector needs to know where to
find their harborage and breeding grounds. German cockroaches are the most common in restaurants, and like dark, warm, moist, and hard to clean environments to lay their eggs (Educational Foundation of the N.R.A., 1995). It is important to share knowledge and educate the operator so he understands that cockroaches can carry bacteria, such as Salmonella, E. coli, and Staphylococcus aureus (Rivault, Cloarec, and Le Guyader, 1993). Once an operator understands the reasons to eliminate cockroaches, he will then understand why they must clean under stoves and fryers to remove the food sources that allow cockroaches to multiply and contaminate the restaurant’s food supply.

**HACCP Inspection**

When complaints involve foodborne illness allegations, the investigation must encompass the suspected food product through the entire food facility. Inspectors accomplish this specialized task by using a modified Hazard Analysis Critical Control Point (HACCP) inspection. According to the National Advisory Committee on Microbiological Criteria for Foods (NACMCF), the principles of the HACCP system are divided into seven steps:
(1) Conduct a hazard analysis, review menu items that require extensive handling and multiple food processes;
(2) Identify the critical control point (CCP) in the process, cooking is a “kill” step;
(3) Establish critical limits for preventative measures associated with each identified CCP, making sure food is cooked to 165°F;
(4) Establish CCP monitoring requirements; use a thermometer;
(5) Establish corrective actions to be taken when monitoring indicates that there is a deviation from an established critical limit, reheat food below 140°F. back up to 165°F.;
(6) Establish effective record keeping procedures that document the HACCP system, write temperatures on a log; and
(7) Establish procedures for verification that the HACCP system is working correctly; recheck your system (Weingold, Guzewich, and Fudala, 1994).
Features of the hazard analysis and procedures for monitoring critical control points (CCP's) of food service operations are to:

(1) Appraise incoming foods for quality;

(2) Appraise method of storing foods frozen, chilled or dry for situations that facilitate contamination;

(3) Appraise situations that could permit contamination during food handling, cooking, hot holding and serving;

(4) Measure time-temperature exposure of food during dry or refrigerated storage, cooking, hot holding, cooling, and reheating to determine if bacteria could survive and multiply;

(5) Appraise cleaning procedures to determine if pathogens are removed from equipment and utensils;

(6) Appraise understanding of operators about foodborne disease hazards and their prevention and training provided by management; and

(7) Determine the conditions of food at all stages of preparation, at the time of serving, and of any leftovers (Bryan, 1981).

As the inspector progresses through the facility, notes are written to document the observations to aid in
organizing the final inspection report (McKemie, 1995). Each item of correction is marked, the point value deducted from 100 points, and the violation to be corrected is written corresponding to the 21 items in the 5 categories listed. An exit interview with the manager of the food facility completes the inspection, discussing the violations and terms of correction necessary to bring the facility back into compliance with minimum Health and Safety regulations.

Factors Most Frequently Responsible for Foodborne Illness

The U.S. Department of Health and Human Services, in the 1990 FDA course manual titled Special Problems in Food Protection identifies the four greatest factors by percentage observed as those most frequently responsible for causing foodborne illness:

- **Holding Temperatures**
  
  (63%) Inadequate refrigeration and cooling
  
  (29%) Advanced preparation of food
  
  (27%) Hot holding of food below 140°F.
(7%) Use of leftover food.

- **Personal Hygiene**
  (26%) Infected persons touching food

- **Inadequate Cooking**
  (25%) Inadequate reheating
  (7%) Use of leftovers
  (5%) Food not thoroughly cooked

- **Cross Contamination**
  (9%) Insufficient cleaning of equipment
  (6%) Cross contamination between raw foods and ready-to-eat foods

- **Other Causes**
  (4%) Acid food stored in toxic metal containers
  (2%) Contaminated ingredients in uncooked foods
  (2%) Food additives
  (1%) Accidental additives
  (1%) Use of foods from unsafe sources

As the statistics show, foodborne illnesses continue to be caused by simple failures to properly hold, cook, and cool food, as well as poor employee personal hygiene. With all the technical procedures to inspect, monitor and regulate food facilities, it is disheartening that
foodborne illnesses continue to occur. Inspection alone cannot guarantee prevention of foodborne outbreaks. Supervision and education of food workers and consistent adherence by food workers to good hygiene practices are critical and perhaps neglected elements, in control and prevention of foodborne disease (Penman, Webb, Woernle, and Currier, 1996).

Studies have shown that food facilities score better when the food service workers have had food handler training courses. A study to evaluate the effectiveness of a food manager training and certification program found increased compliance with restaurant sanitary codes (Cotterchio, et al., 1998). Restaurants for which managers were mandated to attend a training and certification program demonstrated a significant improvement in inspection scores, an improvement that was sustained over a two-year follow-up period. The study used restaurant inspection scores as a proxy measure since a correlation has been noted between foodborne illness and inspection scores. The study’s conclusion was that food manager training and certification programs may be an effective way to improve the sanitary conditions of restaurants and
reduce the spread of foodborne illnesses (Cotterchio, et al., 1998).

The County of San Bernardino, Division of Environmental Health requires every food handler in the county to be trained in proper food handling, personal hygiene, proper food temperatures, what conditions are necessary for bacteria to grow and multiply, and the importance of good sanitation. The Food Industry Retail Sanitation Training (F.I.R.S.T.) program has been a county ordinance since the early 1970’s, a model ordinance in the nation regarding food worker education, and helps the food service workers to deter foodborne illnesses.

**Scoring Systems of Food Facilities**

Grading systems attempt to quantify the measure of sanitation in a food establishment by incorporating a weighted-scoring system (Emanuel, 1995). The scoring system provides inspectors with a means to calculate a sanitation rating score at the conclusion of an inspection to give an idea of how this facility rated with other establishments. The scoring system should be used as a monitoring tool and is more effective when critical
violations are assigned a higher weighted point value than non-critical violations (Emanuel, 1995). The top five critical violations that contributed to foodborne disease outbreaks in 1973-1976 continue today as the most implicated:

1. Inadequate refrigeration,
2. Preparing foods far in advance of service,
3. Holding food in warming devices at bacterial incubating temperatures,
4. Infected persons touching cooked foods, and
5. Inadequate reheating (Bryan, 1978).

Scores usually measure performance, and allow comparisons to be made between facilities, but each score is subject to a range in interpretation that depends on the perspective of the observer. A score of 70 out of 100 may be a passing mark on one test and a failing mark on another (Wiant, 1999). Although there has been a long-term effort to make scores a universally accepted measure of restaurant quality and safety, they are often in conflict about the extent to which scores and grades reflect the quality of food service establishments. Three issues must be discussed to draw conclusions about the value of scores for restaurant inspections. Those issues are 1) the context
within which the inspection is made, (2) the interpretation of scores by the public, and 3) the way scores are used in the management of food protection programs (Wiant, 1999). The traditional scoring systems deducts points from 100, with critical areas counting more than other deficiencies, keeping in mind an inspection represents a snapshot of an hour of time from what may be an 18-hour day for the restaurant. The simplest interpretation uses the 100-point pass/fail test, while more complex interpretations use scores from successive inspections to analyze trends over time (Wiant, 1999). The public views inspections as A, B, C, D, or F, because tests are generally intended to reflect a certain level of knowledge and understanding about a given topic, but people also consider other factors when eating out, such as cleanliness, food quality, and such visible indicators as the use of gloves and hair restraints (Wiant, 1999). The media typically interprets scores in the same way as individual citizens, but may sensationalize a low score, which will reflect poorly on a restaurant by loss of customers, and may focus on failure rather than success.

Scores provide valuable information for managers of food protection programs. Consistent scores either high or
low, help agencies to prioritize restaurants for more or less attention. Many agencies use scores as a factor in the calculation of risk for a given facility. The risk level then determines how frequently inspections are performed at a given facility and helps describe the uniformity of inspections made by staff (Wiant, 1999). It is unusual for a single score or inspection to result in some type of sanction against a restaurant. The motivation of inspection agencies is to use a variety of indicators, such as scores or grades, the nature of the violations, the attitude of the operator, patron complaints, and foodborne illness reports to ensure the protection of community health (Wiant, 1999).

Some health agencies believe food facilities with critical violations such as multiple foods at improper temperatures should score lower for each food item in violation as they pose a higher risk for a foodborne illness (Emanuel, 1995). Currently, the County of San Bernardino, Division of Environmental Health does not demerit the food facility more than once, as the agency believes it would penalize large food facilities with many potentially hazardous foods (PHF’s) and skew the overall scoring system. However, a review of this policy in the
future may yield a different philosophy. Whichever scoring system is used, it must meet the following criteria:

1) A sanitation score must provide a representative measure of overall sanitation;

2) A sanitation score must be easily computed by inspectors and conveyed to establishment operators in the field;

3) A sanitation score must be easily understood by both establishment operators and consumers;

4) A sanitation score must be able to provide a benchmark from which operators are able to progress toward improving the sanitation of their establishments;

5) A sanitation score must be able to provide a benchmark from which inspector improvement or food program improvement progress may be made; and,

6) A sanitation score must have the ability to be used in statistical analysis (Emanuel, 1995).

Sanitation improvements of food establishments may be monitored simply by comparing current to past scores because the percentage-based score is inclusive and needs no further qualification. Inspector abilities may even be measured by comparing different inspectors' percentage
sanitation scores for the same establishment (Emanuel, 1995).

