Chapter 13

PRODUCT PROTECTION PROGRAM
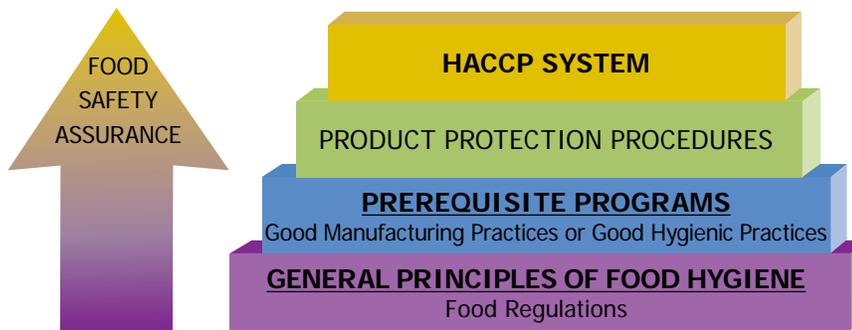
Food processors that **do not** have HACCP plans in place should follow the steps in this chapter to control food safety. This chapter may be less important for those processors who already **do** have HACCP plans in operation.

A *Product Protection Program* allows processors to increase food safety and helps to meet the basic requirements of HACCP – without setting up a full HACCP plan.

A product protection program helps make sure that a company is noticing, monitoring and recording information about food safety procedures. All food processing companies should already be meeting food regulation guidelines. Therefore, a product protection program may not be very different from the food safety procedures a company already has.

Figure 1

FOOD
SAFETY
ASSURANCE

HACCP SYSTEM

PRODUCT PROTECTION PROCEDURES

PREREQUISITE PROGRAMS
Good Manufacturing Practices or Good Hygienic Practices

GENERAL PRINCIPLES OF FOOD HYGIENE
Food Regulations

If the facility is just starting to put together a food safety system, the product protection program should be worked out first. Developing and putting in place a program can take several months. During this time it's very important to have a product protection program to control food safety issues.

Prerequisite programs provide the basic operating conditions to produce safe foods. A product protection program controls the most important steps in the process. It also sets up important records that prove safety controls are in place.

Product protection programs may be used in the short term while developing and putting in place a HACCP plan or it can become another food safety tool. It can be used by processors who already monitor critical points, but who don't have a formal documentation process set up yet.

Create the product protection program at the start of food safety system development. During this period, it's very important to have a product protection program to control food safety issues.

1.0 PREREQUISITE PROGRAMS

There are common hazards in food operations that are found in many facilities. These hazards include foreign objects, pests or germs that contaminate food during production and handling. Prerequisite programs can generally control these hazards.

A prerequisite program allows a company to operate in conditions that produce safe food. Prerequisite programs set up the procedures that are part of the HACCP system including Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP).

Good prerequisite programs improve food safety. They also help reduce the number of things the food processor has to keep an eye on.

The main prerequisite programs that help in creating a product protection program are:

- Employee practices;
- Equipment;
- Sanitation practices; and
- **Specific and general facility maintenance.**

Make sure the company has procedures in place so that none of these activities will lead to product contamination.

See Chapters 4 to 12 for more information on prerequisite programs.

2.0 IDENTIFICATION AND CONTROL OF CRITICAL FACTORS

It's important to develop a product protection program and to control critical factors. These can be done by following these food safety principles:

- Conduct a hazard analysis;
- Determine the critical factors;
- Set critical limits;
- Decide on actions to take when a critical factor or something important is not under control;

- Put in place a system to monitor or control the critical factors; and

- Set up verification – checking procedures – to confirm that the product protection program is working.

These are also the basic principles behind the development of a HACCP plan.

No program is under control without a managing system that documents and records operations. Make sure the company has adequate and correct documentation. This helps create a cost-effective operation. In other words, it helps save money. It also guarantees that all food safety information is documented in official files, where all staff members who need it can find it.

See Chapter 14: Developing and Implementing a HACCP Plan for more information on hazard analysis, as well as understanding and controlling critical factors.

See Appendix D: Food Safety and Risk Analysis for information on how serious or how likely various hazards are, and for help in choosing the right control measures.

3.0 CRITICAL PROCESSING STEPS AND CRITICAL FACTORS

In the food production process there must be steps to get rid of and prevent foodborne hazards. There must also be steps to reduce some hazards to safe levels. The facility's product protection plans should point out these steps and should show ways to control them. It should also put this important information in writing.

Each critical processing step has certain key factors, or requirements, which make that step work well. If any of these requirements aren't fully met, it can affect the safety of the finished product.

There may be more than one critical factor for each processing step. For example, one important processing step may be cooking a product. This will reduce germs to safe levels in raw materials.

