#2. FOOD OPERATION SELF-CONTROL HACCP

by O. Peter Snyder, Jr., Ph.D.
Hospitality Institute of Technology and Management

HACCP is not a magic "silver bullet" to make food safe. While HACCP specifies a need for certain control, it will not be effective until our government actually defines food safety limits and standards for all processes. For example:

1. Specifies correct safe and unsafe levels of microbiological pathogens (bacteria, viruses, parasites), chemical agents, and physical object size that can be consumed. There is no "zero." While we can talk about *Listeria monocytogenes*, for instance, being below a measurable level in processed food, there is no control in the raw food that we buy in the market. In terms of the human immune system, "zero" is probably not desirable, because we need to consume correct levels of pathogens to establish and maintain our immune systems. In terms of physical objects, how large can a stone in rice be, for example, and not be a hazard?
2. Specifies correct measurement of process variables. This includes how to measure the degree of the cleaning of fingertips to remove fecal pathogens or the cleaning of cutting boards and knives to certify that they are safe to use. How do we validate the cooking processes in a restaurant as capable of destroying 100,000 (5D) *Salmonella*?
3. Specifies the competencies of local regulatory authorities who are to certify HACCP processes as capable of safe performance. Today, there are no uniform, national competencies for government food inspectors, who are also under HACCP process certifiers.
4. Establishes and assures that once a safety standard is established, everyone uses the same standard for a food process so that there is uniformity throughout the United States. Today, local inspectors can make any control more stringent if they think it is necessary.

The goal of HACCP should be to keep to a safe level the pathogenic agents (microbiological, chemical, and physical) in food as grown, harvested, and delivered to the retail food system, made safe by the cook, and finally, eaten by the consumer.

There are many safe, pasteurized, processed foods today. They are produced by HACCP processes. We can learn from them. These include: pasteurized eggs, pasteurized meat and poultry products, pasteurized milk, and acidified foods such as salad dressings. All that is needed are correct, tested, minimum safe process standards. Designing a food process to produce safe food is not new technology. It was done long before the term, "HACCP," was invented.

NACMCF HACCP System Principles

The following are the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) components of a HACCP program.

Initiation

1. Assemble the HACCP team.
2. Describe the food and its distribution.
3. Identify intended use and consumers of the food.

4. Develop flow diagrams.
5. Verify flow diagrams.

Principle 1
Conduct a hazard analysis.

Principle 2
Identify the critical control point (CCP) in the process.

Principle 3
Establish critical limits for the prevention measure at the CCP.

Principle 4
Establish CCP monitoring and how to adjust the process to maintain control.

Principle 5
Establish corrective action to be taken when monitoring indicates that there is a deviation from a critical limit.

Principle 6
Establish effective record keeping that documents the HACCP process.

Principle 7
Establish procedures that verify that the HACCP system is working correctly.

These principles are incomplete. Let me explain.

Risk Management is the Goal

Risks are present in raw food. Management and employees carrying out management's rules are the only effective controls. Scientists often say that: *risk = likelihood of an occurrence x severity*. This does not include behavioral control or management effectiveness. Risk management begins with government regulations and guidelines. If they are incomplete, the industry must find correct controls, as is mostly the case with the retail food government regulations. Today, a major problem with government regulations is that they do not describe how to measure risk in the operation. Risk in the operation includes the element of management. The retail food code says nothing about measuring the degree of management control of a retail facility, which is a very real critical control point.

HACCP Self-control

The following are components of a HACCP self-control program as I propose them. This expands upon the NACMCF components so that the cooks in an operation can have a fully effective program to make the raw, contaminated food safe. These components are in line with many other manufacturing safety control systems. I have included the NACMCF principles in parentheses.

1. Management leadership, resources, and involvement.
2. Assemble the unit HACCP-TQM team and establish the HACCP knowledge base.
3. Describe the products, distribution, and intended consumer use (by product category).
4. Describe the unit system, input-process-output, and its processes.
5. Construct flow process diagrams (graphic, box, logic, or narrative) from growing to consumption.
6. If quality-assured policies, procedures, and standards exist, assemble them. If not, write them.