**Case Studies Involving Food Facility Inspection Scores**

Many people have questioned the importance of restaurant health inspections as a food safety strategy. In fact, some have called for the abolishment of inspections on the grounds that they produce no major benefits (Allwood, Lee, and Borden-Glass, 1999). Therefore, to test the hypothesis that inspections are still a valid food safety strategy, a study was conducted to determine how the sanitary rating and the incidence of critical violations change in response to changes in inspection frequency over a two year time frame (Allwood, Lee, and Borden-Glass, 1999). The conceptual basis for this research is that if health inspections are a valid food safety strategy in restaurants, there will be a positive dose-response relationship between frequency of inspection and sanitary rating. Allwood, Lee, and Borden-Glass (1999), describe this research in which food establishments were inspected four times in 1987 and three times in 1988, or four times in 1987 and two times in 1988, or three times in 1987 and two times in 1988. Inspection
scores in this research decreased significantly among establishments that were inspected four times in 1987 and three times in 1988, as well as among establishments that were inspected four times in 1987 and two times in 1988. Also the mean number of food temperature violations increased significantly in restaurants inspected less frequently in 1988 (Allwood, Lee, and Borden-Glass, 1999). The results of this study indicate that the sanitary rating of a restaurant is positively associated with the frequency with which the restaurant is inspected. The finding supports the study's basic assumption that restaurant health inspections continue to play a vital role in protecting the public against foodborne disease (Allwood, Lee, and Borden-Glass, 1999). Regular inspection of food establishments is needed for education of food workers and found that education plays a far more significant role in promoting safe behavior than does enforcement (Allwood, Lee, and Borden-Glass, 1999). Increasing demand by patrons for faster service fosters the tendency of food workers to cut corners on safety in favor of more rapid food production. This tendency particularly relates to issues like proper handwashing, according to the U.S. Food and

Seattle-King County performed a matched case-control study to analyze the association between the results of routine inspections and foodborne outbreaks. They found that restaurants that had foodborne outbreaks had significantly lower mean inspection scores than control restaurants without outbreaks (Irwin, et al., 1989). The study demonstrates that restaurants with poor routine inspection results were at increased risk of foodborne outbreaks. Key risk factors included a low score of less than 86 points out of 100 points, an inspection result warranting follow-up inspection or permit suspension, and violations of recommended food protection measures (Irwin, et al., 1989).

Poor inspection results should trigger appropriate education and regulatory action, which in turn should prevent outbreaks. Detailed education to food handlers and their supervisors on risks associated with specific violations, such as unsafe storage of potentially hazardous foods, is also needed (Irwin, et al., 1989). Food protection programs should also assure that Sanitarians use appropriate inspection techniques and that food handlers
are certified in proper food preparation techniques (Irwin, et al., 1989).

Another study in Seattle-King County was undertaken to determine whether all food establishments really needed four routine inspections a year (Bader, et al., 1978). The control restaurants were inspected four times a year, and the experimental group was inspected once at the beginning of the year and thereafter only on a complaint basis. They found that the inspection scores for a two-year average prior to the study were almost identical overall. The averages overall for the inspection at the end of the study indicated that scores of the experimental group were 47% lower than the controls (Bader, et al., 1978). The most marked difference was found for the Oriental restaurants whose experimental group scores were clearly unsatisfactory. Interesting to note was there were 18 complaints of possible foodborne illness registered against 15 experimental group food service establishments as compared to three complaints against the control group. As a comparison, 28 complaints were registered against 25 "problem" establishments excluded from the study due to serious sanitation violations on more than one recent inspection (Bader, et al., 1978). This study investigates
the hypothesis that "problem" establishments which have more complaints lodged against them actually do score lower than food facilities with no consumer complaints.

**Problem Statement**

As a result of the startling statistics of foodborne illness, associated deaths, and case studies regarding complaints and food facility inspections, a need has been determined to examine a correlation of environmental health food facility inspection scores and consumer complaints. It would be important to determine if the outcome of food facility inspection scores without complaints result in better scores than food facilities with complaints from the consuming public. Are the numbers of complaints related and proportionate to the number of meals served daily? Or is it possible that consumer complaints find their way to the County of San Bernardino, Department of Public Health, Division of Environmental Health, due to a poor attitude by the restaurant management in resolving the patron’s perceived problem? In either case, there may be little relationship between food facility inspection scores and the frequency of complaints.
Research has been found to show there is a significant contribution to the environmental health profession with the evaluation of a need for Registered Environmental Health Specialists to perform inspections in the food facility community (Allwood, Lee, and Borden-Glass, 1999). However, little research has been found to determine if inspections actually make a difference regarding consumer complaints, or are an accurate determinant for food quality across the county. Minimal secondary research has been found to address the issue of inspection scores and complaints in the literature review, so it is possible this topic is delving into virgin territory in comparing the scores of food facility inspection reports and consumer complaints. A few other studies were found of specific relevance, but did not address this topic specifically in regards to consumer complaints. Further research may determine if environmental health inspections have an impact on complaints, and if they make any difference in the safety, quality of food, and sanitation of food facilities.
CHAPTER III RESEARCH METHOD

Background

Consumer Complaints to the Health Department

What happens when things go wrong and the restaurant operator's best intentions fail to meet the expectations of the patron, and no resolution seems viable to placate their most discriminating tastes? Patrons complain to the Health Department. What do all these expectations have to do with the Health Department? This is the local agency that employs Registered Environmental Health Specialists (R.E.H.S.) who inspect and investigate food facilities for compliance with state and local laws, codes, and ordinances.

How does one go about registering a complaint? This may seem like a simple process, but it can appear to be a major hurdle for those who don't know their way through the procedures. How many consumer complaints actually get to the Health Department are just the tip of the iceberg of the total amount of problems or foodborne illnesses that actually occur. The Food and Drug Administration (FDA) describes it as a triangle, where at the bottom the person must first perceive there is a problem worthy of a
complaint. Then they must decide to act, after they determine that they cannot rectify the problem on their own accord, and have tried to remediate the problem to their own satisfaction. Then they try to find the correct agency to lodge their complaint, and when they actually find the right telephone number to call, they must finally decide to lodge the complaint and follow through. This is the reason why the Center for Disease Control and Prevention (CDC) has such sketchy records on the numbers of actual foodborne illnesses in this country. Many complaints never make it up to the top of the triangle and are never reported. Many don't know there is no such thing as the 24-hour flu, and that their illness is more than likely foodborne-related. Many people are not familiar with governmental agencies, or are distrustful of government as a whole. Many come from other countries where they don't feel it is a problem, or simply don't even know where to start the process. Others simply hate bureaucracy, and feel no one can help them or even care about their problem.

So, where does one begin? First, one has to know where to lodge his complaint. In the County of San Bernardino, one needs to know that Environmental Health is a division of the Public Health Department in order to find
it in the local telephone book. Often times people will call a Public Health program not familiar with the telephone number of Environmental Health, and they will get transferred around to various offices until they connect up with the correct Environmental Health office.

Occasionally the complaint does not fall within the jurisdiction of the County Health Department. The office receiving the complaint will try its best to redirect the complaint where it can be handled. Structural problems may be referred to the local Building and Safety Department, which handles plumbing, electrical, and building construction deficiencies, as well as some safety issues. Employee health or worker related issues may be referred to CAL-OSHA, the California Occupational Safety and Health Administration, which handles a wide variety of safety issues such as chemical safety, industrial hygiene activities, and employee safety issues such as slip and fall incidents related to lack of compliance regarding a slippery floor. Out-of-county food or drug issues may be referred to the State Food and Drug Administration (FDA), which investigates food and drug manufacturers for health and safety of their supplies, materials, and products produced. Assisting the public to locate the correct
agency to alleviate their problem often takes a great deal of ingenuity to provide the best service to all concerned.

**County of San Bernardino Complaint Logs**

The County of San Bernardino had an estimated population in 1998 of 1,621,900 people, and employs over 11,000 in county government alone. The county has 26 incorporated cities, with the two largest being San Bernardino with 182,600 residents, and Ontario with 143,800 residents, and is the largest county in size in the entire United States (California Cities, Towns, and Counties, 1999).

The Department of Public Health, Division of Environmental Health inspects over 12,000 food facilities, with 42 R.E.H.S. staff working in the Food Protection and Recreational Health Program. The workload is divided into three main regions located in strategic cities throughout the county in order to provide the best local service to the public. The East Valley Food and Recreational Health Program is located in the city of San Bernardino, the county seat, with a satellite office in Redlands. This office has staff that covers territory from Angeles Oaks,
Yucaipa, Redlands, Loma Linda, Rialto, and reaches to the Riverside County border. The West Valley Food and Recreational Health Program is located in Ontario, the largest, and quickly growing, city in the western part of the county. This region covers areas from Fontana down to Chino and Chino Hills, bordering Riverside County, and west from Montclair to the Los Angeles County border, up to Upland and Mt. Baldy, bordering the Los Angeles National Forest in the mountains. The third region is the Desert and Mountain Region, where the main regional office is located in Victorville, with satellite offices in Barstow, Needles, Twin Peaks, Big Bear, and Yucca Valley. Staff cover the desert east to the Colorado River and Arizona, stretches to the north to Trona by Kern County and Inyo County, and the mountain communities of Lake Arrowhead and Big Bear.

