

**California Department of Public Health
Hazard Analysis Critical Control Point
(HACCP) Tool Chest for
Reduced Oxygen Packaging (ROP)
and Acidification**



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Foreword

The California Department of Public Health, CDPH, HACCP Tool Chest was developed to assist food service operators on special processes as they relate to food preparation in commercial kitchens. Special processing is characterized as a method of preparing a food that has demonstrated an increased risk of foodborne illness. The California Retail Food Code, CFRFC, may require an approved Hazard Analysis and Critical Control Points (HACCP) plan, variance, or both. A HACCP plan is a prescriptive, comprehensive document that describes the process of making a food product from initial ingredients to end consumption. It is intended to ensure the safe receiving, handling, preparation and holding of the food, to deliver a safe product to the end consumer.

A variance is an approved deviation from an established set of rules. In this context, “variance” refers to an approved deviation from the CRFC.

Because special processes demonstrate an increased risk of foodborne illness, it is the responsibility of the operator to prove that their methodology will result in the production of safe food for the end consumer. It is CDPH’s hope that this HACCP Tool Chest will allow your facility to maintain compliance when producing foods using special processing. It may also be useful in the development of a HACCP plan and/or variance application.

Acknowledgements

Some content in the HACCP Tool Chest was adapted from the FDA and USDA guidance and documents.

Glossary

A_w : means water activity that is a measure of the free moisture in a food, is the quotient of the water vapor pressure of the substance divided by the vapor pressure of pure water at the same temperature and is indicated by the symbol A_w .

CCP Decision Tree: means a sequence of questions to assist in determining whether a control point is a CCP.

CFR: means the Code of Federal Regulations. Citations in this part to the C.F.R. refer sequentially to the title, part, and section numbers, such as 21 C.F.R. 178.1010 refers to Title 21, Part 178, Section 1010.

Comminute: reduced in size by methods including chopping, flaking, grinding, or mincing.

Control: means to manage the conditions of an operation to maintain compliance with established criteria and correct procedures are followed and criteria are being met.

Control Measure: means any action or activity that can be used to prevent, eliminate, or reduce a significant hazard.

Corrective Action: means procedures followed when a deviation occurs.

Critical Control Point: means a point or procedure in a specific food system where loss of control may result in an unacceptable health risk.

Critical Limit: means the maximum or minimum value to which a physical, biological, or chemical parameter must be controlled at a critical control point to minimize the risk that the identified food safety hazard may occur.

Cross Contamination: means the transfer of harmful substances or disease-causing microorganisms to food: by food workers, hands, food contact surfaces, equipment and utensils that touch raw foods and then touch ready to eat foods without proper sanitation.

Deviation: Failure to meet an established critical limit for a critical control point (CCP).

FDA: means the United States Food and Drug Administration.

Hazard: means a biological, chemical, or physical property that may cause an unacceptable public

health risk.

Hazard Analysis: means the process of collecting and evaluating information on hazards associated with the food under consideration to decide which are significant and must be addressed in the HACCP plan.

Molluscan Shellfish: means any edible species of fresh or frozen oysters, clams, mussels, and scallops or edible portions thereof, except when the scallop product consists only of the shucked adductor muscle.

Monitor: means to conduct a planned sequence of observations or measurements to assess whether a CCP is under control and to produce an accurate record for future use in verification.

pH: means the symbol for the negative logarithm of the hydrogen ion concentration, which is a measure of the degree of acidity or alkalinity of a solution. Values between 0 and 7 indicate acidity and values between 7 and 14 indicate alkalinity. The value for pure distilled water is 7, which is considered neutral.

Pathogen: means a microorganism (bacteria, fungi, parasite, or virus) that causes disease in humans.

Prerequisite Program: means procedures, including Good Manufacturing Practices, that address operational conditions providing the foundation for the HACCP system.

Record: means a document of monitoring observations or verification activities.

Reduced Oxygen Packaging (ROP): means the reduction of the amount of oxygen in a package by mechanically evacuating the oxygen, displacing the oxygen with another gas or combination of gases, or otherwise controlling the oxygen content in a package to a level below normal surrounding air, which is 21% oxygen.

Risk: means the likelihood that an adverse health effect will occur within a population due to a hazard in a food.

Sanitization: means the application of cumulative heat or chemicals on cleaned food- contact surfaces that, when evaluated for efficacy, is sufficient to yield a reduction of five logs, which is equal to a 99.999 percent reduction, of representative disease micro-organisms of public health importance.

Severity: means the seriousness of the effect(s) of a hazard.

Shellfish Control Authority: means a state, federal, foreign, tribal, or other government entity

legally responsible for administering a program that includes certification of molluscan shellfish harvesters and dealers.

SOP: means a Standard Operating Procedure. This is a written method of controlling a practice in accordance with predetermined specifications to obtain a desired outcome.

Spore: means a dormant form of certain vegetative bacterial cells that are very resistant to treatment with heat and a variety of chemical and radiation treatments that are lethal to most other vegetative (non-spore) cells.

Step: means a point, procedure, operation, or stage in the food system from primary production to final consumption.

USDA: means the United States Department of Agriculture.

Variance: means a written document issued by the department that allows the use of an alternative practice or procedure based on a determination by the department that the alternate practice or procedure is equivalent to the existing requirements, and that a health hazard will not result from the alternative practice or procedure.

Vegetative Cell: A bacterial cell which is capable of actively growing under favorable conditions. Some bacteria can transition from a vegetative cell to a spore cell which can produce toxins that cause foodborne illness in humans.

Validation: means that element of verification focused on collecting and evaluating scientific and technical information to determine if the HACCP plan, when properly implemented, will effectively control the hazards.

Verification: Those activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan.

Hazard Analysis Critical Control Points – 7 Principles

Principle 1- Conduct a Hazard Analysis

To keep food safe, it is necessary to identify hazards associated with the food, so the safety risks can be controlled to prevent individuals from becoming sick or hurt. Hazards can be biological, chemical, or physical. To control the risk, it is important to understand the hazards.

Biological

A biological foodborne illness happens when pathogens such as bacteria, viruses, or parasites are found in food that is eaten, causing illness. Symptoms of foodborne illness include vomiting, diarrhea, fever, and yellowing of the skin or eyes. Mishandling foods during harvesting, transport, preparation or serving can lead to illness. Steps can be taken to help reduce the risk of foodborne illness.

Bacteria: If foods are not stored properly, bacteria can over grow. Some bacteria can form spores (a type of protective shielding) which can be harder to kill than bacteria alone. Spores have an ability to form toxins that can also make people sick. Depending on the type of bacteria eaten, symptoms of foodborne illness can be different. Examples of common bacteria found in food.

Clostridium botulinum Foods: canned food, ROP food, potatoes
Symptoms: nausea, vomiting, double vision, paralysis, and death
Prevention: proper cooling, holding, and reheating of foods

E. coli Food: raw and undercooked beef, contaminated produce
Symptoms: diarrhea, cramps, liver, kidney damage, and death
Prevention: prevent cross-contamination, fully cook meats

Listeria mono. Food: raw meat, deli meats, hot dogs, soft cheese, milk products
Symptoms: spontaneous abortion, sepsis, pneumonia, meningitis
Prevention: pasteurization, fully cook meats, use-by dates

Salmonella spp. Food: poultry, eggs, dairy, beef
Symptoms: diarrhea, cramps, vomiting, fever
Prevention: fully cook foods, prevent cross-contamination

Staphylococcal aureus Food: salads (egg, tuna, chicken, macaroni), deli meats
Symptoms: nausea, vomiting, cramps
Prevention: handwashing, cover cuts and wounds, temp. control

Viruses: Other pathogens that can make people sick are viruses. In the beginning of a viral illness, a person may not show any symptoms and may not know they are sick. This makes it easy to pass pathogens to food. To prevent this from happening, foodservice workers should practice good hand washing habits after coughing, sneezing, or using the bathroom. It's also important that you don't work when you are sick. Symptoms to be concerned about are vomiting, diarrhea, sore throat with a fever, jaundice, and cuts or sores on your hands or forearms. The following are examples of viruses that can contaminate food.

Norovirus: Pathogens can be passed on to any type of food or surface if hands are not washed properly or if employees work when they are sick. Norovirus is very contagious,
Symptoms: Nausea, vomiting, diarrhea

Hepatitis A: Pathogens can be passed on to any type of food or surface if hands are not washed properly or if employees work when they are sick. Hepatitis A is very contagious,
Symptoms: Fever, nausea, vomiting, fatigue, cramping and jaundice (yellowing of the skin and eyes)

Parasites: A parasite is a tiny organism that can be found in foods. It is also found in foods that have been contaminated with human or animal waste. To kill parasites, foods must be cooked at a high temperature or frozen for an extended period. Foods: Fish, meat, and raw vegetables
Symptoms: Diarrhea, stomach pain, nausea, and weight loss

Chemical

Chemicals can be intentionally added, accidentally added, or form naturally on their own in the food. Histamines are naturally produced from some species of fish when it is not maintained at

proper temperatures. Individuals who are allergic to histamines can suffer anaphylaxis or an allergic reaction if they consume certain levels. The intentional addition of salts containing nitrates or nitrites to curing meats can become toxic when too much is added and raise blood pressure in some individuals. Cleaning chemicals can accidentally contaminate food and pose a serious health risk.

Physical

Physical hazards may include materials such as glass, wood, stones, and metal fragments. They can also include insulation, bone, plastic, and personal items such as jewelry. For instance, if you are wearing jewelry while preparing foods, it could come off and fall into the food. To prevent this type of physical hazard from happening, it's best to remove any jewelry while preparing foods.

Two steps to hazard analysis:

Step 1: Identify the hazard

For each hazard, your HACCP team will create a list of possible food safety concerns. The focus should be in hazard areas where there is a high potential for a biological, chemical, or physical hazard to occur. Examples of things to consider when identifying hazards:

A. Ingredients

Does the food contain any sensitive ingredients that may present microbiological hazards (e.g., *Salmonella*, *Staphylococcus aureus*); chemical hazards (e.g., aflatoxin, antibiotic, or pesticide residues); or physical hazards (stones, glass, metal)?

B. Intrinsic Factors

Physical characteristics and composition (e.g., pH, type of acidulants, fermentable carbohydrate, water activity, preservatives) of the food during and after processing.

C. Procedures used for processing

1. Does the process include a controllable processing step that destroys pathogens? If so, which pathogens? Consider both vegetative cells and spores.
2. If the product is subject to recontamination between processing (e.g., cooking, pasteurizing) and packaging which biological, chemical, or physical hazards are likely to occur?

D. Microbial content of food

1. What is the normal microbial content of the food?
2. Does the microbial population change during the normal time the food is stored prior to consumption?
3. Does the subsequent change in microbial population alter the safety of the food?

4. Do the answers to the above questions indicate a high likelihood of certain biological hazards?
- E. Facility design
1. Does the layout of the facility provide an adequate separation of raw materials from ready-to-eat (RTE) foods if this is important to food safety? If not, what hazards should be considered as possible contaminants of the RTE products?
 2. Is positive air pressure maintained in product packaging areas? Is this essential for product safety?
 3. Is the traffic pattern for people and moving equipment a significant source of contamination?
- F. Equipment design and use
1. Will the equipment provide the time-temperature control that is necessary for safe food?
 2. Is the equipment properly sized for the volume of food that will be processed?
 3. Is the equipment reliable or is it prone to frequent breakdowns?
 4. Is the equipment designed to be easily cleaned and sanitized?
- G. Packaging
1. Does the method of packaging affect the multiplication of microbial pathogens and / or the formation of toxins?
 2. Is the package clearly labeled "Keep Refrigerated" if this is required for safety?
 3. Does the package include instructions for safe handling and preparation by the end user?
 4. Does each package contain a proper label?
 5. Are potential allergens in the ingredients included in the list of ingredients on the label?
- H. Sanitation
1. Can sanitation have an impact upon the safety of the food that is being processed?
 2. Can the facility and equipment be easily cleaned and sanitized?
 3. Is it possible to provide sanitary conditions consistently and adequately to assure safe food?
- I. Employee health, hygiene, and knowledge
1. Can employee health or personal hygiene practices impact the safety of the food being processed?
 2. Do the employees understand the process and the factors they must control to assure safe food?
 3. Will the employees inform management of a problem which could impact food safety?

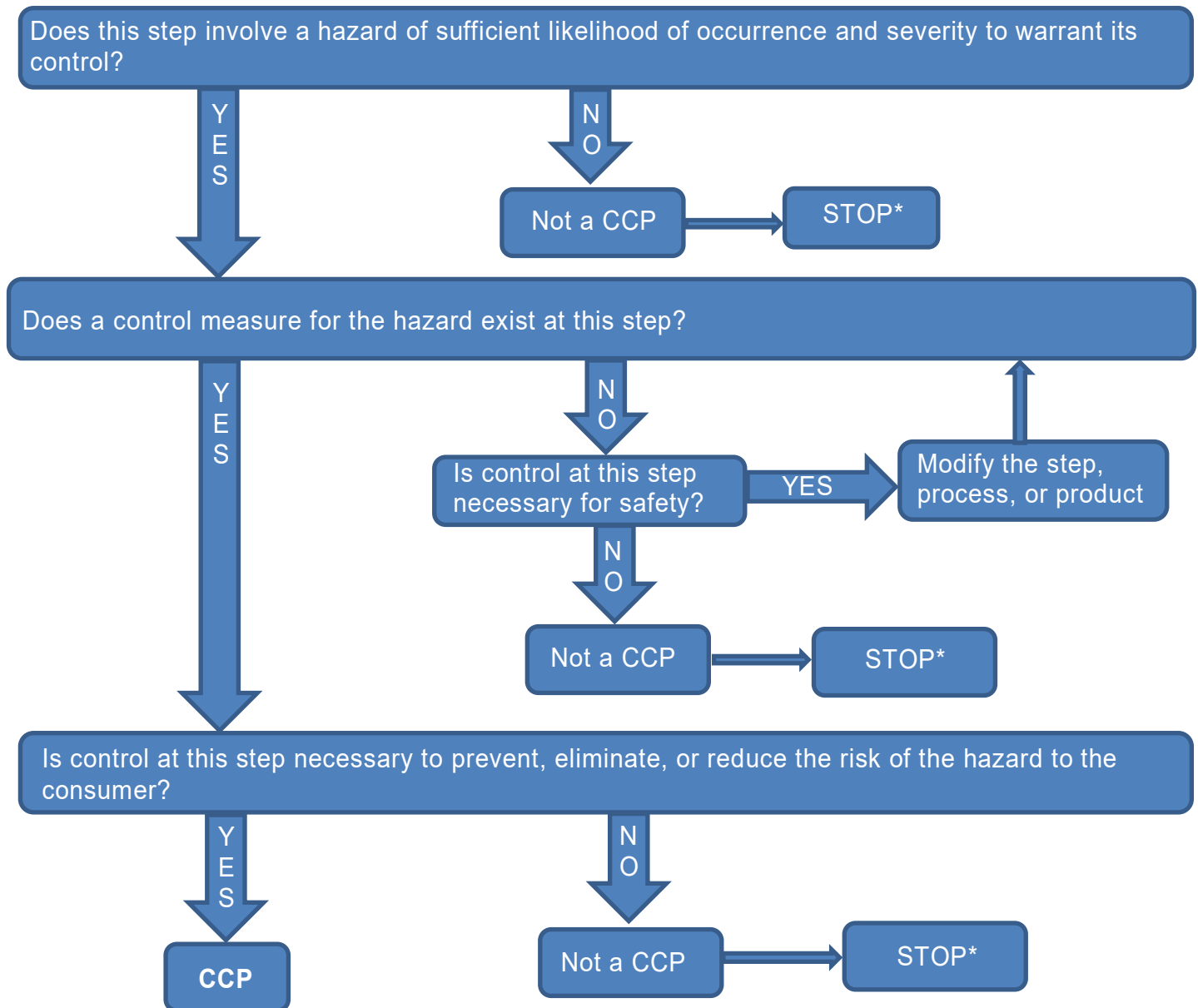
Step 2: Assess the hazard

Once you identify the hazards, your HACCP team should evaluate each one and determine what can be done to eliminate the hazard or bring risk down to an acceptable level.

