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Abstract

Food safety is critical to the success of restaurants. Yet current methods of controlling foodborne illness are inadequate, including time and temperature control, safe food handling procedures, good employee hygiene, cleaning and sanitizing techniques, and Hazard Analysis and Critical Control Points (HACCP) plan. Several barriers to food safety in restaurants are identified and recommendations for management are suggested.

Keywords

Food Safety, foodborne illness, HACCP, National Food Safety Initiative

Overcoming barriers to restaurant food safety

by David Walczak

Food safety is critical to the success of restaurants. Yet current methods of controlling foodborne illness are inadequate, including time and temperature control, safe food handling procedures, good employee hygiene, cleaning and sanitizing techniques, and a Hazard Analysis and Critical Control Points (HACCP) plan. Several barriers to food safety in restaurants are identified and recommendations for management are suggested.

In 1997, President Clinton launched the National Food Safety Initiative,¹ the purpose of which is to develop a comprehensive, farm-to-fork, science-based strategy to improve the safety of the nation's food supply. The key administration actions suggested by the President are to enhance surveillance and build an early-warning system; to improve responses to foodborne outbreaks; to improve risk assessment; to develop new research methods to identify, prevent, and control pathogens; to improve inspections and compliance; to further food

safety education; and to continue the long-range planning process. These new initiatives complement the multiple strategies already in place designed to combat foodborne illness on the farm during manufacturing, transportation, and importation, as well as in restaurants, supermarkets, and institutional food service.

According to the National Food Safety Initiative, food in restaurants "can become contaminated... through poor food handling practices" during preparation.² Joan Loken claims that "improper handling of food accounts for a large percentage of the problem sources."³ Jane M. Hemminger states "the preparation phase of food production is the major source of foodborne errors." She continues, "This is the place where foods spend the most time and are exposed to the most hazards."⁴

This critical point in the farm-to-fork continuum is while food service managers, culinary instruc-

tors, students, and state regulators are doing their best to ensure food safety in restaurants, they are ill-equipped to win the war. The current efforts used to combat foodborne illness are inadequate.

Controls are used

There are five basic ways in which food service personnel try to prevent customers from getting sick in restaurants: time and temperature control, safe food handling procedures, good employee hygiene, cleaning and sanitizing techniques, and a Hazard Analysis and Critical Control Points (HACCP) plan.

The temperature danger zone is the cornerstone of any food safety program. Specific cooking temperatures are used to kill bacteria such as escherichia coli (e-coli) in beef, salmonellosis in poultry, and trichinosis in pork. According to McSwane, Rue, and Linton, "improper cooling of food is the number one contributing factor that leads to foodborne illness."⁵ Citing Centers for Disease Control (CDC) statistics, they conclude that 40 percent of foodborne illnesses are the result of improper cooling.⁶ Cooks should know that foods must be cooled to 70 degrees Fahrenheit within two hours and that they have four hours to bring the temperature of the food down to the required 41 degrees. Foods must be received, stored, reheated, and held at specified temperatures. An easily calibrated, metal stem thermometer is as important to cooks as a sharp knife.

With reference to safe food handling procedures, the prevention of cross contamination is essential. The transfer of germs from one food item to another usually happens via contaminated hands, equipment, and utensils. To stop cross contamination cooks must clean and sanitize cutting boards and other food contact surfaces after each use, as well as store raw foods below ready-to-eat and cooked foods. To stop chemical contamination, food service workers are required to keep pesticides in clearly marked original containers separated from food by a solid partition, not use excessive quantities of additives and preservatives such as monosodium glutamate (MSG), and cook and store foods in non-galvanized containers.

Copper and aluminum can be toxic when they react with certain foods. Single use, disposable spoons should be used to taste food. Cooks learn the four ways to defrost food and FIFO stock rotation. They wear toques to prevent hair from falling into food and cover a cut or burn with a bandage and wear a latex glove to prevent it from getting lost in the item being prepared.

Proper cleaning is vital

Joan Loken says "infected workers and personal hygiene account for about twenty-five percent of foodborne illness outbreaks."⁷ Employees cannot work with food unless they have a clean bill of health. Good personal

hygiene means employees must learn how and when to wash their hands properly. Their uniforms and aprons must be kept clean and should be worn only in designated areas. Uniforms should not be worn to and from work, and aprons should not be worn to the bathroom.