The County of San Bernardino, Department of Public Health, Division of Environmental Health Complaint Logs were reviewed for the fiscal years 1995-1996 and 1996-1997. The year end summary for 1995-1996 reported 255 epidemiological investigations and all other restaurant complaints of 945, for a total of all food quality assurance complaints of 1445 separate incidences. The year
end summary for 1996-1997 reported 246 epidemiological investigations and 954 other restaurant complaints, for a total of all food quality assurance complaints of 1545. The public is becoming more aware of public health concerns, and is reflected in an increase in the number of complaints coming into the Health Department.

Depending on where the food facility is located, the closest regional office logs the complainant’s information on a Complaint Intake Form. Clerical support staff take down the name of the food facility, the address, or at least the nearest cross streets, the name, address, and telephone number of the complainant, and the nature of the complaint. Most people who complain do not want to give their name, and it requires some delicate explaining to let them know that this information is vital and extremely confidential. The complaint is logged into the computerized complaint system, given a computer case number, and retrieved by the complainant’s name. This information is needed if the food facility is taken to court and the owner of the establishment claims the county is harassing him for no cause. However, the confidentiality of the complainant has been upheld in court, and the judge has stated that the complainant’s name
is not subject to the Freedom of Information Act. It may seem easier to access the complaint by the name of the food facility, but many facilities have the same name, as in chain stores, and may have multiple complaints open on the facility, causing a cumbersome process to locate the disposition of a particular case.

If the complaint is regarding an alleged foodborne illness, a Food-Related Alert/Complaint Record form is used to gather vital information as to the potential pathogenic organism that may have caused the illness. The information gathered includes who the complaint was received from, and who the persons affected are, their day and evening telephone numbers, their ages, relationships and common households, and symptoms of illness, such as nausea, vomiting, diarrhea, cramps, and fever. The nature of the complaint includes the suspect foods, the location of their source, and where and when the suspected meal was consumed, the names of all the people who consumed the meal, as well as when the first symptoms began to appear. Most importantly, we need to log a three day case history of all the foods eaten, starting with the day of the illness or outbreak, and going back two days from that point. Many people have a difficult time remembering the last meal they
ate, nonetheless remembering meals they ate perhaps a week ago.

Criteria for Authority to Perform Inspections

Once the important information of the complaint has been received, the complaint is handed over to the district Environmental Health Specialist for investigation. The investigator is a Registered Environmental Health Specialist (R.E.H.S.) who has received at least a Bachelor’s Degree in Environmental Health Science, Biology, Chemistry, Geology, or other related science backgrounds. In order to become registered, they first must apply with the State Health Department to determine that they meet minimum qualifications regarding the number of specific college courses they must pass to obtain a letter of qualification. Depending on the student’s background, they may be qualified to take the state exam straight out of college, or they may need to take a few more science courses and be required to work internship hours from 160 hours up to 720 hours in various specialty subjects of environmental health. Once those requirements are complete, they are given a letter of approval from the
State Health Department to be admitted to take the Registered Environmental Health Specialist Exam, which is administered three times a year. After completing and passing a rigorous 8-hour State exam covering food protection, recreational health, hazardous materials, noise abatement, solid waste, liquid waste, potable water, housing and institutions, and administrative issues, they become Registered Environmental Health Specialists (R.E.H.S.). Inspection staff consider themselves professionals, take pride in their work, and find job satisfaction (McKemie, 1995).

Research Design

The research method chosen for this study is a quantitative, nonexperimental design with measurable data and scores utilized from the San Bernardino County Department of Public Health, Division of Environmental Health, Food Program Official Inspection Reports (OIR). This study is an ex post facto research of master files contained in the main office of the San Bernardino County Food Program using the food facility records from 1996 to 1998.
Hypothesis

The hypothesis of this study is that there is a correlation between food facility inspection scores and consumer complaints. The research examines the premise that those food facilities with consumer complaints will receive lower scores than those food facilities that have not received consumer complaints.

The Food Program OIR utilizes scores ranging from 0 to 100, determined by the points deducted from 21 violation items listed in a column on the form. Scores are good indicators of proper health and safety factors in a food facility. Complaints are an indicator of a perceived problem by the public. This study intends to determine the relationship between low scores and food facilities that receive consumer complaints.
Procedures

Subjects

The City of San Bernardino was chosen as the test study case from which to draw data because it is the largest city in the county, and is the county seat. A computer-generated list known as an "alpha list" was printed for all food facilities in the County operating during the month of May 1999. The alpha list was grouped by the three main regions of the county and divided into individual districts. The East Valley Food and Recreational Health Program is categorized as region 0200, and is further subdivided into 22 districts. Nine districts were identified out of the 22 districts that have food facilities in the city of San Bernardino.

The Official Inspection Report (OIR) categorizes open food handling Public Eating Places (PEP) and prepackaged Food Handling Places (FHP) as the Program Elements which identifies the size of the food facility in terms of seating capacity for PEP's and square footage for FHP's. Only the Public Eating Place (PEP) category of food facilities was counted, which includes all open food
preparation facilities. The smallest program element PEP category is identified and coded as a 1623, which is a food facility that has 0 - 24 seating capacity for patrons, and the largest is identified and coded as a 1627, which is a very large food facility with 150 plus seating capacity for patrons. The seating capacity is determined by a physical count of dining and bar seating, with regard to allowable occupancy posted by the local Fire Department. The program element categories utilized in this study are defined as follows:

<table>
<thead>
<tr>
<th>Program Element Category</th>
<th>Seating Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1623</td>
<td>0 - 24 seats</td>
</tr>
<tr>
<td>1624</td>
<td>25 - 59 seats</td>
</tr>
<tr>
<td>1625</td>
<td>60 - 99 seats</td>
</tr>
<tr>
<td>1626</td>
<td>100 - 149 seats</td>
</tr>
<tr>
<td>1627</td>
<td>150 - plus seats</td>
</tr>
</tbody>
</table>

Note that no schools were included in this study, as they are grouped into a different program element category. Also no other specialty inspection category was included in this study, such as soft serve machine inspection and sampling, or summer lunch inspection program.

A count of 535 public eating places (PEP) was identified from the alpha list. Then a random seed was
collected from the master files stored in the main office of the Environmental Health Division in San Bernardino. A 20% sample was chosen to be representative of the entire population of PEP’s in the city of San Bernardino. This 20% sample was calculated to be 107 master files, which is every fifth PEP file to be counted from the alpha list, starting on a random district and choosing every fifth PEP, going from the first to the ninth district that contains files in the city of San Bernardino.

The time frame for the study was determined to be three years, starting in January 1996, and ending in December 1998. If the fifth master file chosen did not contain records of OIR’s or complaints from 1996 to 1998, it was discarded, and the next PEP that met the criteria behind that file was chosen. Only initial inspection reports (01’s), reinspections (03’s), complaints (04’s), and legal action of closure (054) were collected. Surveys, soft serve machine inspections and sampling, permit information, and other non-related inspections were not utilized from the master files. Each of the three years in the time frame chosen contained multiple initial inspections (01) and reinspections (03), as well as any consumer complaints (04) or legal action of closure (054)
generated during this three year time frame were included in the data collected for this study.

Using the Official Inspection Report (OIR) as a Measurement Tool

In this study, a review was performed of completed official inspections of food facilities to address certain possible violations of CURFFL that may be related to alleged consumer complaints using the County of San Bernardino, Department of Public Health, Division of Environmental Health, Food Program Official Inspection Report, referred to as the OIR.

The measurement tool utilized for data collection was the San Bernardino County, Division of Environmental Health, Food Program Official Inspection Report form (OIR). See the Appendix for the form. This current version of the OIR was formulated by four experienced REHS’s in a committee under guidance from the three Food Program Supervisors. This current version of the OIR has been used in inspections since 1986, modified from a previous form to bring standardization into the inspection process.
The OIR form contains specific information regarding the particular food facility such as the name, address, and telephone number of the establishment, the owner or applicant's name or corporation, and the mailing address, as well as other items described below. Information regarding the expiration date of the current Health Permit is located in a department generated computerized printout known as an alpha list, and also on-site at the facility as the health permit must be posted in a conspicuous location. As per CURFFL, a food facility cannot operate without a current health permit, and to do so is grounds for immediate closure until the facility meets standards, and the permit is applied and paid for.

A Health Permit is not transferable to a new owner, so when the business is sold or moves to another location, a new Health Permit must be obtained. A new or remodeled food facility occasionally opens for business without submitting plans to the health department, as required in CURFFL. In this situation, a permit may not be obtained until complete and detailed plans have been submitted, and approved by the regional plan reviewer. The food facility must pass construction inspections regarding the structural facility, commercial equipment, and approved materials for
the floors, walls, and ceilings. Then the facility must pass a final inspection from Environmental Health, Building and Safety, the Fire Department, the Planning Commission, the Alcohol Beverage Commission, and any other agencies involved prior to issuance of the Health Permit.

The fee schedule for the permit is based on the program element category related to the number of seats, which is generally related to the size of the kitchen of the public eating place (PEP). The program element categories of the PEP's have been described previously. Generally the larger restaurant kitchens take more time to inspect, however, small "mom and pop" food operations may take a great deal more education and time as their knowledge of food handling may be limited, creating a greater potential for foodborne illnesses.