Principle 2- Determine the Critical Control Points (CCPs)

A critical control point (CCP) is a step in the production process of a HACCP plan where a hazard is likely to occur, and where a control can be applied to eliminate or effectively minimize the risk of occurrence.

Use the CCP identification tree as a tool to determine if a step is a critical control point. (*proceed to the next step of HACCP plan)



Principle 3- Establish Critical Limits

Critical limits must be effective at keeping the hazard under control. Each CCP represents a step in the process where control is necessary to prevent, eliminate, or reduce a hazard to an acceptable level. There are times when critical limits are determined by law. For example: poultry must be cooked to an internal temperature of 165°F for 15 seconds. Other critical limits can be set by the sufficient scientific data or even microbial challenge studies.

There are many potential CCPs, therefore there are many possible critical limits. Some examples of CCP include time, temperature, pH, Aw, net weight, visual analysis etc. Some CCPs have only one critical limit while others can have multiple critical limits for example time and temperature, 165°F for 15 seconds, both limits are required to control the hazard.

Examples of critical limits:

Temperature:

- Refrigerated foods must be maintained at 41°F or lower
- Placed in ROP when temperature is above 135°F

Temperature and time: Cook whole muscle meat to 145° for 15 seconds

pH – must be maintained below 4.6

Cooling: Foods must be cooled from 135°F to 70°F within two hours and to 41°F within a total of six hours

Principle 4-Establish Monitoring Procedures

At times a process can fail to reach critical limits, so it is necessary to monitor the process to determine whether a CCP is under control. If the process is out of control the person monitoring the process must also know corrective actions that will allow control of the process to be regained. Monitoring is a planned sequence of measurements or observations that are then recorded to not only to make sure the process is under control but also helps to determine when updates to a plan are needed.

When establishing monitoring it is important to describe the following:

1. **What** a description of what will be monitored
2. **Who** designated staff, that has been trained in the HACCP plan, that also understands corrective actions to be taken when critical limits have not been met
3. **How** is a complete description of how to monitor, this is a measurement or observation which will include any required equipment
4. **When** at what point in the process should the monitoring step be completed

Principle 5—Establish Corrective Actions

Corrective Actions are taken when the critical limits are not met. The actions should be conservative remembering the increased risk this food can pose. Many corrective actions can be written as: “if” this happens, “then” this must happen. Examples of corrective actions can be:

- If 145°F is not reached, then continue cooking until the food reaches 145°F
- When cooling food, if the product does not reach 70°F or less and more than 2 hours have passed, then discard the food
- If the received product’s temperature is greater than 45°F, then the shipment is to be rejected

Corrective Action Plans usually include the following:

- Who is responsible
- How the problem can be fixed
- How product should be treated or discarded
- How to document the occurrence

Principle 6—Establish Verification Procedures

Verification has two distinct concepts: verification and validation.

- Verification is the process of reviewing the HACCP documentation to ensure the HACCP plan is being followed correctly. This frequently involves the review of the required documentation like log sheets or electronic monitoring graphs. Verification is done frequently to ensure the control of the hazards is sufficient.
- Validation is the process of ensuring the HACCP plan is in fact controlling the hazards. Validation happens less frequently and is based on a multitude of things. If during the

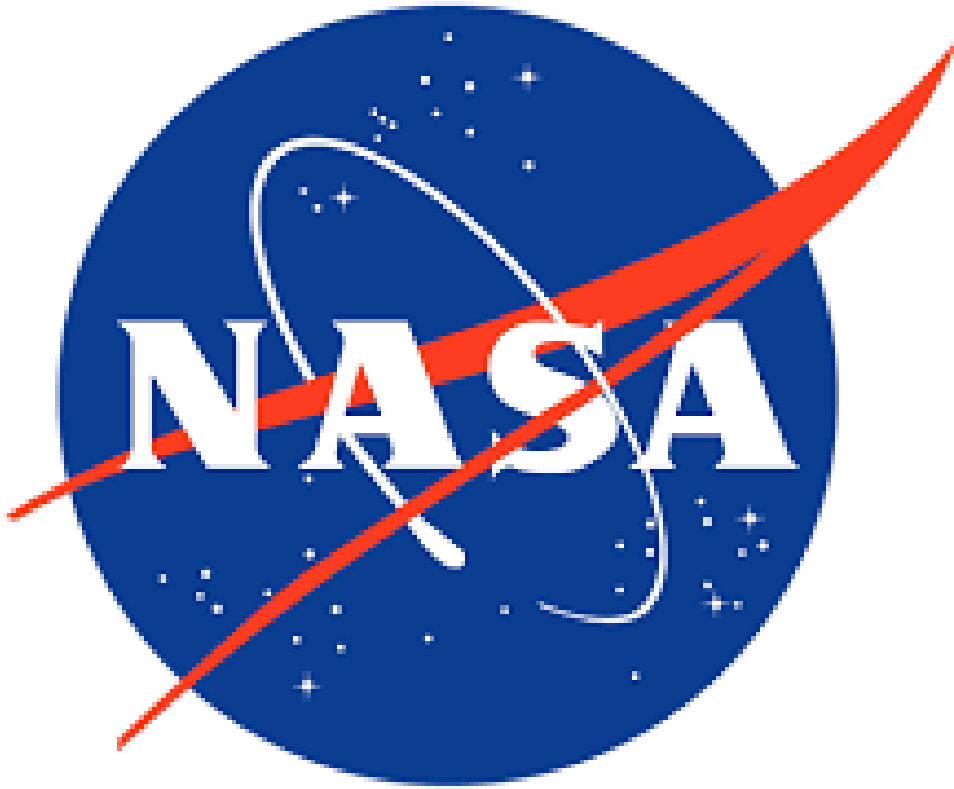
verification of records, it is noticed that the same critical limit is not met, then a review of the HACCP plan is needed and an adjustment to the process established to ensure the critical limit is consistently reached in the future. This is validation.

- Verification means are we following our plan. Validation means is our plan working to control the hazards.

Principle 7—Establish record-keeping

Record-keeping does not need to be complex. Records should be simple, time efficient, and yet ensure that the hazards are under control. Examples can include:

- Process flow diagram
- Logs
- Sampling records
- Data collection



CHAPTER 1

History

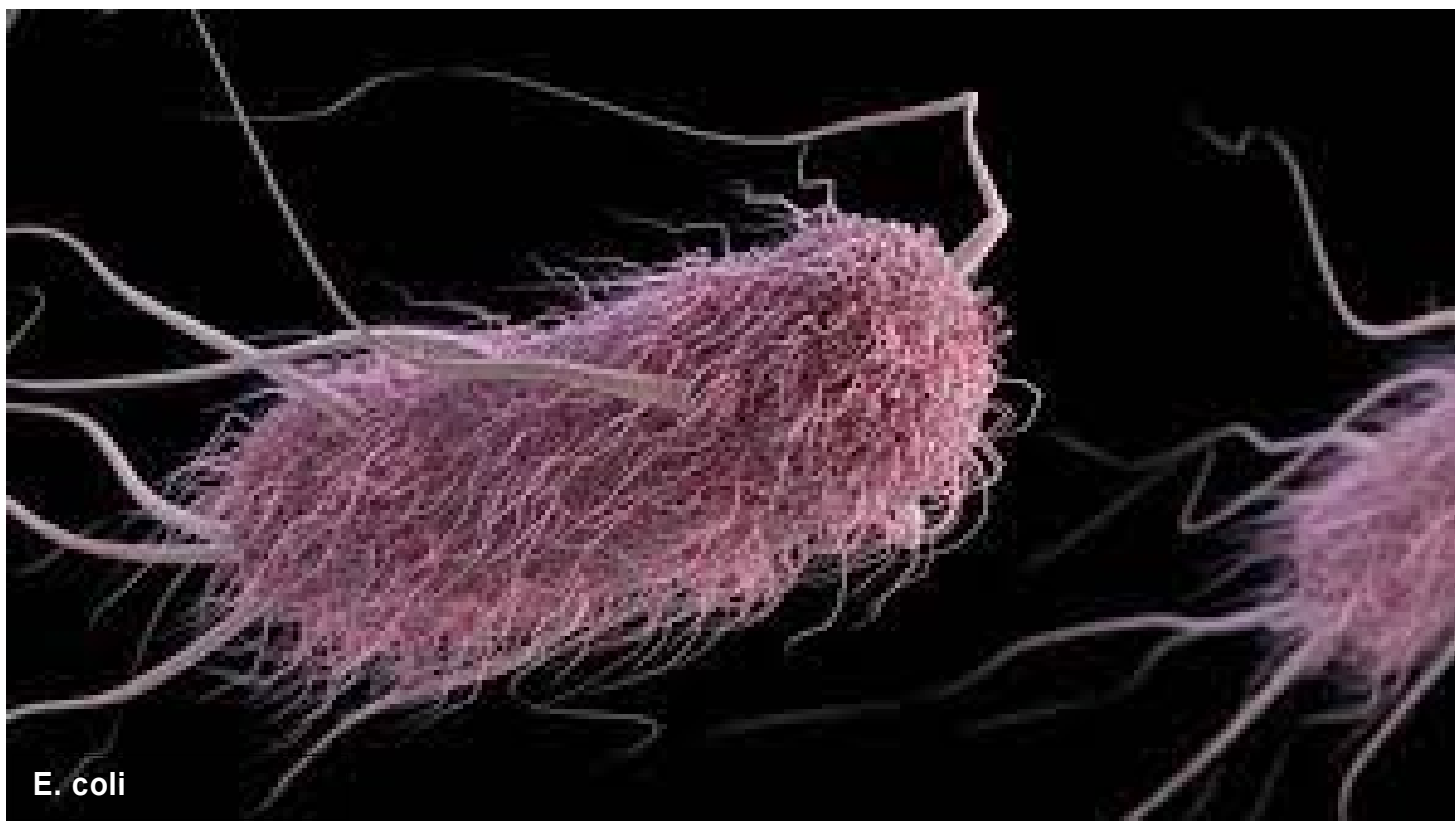


History of HACCP

HACCP as a food safety concept began in the early 1960s. The food safety system was originally developed for the National Aeronautics and Space Administration (NASA). They wanted to ensure that the astronauts did not become sick with a foodborne illness while in space, and that the shelf life of the food was stable for a long time. The Food and Drug Administration (FDA) approached Pillsbury to develop the original plan that consisted of three principles.

Over time HACCP has evolved to include seven principles and has grown to include two authorities. The National Advisory Committee on Microbiological Criteria for Food (NACMCF) which was established in the United States. The organization was established in the late 1980s and is sponsored by the Food Safety and Inspection Service (FSIS), the FDA, and the Center for Disease Control and Prevention (CDC). The World Health Organization (WHO) developed the CODEX Alimentarius Commission (CODEX) for international food safety and the NACMCF has now aligned with CODEX.

Currently, a HACCP based production system is mandated for commercial meat and poultry manufacturers/ processors, juice manufacturers/processors and seafood manufacturers/processors. It's also required in the National School Lunch Program (NSLP) to help ensure safe food for school children. It is voluntary for other commercial food industry, but due to its success in assuring food safety it's been voluntarily adopted by many firms.



CHAPTER 2

Pathogens

The Food Safety Hazards

Food safety hazards have biological, physical, or chemical properties that could cause food to be unsafe and make people sick. One of your goals as a restaurant operator is to keep foods safe by preventing, controlling, reducing or eliminating these hazards. If you are special processing a food, you are engaging in an activity deemed to carry a higher risk of food borne illness. A HACCP Plan shows that you are aware of food safety hazards and know how to address them to reduce or eliminate the risk of illness to the consumer.

Biological hazards account for most of the hazards we are worried about. They are categorized into viruses, bacteria, or parasites. Bacteria can be further categorized into non-spore forming and spore forming. Spore forming refers to the bacteria's ability to create a protective cell, which can make them more resistant to destruction by environmental factors such as heat, cold, or acidity. On the next page is a list of common bacteria and viruses and what you need to know about them.