Proper cleaning and sanitizing techniques are also used to combat the spread of foodborne illness. For example, food personnel are taught not to use side towels or sponges to clean or sanitize knives, cutting boards, and work stations. Times and temperatures necessary to clean and sanitize dishes, eating utensils, tools, and equipment, either manually or mechanically, by using heat or chemicals are well-known and specified in textbooks as well as state and federal food codes. Dishes, tools, and equipment washed by hand must be air-dried.

Hazard Analysis and Critical Control Points (HACCP) is the name of a comprehensive prevention based food safety system. HACCP was developed by the Pillsbury Company in the 1960s for the U. S. space program. Today, federal law requires that all meat and poultry producers must adopt a HACCP system.

Loken argues that HACCP is the cornerstone of a paradigm shift that is occurring at the retail level.⁸ The old food safety paradigm defined a sanitation program according to a 44-point inspection system which included covering and refrigerating all

foods, requiring hair restraints for all food preparation employees, cleaning and sanitizing the physical environment, and monitoring hot and cold temperatures. The new paradigm focuses on HACCP as a food safety system designed to prevent disease. In this system, all foods are cooled rapidly, covered, and then refrigerated. Safe food handling practices and hand washing are critical. Food safety is a continuous, ongoing process.

There are seven steps in the HACCP system. Food service managers must identify the potential food safety hazard and critical control points (CCPs), establish control and monitoring procedures, take corrective actions, keep accurate records, and verify the system is working properly.⁹

Food poisoning is real

In spite of the above efforts, the Centers for Disease Control estimate that 76 million Americans suffer from food poisoning yearly, 325,000 are hospitalized, and 5,000 die. Odds are that one in four people will suffer food poisoning and one in 840 will be hospitalized.¹⁰ According to an ABC News poll, four in 10 people say they worry about contracting food poisoning; 32 percent say they have experienced food illness, and 10 percent know of someone else who has been sickened by food.¹¹

The costs to business can be staggering. The Economic Research Service of the U.S. Department of Agriculture estimates that between \$5.6 and \$9.4 billion a year are

spent on lost productivity costs and medical costs associated with the leading causes of foodborne illness.¹² “The average foodborne outbreak costs an operation upwards of \$100,000. This includes medical charges, lost wages, lost business and lawyers’ fees.”¹³ While preliminary data from the CDC’s Emerging Infections Program Foodborne Diseases Active Surveillance Network (FoodNet) suggest a decrease in the number of foodborne illnesses between 1996 and 1999, clearly, as outlined in the National Food Safety Initiative, more needs to be done to combat this problem.¹⁴

A 1997 study of 14,500 state inspection reports of 5,600 restaurants in Florida conducted by, and reported in, *The Orlando Sentinel* found that there are “thousands of examples (in) many restaurants (which) routinely ignore rules of safe food preparation.”¹⁵ Violations were found to be “widespread and repeated.” Specifically, 43 percent, or 2400 restaurants, “kept food at dangerous temperatures or had inadequate refrigeration equipment,” while 28 percent, or 1,500 restaurants, were cited for employees who practiced poor hygiene. At one particular restaurant, 137 customers were poisoned by food in four separate outbreaks. According to state health department officials, “the restaurant made people sick because workers didn’t follow basic rules of cleanliness.” County health inspectors concluded “lapses in employee

hand washing likely caused each of the four... outbreaks.”

Since 1995, in Palm Beach County, Florida, alone, there have been repeated stories in the newspaper about customers contracting food poisoning because of “a food handling problem,” “improper food temperatures,” and “improper food handling.”¹⁶ Also, as reported in *The Boston Globe*, “some of the city’s most prominent dining establishments and hotels didn’t fare well on surprise health inspections.”¹⁷ One critical violation occurred when a chef failed to wash his hands between preparing separate meals.