The OIR form also contains departmental computer tracking information found on the alpha list such as the establishment number, which remains with the location, even if the food facility moves to another location and another restaurant moves in to the old address. Also service codes provide the specific inspection activity which the environmental health specialist performed. The service codes utilized in this study include:
• 01 - initial inspection - (a scored routine inspection performed twice a year at the food facility to document violations present on that date for correction),

• 03 - follow up inspection - (a non-scored reinspection to review corrective action accomplished at the food facility),

• 04 - complaint investigation - (a non-scored inspection prompted by a consumer complaint regarding potential health and safety violations of the food facility, including alleged foodborne illnesses),

• 054 - legal action - (closure of the food facility for imminent health and safety violations), and

• 05 - initial plus complaint - (a new code designed for this study to indicate that a routine scored inspection had been performed in conjunction with the complaint investigation either due to the severity of the conditions observed at the food facility, or because a routine inspection had not been performed recently on the particular food facility).
The Official Inspection Report (OIR) is based on a scoring system, quantifying the measure of sanitation in a food establishment by incorporating a weighted-scoring system (Emanuel, 1995). Five major categories of the food facility are addressed ranging from the highest risk of potentially causing a foodborne illness to lesser risk:

1) Temperatures,
2) Food Protection,
3) Disease Transmission,
4) Equipment/Utensils, and
5) Premises/Other.

Each of the five categories contains individual items in which their point value toward a possible score of 100 points is weighted according to the potential to cause a foodborne illness. The individual items are numbered from 1 to 21, and will be described as to the violation of CURFFL they incur, and the potential for a foodborne illness, as well as how a consumer complaint would fit into the item in need of correction.

**Category 1: Temperatures**

1. **Food Temperature/Defrost**  
   **Point Value:** 10

CURFFL requires all potentially hazardous food (PHF) capable of supporting pathogenic organisms to be maintained
cold below 41°Fahrenheit (F.), or above 140°F., except while preparation is occurring. Food must be thawed in an approved manner, not just left out on the counter all night. A consumer complaint of a foodborne illness is extremely likely if potentially hazardous food (PHF) is not handled safely.

2. Refrigeration/Freezer Point Value: 3

CURFFL requires all PHF to be maintained below 41°F. and all equipment to be maintained in good operating condition. All frozen food must be kept frozen or cooked prior to refreezing.

3. Thermometer Point Value: 4

CURFFL requires thermometers to be provided for each refrigerator, and a metal probe thermometer to measure the temperatures of food. It is not possible to monitor and maintain food at proper temperatures if a tool is not available.

4. Steamtable/Usage Point Value: 3

CURFFL requires all potentially hazardous food (PHF) that is to be kept hot to be maintained above 140°F. PHF’s left to sit on the steamtable for extended periods at improper temperatures are subject to pathogenic bacterial growth,
which causes foodborne illnesses. Patrons will complain if the hot food they ordered is not served hot, for food safety as well as taste appeal.

Category 2: Food Protection

5. Adulteration/VC&D  Point Value: 11

CURFFL and the Sherman Food and Drug Law requires all food to be pure and free from any contaminants and adulterants. Contaminants may include physical objects, such as foreign objects, chemicals, and microbiological organisms. Any of these contaminants are cause for a complaint, especially when finding a Band-Aid in your sandwich, a strong chemical taste in your cola, or a cockroach in your salad. Both CURFFL and Sherman Food and Drug Law provides the Environmental Health Specialist the authority to condemn, and embargo food on the spot so it may be discarded in a proper manner so it does not pose a health risk to any other patron.

6. Preparation/Service  Point Value: 3

CURFFL requires all food to be prepared and served in a safe and wholesome manner. Potentially hazardous food must be prepared in a diligent manner so that it is not left out in the danger zone between 40°F. and 140°F. for more than 4
hours total for all food handling, preparation, cooling, reheating and service. Cross contamination of raw meat and raw produce could easily cause pathogens to grow on foods that lack a final "kill" step, such as cooking, as salads are served fresh. Many foodborne illness complaints originate from violations of this item, as it carries a great potential to cause bacteria to grow and multiply.

7. Storage/Display  
   Point Value: 3

CURFFL requires all food to be stored at least 6 inches above the floor, and displayed so as to protect the food from adulteration and contaminants. Complaints regarding salad bars fit into this category for proper height and placement of sneeze guards to protect patrons from others sneezing, coughing, or spitting on the remaining food in the salad bar.

8. Labeling/Signs/Advertising  
   Point Value: 3

Most violations in this section are enforced in the Sherman Food and Drug Law relating to "Truth in Menu". Foods must be properly labeled as to their common name, their list of ingredients, location where manufactured, and correct weight of product. The food product must be as claimed, a restaurant cannot use pasteurized processed cheese food product in lieu of a real cheese slice, if the menu states
they sell "cheeseburgers", or use imitation crab unless the menu states the less expensive substitution, such as spelling the product "Krab". All food facilities that offer raw oysters must post a sign warning patrons of the health risks of consuming raw oysters, especially to immuno-compromised individuals.

Category 3: Disease Transmission

9. **Employee Health/Handwash**  
   **Point Value:** 5

CURFFL requires all employees to thoroughly wash their hands before and after specific food handling activities to prevent cross contamination from foods and their human bodies. Employees are not permitted to smoke in the food facility. Employees must be free from communicable diseases, and may be excluded from working in the facility until cleared by a physician. CURFFL states that all employees shall wear hairnets, caps, or other suitable coverings to confine all hair. Patrons complain when employees have soiled hands and proceed to make their sandwich, the bartender puts down his cigarette to mix a drink, or when the employee doesn’t have hair confinement, and they find a hair in their soup. Employees will complain about their co-workers when they suspect one may have a communicable disease they are afraid of contracting.
10. Vectors/Animals/Unauth. Use  Point Value: 3

CURFFL requires a food facility to be constructed, equipped, maintained, and operated as to prevent the entrance and harborage of animals, birds, and vermin, such as rodents and insects. If evidence of mice, rats, cockroaches, or other vermin are observed, the food facility shall contract with a Certified Pest Control Operator (PCO) to control and eradicate the problem via sanitation of the facility, apply approved pesticides, and use exclusionary methods so the vermin cannot return, such as sealing up all open holes to prevent the vermin's entrance. Patrons quickly complain when they see a cockroach crawl across a wall, flies droning around the front door, or a mouse run along the dining room floor.

Category 4: Equipment/Utensils

11. Wash/Sanitize Equipment Point Value: 8

CURFFL requires all multiservice utensils, such as dishes and glasses to be sanitized with chlorine or a quaternary ammonia compound in specific concentrations to reduce the bacteria load. If dishware is not sanitized, there is a potential to infect others with communicable diseases, such as Hepatitis A. Patrons will complain if they see lipstick on their drinking glass, and it's not their color.
12. Equipment/Utensil Condition Point Value: 5

CURFFL requires all utensils, food preparation equipment, refrigeration units, sinks, and dishwashing machines used in the preparation, sale, service, and display of food to be made of nontoxic, non-corrosive materials, and to be constructed, installed, and maintained as to be easily cleaned and in good repair. If fryer baskets are old, brittle, and frayed, small fragments of wire may break off into the basket of french fries, causing a consumer complaint of metal shards in their french fries.

13. Storage Condition/Cleanliness Point Value: 3

CURFFL requires the facility and the storeroom to be kept clean, fully operative, and in good repair. The storeroom shall be maintained clean and organized, and free of unused equipment which may become a location for rodent or insect harborage. Patrons complain when they see the restaurant in an unkempt state, which often indicates the condition of the storage area.

Category 5: Premises/Other

14. Hazards Point Value: 3

CURFFL requires all poisons and chemicals to be stored separate from food for protection from contamination. Also, unsafe electrical wires and units must be repaired in
accordance with building and safety standards. Employees will complain about their food facility regarding unsafe working conditions.

15. Floor/Ceiling/Walls Point Value: 5

CURFFL requires all surfaces of the facility to be maintained clean and in good repair. Grease allowed to accumulate on the floor under a fryer, or food splashed on a wall is an invitation for cockroaches. Customers will complain about the insanitary condition of the restaurant.

16. Plumbing/Sinks/Cross Conn. Point Value: 5

CURFFL requires all plumbing and sinks be installed and maintained so as to prevent any contamination and shall be kept clean, fully operative, and in good repair. An adequate number and type of sinks are required to wash utensils, wash vegetables, wash hands, and wash dirty mops in the food facility without cross contamination. An employee may complain about a leaky faucet, or a broken hot water heater that won’t provide hot water for utensil and handwashing. Hot water is a necessary element for a food facility to operate.

17. Lighting Point Value: 3

CURFFL requires adequate lighting to clean the facility. Also, lights over open food must be protected from breakage.
and glass falling into the food. Patrons would complain about glass in their food and could receive severe injuries if eaten.

18. Liquid/Solid Waste  Point Value:  5
CURFFL requires all liquid waste to be disposed of through the plumbing system into the sewage disposal system. If a floor sink is backing up sewage onto the floor of the restaurant, the opportunities for splashing from walking through the wastewater is serious. This is cause for an immediate closure of the facility due to an imminent health hazard of raw sewage. Complaints would follow from employees and patrons about the odors, as well as resulting foodborne illnesses.

CURFFL requires each food facility to dispose of all waste materials in tied plastic trash bags to go into a dumpster. If the dumpster is not sanitary, complaints about fly breeding and odors will result.

19. Restroom/Dressing Room  Point Value:  4
The County of San Bernardino County Code (local ordinances) requires two public restrooms for public eating places (PEP’s) with dining rooms larger that 300 square feet, or all establishments that sell open alcohol. Patrons will complain if the restrooms are closed due to repair, or if
they cannot obtain access to the restroom, as a food facility cannot operate without restrooms.