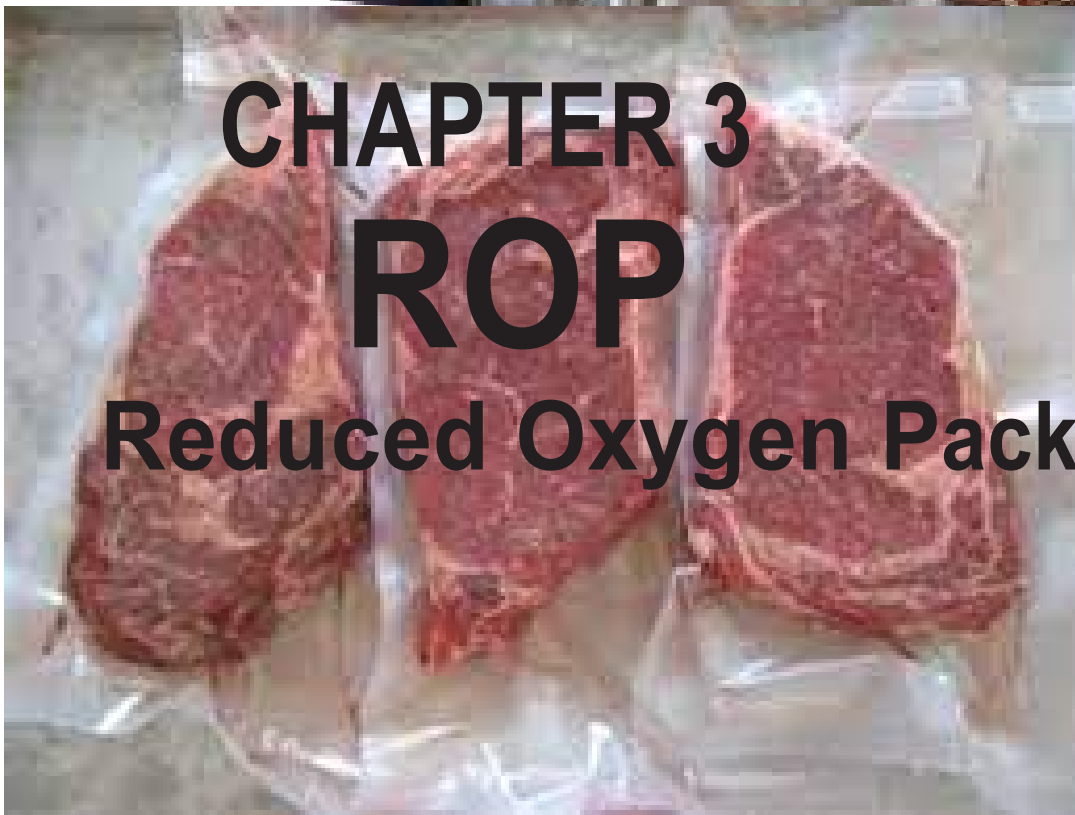
The chart describes the major foods associated with the pathogen. The two significant biological hazards for the ROP of food are *Clostridium botulinum* and *Listeria monocytogenese*. These two bacteria grow in the lack of oxygen and at refrigerated temperatures. It is imperative to control these two. The other pathogens on the list need to be controlled as well to ensure safe food to the consumer. These are controlled at different times during the production of the food. Use this chart to assist in identifying the hazards associated with your foods and to help develop your HACCP plan.

Chemical hazards account for a relatively low risk. For example, if you are engaging in Reduced Oxygen Packaging, Cook/Chill or Sous Vide, a primary chemical concern would be that the bag you are using is food grade- meaning that foods can be heated and stored in them safely. Many plastics are not made to be heated and can leech chemicals during a cooking process. It is important to check with the manufacturer to ensure the bag you use is appropriate for your process. Other chemical concerns could be allergens, preservatives, cleaners, insecticides, or sanitizers.

Physical hazards are not as common. They could include metal, glass, or bone in the food ingredients. In a processing plant a metal detector would be used to scan food items after packaging.

CDPH HACCP TOOL CHEST

Pathogen	Type	Oxygen	Common Foods	Food Safety Controls
<i>Bacillus cereus</i>	Spore forming bacteria	Aerobe	Dairy, cooked (vegetables, rice, potatoes, and pasta), meat products	Personal hygiene, handwashing, temperature control, proper cooling, holding, and reheating
<i>Campylobacter jejuni</i>	Non-spore forming bacteria	Micro-aerobe	Poultry, contaminated water	Personal hygiene, cooking temps, prevent cross contamination between raw and ready to eat
<i>Clostridium botulinum</i>	Spore forming bacteria	Anaerobe	Canned foods, ROP foods, baked potatoes, garlic in oil	Personal hygiene, cooking temps, proper cooling, holding, and reheating, can inspection
<i>Clostridium perfringens</i>	Spore forming bacteria	Anaerobe	Meat, poultry, produce	Personal hygiene, cooking temps, proper cooling, holding, and reheating
<i>Escherichia coli</i>	Vegetative non-spore bacteria	Facultative anaerobe	Meat, contaminated vegetables	Personal hygiene, cooking temps, prevent cross contamination, proper holding, approved suppliers
Hepatitis A	virus		Found in human feces, ready-to-eat foods, shellfish, contaminated water	Personal hygiene, handwashing, eliminate bare-hand-contact, approved suppliers, exclude jaundice employees
<i>Listeria monocytogenese</i>	Non-spore bacteria	Facultative anaerobe	Unpasteurized milk, cheese, ice cream, raw vegetables, raw and cooked poultry, meat, and smoked fish	Personal hygiene, handwashing, cooking temps, holding temps, prevent cross contamination, use-by dates, avoid un-pasteurized dairy products
Norovirus	virus		Found in human feces, ready-to-eat foods, shellfish, contaminated water	Personal hygiene, handwashing, eliminate bare-hand-contact, approved suppliers, exclude employees with diarrhea
<i>Salmonella</i>	non-spore bacteria	Facultative anaerobe	poultry, eggs	Personal hygiene, cooking temps, prevent cross contamination, proper holding
<i>Shigella</i>	non-spore bacteria	Facultative anaerobe	salads, raw vegetables, milk and dairy, fruit, bakery items, ready-to-eat foods	Personal hygiene, cooking temps, prevent cross contamination, proper holding
<i>Staphylococcus aureus</i>	vegetative toxin-forming bacteria	facultative anaerobe	food handlers are main source: hair, throat, skin, and nasal passages	Personal hygiene, cooking temps, prevent cross contamination, proper holding



Reduced Oxygen Packaging (ROP)

Two-Barrier ROP

Reduced Oxygen Packaging (ROP) is a useful tool in a commercial kitchen. Spoilage organisms require oxygen to grow, so ROP prevents their growth. Spoilage organisms are responsible for the off odors, taste, texture, and the presence of slime that happen to food over time. These changes help us determine when food is no longer fresh. When the milk smells sour, we don't want to drink it. When the bread has green stuff growing on it, we are likely to toss it out. The ROP of foods prevents spoilage organisms from growing, allowing for an extended shelf-life. At the same time ROP foods have greater risks for food borne illness due to anerobic pathogen growth. There are two major pathogens of concern when oxygen is greatly reduced, *Clostridium botulinum* and *Listeria monocytogenes*. To ROP food it is necessary to demonstrate that a facility can control these two pathogens. This is accomplished through a written HACCP plan that describes the HACCP system the facility will use to control the growth of these two pathogens.

Foods that cannot support bacterial growth (non-potentially hazardous foods) are not a concern for *C. botulinum* or *L. monocytogenes* proliferation. Foods that can support growth (potentially hazardous foods, PHF) must have at least two control measures or barriers in place. This is known as Two-Barrier Reduced Oxygen packaging. The first barrier will always be refrigeration. Foods must be held at or below 41° F. The second barrier is one or more of the following:

- 1) Has a Water Activity (aw) of 0.91 or less,
- 2) Has a pH of 4.6 or less,
- 3) Is a meat or poultry product cured at a food processing plant regulated by the USDA and is received in an intact package, or
- 4) Is a food with a high level of competing organisms such as raw meat or raw poultry.

If your food falls within one or more of these parameters, a HACCP plan approved by CDPH is required. The packaged foods may be held for up to 30 days at 41°F except for time the food is frozen. Your plan must include not just the barriers utilized, but also labeling requirements, operational procedures, using commercial grade equipment, identification of segregated work areas and a

training program.

Fish

When fish is placed in ROP packaging it must be frozen **before** packaging, frozen **during** packaging, and **after** packaging. A CDPH approved HACCP plan is required.

Cook-Chill and Sous Vide

When foods are cooked and then placed in a bag, cooled, and stored the process is known as cook-chill. When food is placed in ROP raw and then cooked in the bag, either cooled and stored, or served the process is known as sous vide cooking. Both processes provide the right conditions for the overgrowth of *C. botulism* and *L. monocytogenes*. The CFRC does not address this type of ROP except to exempt ROP that complies with the following conditions:

1. The food is labeled with the production date and time,
2. The food is held at 41°F or lower during refrigerated storage, and
3. The food is removed from its package in the food facility within 48 hours after packaging. (the 48-hour limit includes anytime the food is frozen)

Facilities that wish to prepare foods using one of these two processes, a CDPH approved HACCP plan is required and compliance with the FDA Food Code section 3-502.12(D).

(D) .. A food establishment that packages potentially hazardous food using a cook-chill or sous vide process shall:

- (1) Provide to the regulatory authority prior to implementation, a HACCP plan that contains the information as specified under (CFRC Section 114419)
- (2) Ensure the food is:
 - (a) Prepared and consumed on the premises, or prepared and consumed off the premises but within the same business entity with no distribution or sale of the packaged product to another business entity or the consumer,
 - (b) Cooked to heat all parts of the food to a temperature and for a time as specified under CRFC Section 114004.
 - (c) Protected from contamination before and after cooking
 - (d) Placed in a package with an oxygen barrier and sealed before cooking, or placed in a package and sealed immediately after cooking and before reaching a temperature 135°F or below

- (e) Cooled to 41°F in the sealed package or bag as specified in Section 114002 of the CFRC
 - (i) Cooled to 34°F within 48 hours of reaching 41°F and held at that temperature until consumed or discarded within 30 days after the date of packaging; or
 - (ii) Held at 41°F or less for no more than 7 days, at which time the food must be consumed or discarded; or
 - (iii) Held frozen with no shelf life restriction while frozen until consumed or used.
 - (f) Held in a refrigeration unit that is equipped with an electronic system that continuously monitors time and temperature and is visually examined for proper operation twice daily,
 - (g) If transported off-site to a satellite location of the same business entity, equipped with verifiable electronic monitoring devices to ensure that times and temperatures are monitored during transportation, and
 - (h) Labeled with the product name and the date packaged; and
- (3) Maintain the records required to confirm that cooling and cold holding refrigeration time/temperature parameters are required as part of the HACCP plan and:
- (a) Make such records available to the regulatory authority upon request, and
 - (b) Hold such records for at least 2 years; and
- (4) Implement written operational procedures and a training program

Cheese

A food service operation that packages cheese utilizing a ROP method must:

- 1) Limit the cheese packaged to those that are commercially manufactured in a food processing plant with no ingredients added at the food service operation and is limited to hard cheese (21 CFR 133.150), pasteurized process cheese (21 CFR 133.169) or semi soft cheeses (21 CFR 133.187)
- 2) Have a CDPH approved HACCP plan that identifies the food, maintained at or below 41 degrees F has operational procedures and documented training program
- 3) Labels the cheese with a “use by” date that does not exceed 30 days from the packaging or the original manufacturer’s “sell by” or “use by” date, whichever occurs first; and

- 4) Discard the ROP cheese if it is not sold for off-premises consumption or consumed on-site within 30 calendar days of its packaging

Examples of cheeses that may be packaged under ROP include Asiago medium, Asiago old, Cheddar, Colby, Emmentaler, Gruyere, Parmesan, Reggiano, Romano, Sapsago, Swiss, pasteurized process cheese, Asiago fresh and soft, Blue, Brick, Edam, Gorgonzola, Gouda, Limburger, Monterey, Monterey Jack, Muenster, Provolone, and Roquefort.

Soft cheeses such as Brie, Camembert, Cottage, and Ricotta may not be packaged under reduced oxygen because of their ability to support the growth of *L. monocytogenes* under modified atmosphere conditions.

Labeling

Foods must be conspicuously labeled with a date and time that the item was packaged. The foods must be held at or below 41 ° F, the date the food should be discarded is also be on the label for the process that is used, except for the time food is maintained frozen, or the original manufacturer's "sell by" or "use by" date, whichever comes first.

Standard Operating Procedures (SOPs)

Standard Operating Procedures, or commonly referred to as SOPs, would include a bare hand contact prohibition, designated work areas for ROP, barriers or other methods to reduce cross contamination, restricting equipment access to trained personnel, receiving food, cooking, and reheating food, and describing cleaning and sanitizing of food contact surfaces, to name a few.

Staff Training

A training program for designated staff that are responsible for ROP is required and must be in writing as part of the HACCP plan. The training program should ensure that staff involved understand the concepts required for safe operation, equipment used, facilities, and the HACCP plan. A log of staff training is required.

When is a HACCP Plan Required for ROP?

Reduced Oxygen Packaging (ROP) Regulatory Requirements

Process	Hold Temperature	Max Hold Time	CDPH Approved HACCP Plan Required	CDPH Approved Variance Required
2-Barrier ROP	41°F	30 days	Yes	No
2-Barrier ROP	Frozen	no max	Yes	No
Fish	Frozen	no max	Yes	No
Cheese	41°F	30 days	Yes	Yes
Cook-Chill, Sous vide	41°F	48 hours total*	No	No
Cook-Chill, Sous vide	41°F	7 days	Yes	Yes
Cook-Chill, Sous vide	34°F	30 days	Yes	Yes
Cook-Chill, Sous vide	Frozen	no max	Yes	Yes

*This is a 48 hour hold only. Freezing does not stop the clock. The food must be removed from ROP within 48 hours.



CHAPTER 4

Acidification

Acidification of Food

The preservation of foods through the manipulation of pH has been used for centuries. Fermentation of foods such as yogurt, kimchi, sauerkraut, and buttermilk by lactic acid produced by certain bacteria are examples of ways that cultures have traditionally changed the acidity of a food item. Lactic acid can slow down or prevent the growth of disease or spoilage causing organisms. This prolongs the shelf life of a food item while allowing the nutrient value to remain relatively unchanged.