Sanitation should be increased

One reason customers continue to get sick in restaurants is because of the narrow microbiological base upon which the war on foodborne illness is currently being fought.¹⁸ Food service managers and supervisors need to start looking beyond this narrow base to include more organizational behavior processes in their arsenal. Shortcuts, trade-offs, informal work norms, fatigue, work stress, working while sick, and organizational culture were all found to lead to sanitation violations.¹⁹

A new study reveals the extent, causes, and consequences of kitchen violence in restaurants rated by Guide Michelin in the eastern region of the United Kingdom.²⁰ Stress, workload surges at peak times, tight specifications, and the need to produce high-quality items efficiently are

among the organizational variables that can lead to such violent behaviors as physical and mental abuse, humiliation, and "tyranny over others." Such violence can lead to "strained relationships, alcoholism and heavy smoking," which "must probably reduce job satisfaction, and increase staff turnover, absenteeism and stress. This may reduce productivity through low morale, but a more serious consequence is the loss of creativity upon which the industry is based."²¹ One can speculate about the extent to which workplace bullying results in food safety blunders, breakdowns, and intentional subterfuge.

While cooks and food service managers know what the textbooks say and the law requires, sometimes the message gets lost in the transition to the shop floor. This is recognized by Kevin Finch, Border Grill's director of operations, who says, "You have to walk the walk... Everybody has a great manual... And it is important to have it in writing. The question is, do they follow it when the restaurant gets busy, or do they cut corners? We struggle to make the manual a reality."²² There are five things management could do to prevent the breakdown in the transition of food safety procedures from theory to reality.²³ Management must pay more than lip service to sanitation, train food handlers properly, provide the time necessary to clean, provide the appropriate supplies, and be its own health inspector.

Concept can be adapted

The fact that HACCP was developed by and for the manufacturing sector of the food industry makes application to the retail segment difficult. However, the federal Food Code says that this is not a problem. With reference to restaurants, the Food Code states that "HACCP is not something limited to food franchises or chains. The concept can be applied by small independents as well as national or regional companies and can be integrated into the recipes and standard operating procedures of any size establishment."²⁴ HACCP can be applied to the retail sector, but there are barriers to implementation not identified in the literature.

While large national and regional chains and franchises may have the resources to adopt the HACCP system, most local chains and small independent restaurants do not. Another obstacle is "the absence of a corporate policy or standard procedures."²⁵ According to Dennis Thayer, the National Restaurant Association's manager of public health and safety, "restaurant operators don't think of standard operating procedures. They think of things they do, like clean and sanitize equipment."²⁶ Because HACCP is relatively new, most chefs and restaurant managers do not know how to develop and implement this food safety system. Even if they did have the knowledge, it is unlikely that small independents and chains have the financial

resources to train all food service personnel in the seven steps necessary to implement HACCP successfully. The high rate of turnover makes HACCP training even more difficult. It is well recognized that training and management follow-through are keys to the successful application of HACCP. However, current efforts to train personnel, even according to the old paradigm previously identified by Loken, are at times neither adequate nor taken seriously.

There are two problems inherent in HACCP that serve as additional barriers to implementation. First, food-handling practices, the major source of foodborne illness in the retail sector, cannot be considered critical control points.³⁰ Critical control points must be easily measured, monitored, and documented. The criteria mostly frequently used for critical limits are time, temperature, humidity, water content and pH level in food, titratable acidity, preservatives, salt concentration, available chlorine, and viscosity. For example, the specific temperature to which food must be cooked to kill bacteria is a critical control point because it can be easily measured, monitored, and documented. However, so much of the handling of food in the retail sector cannot be quantified. How do you easily measure, monitor, and document if food service employees touched their nose, mouth, or skin, or if they or their clothing are contaminated with feces or urine after visiting the bathroom? Under HACCP, safe food handling proce-

dures are considered to be "general operational practices that pose high risk," but they are not critical control points.³⁰ To be sure, there is much that can be quantified in restaurant food preparation, but the difficulties in measuring, monitoring, and documenting safe food handling practices serve as a formidable barrier to HACCP implementation.

Monitoring is difficult

Another problem with HACCP at the retail level is related to the monitoring phase. Once the potential food safety hazards and critical control points are identified and control procedures established, step four is to monitor these procedures. Loken identifies four ways to monitor if the critical control point controls are being followed: "physical measurements (time and temperature logs); visual observations (watching worker practices, inspecting raw materials); sensory evaluations (smelling for off-odors, looking for off-colors, feeling for texture), (and) chemical measurements (pH or acidity)."³¹

Visual and sensory monitoring procedures, the two mostly likely procedures to be used to establish safe food handling practices, are very subjective and open to interpretation. Furthermore, watching worker practices assumes that the observer knows what to look for and makes observations on a fairly continuous basis. While these hurdles may be overcome with serious training, the cost of such training would be prohibitive.