20. Exhaust/Ventilation System

Point Value: 4

CURFFL requires ventilation to remove toxic gases, heat, grease, vapors, and smoke from the food establishment, as well as a reasonable condition of comfort for the employees. Employees complain when their work environment becomes too hot to tolerate.

21. Worker Certification/Permit

Point Value: 7

The County of San Bernardino County Code requires all food workers to obtain food handler cards, called FIRST cards, and attend training regarding personal hygiene, how bacterial growth is related to improper food temperatures, proper food handling techniques, and the importance of sanitation. Also, the food facility cannot operate without a valid health permit. Employees complain when other staff has not gotten a food handler’s card.

Data Collection Procedures and Data Analysis

One hundred and seven (107) food facility master files from the main office of the County of San Bernardino, Division of Environmental Health, Food Program were
utilized for data collection. All initial inspections (01's), reinspections (03's), legal action of closure (054's), and complaints (04's) of the random seed sample population during 1996 through 1998 were entered into the computer. Any confidential information on the complaint form was blacked out to protect the confidentiality of the complainant.

The software program utilized was the Microsoft 1997 Access data analysis and worksheet program, which was utilized to create fields and records of data collected from the OIR's. Five hundred eighty six (586) records of these OIR inspections were entered into the database program. Later, it was determined that reinspections (03's) were not necessary data to be entered, as they are an unscored inspection and would not have value in statistical analysis, so this 03 data was deleted from the system, leaving 484 records of initial inspections (01's), and complaint inspections (04's). After the 484 records were corrected for accuracy, the records from the Microsoft 1997 Access program was transferred to another computer software program titled SPSS, which is a "Statistical Package for the Social Sciences".
The fields from the OIR entered in the Access Program included:

EstNumb - Establishment number is a specific computer generated number assigned to each food facility.

NameEst - Establishment name is the name of the food facility whose records were sampled.

Date - This is the date that the food facility inspection was performed.

REHS - This is the initials of the inspector who performed the specific inspection.

Service - This is the code of the type of inspection performed, such as initial (01), reinspection (03), complaint (04), and legal action (054).

PgmElem - This is the program element associated with the size of the food facility, such as a 1623 has 0-24 seats for patrons in the facility.

FdTemp1 through Wcard 21 - These are the 21 Health and Safety violations listed previously that make up the point score with deductions beginning from 100 points.

Score - The point score that starts with 100 points and then deductions are made from the violation list of 21 items.
TypeFd - This is the type of food facility being inspected, such as American, American-fast food, American-deli, Mexican, Mexican-fast food, Asian, Pizza, or Italian.

EstStat - This is the status of the food facility, such as no reinspection required, a reinspection is required, or legal action taken.

ComplType - This is the type of complaint that was investigated at the facility, if there was a complaint at the site. Examples include poor food handling, food problems, vector, or foodborne illness investigation. If no complaint was noted, the field was left blank.
CHAPTER IV RESULTS

Results, Tables and Figures

Four hundred eighty four (484) records were analyzed from the Access and SPSS software programs. Three hundred ninety three (393) records or 81.2% were initial (01) inspections, and 91 records or 18.8% were complaints and closures. The mean score of the 393 initial inspections was 75.36 out of 100 possible points, or 75.36%, with a standard deviation of 13.35.

The scores of initial inspections ranged from a low of 12% to a high of a perfect score of 100%. The mean score of the 394 initial inspections was 75.17%, with a standard deviation of 13.86. One inspection report was coded improperly and when found in the analysis was changed to the correct service code.

<table>
<thead>
<tr>
<th>INITIAL INSPECTIONS AND COMPLAINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL INSPECTIONS</td>
</tr>
<tr>
<td>INITIAL COMPLAINS + CLOSURE TOTAL</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>SCORE SERVICE</td>
</tr>
<tr>
<td>393</td>
</tr>
</tbody>
</table>

TABLE 1. Counts of Initial Inspections and Complaints
MEAN SCORE OF INITIAL INSPECTIONS

<table>
<thead>
<tr>
<th>SCORE</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Inspection</td>
<td>75.36</td>
<td>393</td>
<td>13.35</td>
</tr>
<tr>
<td>Total</td>
<td>75.36</td>
<td>393</td>
<td>13.35</td>
</tr>
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</table>

TABLE 2. Mean Score of Initial Inspections

The service codes were divided into three categories of initial (01), complaint (04), and legal action of closure (054). There were 394 initial inspections (01’s), which was 81.4% of the total sample. There were 82 complaints (04’s), which was 16.9% of the total sample, and 8 legal actions of closure (054), which was 1.7% of the total sample.

<table>
<thead>
<tr>
<th>SERVICE</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Initial Inspection</td>
<td>394</td>
<td>81.4</td>
<td>81.4</td>
<td>81.4</td>
</tr>
<tr>
<td>Complaint</td>
<td>82</td>
<td>16.9</td>
<td>16.9</td>
<td>98.3</td>
</tr>
<tr>
<td>Closure</td>
<td>8</td>
<td>1.7</td>
<td>1.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE 3. Frequency of each Type of Service Codes
A t-test was run on the group statistics of service codes of initial inspections (01's) and initial plus complaint (05's). Scored inspections (01's) were then subdivided into two categories, scored initial inspections alone (01's), and scored initial inspections occurring in conjuncture with complaints (05's).

The first sample contained 372 scored initial inspections (01's) performed with no complaint on that date, with the mean score of 75.71 points out of 100, or 75%, with a standard deviation of 13.23, and a standard error mean of 0.69.

The second sample contained 21 inspections that were performed in conjunction with a complaint investigation (initial plus complaint, 05). The mean score was 69.14 points out of 100, or 69%, with a standard deviation of 14.25, and a standard error mean of 3.11.
Independent Samples Test

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>SCORE</td>
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<td></td>
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<tr>
<td>Equal variances assumed</td>
<td>621</td>
<td>.431</td>
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<tr>
<td>Equal variances not assumed</td>
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</table>

TABLE 4. T-test of Differences of Means

Group Statistics

<table>
<thead>
<tr>
<th>SERVICE</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORE</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Initial Inspection</td>
<td>372</td>
<td>75.71</td>
<td>13.23</td>
<td>.69</td>
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<tr>
<td>Initial Plus Complaint</td>
<td>21</td>
<td>69.14</td>
<td>14.25</td>
<td>3.11</td>
</tr>
</tbody>
</table>

TABLE 5. Mean Scores of Initial Inspections and Initial Plus Complaint.
SERVICE

FIGURE 1. Mean Score of Initial Inspections and Initial Plus Complaint.

Mean scores were then compared with the types of complaints that occurred with initial inspections (05's, initial plus complaint). All other complaints were not accompanied by a scored inspection, so no numeric data of this type could be generated with those inspections. There were a total of 21 complaints in the category of initial plus complaint (05). There was one (1) scored inspection
with a complaint involving chemicals in the food, with the mean score of 84%. One (1) scored inspection with a complaint involved dirty restrooms, with a mean score of 77%. There were nine (9) scored inspections with complaints alleging foodborne illness, which resulted in the mean score of 75.11% and a standard deviation of 13.65. There was one (1) scored inspection with a complaint involving handling money with food, which had a mean score of 74%. There were four (4) scored inspections with complaints regarding various food problems. The mean score was 64.25% with a standard deviation of 11.81. The lowest mean scores involved five (5) scored inspections with complaints regarding vector concerns. The mean score was 56.80%, with a standard deviation of 12.91.
INITIAL PLUS COMPLAINTS
SCORE VERSUS TYPE OF
COMPLAINT

<table>
<thead>
<tr>
<th>COMPLAINT</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C= CHEMICAL IN FOOD</td>
<td>Mean 84.00&lt;br&gt;N 1&lt;br&gt;Std. Deviation .</td>
</tr>
<tr>
<td>C= DIRTY RR</td>
<td>Mean 77.00&lt;br&gt;N 1&lt;br&gt;Std. Deviation .</td>
</tr>
<tr>
<td>C= FBI</td>
<td>Mean 75.11&lt;br&gt;N 9&lt;br&gt;Std. Deviation 13.65</td>
</tr>
<tr>
<td>C= FOOD PROBLEMS</td>
<td>Mean 64.25&lt;br&gt;N 4&lt;br&gt;Std. Deviation 11.81</td>
</tr>
<tr>
<td>C= HANDLING MONEY WITH FOOD</td>
<td>Mean 74.00&lt;br&gt;N 1&lt;br&gt;Std. Deviation .</td>
</tr>
<tr>
<td>C= VECTOR</td>
<td>Mean 56.80&lt;br&gt;N 5&lt;br&gt;Std. Deviation 12.91</td>
</tr>
<tr>
<td>INITIAL WITH NO COMPLAINT</td>
<td>Mean 75.71&lt;br&gt;N 372&lt;br&gt;Std. Deviation 13.23</td>
</tr>
<tr>
<td>Total</td>
<td>Mean 75.36&lt;br&gt;N 393&lt;br&gt;Std. Deviation 13.35</td>
</tr>
</tbody>
</table>

TABLE 6. Initial Plus Complaint Score Versus Type of Complaint

Twenty (20) different types of consumer complaints were identified of the 82 complaints in the sample. Some
complaints had multiple reasons for the complaint, such as handling money with food, and dirty restroom, but were only counted as one complaint investigation. The types of complaints found included:

- Chemical in food,
- Dirty dishes,
- Dirty restaurant,
- Dirty restroom,
- Food problems*,
- Food worker communicable disease,
- Foodborne illness,
- Hair in food,
- Handling money with food,
- Illegal food source,
- Illegal or improper ventilation,
- No access to restroom,
- No employee handwashing,
- No food handler cards,
- No hair confinement,
- Poor employee practices,
- Poor food handling,
• Poor sanitation,
• Reuse of food, and
• Vector.