Fermentation is not necessary for acidification of foods. Manipulation of pH can also be achieved by adding acids directly to the food. The term pH expresses the negative logarithm of the hydrogen ion concentration, which is a measure of the degree of acidity or alkalinity of a solution. The solution in this case is the food environment. Vinegar (acetic acid) or citric acid are common additives that are used to reduce the pH (acidify) a food item. An acidified food is defined by the FDA (21 CFR 114.3 (b)) as a low acid food to which acid(s) or acid food(s) are added to produce a product that has a finished equilibrium pH of 4.6 or below and a water activity greater than 0.85. Equilibrium pH is the condition achieved when all components-solid and liquid-have the same pH. This state must be reached and maintained in each container, so the pH does not rise above 4.6. A pH meter is used to verify that the solution (food item) does not rise above this level. It is required that a pH meter is on-site at the facility and used anytime that pH is specified as a critical control point for a process.

There are multiple methods for producing acidified food products. One of the most common forms of acidification is pickling of food items. This is usually achieved by blanching (partial cook) a food item and then immersing into an acid solution such as vinegar. The blanching allows for a quicker penetration of the outside cell walls of the food item. Larger foods are sometimes heated in a hot acid bath to achieve that penetration. Once again, equilibrium pH is the point where the internal portions of the food and the liquid (brine) have the same pH. Acids can also be added directly to a batch of ingredients, which is typically used for liquid food items. Other types of acidification include adding a specific predetermined amount of acid to individual containers during filling or adding acid foods to low acid foods in controlled portions.

If you are acidifying foods within your facility, a CDPH approved HACCP plan is required. Acidification can include canning vegetables, making kimchi, acidification of sushi rice, kombucha, certain jellies and more. If you are also canning foods within your facility and the food is

determined to be low acid food, a cannery license could be needed. To determine if a cannery license is needed or a CDPH approved HACCP plan is needed, a sample must be sent for lab certification of pH. A **Request for pH Control** can be found at:

<https://www.cdph.ca.gov/Programs/CEH/DFDCS/Pages/FDBPrograms/FoodSafetyProgram/CanneryInspectionProgram.aspx>

Common Foods pH Ranges

Food	pH Range	
Dairy Products	Butter	6.1 - 6.4
	Buttermilk	4.5
	Milk	6.3 - 6.5
	Cream	6.5
	Cheese (American mild and cheddar)	4.9 - 5.9
	Yogurt	3.8 - 4.2
Meat and Poultry	Beef (ground)	5.1 - 6.2
	Ham	5.9 - 6.1
	Veal	6.0
	Chicken	6.2 - 6.4
Fish and Shellfish	Fish (most species)	6.6 - 6.8
	Clams	6.5
	Crabs	7.0
	Oysters	4.8 - 6.3
	Tuna Fish	5.2 - 6.1
	Shrimp	6.8 - 7.0
	Salmon	6.1 - 6.3
	White Fish	5.5
Fruits and Vegetables	Apples	2.9 - 3.3
	Apple Cider	3.6 - 3.8
	Bananas	4.5 - 4.7
	Figs	4.6
	Grapefruit (juice)	3.0
	Limes	1.8 - 2.0
	Honeydew melons	6.3 - 6.7
	Oranges (juice)	3.6 - 4.3

Food	pH Range	
Fruits and Vegetables (cont'd)	Plums	2.8 - 4.6
	Watermelons	5.2 - 5.6
	Grapes	3.4 - 4.5
	Asparagus (buds and stalks)	5.7 - 6.1
	Beans (string and lima)	4.6 - 6.5
	Beets (sugar)	4.2 - 4.4
	Broccoli	6.5
	Brussels Sprouts	6.3
	Cabbage (green)	5.4 - 6.0
	Carrots	4.9 - 6.3
	Cauliflower	5.6
	Celery	5.7 - 6.0
	Corn (sweet)	7.3
	Cucumbers	3.8
	Eggplant	4.5
	Egg yolks (white)	6.0 - 6.3 (7.6-9.5)
	Lettuce	6.0
	Olives (green)	3.6 - 3.8
	Onions (red)	5.3 - 5.8
	Parsley	5.7 - 6.0
	Parsnip	5.3
	Potatoes (tubers and sweet)	5.3 - 5.6
	Pumpkin	4.8 - 5.2
Rhubarb	3.1 - 3.4	
Spinach	5.5 - 6.0	
Squash	5.0 - 5.4	
Tomatoes (whole)	4.2 - 4.3	
Turnips	5.2 - 5.5	

Your HACCP plan for acidification must contain these critical factors and must be documented to ensure that process and procedures for acidification are being controlled:

- pH monitoring
 - Acidified product must reach a uniform pH of 4.6 throughout the product when packaged
 - Acidified product must reach a uniform pH of 4.2 when not packaged

- pH testing must be done before equilibrium and after equilibrium
- Records of the pH measurements must be retained and available for review
- If heat-treatment of product is done, monitoring of the process must be recorded and available for review
- Document how the containers will be handled to prevent contamination
- The integrity of the product seal is ensured

Deviation from this requires one of the following processes:

- The food must be fully re-acidified,
- Thermal processing of the product as a low acid food,
- Discarding the food product, or
- Setting aside the product for further evaluation by certified lab

As part of your HACCP plan, detailed information is required regarding pH meters including usage of the meter and staff training. All pH meters require continuous calibration to ensure proper readings. pH meters are calibrated by using known solutions called buffers which are of a specific pH to check/standardize the equipment. Typically, buffer solutions are 4.0 and 7.0 and should be used prior to checking product pH values at the start of the process and then once an hour after that. When not in use it is pH meters should be stored in a buffer of solution with a pH of 4.0. As a side note, to help ensure the accuracy of the pH meter, buffer solutions used for calibration should be at the same temperature as the product to be tested. A record of the calibration of the meters must be kept and available for review.

Sushi Rice

The acidification of sushi rice to render it non-hazardous is a common practice in many restaurants. This extends the time sushi rice can remain at room temperature which makes it easier to handle when making sushi. CDPH has simplified the HACCP approval process for sushi rice by creating a one page form for approval. A full HACCP plan for the acidification of sushi rice can be submitted or the sushi rice form on our website may be submitted. Approval is given in the form of an approval letter from CDPH. The pH of acidified rice must be 4.2 or lower. The pH should be measure with either a calibrated pH meter or narrow range pH paper.

Potentially Hazardous Foods:

The following charts are to assist in determining whether a food is potentially hazardous. When acidification of food is accomplished you will meet one of the criteria on the charts.

Table A. Interaction of pH and aw for control of spores in food heat-treated to destroy vegetative cells and subsequently packaged

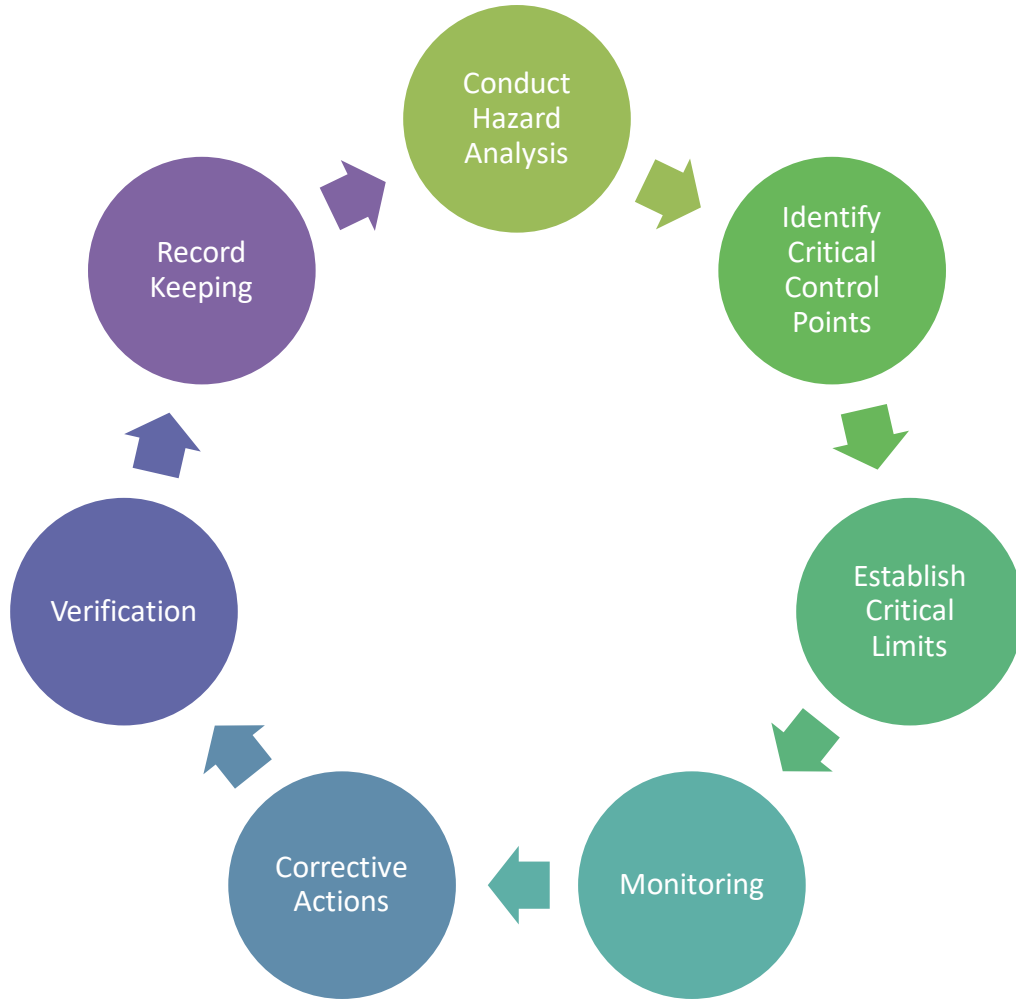
a _w values	pH values		
	4.6 or less	> 4.6 - 5.6	> 5.6
≤ 0.92	non-PHF*	non-PHF	non-PHF
> 0.92 - .95	non-PHF	non-PHF	PA**
> 0.95	non-PHF	PA	PA

*PHF means Potentially Hazardous Food
 ** PA means Product Assessment required

Table B. Interaction of pH and aw for control of vegetative cells and spores in food not heat-treated or heat-treated but not packaged

a _w values	pH values			
	< 4.2	4.2 - 4.6	> 4.6 - 5.0	> 5.0
< 0.88	non-PHF*	non-PHF	non-PHF	non-PHF
0.88 - 0.90	non-PHF	non-PHF	non-PHF	PA**
> 0.90 - 0.92	non-PHF	non-PHF	PA	PA
> 0.92	non-PHF	PA	PA	PA

* PHF means Potentially Hazardous Food
 ** PA means Product Assessment required



CHAPTER 5

Writing Your HACCP Plan

Introduction:

Submitting a HACCP Plan and Variance Request

This outlines the expectations for what will be submitted with each Variance and or HACCP plan submission. While it is the facility's responsibility to put their plan together, there are many resources available in the form of classes or private contractors. The FDA has also provided HACCP resource materials that can be found at:

<https://www.fda.gov/food/hazard-analysis-critical-control-point-haccp/haccp-principles-application-guidelines>

Variance Request

Each Variance Request must include:

- A detailed description of the requested variance, including citation to the relevant subdivisions specified in Section 113936
- An analysis of the science-based rationale upon which the proposed alternate practice or procedure is based, to include, if and as appropriate, microbial challenge and process validation studies demonstrating how potential health hazards dealt with in those subdivisions that are relevant to the requested variance will be addressed.
- A description of the specific procedures, processes, monitoring steps, and other relevant protocols that will be implemented pursuant to the variance to address potential health hazards dealt with in those subdivisions specified in Section 113936 that are relevant to the requested variance.
- A Service Request for a Variance

HACCP Plan

Each HACCP plan must include:

Section 1 - Introduction

- A Service Request for a HACCP Plan Review Form which includes:
 - General Facility Information
 - Type of HACCP plan submitted, multiple type of plan can be submitted as one plan if all required documents support each type of plan.
- Provide information on who is responsible for writing the plan
- A description of the product

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- A list of ingredients and recipes of formulations
- A list of equipment and materials used with specification sheets for ROP equipment and electronical monitoring if required
- Designated work area
- Laboratory verification of pH and/or water activity (Aw) when required

Section 2 – The Flow Chart

- A chart that documents the flow of food from receiving thru service to the customer
- The chart must identify each step that is a critical control point

Section 3 – The Hazard Analysis

- A chart that identifies each operational step the food will go through in your facility
- The potential hazards: biological, chemical, and physical that exist for each step
- Determination of significant hazards and the likelihood of occurrence
- Justification of the determination
- List of control measures that can be applied to prevent significant hazards
- Identification of critical control points

Section 4 – The HACCP Worksheet

- A chart documenting each critical control point, the critical limit, the monitoring procedures, the corrective actions, verification, and record keeping

Section 5 – The SOPs

Required for Each HACCP Plan

- No Bare Hand Contact with Ready to Eat Foods
- Receiving
- Hot and Cold Storage
- Thermometer Calibration
- Labeling
- Cleaning and Sanitation
- Personal Hygiene and Employee Health
- Prevention of Cross Contamination

Additional SOPs

- Cooking
- Reheating
- Cooling

- Other as needed to support your plan

Section 6 – The Training Program

- A written program that outlines the training food employees and managers receive to perform the special process tasks
- A training log documenting the employee's name, the training received, the date and time of the training, and the trainer's name

Section 7 – The Records

Examples include:

- Receiving log
- Refrigeration log
- Cooking and reheating log
- Hot holding log
- Thermometer calibration log
- Cooling log
- Discarded product log
- Others as needed to support your plan

HACCP plan and Variance's approvals are given in the form of a letter that may be sent by mail or electronically. This letter must always be kept on site. The HACCP plan must always be kept on site as well.

All HACCP plans have seven main components:

- 1) Conduct a hazard analysis
- 2) Determine Critical Control Points (CCP)
- 3) Establish Critical Limits
- 4) Establish monitoring procedures
- 5) Establish corrective actions
- 6) Establish verification of procedures
- 7) Establish record keeping and documentation procedures

The Hazard Analysis

A **food safety hazard** is any unacceptable contamination by a biological, chemical, or physical agent at sufficient levels to cause a food to be unsafe for human consumption. By far the most common agents are biological, mainly harmful bacteria, viruses, and parasites.

Biological hazards include bacteria, bacterial toxins, viruses, and parasitic organisms that could survive, grow, or contaminate food products/raw materials, and potentially cause foodborne illness.

Chemical hazards could result from several sources: agricultural chemicals, insecticides, fungicides, cleaning/sanitizing agents and chemicals, employee medications and personal care items, certain naturally occurring toxins such as Scombrototoxin (histamine), Ciguatoxin, mycotoxins from mold, shellfish toxins, and misuse of food chemicals (preservatives, additives, etc.).