How well this step works depends on several key requirements and some examples include how long and at what temperature the product is cooked. If these set limits aren't met, this step might not destroy enough germs to make food products safe.

Some examples of critical process steps and their contributing critical factors are:

Critical Process Steps	Critical Factors
Cooking	Time, temperature
Cooling	Time, temperature
Formulation	pH, concentration (e.g. parts per million – ppm and nitrite levels)
Dehydration	Water activity
Chemical treatment	Ozonation (ozone levels)
Metal detection	Sensitivity (test sphere)
Freezing (fish, pork, wild game) for parasite control	Time, temperature
Skinning	Microbiological factors
Sifting	Mesh size
Chlorination	Concentration, volume
Filtration	Filter size

Critical limits are the lowest and/or highest allowable levels for critical factors. These relate to each key processing step. Reaching or staying within these limits means the difference between a product being safe or unsafe, or a product being acceptable or unacceptable.

Critical limits should be based on government regulations, industry standards, scientific findings, and/or risk levels related to the product (see Appendix D: Food Safety Risk Analysis).

Each critical limit should be set or defined clearly and should be measurable whenever possible. When monitoring a sample, if a result is outside the defined limit there is a deviation – a situation that isn't normal. It's important to correct these abnormal or unusual situations right away.

4.0 MONITORING CRITICAL FACTORS

It isn't enough to simply have controls. To provide the greatest food safety, the controls must be tracked – or monitored – to make sure they're inside critical limits. Monitoring includes regular measuring and recording of values (results) at certain fixed times.

Use monitoring to constantly check all critical factors. Activities could include:

- pH and temperature tests;
- Visual observations; and
- Checking documents.

While monitoring critical factors, it's also important to check on employee practices. Also check on equipment, sanitation practices, and both specific and general facility maintenance. Again, have procedures to prevent these factors from causing product contamination.

Decide ahead of time all procedures for monitoring and put them in writing. This document should show who will do the monitoring, how often, and what the critical limits are. It should also show what corrective actions to take when there is a deviation or something goes wrong.

Monitoring should allow for corrective actions immediately, before the situation gets out of control. The frequency of monitoring will depend on the risk related to the product. It also depends on how hard it is to monitor within the operation.

Examples of records that could be used as part of a production protection program include:

- Calibration record;
- Action taken record;
- Recording charts;
- Quality control pasteurization verfication records**;**
- Quality control audit records;
- Product deviation records;
- Records of discussions; and
- HTST equipment and controls test records.

5.0 DEVIATIONS AND CORRECTIVE ACTIONS

When a critical limit is not met, a deviation has occurred. This may be because of a failure in standard operating procedures (SOPs) or in a prerequisite program.

For each possible deviation, decide on a corrective action. Write down procedures for each corrective action and make sure all employees know them and follow them.

Training employees on corrective actions ahead of time gives them clear direction on what to do if a deviation occurs. If workers are trained in using this knowledge, they often will realize when something goes wrong.

However, because staff may lack the necessary skills, they might be unwilling or unable to correct the deviation. In additional, they might not be able to correct the deviation quickly enough. Documenting and training staff in corrective actions helps to make sure that consistent action is taken. It also provides records that can point out unusual patterns.

Corrective actions should:

- Make sure that the critical factor is brought back under control;
- Prevent unacceptable product from reaching consumers;
- Prevent a deviation from happening again; and
- Allow for changes to the process or to the monitoring to make them work better.

Corrective action documents should state:

- Date and time the deviation is noticed;
- What the deviation is;
- Corrective actions to be taken;
- Name of the employee responsible for taking the corrective action; and
- Date, time and signature of employee responsible for confirming that the corrective activity was done as required.

Corrective actions can be recorded directly onto related records. It might be useful to develop separate corrective action request forms as stand-alone records. Again, these may be useful in spotting problem trends.

6.0 DOCUMENTATION OF CRITICAL FACTORS

The documents required in a product protection program include:

- Written procedures for how critical factors will be controlled in the facility; and
- Records to show that these procedures are followed, and that the critical limits are met.

These documents should prove that monitoring and verification happen often enough to protect food safety and that critical limits for food safety are met.

The company should also be able to show that:

- Monitoring and verification are recorded at a reasonable frequency; and
- Deviations and corrective actions are recorded when critical limits aren't being met.

All documentation created provides a historical record of the company's process and monitoring. It also shows any deviations and the related corrective actions taken. If there is a problem, exact records help to trace back or troubleshoot.

See Chapter 3: Documentation and Record Keeping for more information on documentation.

7.0 VERIFICATION OF CRITICAL FACTORS

Someone other than the operator and monitor should verify that:

- Monitoring is being done as written in the product protection program; and
- Accurate and complete records are kept.