*The combined category titled food problems included:

• Foreign objects in food,
• Adulterated food,
• Spoiled food,
• Food not hot enough,
• Food not cooked enough,
• Food that tastes bad, and
• Undercooked meat.
FIGURE 2. Mean Score of Initial Plus Complaint Versus Type of Complaint

(X = Initial inspections without complaints.)

Mean food facility scores were compared with each type of food service. The food service categories were grouped as American, American-deli, American-fast food, Asian, Italian, Mexican, Mexican-fast food, and Pizza food service. Twenty OIR’s were categorized as American-deli food service, which scored the highest with 78.70%, and a standard deviation of 10.78. The next highest mean scores occurred with 178 OIR’s in the category of American food
service, which resulted in a mean score of 77.59%, and a standard deviation of 12.59. The third highest scores were from 43 OIR’s in the American-fast food category, with a mean score of 77.53%, and a standard deviation of 11.28. The fourth highest scores were from 43 OIR’s in the Pizza category, with a mean score of 75.35%, and a standard deviation of 9.99. The fifth lowest scores were from 48 OIR’s in the Mexican food category, with a mean score of 75.04%, and a standard deviation of 11.54. The sixth lowest scores were from 15 OIR’s in the Mexican-fast food category, with a mean score of 73.73%, and a standard deviation of 16.86. The next to the lowest scores were from 7 OIR’s from the Italian food category, with a mean score of 71%, and a standard deviation of 16.28. The poorest scores occurred in 39 OIR’s from the Asian food category, with an extremely low mean score of 62.87%, and a standard deviation of 16.89.
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM-DELI</td>
<td>78.70</td>
<td>20</td>
<td>10.18</td>
</tr>
<tr>
<td>AM-FAST</td>
<td>77.53</td>
<td>43</td>
<td>11.28</td>
</tr>
<tr>
<td>AM</td>
<td>77.59</td>
<td>178</td>
<td>12.59</td>
</tr>
<tr>
<td>ASIAN</td>
<td>62.87</td>
<td>39</td>
<td>16.89</td>
</tr>
<tr>
<td>ITALIAN</td>
<td>71.00</td>
<td>7</td>
<td>16.28</td>
</tr>
<tr>
<td>MEX-FAST</td>
<td>73.73</td>
<td>15</td>
<td>16.86</td>
</tr>
<tr>
<td>MEX</td>
<td>75.04</td>
<td>48</td>
<td>11.54</td>
</tr>
<tr>
<td>PIZZA</td>
<td>75.35</td>
<td>43</td>
<td>9.99</td>
</tr>
<tr>
<td>Total</td>
<td>75.36</td>
<td>393</td>
<td>13.35</td>
</tr>
</tbody>
</table>

Table 7. Mean Score of Specific Types of Food Service
FIGURE 3. Mean Score of Initial Inspections Versus Specific Types of Food Service
Scores were then compared with the status of the inspection of the food facility, such as whether or not a reinspection was required. The sample resulted in 221 inspections that did not require reinspections, with a mean score of 82.96%, and a standard deviation of 7.54. The mean score of 171 inspections that did require a reinspection was 65.52%, with a standard deviation of 12.83.
### TABLE 8. Mean Score Versus Status of Food Facility

<table>
<thead>
<tr>
<th>STATUS</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO REINSPI</td>
<td>82.96</td>
<td>221</td>
<td>7.54</td>
</tr>
<tr>
<td>REINSPI</td>
<td>65.52</td>
<td>171</td>
<td>12.83</td>
</tr>
<tr>
<td>Total</td>
<td>75.36</td>
<td>393</td>
<td>13.35</td>
</tr>
</tbody>
</table>

### FIGURE 5. Mean Score Versus Status of Food Facility
The mean score was then compared by each inspector. The highest mean score was 87% which was one (1) scored inspection by DL. The next highest mean score was 86% with 3 inspections by PB, with a standard deviation of 5.29. The second lowest mean score of 66.39% involved 90 inspections done by MK, with a standard deviation of 12.78. The poorest mean score was 50.83% involving 8 inspections performed by VS, with a standard deviation of 9.10.
<table>
<thead>
<tr>
<th>SCORE * INSPECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>DA</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>DL</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>El</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>JB</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>JN</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>MK</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>PB</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>RC</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>RM</td>
</tr>
<tr>
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</tr>
<tr>
<td>VS</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**TABLE 9. Mean Score of Initial Inspections per Inspector**
FIGURE 6. Mean Score of Initial Inspections per Inspector
The program elements, which determine the size of the food facility by seating capacity were summarized to determine the frequency of each category and cross tabulated with the service codes to subdivide the three codes of 01's, 04', and 054's.
## TABLE 10. Frequency of each Category Size of Program Element

The 1623 category, which was the smallest seating category of 0-24 seats, had 169 inspections, which was the highest number of total facilities at 34.9%. The service codes in the 1623 category were subdivided to report 151 initial inspections, which was 38.3% of the 1623’s, 17 complaints, which was 20.7% of the 1623’s, and 1 closure for 12.5% of the total 1623’s.

The 1624 category has a 25-59 seating capacity, and had 113 initial inspections, which was 28.7% of the total, had 15 complaints, which was 18.3% of the total inspections. It had 2 closures, which was 25% of the total of 130 inspections in the 1624 category, and represented 26.9% of the total inspections.

<table>
<thead>
<tr>
<th>PROGRAM ELEMENT</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid 1623</td>
<td>169</td>
<td>34.9</td>
<td>34.9</td>
<td>34.9</td>
</tr>
<tr>
<td>1624</td>
<td>130</td>
<td>26.9</td>
<td>26.9</td>
<td>61.8</td>
</tr>
<tr>
<td>1625</td>
<td>87</td>
<td>18.0</td>
<td>18.0</td>
<td>79.8</td>
</tr>
<tr>
<td>1626</td>
<td>36</td>
<td>7.4</td>
<td>7.4</td>
<td>87.2</td>
</tr>
<tr>
<td>1627</td>
<td>62</td>
<td>12.8</td>
<td>12.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The 1625 category has a seating capacity of 60-99 seats, and had 70 initial inspections, which was 17.8% of the total inspections, had 16 complaints, which was 19.5% of the total. It also had 1 closure, which was 12.5% of the total 87 inspections in the 1625 category and represented 18% of all the inspections.

The 1626 category has a 100-149 seating capacity, with 23 initial inspections, which was 5.8% of the total and 12 complaints, which was 14.6% of the total. It also had 1 closure, which was 12.5% of the total of 36 inspections, which represented 7.4% of the total inspections.

The 1627 category has 150 plus seating capacity, with 37 initial inspections, which was 9.4% of the total, and 22 complaints, which was 26.8% of the total inspections. It also had 3 closures, which was 37.5% of the total closures, for a total of 62 inspections, which represented a total of 12.8% of the inspections.
<table>
<thead>
<tr>
<th>PROGRAM ELEMENT</th>
<th>Count</th>
<th>Initial Inspection</th>
<th>Complaint</th>
<th>Closure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGRAM ELEMENT 1623</td>
<td>Count</td>
<td>151</td>
<td>17</td>
<td>1</td>
<td>169</td>
</tr>
<tr>
<td>% within SERVICE</td>
<td>38.3%</td>
<td>20.7%</td>
<td>12.5%</td>
<td>34.9%</td>
<td></td>
</tr>
<tr>
<td>PROGRAM ELEMENT 1624</td>
<td>Count</td>
<td>113</td>
<td>15</td>
<td>2</td>
<td>130</td>
</tr>
<tr>
<td>% within SERVICE</td>
<td>28.7%</td>
<td>18.3%</td>
<td>25.0%</td>
<td>26.9%</td>
<td></td>
</tr>
<tr>
<td>PROGRAM ELEMENT 1625</td>
<td>Count</td>
<td>70</td>
<td>16</td>
<td>1</td>
<td>87</td>
</tr>
<tr>
<td>% within SERVICE</td>
<td>17.8%</td>
<td>19.5%</td>
<td>12.5%</td>
<td>18.0%</td>
<td></td>
</tr>
<tr>
<td>PROGRAM ELEMENT 1626</td>
<td>Count</td>
<td>23</td>
<td>12</td>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>% within SERVICE</td>
<td>5.8%</td>
<td>14.6%</td>
<td>12.5%</td>
<td>7.4%</td>
<td></td>
</tr>
<tr>
<td>PROGRAM ELEMENT 1627</td>
<td>Count</td>
<td>37</td>
<td>22</td>
<td>3</td>
<td>62</td>
</tr>
<tr>
<td>% within SERVICE</td>
<td>9.4%</td>
<td>26.8%</td>
<td>37.5%</td>
<td>12.8%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>394</td>
<td>82</td>
<td>8</td>
<td>484</td>
</tr>
<tr>
<td>% within SERVICE</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 11. Breakdown of Service Codes per each Category