Physical hazards include inadvertent field matter (stones, wood, metal fragments, etc.); inadvertent processing residues (glass, metal fragments, etc.); intentional materials (employee sabotage) and miscellaneous particulates and fragments.

Special processed foods have a higher risk for biological and chemical hazards due to a reduced oxygen atmosphere in a bag. Hazards are a huge threat to your business. You need to understand the operation and determine what food safety hazards are likely to occur. You need to understand how the people, equipment, methods, and foods all affect each other as well as the processes and procedures used to prepare the food.

Conducting a Hazard Analysis is the first step in creating your HACCP Plan. The HACCP team who will be creating the HACCP Plan for your facility should evaluate the hazards of significance and preventative measures needed for each food product and process you wish to conduct. You should use as many sources of information as possible in this evaluation phase, including scientific literature, expert opinion, laboratory testing and your state food code. Go to the UDSA and FDA websites for guidance documents and generic HACCP Plans. The FDA link is provided below.

<http://www.fda.gov/downloads/Food/GuidanceRegulation/HACCP/UCM077957.pdf>

First think about the flow of the food through your restaurant – these are called operational steps. Typical operational steps include receiving, storing (cold and dry), preparation, cooking, packaging,

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cooling, storing, reheating, and serving. These steps will be different depending on your special process you are utilizing. Think about any potential biological, physical, or chemical hazards at each of these steps. Let's take chicken for example- the primary pathogens of concern would be *Salmonella* and *Campylobacter jejuni* at receiving, storing, and cooking. Physical hazards might be bone in the chicken. A chemical hazard might be very strong quaternary ammonium sanitizer residue on the food prep table. Are these hazards significant? How do you control these hazards? To determine whether the hazards are significant, use the critical control point decision tree.

With this information you can complete the Hazard Analysis worksheet answering the questions as to whether a hazard exists at each point in your facility, determine it's a significant risk or not, determine control measures, and finally determine whether the step is a Critical Control Point (CCP).

Hazard Analysis Worksheet

Process Step	Potential Hazard Introduced, controlled, or enhanced at this step	Is the potential hazard significant?	Justification for decision	What control measures can be applied to prevent the significant hazards?	Is this step a Critical Control Point (CCP)?
Receiving	B- C- P-				
Storage	B- C- P-				
Preparation	B- C- P-				
Cook	B- C- P-				
Cool	B- C- P-				
Final Preparation	B- C- P-				
Cold Storage	B- C- P-				
Serving	B- C- P-				

Annex 4, Table 1. Selected Biological Hazards Found at Retail, Associated Foods, and Control

Hazard		Associated Foods	Control Measures
Bacteria	Bacillus cereus (intoxication caused by heat stable, preformed emetic toxin and infection by heat labile, diarrheal toxin)	Meat, poultry, starchy foods (rice, potatoes), puddings, soups, cooked vegetables	Cooking, cooling, cold holding, hot holding
	Campylobacter jejuni	Poultry, raw milk	Cooking, handwashing, prevention of cross-contamination
	Clostridium botulinum	Vacuum-packed foods, reduced oxygen packaged foods, under- processed canned foods, garlic- in-oil mixtures, time/temperature abused baked potatoes/sautéed onions	Thermal processing (time + pressure), cooling, cold holding, hot holding, acidification and drying, etc.
	Clostridium perfringens	Cooked meat and poultry, Cooked meat and poultry products including casseroles, gravies	Cooling, cold holding, reheating, hot holding
	E. coli O157:H7 (other shiga toxin-producing E. coli)	Raw ground beef, raw seed sprouts, raw milk, unpasteurized juice, foods contaminated by infected food workers via fecal-oral route	Cooking, no bare hand contact with RTE foods, employee health policy, handwashing, prevention of cross-contamination, pasteurization, or treatment of juice
	Listeria monocytogenes	Raw meat and poultry, fresh soft cheese, paté, smoked seafood, deli meats, deli salads	Cooking, date marking, cold holding, handwashing, prevention of cross-contamination
	Salmonella spp.	Meat and poultry, seafood, eggs, raw seed sprouts, raw vegetables, raw milk, unpasteurized juice	Cooking, use of pasteurized eggs, employee health policy, no bare hand contact with RTE foods, handwashing, pasteurization, or treatment of juice
	Shigella spp.	Raw vegetables and herbs, other foods contaminated by infected workers via fecal-oral route	Cooking, no bare hand contact with RTE foods, employee health policy, handwashing
	Staphylococcus aureus (preformed heat stable toxin)	RTE PHF foods touched by bare hands after cooking and further time/temperature abused	Cooling, cold holding, hot holding, no bare hand contact with RTE food, handwashing

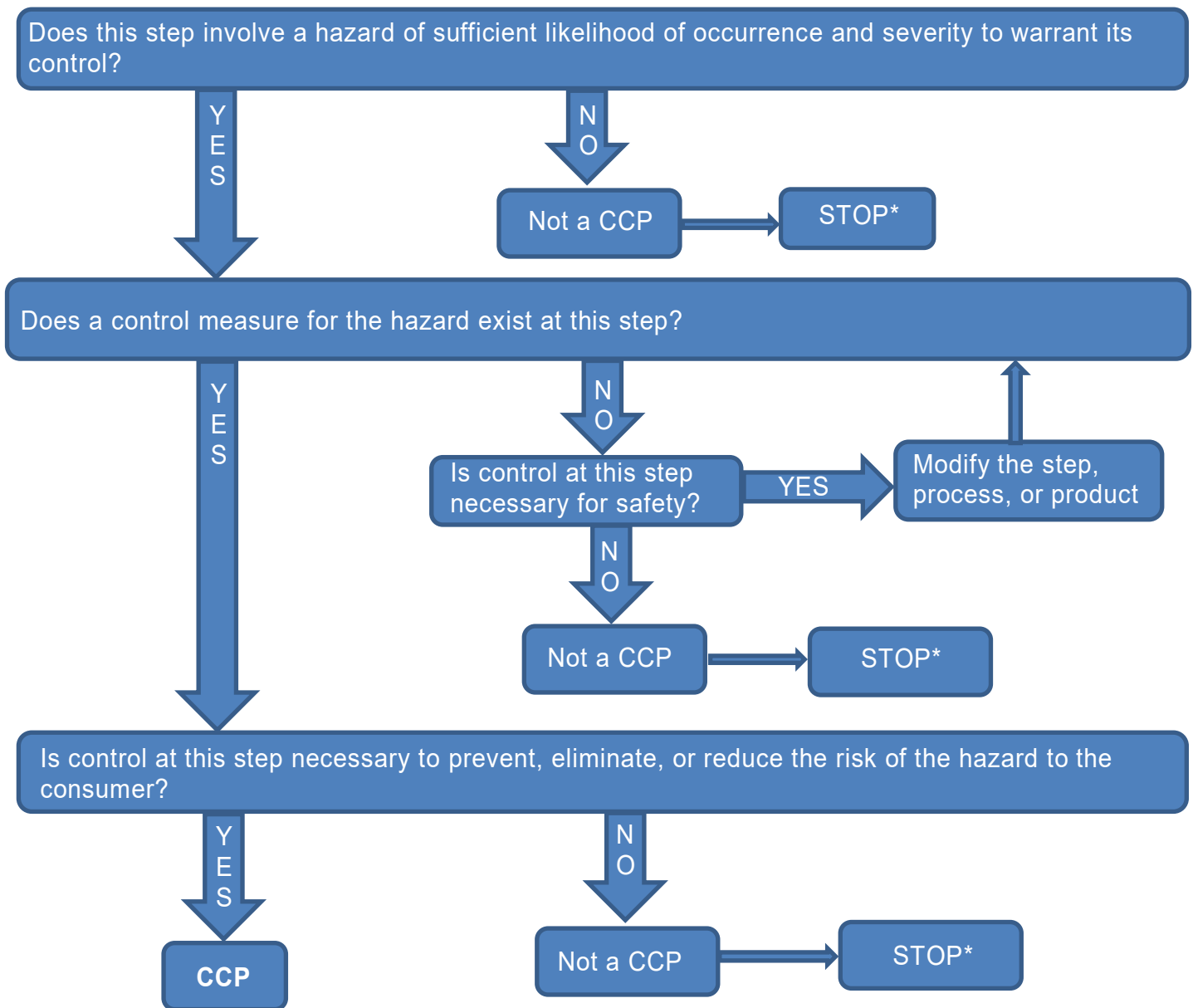
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	Vibrio spp.	Seafood, shellfish	Cooking, approved source, prevention of cross-contamination, cold holding
Parasites	Anisakis simplex	Various fish (cod, haddock, fluke, pacific salmon, herring, flounder, monkfish)	Cooking, freezing
	Taenia spp.	Beef and pork	Cooking
	Trichinella spiralis	Pork, bear, and seal meat	Cooking
Viruses	Hepatitis A and E	Shellfish, any food contaminated by infected worker via fecal-oral route	Approved source, no bare hand contact with RTE food, minimizing bare hand contact with foods not RTE, employee health policy, handwashing
	Other Viruses (Rotavirus, Norovirus, Reovirus)	Any food contaminated by infected worker via fecal-oral route	No bare hand contact with RTE food, minimizing bare hand contact with foods not RTE, employee health policy, handwashing
RTE = ready-to-eat PHF = potentially hazardous food (time/temperature control for safety food)			

Annex 4 FDA Food Code

Critical Control Point Determination

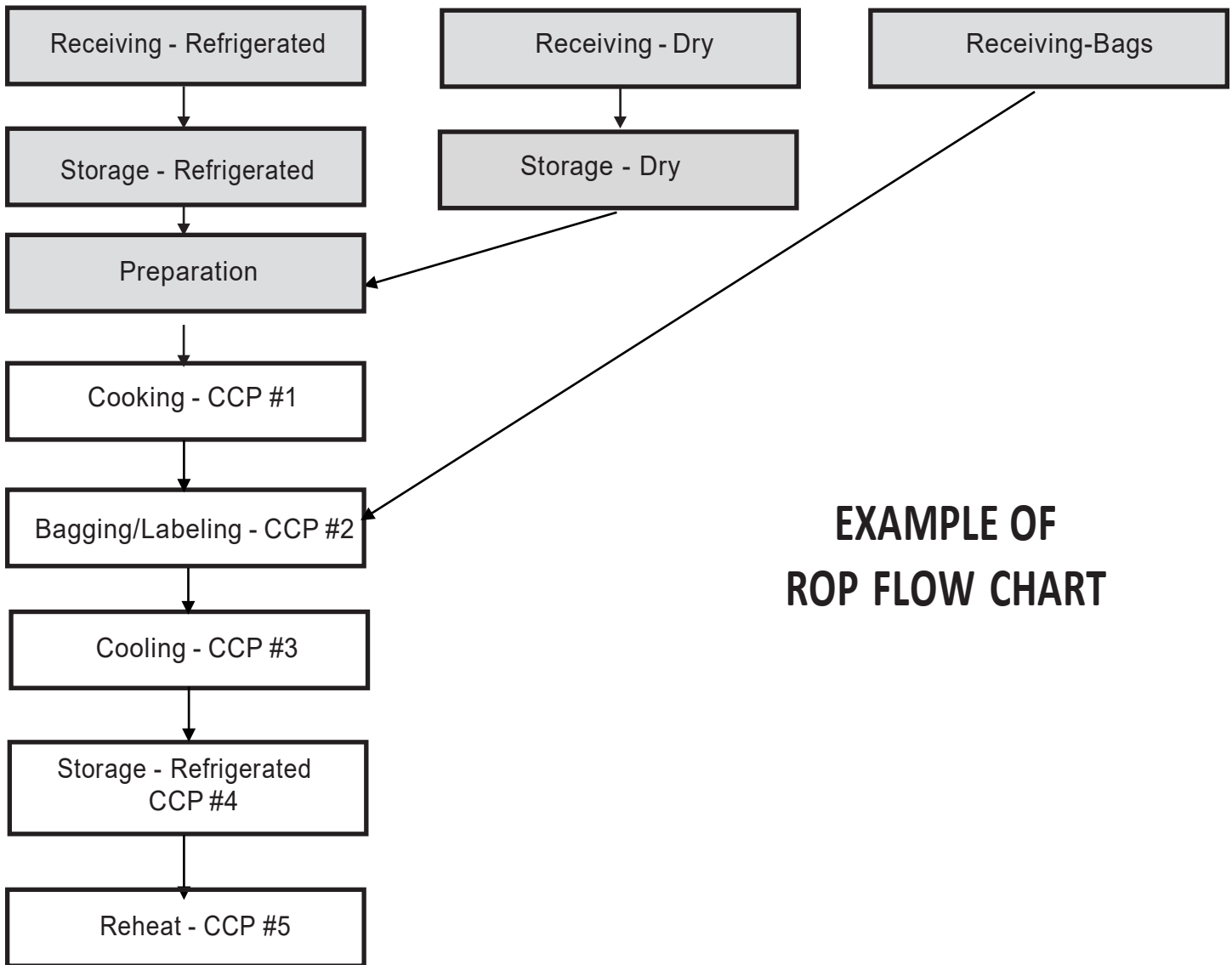
Use the CCP identification tree as a tool to determine if a step is a critical control point.
 (*proceed to the next step of HACCP plan)



The Flow Chart

The Flow Chart is like a road map showing the flow of food through your restaurant from Receiving to Serving. It helps to verify that all the steps the food goes through have been captured. The Flow Chart can be a verification tool it delimitates how the food is processed in the same way each time.

HACCP Plan Flow Charts will look different from operation to operation, and process to process. They will help you when writing your Hazard Analysis to determine if operational steps are to be identified as CriticalControl Points (CCPs).