Furthermore, cooks, supervisors, and managers do not just sit around with nothing to do. They usually work side by side with the other cooks and are too busy to make systematic observations on a continuous, or interval, basis, and are often just as guilty as the other cooks of committing food safety violations.³²

While physical and chemical measurements are exact, the problem is that with the exception of the chef's thermometer and test strips which measure the concentration of sanitizer in the third compartment of the sink, they are not readily available at the retail level. Microbiological testing is not effective for monitoring because of its time-consuming nature. Hence, "most monitoring procedures for CCPs will need to be done rapidly because the time frame between food preparation and consumption does not allow for lengthy analytical testing."³³

Even if rapid tests were available, restaurants would have to train individuals in the monitoring technique. They would have to "completely understand the purpose and importance of monitoring, and be unbiased in monitoring and reporting so that monitoring is accurately recorded. The designated individuals must have ready access to the CCP being monitored and to the calibrated instrumentation designated in the HACCP plan."³⁴ The chef would need to become a scientific lab technician before training other cooks to become the same. It

is doubtful that in small independent restaurants or local chains cooks so inclined could be found.

What should managers do?

The first thing restaurant managers need to do is stay the course. The literature is full of information on how to combat foodborne illness. If the latest CDC statistics are accurate, foodborne illness is decreasing, so food managers are doing something right. However, too many people still get sick, are hospitalized, or die from foodborne illness, so there is room for improvement.

Additionally, food service managers need to move beyond the narrow microbiological base upon which the war on foodborne illness is currently being fought to incorporate an understanding of how organizational behaviors can undermine their food safety goals. They need to become sensitive to the many ways textbook knowledge gets lost in the transition to the shop floor. Managers must also implement HACCP, even with its attendant shortcomings and inherent problems and commit the financial resources necessary to train food service personnel thoroughly.

In the near future, restaurant managers and chefs may find available some physical and chemical tools necessary to monitor and verify with scientific certainty the critical control procedures implemented.

One such test is called the Adenosine triphosphate (ATP) bioluminescence cleaning validation

test.³⁵ ATP is designed for on-line, immediate validation of efforts to combat foodborne illness. Every cell in all living things contains adenosine triphosphate. ATP provides a source of energy that powers the cell and ultimately the organization itself. Luciferin, an enzyme derived from fireflies, reacts with ATP and produces light which is easily measured, and can be used to quantify the ATP present on various surfaces. Since food residue usually contains large amounts of ATP, bioluminescence reactions provide a very sensitive, specific way to measure residual contamination and, therefore, cleaning effectiveness. Food residue is a fertile ground for bacteria that can cause both food spoilage and foodborne illness. Therefore, it is essential to know that food residue has successfully been removed from the kitchen.

ATP technology is currently used in food processing plants to instantly detect food residue and microorganisms. However, current ATP systems are too expensive for small food service operations in the retail sector since highly trained personnel must be on hand to use the equipment and interpret the results. Both of these factors make it difficult for retailers to adopt this technology. In South Florida, Health and Food Safety Technology Corporation (HFST) is a new company that plans to offer ATP-type technology services to restaurants at an affordable price.³⁶

While technology may help food service managers fight the war on foodborne illness, it is no

panacea. As Jorge Hernandez reminds us in his article, "The Myth of the Magic Bullet," the fundamentals of food safety—safe food handling, good hygiene, and times and temperatures—will remain the most important weapons.³⁷

Safety remains priority

With so many people still getting sick from foodborne illnesses, food safety will remain a top priority for those on the front line of this battle. In an interview entitled "Visions of the Future," Debi Benedetti, chief administrative officer for Bon Appétit Management Company, makes this point clear: "A major focus will be food safety." She continues, "Our commitment to food preparation and sources should be our No. 1 priority. Every day we employ a work force who (sic) can and does cause grave injury to our guests. Food safety will continue to be 'front page' until we can assure the public that we take it seriously."³⁸

However, it will take more than a serious commitment. Food service managers, chefs, culinary students, and government regulators need to move away from the old food safety paradigm and embrace the new paradigm identified by Loken.

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