Size of Program Element

106
FIGURE 8. Mean Number of Violations per each Category Size of Program Element
FIGURE 9. Mean Score of Initial Inspections per each Category Size of Program Element

The OIR violation items numbered 1 through 21 were summarized to determine which violations occurred more frequently than others did. There were a total of 2053 individual violations cited in the 389 valid cases of initial inspections. The 6 most often cited violations that were found will be discussed. The violation most often cited was #12-Equipment Condition. This item was cited in 285 initial inspections, which resulted in 13.9% of the total responses, and occurred in 73.3% of the cases.
The second most commonly cited item was #15-Floor/Ceiling/Walls, which was cited in 282 initial inspections, which accounted for 13.7% of the responses, and occurred in 72.5% of the cases. The third most frequently cited item was #16-Plumbing/Sinks/Cross Connections. This was cited in 201 initial inspections, which was 9.8% of the responses, and occurred in 51.7% of the cases. The fourth most often cited violation was #19-Restroom/Dressing Room. This item was cited in 168 initial inspections, which was 8.2% of the responses, and occurred in 43.2% of the cases. The fifth most frequently cited violation was #9-Employee Habits/Health/Handwashing. This was cited in 111 initial inspections, which was 5.4% of the responses, and occurred in 28.5% of the cases. The sixth most commonly cited violation was #3-Thermometer, which was cited in 106 initial inspections and resulted in 5.2% of the responses, and occurred in 28.5% of the cases.
Official Inspection Report #1-#21 Item Group Violations

(Value tabulated = 1)

<table>
<thead>
<tr>
<th>Name</th>
<th>Count</th>
<th>Responses</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. FOODTEMP</td>
<td>70</td>
<td>3.4</td>
<td>18.0</td>
</tr>
<tr>
<td>2. REFRIG/FREEZER</td>
<td>93</td>
<td>4.5</td>
<td>23.9</td>
</tr>
<tr>
<td>3. THERMOMETER</td>
<td>106</td>
<td>5.2</td>
<td>27.2</td>
</tr>
<tr>
<td>4. STEAMTABLE</td>
<td>16</td>
<td>0.8</td>
<td>4.1</td>
</tr>
<tr>
<td>5. VC&amp;DESTROY</td>
<td>40</td>
<td>1.9</td>
<td>10.3</td>
</tr>
<tr>
<td>6. PREP/SERVICE</td>
<td>49</td>
<td>2.4</td>
<td>12.6</td>
</tr>
<tr>
<td>7. STORAGE</td>
<td>96</td>
<td>4.7</td>
<td>24.7</td>
</tr>
<tr>
<td>8. LABEL/SIGNS</td>
<td>16</td>
<td>0.8</td>
<td>4.1</td>
</tr>
<tr>
<td>9. EMP.HANDWASH</td>
<td>111</td>
<td>5.4</td>
<td>28.5</td>
</tr>
<tr>
<td>10. VECTOR</td>
<td>81</td>
<td>3.9</td>
<td>20.8</td>
</tr>
<tr>
<td>11. WASH/SANITIZE</td>
<td>36</td>
<td>1.8</td>
<td>9.3</td>
</tr>
<tr>
<td>12. EQUIP/CONDITION</td>
<td>285</td>
<td>13.9</td>
<td>73.3</td>
</tr>
<tr>
<td>13. STORAGE/CONDITION</td>
<td>81</td>
<td>3.9</td>
<td>20.8</td>
</tr>
<tr>
<td>14. HAZARDS</td>
<td>53</td>
<td>2.6</td>
<td>13.6</td>
</tr>
<tr>
<td>15. FLOOR/WALLS</td>
<td>282</td>
<td>13.7</td>
<td>72.5</td>
</tr>
<tr>
<td>16. PLUMBING</td>
<td>201</td>
<td>9.8</td>
<td>51.7</td>
</tr>
<tr>
<td>17. LIGHTING</td>
<td>75</td>
<td>3.7</td>
<td>19.3</td>
</tr>
<tr>
<td>18. WASTE</td>
<td>43</td>
<td>2.1</td>
<td>11.1</td>
</tr>
<tr>
<td>19. RESTROOM</td>
<td>168</td>
<td>8.2</td>
<td>43.2</td>
</tr>
<tr>
<td>20. EXHAUST/VENT</td>
<td>67</td>
<td>3.3</td>
<td>17.2</td>
</tr>
<tr>
<td>21. WORKERCARD/PERMIT</td>
<td>84</td>
<td>4.1</td>
<td>21.6</td>
</tr>
</tbody>
</table>

Total Responses 2053 100.0 527.8

(95 missing cases; 389 valid cases)
(Missing cases consisted of non-scored complaints and closures)

TABLE 12. Summary of OIR Items # 1-21 Violation Responses
CHAPTER V DISCUSSION

Principal Findings and Interpretation of Results

The hypothesis that food facilities which receive consumer complaints scored lower than food facilities which don’t receive complaints was supported when the mean scores were calculated (see Table 5 and Figure 1). The mean score was 75.71% for the sample of initial inspections (01’s) that did not receive any complaints. The mean score was 69.14% for those food facilities that did receive one or more consumer complaints (05’s, Initial Plus Complaint). The difference in these two mean scores supports the hypothesis that food facilities that receive consumer complaints do, in fact, score lower than food facilities without complaints (see Figure 1 for this data); therefore, the continued use of complaint records as a valid measure of food quality across the county is justified.

The mean score of the 394 initial inspections was 75.17%, which resulted from a range of 12 to 100% scores on the OIR’s. Table 3 addresses the frequency of the types of inspections. This mean score could indicate a “C” letter grade if San Bernardino County, Division of Environmental Health posted grades, however, this county deducts heavily
for high-risk type food violations, which may account for the 75.17% mean score on OIR's. It was interesting to find that of the 484 total inspections, there were 82 complaint investigations, or 16.9% of the entire number of inspections. This indicates that one of every six inspections were initiated by a consumer complaint.

Of the 21 complaints that accompanied initial inspections, 9 were alleged foodborne illnesses, 5 were concerning vectors, and 4 were various food related problems. The highest number of complaints were involving foodborne illnesses. Perhaps because of the nature of the complaint, these inspections were scored (see Table 6 for this data).

The mean score of the 21 complaints ranged from a low of 56.80% for vector issues, and 64.25% for food related problems, up to a score of 84% for a complaint of chemicals in the food, with a mean of all complaints scoring 69.14%. It is possible that the lower scores indicated the complaint may have been valid, and may also have been the cause to identify other problems in the food facility, thus further lowering the score even more.

Figure 2 compares the mean score with the type of complaint and also with "X", which was the mean score of
initial inspections without complaints, to show the comparative difference. Scores of vector issues and food related problems were exceptionally low, indicating that these types of complaints promulgated the identification of other violations to markedly lower the score.

Mean food facility scores were compared with the 8 types of food service identified in Table 7 and Figure 3. It was interesting to find that the 3 American type food service scored the highest mean, with American-deli at 78.70%, American food service at 77.59% and American-fast food at 77.53%. The poorest scores by far were the Asian food facilities, with a low mean score of 62.87%. Asian food facilities may score so poorly due to a cultural difference in their food handling practices. Perhaps more education regarding the public health implications of poor food handling and sanitation on the part of the inspector could increase their knowledge of acceptable food handling practices to reduce potential complaints, foodborne illnesses, and increase scores.

This philosophy is addressed in Figure 4 that relates the mean number of violations with the 8 types of food service. Asian food service had the greatest mean number of violations at 5.3 per inspection. Mexican food was the
second poorest with a mean of 5 violations per inspections. Cultural and language barriers need to be overcome so the issues of proper food handling and sanitation can be understood and corrected on a regular basis.

Mean scores were then compared with whether or not a reinspection was required on the initial inspection. Table 8 compares the mean scores with the status of the facility. The first box contained one OIR regarding a closure, with a mean score of 77%. Since there was not sufficient data for comparison, this score was disregarded. It was interesting to find that the mean score of food facilities that did not require a reinspection rated a mean score of 82.96%. This is a fairly high score the inspection standards of San Bernardino County. Of the food facilities that did require one or more reinspections, the mean score was quite low at 65.52%. This indicates that the inspectors are recognizing a problem with the food facilities with lower scores and are returning with revisits to assure the violations are corrected to maintain public health standards. Further studies may be done to research if, in fact, the violations corrected are being maintained, and if not, what education or enforcement may be needed to bring up and maintain these low scoring food facilities to acceptable public health
standards. It would be important to determine what type of monitoring works best to maintain these food facilities with higher scores.

The mean score was then compared by each inspector. Mean scores that contained 3 or less inspections by DL, PB, RC, or RM may not be representative of the true mean scores normally averaged by this inspector due to such a small number of inspections in this region during this time frame. However, the remaining mean scores show quite a variance from inspector to inspector. See Figure 6 for this data. This data may indicate that standardization of inspection scoring techniques may be necessary to reduce the range differential between inspectors. This procedure has been implemented by the department and is on-going to assure uniformity of inspections. Since most of the inspectors changed territorial districts of inspection during the study time frame, and since inspectors may perform complaint investigations outside their district boundaries as needed, the data on types of food service should remain consistent and generalizable.

Figure 7 shows the inverse relationship of mean number of violations relating to each inspector. Those inspectors
who had low mean scores also contained a larger mean number of violations.