The HACCP Plan Worksheet

The HACCP Plan Worksheet is where the plan specific can be found. It details the “who, what, where and when” with the Critical Control Points identified in our Hazard Analysis. The HACCP Plan Worksheet contains the following:

- Established critical control points based on the hazard analysis
- Critical limits to control the hazards identified
- What will be monitored, how will it be monitored, when will be monitored, and who will monitor the hazards in the operational steps
- Corrective actions for deviation from established critical limits
- How you will verify that your HACCP plan is being followed correctly and by who
- Records that will be kept for verification

This worksheet is the heart of your HACCP Plan

How to fill in the worksheet:

- 1) The Critical Control Point column is our starting point. This column is where you will list the identified Critical Control Points (CCP) from the Hazard Analysis Worksheet. List each of the CCP in descending order under the CCP. Example: CCP 2 - Storage

- 2) The Critical Limits column is next. This column is where you will list the critical limits for your identified critical control points. Example: Potentially hazardous foods must be stored at or below 41°F

- 3) The Monitoring column and is divided into 4 sections – What, How, Frequency and Who. Monitoring is how you ensure the Critical Limits have been reached and who is responsible.
 - a. “What” are we going to be measuring? - The internal temperature.
 - b. “How” are we going to measure? – using a probe food thermometer
 - c. “When” are we going to measure– how often will the measurement be taken
 - d. “Who” is going to be measuring? designated person(s) or position (sous chef)

- 4) Corrective Action is the next column. Even with the best intentions, sometimes things do not go as planned. When a critical limit is not met an intervention must happen. This column provides specific actions to be taken when there is a deviation from the critical limit.

5) Verification is having someone else check the records created in the process to ensure critical limits are met, and that the plan is followed. The person usually doing verification is the manager or owner. Verification is a good way to spot training issues as well. If you have a new person you can tell rather quickly if they need more help on understanding how to do this task.

6) The last column is Records. This is where the list of records to be maintained for this CCP will be listed. The records are listed here so the individual in charge of verification doesn't miss anything. It is also where validation of the plan starts. If the same corrective action is taking place over and over, an adjustment to the plan is warranted. This is validation of the plan.

The HACCP Plan Worksheet is where you state how you are going to be proactive on serving safe food. This demonstrates that you understand how to prepare food safely and can track the food ensuring critical limits are met to prevent the overgrowth of pathogens. This will help in the prevention of a food borne illness.

Chart 4-A Summary Chart for Minimum Cooking Food Temperatures and Holding Times Required by Chapter 3

Food	Minimum Temperature	Minimum Holding Time at the Specified Temperature
Raw Eggs prepared for immediate service, Commercially Raised Game Animals and Exotic Species of Game Animals, Fish, Pork, and Meat Not Otherwise Specified in this Chart	63°C (145°F)	15 seconds
Raw Eggs not prepared for hot holding, Comminuted Commercially Raised Game Animals and Exotic Species of Game Animals, Comminuted Fish and Meats, Injected Meats and Mechanically Tenderized Meats	70°C (158°F)	< 1 second
	68°C (155°F)	15 seconds
	66°C (150°F)	1 minute
	63°C (145°F)	3 minutes
Poultry Baluts Stuffed Fish; Stuffed Meat; Stuffed Pasta; Stuffed Poultry; Stuffed Ratites, Stuffing Containing Fish, Meat, Poultry, or Ratites, Wild Game Animal	74°C (165°F)	15 seconds
Food Cooked in A Microwave Oven	74°C (165°F) and hold for 2 minutes after removing from microwave oven	

Standard Operating Procedures (SOPs) and Logs

Standard Operating Procedures, commonly called SOPs, are a detailed set of instructions, steps or procedures that control the operational conditions within a food establishment, which allow for environmental conditions favorable to the production of safe food. These written procedures are often equivalent to prerequisite programs of HACCP.

HACCP records usually include logs. There are many different logs that might be necessary to ensure your plan is followed and the foods are reaching the critical limits required for food safety.

The following is a list of required and possible SOPs and logs.

Section 5 – The SOPs

Required for Each HACCP Plan

- No Bare Hand Contact with Ready to Eat Foods
- Receiving
- Hot and Cold Storage
- Thermometer Calibration
- Labeling
- Cleaning and Sanitation
- Personal Hygiene and Employee Health
- Prevention of Cross Contamination

Additional SOPs

- Cooking
- Reheating
- Cooling
- Other as needed to support your plan

Section 6 – The Training Program

- A written program that outlines the training food employees and managers receive to perform the special process tasks
- A training log documenting the employee's name, the training received, the date and time of the training, and the trainer's name

Section 7 – The Records

Examples include:

- Receiving log

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- Refrigeration log
- Cooking and reheating log
- Hot holding log
- Thermometer calibration log
- Cooling log
- Discarded product log
- Others as needed to support your plan

Sample SOP are given next. These sample SOPs should be adjusted to fit your operation procedures within your facility.

HACCP Based SOP, sample

STANDARD OPERATING PROCEDURE (SOP) FOR ELIMINATING BARE HAND CONTACT WHEN HANDLING REDUCED OXYGEN PACKAGED (ROP) AND READY-TO-EAT (RTE) FOODS

PURPOSE: To prevent foodborne illness due to hand-to-food cross-contamination.

SCOPE: This procedure applies to foodservice employees who prepare, handle, or serve Reduced Oxygen Packaged (ROP) and Ready-To-Eat (RTE) food.

KEY WORDS: Ready-to-Eat Food (RTE), Reduced Oxygen Packaging (ROP), and Cross Contamination

1. READY-TO-EAT FOOD means food that:
 - Is in a form that is edible without additional preparation to achieve food safety
 - A raw or partially cooked animal food specifically ordered by a customer, and the customer is advised of the hazard.
 - Ready-to-Eat Food includes but is not limited to:
 - Raw animal food that is cooked as required in Cooking and Reheating SOPs.
 - Raw fruits and vegetables which are thoroughly washed to remove soil and other contaminants.
 - Fruits and vegetables which are cooked and held for hot holding, as required in Cooking and Reheating SOPs.
 - All potentially hazardous food that is cooked as required in the Cooking and Reheating SOP and cooled as required in the Cooling SOP.
 - Plant food for which further washing, cooking, or other processing is not required for food safety, and from which rinds, peels, husks, or shells, if naturally present are removed.
 - Substances derived from plants including but not limited to spices, seasonings, and sugar, that will not be cooked.
 - A bakery item including but not limited to bread, cakes, pies, fillings, or icing for which further cooking is not required for food safety.
 - Commercially processed food for which further cooking is not required for food safety.
2. REDUCED OXYGEN PACKAGING (ROP) means the reduction of the amount of oxygen in a package by removing oxygen, displacing oxygen, and replacing it with another gas or combination of gases, or otherwise controlling the oxygen content to a level below that normally found in the surrounding 21% oxygen atmosphere.
3. CROSS-CONTAMINATION means the passing of bacteria, microorganisms, or other harmful substances indirectly from one surface to another through improper or unsanitary equipment, procedures, or products.

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP.
2. Follow all California Retail Food Code laws and FDA Food Code where appropriate.
3. Use proper handwashing procedures to wash hands and exposed arms prior to preparing or handling food or at any time when the hands may have become contaminated. See Washing Hands SOP.
4. Do not use bare hands to handle food that will be placed in ROP at any time (including when washing uncut, whole fruits and vegetables), and do not use bare hands to handle ready-to-eat foods at any time.
5. Use suitable utensils when working with ROP and ready-to-eat food. Suitable utensils may include:
 - Single-use gloves
 - Deli tissue
 - Foil wrap
 - Tongs, spoodles, spoons, spatulas, and other dispensing equipment

MONITORING:

A designated foodservice employee(s) will visually observe that bare hand contact of ROP and ready-to-eat food is eliminated, and that gloves or suitable utensils are used and changed at the appropriate times during all hours of operation.

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. Discard ROP and ready-to-eat food touched with bare hands.

VERIFICATION AND RECORD KEEPING:

The Person in Charge (PIC) will verify that foodservice workers are using suitable utensils or gloves by visually monitoring foodservice employees during all hours of operation.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

STANDARD OPERATING PROCEDURE (SOP) FOR RECEIVING DELIVERIES

PURPOSE: To ensure that all food is received fresh and safe when it enters the foodservice operation and to transfer food to proper storage as quickly as possible.

SCOPE: This procedure applies to foodservice employees who handle, prepare, or serve food.

KEY WORDS: Cross-Contamination, Temperatures, Receiving, Holding, Frozen Goods, Delivery

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP.
2. Follow California Retail Food Code.
3. Schedule deliveries to arrive at designated times during operational hours.
4. Post the delivery schedule, including the names of vendors, days and times of deliveries, and drivers' names.
5. Establish a rejection policy to ensure accurate, timely, consistent, and effective refusal and return of rejected goods.
6. Organize freezer and refrigeration space, loading docks, and storerooms before deliveries.
7. Gather product specification lists and purchase orders, temperature logs, calibrated thermometers, pens, flashlights, and clean loading carts before deliveries. Refer to the Using and Calibrating Thermometers SOP.
8. Keep receiving area clean and well lighted.
9. Do not touch ready-to-eat foods with bare hands.
10. Determine whether foods will be marked with the date arrival or the "use by" date and mark accordingly upon receipt.
11. Compare delivery invoice against products ordered and products delivered.
12. Transfer foods to their appropriate locations as quickly as possible.

MONITORING:

1. Inspect the delivery truck when it arrives to ensure that it is clean, free of putrid odors, and organized to prevent cross-contamination. Be sure refrigerated foods are delivered on a refrigerated truck.
2. Check the interior temperature of refrigerated trucks.
3. Confirm vendor name, day, and time of delivery, as well as driver's identification before accepting delivery. If driver's name is different from what is indicated on the delivery schedule, contact the vendor immediately.
4. Check frozen foods to ensure that they are all frozen solid and show no signs of thawing and refreezing, such as the presence of large ice crystals or liquids on the bottom of cartons.
5. Check the temperature of refrigerated foods.

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- a. For fresh meat, fish, and poultry products, insert a clean and sanitized thermometer into the center of the product to ensure a temperature of 41 °F or below. The temperature of milk should be 41 °F or below.
 - b. For packaged products, insert a food thermometer between two packages being careful not to puncture the wrapper. If the temperature exceeds 41 °F, it may be necessary to take the internal temperature before accepting the product.
 - c. For eggs, the interior temperature of the truck should be 41 °F or below.
6. Check dates of milk, eggs, and other perishable goods to ensure safety and quality.
 7. Check the integrity of food packaging.
 8. Check the cleanliness of crates and other shipping containers before accepting products. Reject foods that are shipped in dirty crates.

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. Reject the following:
 - Frozen foods with signs of previous thawing
 - Cans that have signs of deterioration, such as swollen sides or ends, flawed seals or seams, dents, or rust
 - Punctured packages
 - Foods with outdated expiration dates
 - Foods that are out of safe temperature zone or deemed unacceptable by the established rejection policy

VERIFICATION AND RECORD KEEPING:

Record the temperature and the corrective action on the delivery invoice or on the Receiving Log. The foodservice manager will verify that foodservice employees are receiving products using the proper procedure by visually monitoring receiving practices during the shift and reviewing the Receiving Log at the close of each day. Receiving Logs are kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

STANDARD OPERATING PROCEDURE (SOP) FOR HOT AND COLD HOLDING POTENTIALLY HAZARDOUS FOODS

PURPOSE: To prevent foodborne illness by ensuring that all potentially hazardous foods are held under the proper temperature.

SCOPE: This procedure applies to foodservice employees who prepare or serve food.

KEY WORDS: Cross-Contamination, Temperatures, Holding, Hot Holding, Cold Holding, Storage

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP. Refer to the Using and Calibrating Thermometers SOP.
2. Follow California Retail Food Code requirements.
 - Hold hot foods at 135 °F or above
 - Hold cold foods at 41 °F or below
3. Preheat steam tables and hot boxes.

MONITORING:

1. Use a clean, sanitized, and calibrated probe thermometer to measure the temperature of the food.
2. Take temperatures of foods by inserting the thermometer near the surface of the product, at the thickest part, and at other various locations.
3. Take temperatures of holding units by placing a calibrated thermometer in the coolest part of a hot holding unit or warmest part of a cold holding unit.
4. For hot foods held for service:
 - Verify that the air/water temperature of any unit is at 135 °F or above before use.
 - Reheat foods in accordance with the Reheating for Hot Holding SOP.
 - All hot potentially hazardous foods should be 135 °F or above before placing the food out for display or service.
 - Take the internal temperature of food before placing it on a steam table or in a hot holding unit and at least every 2 hours thereafter.
5. For cold foods held for service:
 - Verify that the air/water temperature of any unit is at 41 °F or below before use.
 - Chill foods, if applicable, in accordance with the Cooling Potentially Hazardous Foods SOP.
 - All cold potentially hazardous foods should be 41 °F or below before placing the food out for display or service.
 - Take the internal temperature of the food before placing it onto any salad bar, display cooler, or cold serving line and at least every 2 hours thereafter.
6. For cold foods in storage:
 - Take the internal temperature of the food before placing it into any walk-in cooler or reach-in cold holding unit.

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- Chill food in accordance with the Cooling Potentially Hazardous Foods SOP if the food is not 41 °F or below.
- Verify that the air temperature of any cold holding unit is at 41 °F or below before use and at least every 4 hours thereafter during all hours of operation.

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. For hot foods:
 - Reheat the food to 165 °F for 15 seconds if the temperature is found to be below 135 °F and the last temperature measurement was 135 °F or higher and taken within the last 2 hours. Repair or reset holding equipment before returning the food to the unit, if applicable.
 - Discard the food if it cannot be determined how long the food temperature was below 135°F.
3. For cold foods:
 - Rapidly chill the food using an appropriate cooling method if the temperature is found to be above 41 °F and the last temperature measurement was 41 °F or below and taken within the last 2 hours:
 - Place food in shallow containers (no more than 4 inches deep) and uncovered on the top shelf in the back of the walk-in or reach-in cooler.
 - Use a quick-chill unit like a blast chiller.
 - Stir the food in a container placed in an ice water bath.
 - Add ice as an ingredient.
 - Separate food into smaller or thinner portions.
4. Repair or reset holding equipment before returning the food to the unit, if applicable.
5. Discard the food if it cannot be determined how long the food temperature was above 41 °F.

VERIFICATION AND RECORD KEEPING:

Foodservice employees will record temperatures of food items and document corrective actions taken on the Hot and Cold Holding Temperature Log. A designated foodservice employee will record air temperatures of coolers and cold holding units on the Refrigeration Logs. The foodservice manager will verify that foodservice employees have taken the required holding temperatures by visually monitoring foodservice employees during the shift and reviewing the temperature logs at the close of each day. The temperature logs are to be kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

STANDARD OPERATING PROCEDURE FOR USING AND CALIBRATING THERMOMETERS

PURPOSE: To prevent foodborne illness by ensuring that the appropriate type of thermometer is used to measure internal product temperatures and that thermometers used are correctly calibrated for accuracy.