Verification procedures used to check the safety of the product also show how strong food safety controls are. Verification activities might include:

- Product sampling;
- Audits (detailed checks) of monitoring records;
- In-house inspections or audits; and
- Environmental sampling.

Verification procedures should involve a review of records, corrective actions, and onsite activities. This makes sure the monitor is checking activities correctly.

8.0 TRAINING STAFF IN PRODUCT PROTECTION PROCEDURES

Employees who are responsible for monitoring critical processing points should be trained to understand the importance of the critical limits. Staff must also be trained to understand procedures for monitoring these limits. They should also understand deviation procedures and how document control works.

Staff members who monitor critical processing points need training in the following:

- Their job functions;
- Filling out forms;
- Understanding reasons for certain corrective actions; and
- Understanding the importance of the processing step in the facility's product protection program.

When training staff members on how to monitor critical processing steps, teach them to keep these points in mind:

- Why the processing step exists;
- What the critical limits are;
- Procedures for monitoring the critical factors;
- Abnormal or unusual situations; and
- Effective documentation.

Comparing Skills and Knowledge

A food handler in a manufacturing facility prepares, stuffs, and cooks beef potpies.

The staff member who does this work must have both food safety and food hygiene knowledge. They must have the skills to make sure that the end product is made safely.

The food safety and food hygiene knowledge needed for this job includes:

- **Knowing** that raw meat is likely to be contaminated with dangerous bacteria and that eating undercooked product could result in food poisoning;

- **Knowing** the right cooking time and temperature needed to make sure that products are cooked thoroughly;

- **Knowing** the correct storage temperatures for both the raw materials and finished products;

- **Knowing** that hands, gloves, or the equipment used to handle raw materials may contaminate finished products; and

- **Knowing** about other possible sources of cross-contamination that can affect the finished product, such as dirty clothes or equipment.

The food safety and food hygiene skills needed for this job include:

- **The skill** needed to check the product to make sure that it is cooked thoroughly;

- **The skills** needed to make sure that equipment is set at the right temperatures;

- **The skill** to wash hands and equipment in ways that reduce the possibility of cross-contamination; and

- **The skills** needed to keep the work area clean.
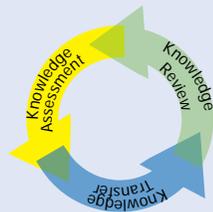
Based Upon - Food Safety Standards: Food Handling Skills and Knowledge. Australia New Zealand Food Authority © May 2001
http://www.foodstandards.gov.au/_srcfiles/39997-TF1a.pdf.

9.0 SAMPLE PRODUCT PROTECTION PROGRAM

Pasteurization in the Production of Unsalted butter

Raw milk, used in the production of unsalted butter, could contain pathogens. These are harmful substances that cause foodborne illness.

In production, a pasteurization step is needed to destroy these harmful pathogens. This must be done without affecting the quality of the finished product.

Assuming that the facility in this example has prerequisite programs providing a food safe environment, the following shows how a 'critical factor monitoring program' might look.

Hazard Description:

- Pathogen survives because of inadequate time and/or temperature of pasteurization.

Critical Limits:

- Pasteurization temperature not less than 75°C (166°F) for a holding time of not less than sixteen (16) seconds.

Monitoring Procedures:

- Operator monitors cut-in/cut-out temperature at start-up for each batch.
- Operator checks that the indicating thermometer reading is 75°C (166°F) and is recorded on the pasteurizer chart. (do we need to say how often they check?
- Operator checks that the recording thermometer is reporting the same temperature as the indicating thermometer.
- Operator records this temperature check information on the pasteurizer chart.
- Operator checks every day that the seal is intact on the flow control device.

Corrective Actions:

- Activate manual divert. Hold all the product processed since last satisfactory check.

- Inform quality control supervisor, who will decide on disposition (disposing of, or removing product).

- Investigate, identify and correct the cause of problem. (what does do quality control mean?).

Verification Procedures:

- Quality Control calibrates and checks (including thermometric response) the indicating and recording thermometers every three months.

- Quality Control reviews and verifies recording charts of every production batch for completeness.

- Quality Control double checks operator's monitoring procedures at least once a month.

- Quality Control verifies re-direction of affected batch.

- Quality Control verifies hold time, either when the system changes, or at least once per year.

- Quality Control verifies HTST equipment and control test results twice per year.

10.0 SOURCES OF INFORMATION

1. Canadian Food Inspection Agency. *HACCP Generic Model: Unsalted Butter.* http://www.inspection.gc.ca/english/fssa/polstrat/haccp/butbeu/butbeu10e.shtml.

2. Food Safety Standards: Food Handling Skills and Knowledge. Australia New Zealand Food Authority © May 2001. http://www.foodstandards.gov.au/_srcfiles/39997-TF1a.pdf.