7. Analyze each step for microbiological, chemical, and physical hazards. (NACMCF Principles 1, 2, 3)
    a. Identify acceptable and unacceptable illness and injury threshold limits for hazards that could be in or get into the products.
    b. Do risk analysis.
    c. Identify critical process variable targets and limits.
    d. Improve existing policies, procedures, and standards.
    e. Establish a SPC (Statistical Process Control) defect prevention program.
8. Establish structured process measuring and control procedures for process variables, using SPC to keep each step in control. Gather information for process improvement. (NACMCF Principle 4)
9. Identify corrective action to be taken with the process and product if the critical process variables exceed critical hazard limits. (NACMCF Principle 5)
10. Assemble all material. Write / revise the HACCP plan. (NACMCF Principle 6)
11. Establish management oversight and verification procedures to assure that the process is operating according to the policies, procedures, and standards. (NACMCF Principle 7)
12. Develop the organization chart and employees' jobs and responsibilities for zero-defect capability. Do training to mastery.
13. Operate, check, measure, and look for opportunities to reduce process variability and risk.
    a. Make system improvements.
    b. Go to the next production cycle.

HACCP Program as a Part of Continuous Improvement

HACCP as described by the government is still only a component of the design of the system. HACCP is truly not a stagnant, one-time design requirement. The HACCP program in a retail food operation is an ongoing, changing process that needs improvement. There is always an opportunity to improve the policies, procedures, and standards governing fingertip washing, cleaning cutting board, cooking / pasteurizing chicken or hamburgers, and cooling food safely. HACCP correctly says that the processes should be monitored and data should be recorded.

However, the government's focus is on the review of these records to show past deviations, which could lead to punitive action against the operator. Actually, what is needed is for the manager to apply these data to a Statistical Process Control program and to predictive process performance in order to determine the processes that are most likely to fail and therefore, which processes should be researched and improved. The government should really be measuring the operator's preventive program and its continuous improvement.

Two key components of a good prevention program are as follows:

1. The operator knows all of the hazards and has found and verified effective hazard controls.
2. The operator is training the cooks on the line and cleaning / maintenance personnel to perform the hazard control procedures with zero defects.

The outcome of a prevention program is that a regulatory inspector should be able to validate that any employee on the line can perform safety-validated procedures with zero defects. This is done by having the employee demonstrate these procedures. Of course, first, all of the inspectors must be standardized.

Again, we must remember that these procedures must come from a source whereby they have been tested and proven to be effective, in this case, in retail operations. If the government cannot

do this, the industry must. Writing regulations with controls and never validating these controls, as is the case with current regulations, has no impact on food safety and leads to continuing foodborne illness.

The Unit Policies, Procedures, and Standards Manual

HACCP requires the operator to strive for zero-defect employee job performance. To do this, there must be written procedures in a policies, procedures, and standards manual. This includes many other operating policies, procedures, and standards besides those that control the hazards. The manual includes customer satisfaction, because it is not feasible to separate the safe preparation of food from the quality preparation of a product. Ingredients must be chosen with customers' allergic reactions in mind as well as cost. One must consider, too, the ability, for example, of a soup, to withstand perhaps many hours of hot holding. Every food procedure can be done in many different ways with many different types of ingredients.

The current situation whereby operators feel that employee turnover is such a problem that they have no time to train their employees is totally incompatible with HACCP. HACCP says that when an employee is hired, that employee is not put on the line until he or she understands the hazards and controls associated with the tasks he or she is to perform. If these controls are not written down, there will be no uniformity in training, performance, or enforcement within the unit.

Basic Contents of a HACCP Policies, Procedures, and Standards Manual

1. Food safety policy and procedures
2. Organization for HACCP-based TQM
3. System description
4. Reserved for special uses (e.g., GMPs)
5 Supplier HACCP
6. Recipe HACCP
7. Cleaning and sanitizing schedule and instructions
8. Maintenance schedule and instructions
9. Pest control schedule and instructions
10. HACCP-TQM employee training program and record
11. Self-inspection, continuous quality improvement
12. Food safety program verification and certification

Summary

This article has pointed out that government-based food safety by inspection will never be a valid food safety assurance program. Even when inspectors are present, as they are in USDA operations, there are frequent mistakes made. Only the employee on the line can control the process. Therefore, HACCP-educated managers must train all line employees to perform their tasks with zero defects.

HACCP is an effective analysis methodology. It is used by the quality control industry, by NASA, and other agencies. However, it must be incorporated in an ongoing, management-driven operating system in which management has continuous oversight to assure that the employee instructions as detailed in a policies, procedures, and standards manual are correct; that the employee on the line has been trained to follow these instructions; and that when there is a need for improvement, that improvement is prompt.

The key to making HACCP an effective prevention system for the retail food industry is not the analysis and specification of safe processes. The key is the simplification and minimization of these mandatory, written instructions that everyone follows, so that the operator does not waste time keeping complicated instructions and training up to date.

The next article in this series will discuss implementing an effective, written management program that can be kept current and is easy to use in training.