The program element was summarized to determine the frequency of each size in the categories, and cross tabulated with the service codes. The 1623 category, which has the least number of seats at 0-24 seating, had the most food facilities in this study with 34.9%. Table 10 shows the breakdown, which may be due to the vast number of fast food restaurants and small "mom and pop" food facilities. The program element 1623 category also contained the second largest number of complaints in the study at 20.7%, as reported in Table 11. This may be due to a large volume of customers being served on a fast high-paced basis, or a lack of food handing knowledge in these facilities with an extremely high young employee turnover rate.

The program element 1627, which has the largest seating capacity of over 150 seats, was the second smallest in the number of food facilities in this study, but had the greatest number of complaints at 22, which was 26.8% of the total complaints, as shown on Table 11. The high number of complaints may be attributed to consumers not obtaining the "perfect" dining experience, poor service, or inappropriate remediation by the management to correct the problem
addressed by the customer. Also, larger facilities with a greater number of seats have a vast amount of customers due to seating capacity alone.

The mean score was compared to the size of the food facilities as categorized by their program element, as shown in Figure 9. The smallest facilities in the 1623 category had the highest mean score, while the largest facilities in the 1627 category had the poorest score. The cause could be due to some smaller facilities having a limited menu, with less opportunity for certain violations to be cited. The reason for the poorest mean score in the 1627 category could be due to larger kitchens with numerous activities, greater number of staff, more complicated menu items, and more food handling procedures like cooling and reheating and hot holding of food to lower mean scores and increase the mean number of violations as shown in Figure 8.

The lists of 21 OIR violations from the 393 valid cases were summarized to determine item frequency. It was interesting to find the six most frequently cited violations were:

1. Equipment/Utensil/Condition (#12)

2. Floors/Ceilings/Walls (#15)
3. Plumbing/Sinks/Cross Connections (#16)
4. Restroom/Dressing Room (#19)
5. Employee Habits/Health/Handwashing (#9), and
6. Thermometers (#3).

The first, second, and fourth most frequently cited violations are directly related to sanitation and cleanliness issues. The third, fifth, and sixth items are violations that can lead directly to a foodborne illness, and are Hazard Analysis Critical Control Point (HACCP) related violations.

The two most frequently cited violations may be due to numerous older food facilities in the city of San Bernardino. They may be difficult to maintain in a clean state, or it may be due to a lack of funding for maintenance and janitorial staff to keep equipment and surfaces clean and in good repair at all times.

Recommendations for Future Research

For further studies, it would be interesting to thoroughly train inspectors in HACCP inspection methods, and then determine if the most often cited violations were more HACCP oriented and different from those observed in
this study. This specific HACCP training may also reduce the numbers of consumer complaints by providing extensive employee training in proper food handling techniques.

Further research may determine if environmental health inspections have an impact on reducing complaints, and if they make any difference in the safety, quality of food, and sanitation of food facilities.

Conclusions

In summary, the hypothesis that food facilities which receive consumer complaints score lower than food facilities that don't receive complaints was supported by this study's data. The sample mean score of food facilities that received complaints was much lower than those food facilities without complaints. This is significant because it may cause local health departments to review their policies on how they handle inspections involving food facilities that receive complaints and determine that a policy change is needed to provide more attention to inspections of food facilities that receive consumer complaints. Also, the knowledge that food facilities with complaints score lower than food facilities
without complaints may influence health departments to increase food handler education at those food facilities with complaints. This increased food handler education may not only decrease the number of consumer complaints, but also improve food handler techniques and inspection scores, and reduce the risk of foodborne illness.
### APPENDIX: Forms

**County of San Bernardino**  
**DEPARTMENT OF PUBLIC HEALTH**  
**Environmental Health Services**

**FOOD PROGRAM OFFICIAL INSPECTION REPORT**

<table>
<thead>
<tr>
<th>ESTABLISHMENT NAME</th>
<th>PHONE</th>
<th>DATE</th>
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<td>MAILING ADDRESS</td>
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<td>REINSPECTION DATE</td>
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<tbody>
<tr>
<td>1. Food Temp./Defrost</td>
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<td>2. Refrigerator/Freezer</td>
<td>3</td>
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<tr>
<td>3. Thermostat</td>
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<tr>
<td>4. Suspending/Resuscitation</td>
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<td>5. Adulteration/VC&amp;D</td>
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<td>6. Prep./Service</td>
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<tr>
<td>7. Storage/Display</td>
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<tr>
<td>8. Labeling/Signs/Adv.</td>
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<tr>
<td>9. Employee Habits/Health/Handwashing</td>
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<tr>
<td>10. Vectors/Animals/Unauthorized Use</td>
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<tr>
<td>11. Wash/Sanitize Equip.</td>
<td>8</td>
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<tr>
<td>12. Equip./Utensils/Cond.</td>
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<tr>
<td>13. Storage Condition/Cleanliness</td>
<td>3</td>
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<td>14. Hazards</td>
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<tr>
<td>15. Floor/Ceiling/Walls</td>
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<tr>
<td>16. Plumbing/Sinks/Cross Connections</td>
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<td>17. Lighting</td>
<td>3</td>
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<tr>
<td>18. Liquid/Solid Waste</td>
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<tr>
<td>19. Restroom/Dressing Room</td>
<td>4</td>
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<tr>
<td>20. Exhaust/Vent. System</td>
<td>4</td>
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<tr>
<td>21. Worker Certification/Permit</td>
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</table>

**The following items represent Health Code violations and must be corrected:**

*Permittee has a right to a hearing if requested in writing within 15 calendar days of receipt of this notice, to show cause why the permit to operate should not be suspended or revoked. Initials of permittee or employee.*
FOOD RELATED ALERT/COMPLAINT RECORD:  
PART 1

<table>
<thead>
<tr>
<th>COMPLAINT NUMBER:</th>
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<table>
<thead>
<tr>
<th>COMPLAINANT:</th>
<th>ADDRESS</th>
<th>PHONE NUMBER:</th>
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<tbody>
<tr>
<td>SUSPECT ESTABLISHMENT:</td>
<td>ADDRESS</td>
<td>PHONE NUMBER:</td>
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<table>
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<tr>
<th>COMPLAINT:</th>
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<table>
<thead>
<tr>
<th>PHONE HOME:</th>
<th>PHONE WORK:</th>
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</table>

<table>
<thead>
<tr>
<th>SUSPECT MEAL DATE/TIME:</th>
<th>DATE</th>
<th>TIME</th>
<th>TAKE OUT</th>
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<table>
<thead>
<tr>
<th>ALL FOODS EATEN AT SUSPECT MEAL:</th>
<th>COMPLETE APPROPRIATE MEAL ON REVERSE SIDE</th>
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<thead>
<tr>
<th>INITIAL SYMPTOM (ONSET):</th>
<th>DATE</th>
<th>TIME</th>
<th>DURATION</th>
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<th>PREDOMINANT SYMPTOM:</th>
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<thead>
<tr>
<th>LAST MEAL EATEN:</th>
<th>DATE</th>
<th>TIME</th>
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<table>
<thead>
<tr>
<th>NO. EATING THE SUSPECT MEAL:</th>
<th>NUMBER ILL:</th>
<th>NUMBER NOT ILL:</th>
<th>SOURCE OF FOOD/ BRAND/LOT #:</th>
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<table>
<thead>
<tr>
<th>DATE/DURATION/SEVERITY PERSON(S) AFFECTED</th>
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<table>
<thead>
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<th>SEVERITY</th>
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<th>NOTE SEVERITY BY:</th>
<th>+, +, +, +, +</th>
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<th>1.</th>
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<td>PHONE:</td>
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<table>
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<tr>
<th>PHYSICIAN CONSULTED</th>
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<tr>
<th>PHYSICIAN'S NAME</th>
<th>PHYSICIAN PHONE #:</th>
<th>HOSPITALIZED OR ER</th>
<th>HOSPITAL NAME</th>
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<table>
<thead>
<tr>
<th>INFORMATION TAKEN BY:</th>
<th>DATE:</th>
<th>TIME:</th>
<th>REVIEWED BY:</th>
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<th>TIME:</th>
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<th>ACTION TAKEN:</th>
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<th>EMAIL</th>
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### Part 2: CASE HISTORY: Food History and Common Sources

<table>
<thead>
<tr>
<th></th>
<th>Day of Illness/Outbreak, Date</th>
<th>Day Before Illness/Outbreak, Date</th>
<th>Two Days Before Illness/Outbreak, Date</th>
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<tbody>
<tr>
<td><strong>Place</strong></td>
<td>Breakfast</td>
<td>Breakfast</td>
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<tr>
<td><strong>Hour</strong></td>
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<tr>
<td><strong>Items</strong></td>
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</tr>
<tr>
<td><strong>Companions</strong></td>
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<td></td>
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<tr>
<td><strong>Place</strong></td>
<td>Lunch</td>
<td>Lunch</td>
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<tr>
<td><strong>Hour</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Items</strong></td>
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<td><strong>Companions</strong></td>
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<td></td>
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</tr>
<tr>
<td><strong>Place</strong></td>
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<td><strong>Items</strong></td>
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<td><strong>Companions</strong></td>
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<tr>
<td><strong>Place</strong></td>
<td>Snacks</td>
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<tr>
<td><strong>Items</strong></td>
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**INVESTIGATOR**

- **Title**
- **Agency**
- **Date**
REFERENCES


Carsberg, H. (1997). Understanding insects is key to controlling them. *Food Quality, 3*(21), 84-85


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