SCOPE: This procedure applies to foodservice employees who prepare, cook, and cool food.

KEY WORDS: Thermometers, Calibration

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP.
2. Follow California Retail Food Code requirements.
3. Follow the food thermometer manufacturer's instructions for use. Use a food thermometer that measures temperatures from 0 °F (-18 °C) to 220 °F (104 °C) and is appropriate for the temperature being taken. For example:
 - Temperatures of thin products, such as hamburgers, chicken breasts, pizza, filets, nuggets, hot dogs, and sausage patties, must be taken using a thermistor or thermocouple with a thin probe.
 - Bimetallic, dial-faced stem thermometers are accurate only when measuring temperatures of thick foods. They may not be used to measure temperatures of thin foods. A dimple mark located on the stem of the thermometer indicates the maximum food thickness that can be accurately measured.
 - Use only oven-safe, bimetallic thermometers when measuring temperatures of food while cooking in an oven.
4. Have food thermometers easily accessible to foodservice employees during all hours of operation.
5. Clean and sanitize food thermometers before each use. Refer to the Cleaning and Sanitizing Food Contact Surfaces SOP for the proper procedure to follow.
6. Store food thermometers in an area that is clean and where they are not subject to contamination.
7. Thermometers in food storage units must be PERMANENTLY AFFIXED.
8. Thermocouple or Digital Thermometer required when cooking small masses. (ex. meat patties, fish fillets)

MONITORING:

1. Foodservice employees will use either the ice-point method or boiling-point method to verify the accuracy of food thermometers. This is known as calibration of the thermometer.
2. To use ice-point method:
 - Insert the thermometer probe into a cup of crushed ice.
 - Add enough cold water to remove any air pockets that might remain.
 - Allow the temperature reading to stabilize before reading temperature.

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- Temperature measurement should be 32 °F (± 2 °F) [or 0 °C (± 1 °C)]. If not, adjust according to manufacturer's instructions.
3. To use boiling-point method:
 - Immerse at least the first two inches of the probe into boiling water.
 - Allow the temperature reading to stabilize before reading temperature.
 - Reading should be 212 °F (± 2 °F) [or 100 °C (± 1 °C)]. This reading may vary at higher altitudes. If adjustment is required, follow manufacturer's instructions.
 4. Foodservice employees will check the accuracy of the food thermometers:
 - At regular intervals (at least once per week)
 - If dropped
 - If used to measure extreme temperatures, such as in an oven
 - Whenever accuracy is in question

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. For an inaccurate, bimetallic, dial-faced thermometer, adjust the temperature by turning the dial while securing the calibration nut (located just under or below the dial) with pliers or a wrench.
3. For an inaccurate, digital thermometer with a reset button, adjust the thermometer according to manufacturer's instructions.
4. If an inaccurate thermometer cannot be adjusted on-site, discontinue using it, and follow manufacturer's instructions for having the thermometer calibrated.
5. Retrain employees who are using or calibrating food thermometers improperly.

VERIFICATION AND RECORD KEEPING:

Foodservice employees will record the calibration temperature and any corrective action taken, if applicable, on the Thermometer Calibration Log each time a thermometer is calibrated. The foodservice manager will verify that foodservice employees are using and calibrating thermometers properly by making visual observations of the employees during the calibration process and all operating hours. The foodservice manager will review and initial the Calibration Log daily. The Calibration Log will be kept on file a minimum of 1 year. The foodservice manager will complete the Food Safety Checklist daily. The Food Safety Checklist is to be kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

STANDARD OPERATING PROCEDURES (SOP) FOR DATE MARKING READY-TO-EAT, POTENTIALLY HAZARDOUS FOOD

PURPOSE: To ensure appropriate rotation of ready-to-eat food to prevent or reduce foodborne illness from *Listeria monocytogenes*.

SCOPE: This procedure applies to foodservice employees who prepare, store, or serve food.

KEY WORDS: Ready-to-Eat Food, Potentially Hazardous Food, Date Marking, Cross-Contamination

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP. The best practice for a date marking system would be to include a label with the product name, the day or date, and time it is prepared or opened. Examples of how to indicate when the food is prepared or opened include:
 - Labeling food with a calendar date, such as “cut cantaloupe, 5/26/05, 8:00 a.m.,”
 - Identifying the day of the week, such as “cut cantaloupe, Monday, 8:00 a.m.,” or
 - Using color-coded marks or tags, such as cut cantaloupe, blue dot, 8:00 a.m. means “cut on Monday at 8:00 a.m.”
2. Follow California Retail Food Code requirements.
3. Label ready-to-eat, potentially hazardous foods that are prepared on-site and held for more than 24 hours.
4. Label any processed, ready-to-eat, potentially hazardous foods when opened, if they are to be held for more than 24 hours.
5. Refrigerate all ready-to-eat, potentially hazardous foods at 41 °F or below.
6. Serve or discard refrigerated, ready-to-eat, potentially hazardous foods within 7 days.
7. Indicate with a separate label the date prepared, the date frozen, and the date thawed of any refrigerated, ready-to-eat, potentially hazardous foods.
8. Calculate the 7-day time by counting only the days that the food is under refrigeration. For example:
 - On Monday, 8/1/05, lasagna is cooked, properly cooled, and refrigerated with a label that reads, “Lasagna, Cooked, 8/1/05.”
 - On Tuesday, 8/2/05, the lasagna is frozen with a second label that reads, “Frozen, 8/2/05.” Two labels now appear on the lasagna. Since the lasagna was held under refrigeration from Monday, 8/1/05 – Tuesday, 8/2/05, only 1 day is counted towards the 7-day time.
 - On Tuesday 8/16/05 the lasagna is pulled out of the freezer. A third label is placed on the lasagna that reads, “Thawed, 8/16/05.” All three labels now appear on the lasagna. The lasagna must be served or discarded within 6 days.

MONITORING:

A designated employee will check refrigerators daily to verify that foods are date marked and that foods exceeding the 7-day time are not being used or stored.

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. Foods that are not date marked or that exceed the 7-day time will be discarded.

VERIFICATION AND RECORD KEEPING:

The foodservice manager will complete the Food Safety Checklist daily. The Food Safety Checklist is to be kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP

STANDARD OPERATING PROCEDURE (SOP) FOR CLEANING AND SANITIZING FOOD CONTACT SURFACES

PURPOSE: To prevent foodborne illness by ensuring that all food contact surfaces are properly cleaned and sanitized.

SCOPE: This procedure applies to foodservice employees involved in cleaning and sanitizing food contact surfaces.

KEY WORDS: Food Contact Surface, Cleaning, Sanitizing

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP.
2. Follow all California Retail Food Code requirements.
3. Follow manufacturer's instructions regarding the use and maintenance of equipment and use of chemicals for cleaning and sanitizing food contact surfaces.
4. Wash, rinse, and sanitize food contact surfaces of sinks, tables, utensils, thermometers, carts, and equipment:
 - Before each use
 - Between uses when preparing different types of raw animal foods, such as eggs, fish, meat, and poultry
 - Between uses when switching from raw animal foods to ready-to-eat foods
 - Any time contamination occurs or is suspected
5. Wash, rinse, and sanitize food contact surfaces of sinks, tables, utensils, thermometers, carts, and equipment using the following procedure:
 - Wash surface with detergent solution.
 - Rinse surface with clean water.
 - Sanitize surface using a sanitizing solution mixed at a concentration specified on the manufacturer's label.
 - Place wet items in a manner to allow air drying.
6. If a 3-compartment sink is used, setup and use the sink in the following manner:
 - In the first compartment, wash with a clean detergent solution at or above 110°F or at the temperature specified by the detergent manufacturer.
 - In the second compartment, rinse with clean water.
 - In the third compartment, sanitize with an approved sanitizing solution mixed at a concentration specified on the manufacturer's label or by immersing in hot water at or above 171°F for 30 seconds. Test the chemical sanitizer concentration by using an appropriate test kit, i.e., test strips or equivalent.
 - Drain and refill compartments periodically and as needed to keep the water clean.
7. If a dish machine is used:

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- Check with the dish machine manufacturer to verify that the information on the data plate is correct.
- Refer to the information on the data plate for determining wash, rinse, and sanitization (final) rinse temperatures; sanitizing solution concentrations; and water pressures, if applicable.
- Follow manufacturer's instructions for use.
- Drain and refill the machine periodically and as needed to keep the water clean.
- Ensure that food contact surfaces reach a surface temperature of 160°F or above if using hot water to sanitize.

MONITORING:

Foodservice employees will:

1. During all hours of operation, visually and physically inspect food contact surfaces of equipment and utensils to ensure that the surfaces are clean.
2. If using a 3-compartment sink:
 - Visually monitor to ensure the water in each compartment is clean.
 - Take the water temperature in the first compartment of the sink by using a calibrated thermometer. Refer to Using and Calibrating Thermometers SOP.
 - If using chemicals to sanitize, test the sanitizer concentration by using the appropriate test kit for the chemical.
 - If using hot water to sanitize, use a calibrated thermometer to measure the water temperature.
3. If using a dish machine:
 - Visually inspect the water and the interior parts of the machine to ensure they are clean and free of debris.
 - Continually monitor the temperature and pressure gauges, if applicable, to ensure that the machine is operating according to the data plate.
 - For hot water sanitizing dish machine, ensure that food contact surfaces are reaching the appropriate temperature by placing a piece of heat sensitive tape on a small ware item or a maximum registering thermometer on a rack and running the item or rack through the dish machine.
 - For chemical sanitizing dish machine, check the sanitizer concentration on a recently washed food-contact surface using an appropriate test kit, i.e., test strip or equivalent.

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. Wash, rinse, and sanitize dirty food contact surfaces. Sanitize food contact surfaces if it is discovered that the surfaces were not properly sanitized. Discard food that comes in contact with food contact surfaces that have not been sanitized properly.
3. In a 3-compartment sink:
 - Drain and refill compartments if water is dirty.
 - Adjust the water temperature by adding hot water until the desired temperature is reached.
 - Add more sanitizer or water, as appropriate, until the proper sanitizer concentration is achieved.
4. In a dish machine:

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- Drain and refill machine if water is dirty.
- Contact the appropriate individual(s) to have the machine repaired if the machine is not reaching the proper wash temperature indicated on the data plate.
- For a hot water sanitizing dish machine, retest by running the machine again. If the appropriate surface temperature is still not achieved on the second run, contact the appropriate individual(s) to have the machine repaired. Wash, rinse, and sanitize in the 3-compartment sink until the machine is repaired.
- For a chemical sanitizing dish machine, check the level of sanitizer remaining in bulk container. Fill, if needed. "Prime" the machine according to the manufacturer's instructions to ensure that the sanitizer is being pumped through the machine. Retest sanitizer solution concentration using an appropriate test kit. If the proper sanitizer concentration level is not achieved, stop using the machine and contact the appropriate individual(s) to have it repaired. Use a 3-compartment sink to wash, rinse, and sanitize until the machine is repaired.

VERIFICATION AND RECORD KEEPING:

The foodservice manager will verify that foodservice employees are following this procedure.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

STANDARD OPERATING PROCEDURE (SOP) FOR EMPLOYEE HEALTH & PERSONAL HYGIENE

PURPOSE: To prevent foodborne illness due to employee health and personal hygiene.

SCOPE: This Standard Operating Procedure (SOP) describes the policy that staff will adhere to in order to ensure all foodservice employees will maintain good personal hygiene and follow proper Employee Health practices to ensure food safety.

INSTRUCTIONS :

1. Follow all California Retail Food Code requirements.
2. Grooming:
 - a. Arrive at in a clean condition – clean hair and clean outer clothing.
 - b. Fingernails should be trimmed, clean, polish-free, and maintained so edges and surfaces are cleanable and not rough. No artificial nails are permitted in the food production area.
 - c. Wash hands (including under fingernails) and up to forearms vigorously and thoroughly with soap and warm water for a period of 20 seconds:
 - i. When entering the facility before work begins.
 - ii. Immediately before preparing food or handling equipment.
 - iii. As often as necessary during food preparation when contamination occurs.
 - iv. In the restroom after toilet use and when you return to your workstation.
 - v. When switching between working with raw foods and working with ready-to-eat or cooked foods.
 - vi. After touching face, nose, hair, or any other body part, and after sneezing or coughing.
 - vii. After performing any cleaning duties.
 - viii. Between each task performed and before wearing disposable gloves.
 - ix. After smoking, eating, or drinking.
 - x. Any other time an unsanitary task has been performed (i.e., taking out garbage, handling cleaning chemicals, wiping tables, picking up a dropped food item, etc.)
 - d. Wash hands only in hand sinks designated for that purpose.
 - e. Dry hands with single use towels. Turn off faucets using a paper towel in order to prevent recontamination of clean hands.
3. Proper Attire:
 - a. Wear appropriate clothing- clean uniform with sleeves and clean non-skid close-toes work shoes that are comfortable for standing and working on floors that can be slippery.
 - b. Aprons used by employees are to be hung in a designated area when not in use. They are not to be worn in the toilet area, eating areas or locker rooms.

- c. Use disposable gloves, or dispensing equipment such as tongs, spatulas or tissue paper when handling ready-to-eat foods that will not be heat-treated.
 - d. Change disposable gloves as often as handwashing is required. Wash hands before donning and after discarding gloves.
4. Hair restraints and jewelry:
- a. Effective hair restraints must be worn in food preparation and service areas.
 - b. Keep beard and mustaches neat and trimmed. Beard restraints are required in any food production area.
 - c. No jewelry (except a wedding band or other plain ring or medical identification bracelet) is allowed during handling of food.
5. Illness:
- a. Food employees shall report to Person in Charge when they have a symptom caused by illness, infection, or other source that is:
 - i. Associated with, diarrhea, vomiting or other acute gastrointestinal illness
 - ii. Jaundice
 - iii. Sore throat with fever
 - iv. A boil, infected wound or other lesion containing pus that is open or draining. If located on the hands or wrists, a finger cot that protects the lesion and a single use glove must be worn. Lesions on exposed portions of the arms must be protected by an impermeable cover.
 - b. Employees with gastrointestinal symptoms (vomiting and/or diarrhea) will be excluded for a minimum of 48 Hours after symptoms have stopped.
 - c. Employees with jaundice will be excluded until laboratory results indicate the individual is not currently infected with Hepatitis A.
 - d. Employees with acute respiratory infection or sore throat with fever will be excluded until symptom free. Employees could be re-assigned to activities so that there is no risk of transmitting a disease through food.
6. Cuts, Abrasions and Burns:
- a. Bandage any cut, sores, rash, lesion, abrasion or burn that has broken the skin.
 - b. Wear disposable gloves to cover bandages on hands. Change as appropriate.
 - c. Inform Person in Charge of all wounds.
7. Smoking, eating and gum chewing:
- a. Eating and drinking is prohibited in areas where contamination of exposed food, clean equipment, utensils, unwrapped single-service and single use articles could occur.
 - b. Smoke only in designated areas. No smoking or chewing tobacco shall occur inside food preparation and service areas.
 - c. A closed beverage container may be used in the kitchen if the container is handled to prevent contamination.
 - d. Refrain from chewing gum or eating candy while working in food preparation areas.
8. No Bare Hand Contact with Ready-to-Eat (RTE) Foods

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Food handlers may use single service gloves, tongs, spatulas, serving spoons, deli paper and/or toothpicks to prevent contact with ready to eat food items with bare hands during food preparation and/or service.

MONITORING:

Person in Charge will:

- a. Visually inspect employees when they report to work to ensure all employees are adhering to the health and hygiene policies.
- b. Visually monitor employee handwashing during all hours of operation.
- c. Visually monitor employees during all hours of operation to ensure proper procedures are followed to avoid bare-hand contact with ready-to-eat foods.
- d. Visually observe handwashing sinks to ensure all handwashing sinks are properly supplied during all hours of operation.

CORRECTIVE ACTION:

- 1) Retrain any employee found not following the procedures in this SOP.
- 2) Ensure employees that are observed not washing their hands at the appropriate times are required to immediately wash their hands using the proper procedures
- 3) Ensure employees that are observed contacting ready-to-eat food with bare hands are retrained to ensure proper procedures to avoid bare hand contact with ready-to-eat foods and proper handwashing procedures.
- 4) Ensure employees exhibiting signs of illness are excluded for the period of time outlined in this SOP.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

STANDARD OPERATING PROCEDURE (SOP) FOR THE PREVENTION OF CROSS CONTAMINATION DURING STORAGE AND PREPARATION

PURPOSE: To reduce foodborne illness by prevention unintentional contamination of food

SCOPE: This procedure applies to anyone who is responsible for receiving, storing, preparing, and serving food.

RESPONSIBILITY: It is the responsibility of the management to ensure that the following procedures are adhered to and understood by all relevant personnel and the personnel follow the California Retail Food Code requirements.

INSTRUCTIONS:

1. Wash hands properly. Refer to the Employee Health and Personal Hygiene SOP.
2. Avoid touching ready-to-eat food with bare hands.
3. Separate raw animal foods such as eggs, fish, meat, and poultry from ready-to-eat foods such as lettuce, cut melons, and lunch meats during receiving, storage, and preparation.
4. Separate different types of raw animal foods such as eggs, fish, meat, and poultry from each other, except when combined in recipes.
5. Store raw animal foods in refrigerators or walk-in coolers by placing the raw animal foods on shelves in order of cooking temperatures with the raw animal food requiring the highest cooking temperature, such as chicken, on the lowest shelf.
6. Separate unwashed fruits and vegetables from washed fruits and vegetables and other ready-to-eat foods.
7. Use only dry, cleaned, and sanitized equipment and utensils. Refer to Cleaning and Sanitizing SOP for proper cleaning and sanitizing procedures.
8. Touch only those surfaces of equipment and utensils that will not come in direct contact with food.
9. Place food in covered containers or packages, except during cooling, and store in the walk-in refrigerator or cooler.
10. Designate an upper shelf of a refrigerator or walk-in cooler as the "cooling" shelf. Uncover containers of food during the initial quick cool-down phase to facilitate cooling.
11. Clean exterior surfaces of food containers such as cans and jars, or visible soil before opening.
12. Store damaged goods in a separate location.

MONITORING:

Designated employee will continually monitor food storage and preparation to ensure that food is not cross-contaminated.

CORRECTIVE ACTION:

1. Retrain any employee found not following the procedures in this SOP.
2. Separate foods found improperly stored.
3. Discard ready-to-eat foods that are contaminated by raw eggs, raw fish, raw meat, or raw poultry.

VERIFICATION AND RECORD KEEPING:

1. The manager will visually observe that employees are following these procedures and taking all necessary corrective actions during all hours of operation.
2. The manager will periodically check the storage of foods during hours operation.
3. Employees will document any discarded food on the Damaged and Discarded Product Log.
4. The manager will verify that appropriate corrective actions are being taken by reviewing, initialing, and dating the Damaged and Discarded Product Log.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

STANDARD OPERATING PROCEDURE (SOP) FOR COOKING REDUCED OXYGEN PACKAGED (ROP) FOODS

PURPOSE: To prevent foodborne illness by ensuring that all Reduced Oxygen Packaged (ROP) foods are cooked to the appropriate internal temperature.

SCOPE: This procedure applies to foodservice employees who prepare or serve ROP food.

KEY WORDS: Cross-Contamination, Cook, Reduced Oxygen Packaging (ROP), Temperature

1. Cross-contamination means the passing of bacteria, microorganisms, or other harmful substances indirectly from one surface to another through improper or unsanitary equipment, procedures, or products.
2. Cook means to transform food and make it suitable for consumption by heating.
3. Reduced oxygen packaging (ROP) means the reduction of the amount of oxygen in a package by removing oxygen, displacing oxygen, and replacing it with another gas or combination of gases, or otherwise controlling the oxygen content to a level below that normally found in the surrounding 21% oxygen atmosphere.
4. Temperature means the amount of heat or cold measured on a thermometer. This SOP measures temperature in degrees Fahrenheit (°F).

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP. Refer to the Using and Calibrating Thermometers SOP.
2. Follow all California Retail Food Code requirements.
3. If a recipe contains a combination of animal products, cook the product to the highest required temperature.
4. Cook ROP products to the required temperatures outlined in the California Retail Food Code.

MONITORING:

Use a clean, sanitized, and calibrated probe thermometer, preferably a thermocouple for monitoring cooking food. Cooking time and temperatures will be monitored by responsible person, trained in the cooking of foods.

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. Continue cooking food until the required time and temperature are achieved.

VERIFICATION AND RECORD KEEPING:

Foodservice employees will record product name, time, temperatures, and any corrective action taken on the cooking log. Management will verify that foodservice employees have taken the required cooking temperatures by visually monitoring foodservice employees and preparation

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procedures during the shift and reviewing and initialing the cooking log. Records will be maintained for 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

Standard Operating Procedures for Reheating Potentially Hazardous Foods

PURPOSE: To prevent foodborne illness by ensuring that all foods are reheated to the appropriate internal temperature.

SCOPE: This procedure applies to foodservice employees who prepare or serve food.

KEY WORDS: Cross-Contamination, Temperatures, Reheating, Holding, Hot Holding

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP. Refer to the Using and Calibrating Thermometers SOP.
2. Follow California Retail Food Code requirements.
3. Reheat the following products to 165 °F for 15 seconds:
 - Any food that is cooked, cooled, and reheated for hot holding
 - Leftovers reheated for hot holding
 - Products made from leftovers, such as soup
 - Precooked, processed foods that have been previously cooled
4. Reheat food for hot holding in the following manner if using a microwave oven:
 - Heat processed, ready-to-eat foods from a package or can to at least 135 °F for 15 seconds
 - Heat leftovers to 165 °F for 15 seconds
 - Rotate (or stir) and cover foods while heating
 - Allow to sit for 2 minutes after heating
5. Reheat all foods rapidly. The total time the temperature of the food is between 41 °F and 135°F may not exceed 2 hours.
6. Serve reheated food immediately or transfer to an appropriate hot holding unit.

MONITORING:

1. Use a clean, sanitized, and calibrated probe thermometer.
2. Take at least two internal temperatures from each pan of food.

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. Continue reheating and heating food if the internal temperature does not reach the required temperature.

VERIFICATION AND RECORD KEEPING:

Foodservice employees will record product name, time, the two temperatures/times, and any corrective action taken on the Cooking and Reheating Temperature Log. Foodservice manager will verify that foodservice employees have taken the required reheating temperatures by visually

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monitoring foodservice employees during the shift and reviewing, initialing, and dating the Cooking and Reheating Temperature Log at the close of each day. The temperature logs are kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

HACCP Based SOP, sample

Standard Operating Procedure (SOP) for Cooling Potentially Hazardous Foods

PURPOSE: To prevent foodborne illness by ensuring that all potentially hazardous foods are cooled properly.

SCOPE: This procedure applies to foodservice employees who prepare or serve food.

KEY WORDS: Cross-Contamination, Temperatures, Cooling, Holding

INSTRUCTIONS:

1. Train foodservice employees on using the procedures in this SOP. Refer to the Using and Calibrating Thermometers SOP.
2. Follow California Retail Food Code requirements.
3. Modify menus, production schedules, and staff work hours to allow for implementation of proper cooling procedures.
4. Prepare and cool food in small batches.
5. Chill food rapidly using an appropriate cooling method:
 - Place food in shallow containers no more than 4 inches deep and uncovered on the top shelf in the back of the walk-in or reach-in cooler.
 - Use a quick-chill unit such as a blast chiller.
 - Stir the food in a container placed in an ice water bath.
 - Add ice as an ingredient.
 - Separate food into smaller or thinner portions.
 - Pre-chill ingredients and containers used for making bulk items such as salads.
6. Chill cooked, hot food from:
 - 135 °F to 70 °F within 2 hours. Take corrective action immediately if food is not chilled from 135 °F to 70 °F within 2 hours.
 - 70 °F to 41 °F or below within 4 hours. The total cooling process from 135 °F to 41 °F may not exceed 6 hours. Take corrective action immediately if food is not chilled from 135 °F to 41 °F within the 6-hour cooling process.
7. Chill prepared, ready-to-eat foods such as tuna salad and cut melons from 70 °F to 41 °F or below within 4 hours. Take corrective action immediately if ready-to-eat food is not chilled from 70 °F to 41 °F within 4 hours.

MONITORING:

1. Use a clean, sanitized, and calibrated probe thermometer to measure the internal temperature of the food during the cooling process.
2. Monitor temperatures of products every hour throughout the cooling process by inserting a probe thermometer into the center of the food and at various locations in the product.

CORRECTIVE ACTION:

1. Retrain any foodservice employee found not following the procedures in this SOP.
2. Reheat cooked, hot food to 165 °F for 15 seconds and start the cooling process again using a different cooling method when the food is:
 - Above 70 °F and 2 hours or less into the cooling process; and
 - Above 41 °F and 6 hours or less into the cooling process.
3. Discard cooked, hot food immediately when the food is:
 - Above 70 °F and more than 2 hours into the cooling process; or
 - Above 41 °F and more than 6 hours into the cooling process.
3. Use a different cooling method for prepared ready-to-eat foods when the food is above 41 °F and less than 4 hours into the cooling process.
4. Discard prepared ready-to-eat foods when the food is above 41 °F and more than 4 hours into the cooling process.

VERIFICATION AND RECORD KEEPING:

Foodservice employees will record temperatures and corrective actions taken on the Cooling Temperature Log. Foodservice employees will record if there are no foods cooled on any working day by indicating “No Foods Cooled” on the Cooling Temperature Log. The foodservice manager will verify that foodservice employees are cooling food properly by visually monitoring foodservice employees during the shift and reviewing, initialing, and dating the temperature log each working day. The Cooling Temperature Logs are to be kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

The Training Program

Special processing should not be done by just anyone in your restaurant. You will want to assign specific people who can carry out the requirements of your HACCP plan. You need to create a training program that defines what the employee must learn before they can actually do the special processing. The program can be written in SOP format detailing each step of a particular function for example: how they clean the vacuum packaging machine, how and where they label the foods, how they fill the sous vide bags, etc.

You will also keep a training log for each employee that will be doing the special processing identifying what training they received, the date of the training, the signature of who did the training, and the signature of the employee. This ensures that:

- 1) The employee is receiving the training needed to work the HACCP Plan
- 2) The employee understands this training is important
- 3) The employee is taking responsibility for doing the work correctly
- 4) The employee understands what the critical limits are to reduce hazards in the food, and corrective actions in case the critical limits have not been achieved
- 5) The employer is providing the training to ensure the food stays safe for the customers

Training your employees goes beyond telling them to get their food handler card. It means possibly watching food safety videos, reading the SOP's, going to specialized managers training or becoming ServSafe certified, attending HACCP trainings, having a salesperson train employee on operating a new piece of equipment, or you personally teaching employees how you want a specific task done.

Special processing in your restaurant is a higher risk practice. Your business is resting in the hands of an employee that will be processing the food. Having a well-documented training program will help ensure safe food handling practices in your kitchen.

The Records

Records are the format for documenting the data, proving that the critical limits have been met, and documenting corrective actions if those limits are not met. Records are reviewed to verify that a HACCP plan is being followed. Records are usually kept in a chart format

There are a number of different types of logs used in HACCP Plans. The more common ones are:

- Receiving Log (date/products/temperatures)
- Daily Refrigeration/Freezer Temperatures Logs
- Cook/Cool/Reheat Logs (dates/products/finished cook dates/times/temperatures and coolingdates/times/temperatures and reheating dates/times/temperatures)
- Thermometer Calibration Log (dates/calibrated to 32F in ice water)
- Employee Training Log (date/subject of training)

These are just examples of logs. The logs your facility will use depends on what special process you are utilizing. If you are vacuum packaging raw beef steaks you might want a log for recording dates you vacuum packed the product, the amount of packaged product, and the use by date. Not all logs are for temperatures: logs can be for any data you want to track, such as Employee Training.

Logs are usually kept for a period of time in your restaurant. Many places keep them for a year or more. The logs will be reviewed by your Health Inspector during your routine inspections.

When you develop a HACCP Plan and or Variance it is not just a document that needs to get approval from California Department of Public Health it is a legal document. If someone should claim that they got sick from food prepared under the HACCP Plan your charts and HACCP Plan could be admissible in a court of law. Operating under an approved HACCP Plan could help reduce your liability. It's very important that once you have an approved HACCP Plan that you are earnest at maintaining the logs as they are your proof of compliance.

