

# FOOD HACCP PROCESSES

## GENERAL

Operations shall comply with government regulations that include adequate (HACCP) hazard control and quality assurance for receiving, inspecting, transporting, segregating, preparing, manufacturing, packaging, labeling and storing food.

Quality assurance operations shall be employed to ensure that food is suitable for human consumption and that food packaging materials are safe and suitable.

Recipes or production logs will be used by designated employees to document product production and ingredients used.

Production procedures shall not contribute contamination from any source.

Chemical, microbial, or extraneous material testing procedures shall be used where necessary to identify sanitation failures or possible food contamination.

Cooked food shall be considered to be potentially hazardous unless it has a pH less than 4.6 (to control the growth of *Clostridium botulinum*), an  $a_w$  less than 0.92 (to control growth of *Bacillus cereus*), or is commercially sterilized and in a sealed, approved container. Food that is not heat pasteurized, such as salad dressings with raw egg yolk shall have a pH of less than 4.2 to control and inactivate *Salmonella* spp. and  $a_w$  equal to or less than 0.85 (to control growth of *Staphylococcus aureus*).

All food that may have become contaminated or is suspect shall be placed on hold and segregated. It shall then be evaluated by the HACCP team and a disposition made. This disposition will be dependent upon the evaluation.

### Determination if a production step is a CCP

1. Could contamination with a hazard occur in excess of critical limit / acceptable level? (If yes, do 2.)
2. Will a subsequent step eliminate / reduce the hazard to an acceptable level? (If no, do 3.) (If yes, go to next step.)
3. This step is required to reduce / prevent / eliminate the hazard to an acceptable level.

**Quality control operations.** The manufacturer, distributor, and holder of food shall at all times utilize quality control operations that reduce natural or unavoidable defects to the lowest level currently feasible. We will have written specifications for ingredients and components that identify criteria essential for the manufacturing process and product safety.

**Methods of verification.** This facility uses the three methods of verification as required by 9 CFR 417.4. The following is an explanation of each procedure, frequency, and results of these verification methods.

**Calibration.** Calibration of instruments such as thermometers used for the documentation of CCP temperature is performed on a weekly basis. Thermometers are calibrated against the \_\_\_\_\_ thermometer. The \_\_\_\_\_ thermometers are sent out and certified annually. The certificate of calibration is kept on file. The calibration of the thermometers is also verified with a records review of the weekly document. In addition, the

**Equipment / Instrument Calibration and Verification Log** (see *MANAGEMENT / QUALITY ASSURANCE AND QUALITY CONTROL* section) will indicate that, and at least one instrument

calibration has been verified with a direct observation. If any of the verifier's results are unacceptable, a **Corrective Action Report** will be completed (see *MANAGEMENT / HACCP TEAM* section).

**Records review.** A records review will be completed on every batch of product unless a direct observation is performed. When performing a records review of any HACCP documentation, the verifier will make sure that the records are written in ink, complete, accurate, performed at proper intervals or times, and that any required corrective action or additional documentation has been completed. The verifier will initial or sign the document upon completion of the review and indicate that the method of verification was a records review. The verifier must also indicate the results of the review as being either acceptable or unacceptable (pass / fail). If the results are not acceptable, a **Corrective Action Report** will be completed (see *MANAGEMENT / FOOD HACCP TEAM* section).

**Direct observation.** A direct observation will be performed a minimum of once per day per HACCP plan. When performing a direct observation, the verifier will observe the monitor taking and recording the results of the CCP or calibration being documented. The verifier will make sure that the proper procedures are used to take the temperatures of other readings and that the monitor properly records all required times, temperatures, or other readings. The verifier will initial or sign the document upon completion of the direct observation and indicate the results of the review as being either acceptable or unacceptable (pass / fail). If the results are not acceptable, a **Corrective Action Report** will be completed (see *MANAGEMENT / HACCP TEAM* section).

## MENU ITEM HAZARD AND CONTROL GROUPS

Some food supplies / ingredients are made safe by the suppliers, while others are made safe by the cook. Encl. 1a shows various categories of supplier-made-safe and cook-made safe ingredients. Encl. 1b is a blank form to be used to list supplier-made-safe and cook-made safe ingredients used by this facility.

A copy of the menu is included in this policies manual. Menu item processes will be grouped by the following five USDA-established categories.

- I. Not heat treated, not shelf stable
- II. Not heat treated, with inhibitors to make shelf stable.
- III. Fully cooked, not shelf stable
- IV. Fully cooked, with inhibitors to make shelf stable
- V. Commercially sterile, shelf stable

Encl. 2 shows food flows for these five microbiological hazard control groups.

## RECIPE HACCP AND INGREDIENT HAZARDS

Purchase ingredients for which suppliers can identify the hazards that they have prevented, eliminated, or reduced to a safe level or can tell us the level of hazard that we must prevent, eliminate, or reduce to a safe level.

## CHEMICAL ADDITIVES

Sulfites and sulfates shall not be used in any food preparation, unless present as an ingredient in a commercial item.

Monosodium glutamate (MSG) can cause illness in some people if used in excess. It shall be used at 0.5% or less on a weight basis. [For example, no more than 1/8 teaspoon (1.7 g) of MSG shall be used per 12-ounce portion (340 g) of food.]

Nitrates and nitrites, if used in sausage manufacture, shall be used at a concentration of less than 200 ppm.

There shall be HACCP recipe procedures for the use of any food chemical in a recipe where there is any question of safety.

## ALLERGIES AND ADVERSE FOOD REACTIONS

Customer food allergies can be life threatening. When a customer asks about specific ingredients in a menu item, the cook / food preparer must be able to provide accurate information. There must not be any "secret ingredients" in a recipe. The following is a list of major allergen groups.

- Cow's milk
- Legumes
- Crustacea
- Fish
- Corn
- Eggs
- Wheat
- Tree nuts

## FOOD CONTROL GROUP FLOW DIAGRAMS, HACCP PLANS, AND RECIPE HACCP

Encl. 3 is an example of a HACCP flow chart for chicken cacciatore. Encl. 4 shows a flow with a full HACCP plan. Encl. 5 is an example HACCP plan for the chicken cacciatore. A HACCP plan will be developed for each HACCP production group using the form, **Food HACCP Plans**, Encl. 6. Encl. 7 is an example of a HACCP'd recipe for chicken cacciatore.

HACCP plans and HACCP'd recipes, product specification sheets, validation studies, and technical reports for this facility will be kept in this section of the manual.

## PROCESS TEMPERATURE CONTROL

The critical process control temperatures for developing a HACCP process are shown in Encl. 8. We will strive to always meet these critical limits.

## FOOD PRE-PREPARATION HAZARD AND CONTROL RULES

**Food thawing.** Thaw in the refrigerator. Thawing can also be done in the microwave followed by immediate cooking or in cold, flowing water. Alternatively, food / meat can be cooked directly from the frozen. If thawing, make sure the center gets thawed by testing with your thermometer for a temperature of above 32°F before beginning the cooking process.

**Food washing.** All raw fruits and vegetables must be double washed before preparation. Take off the wrapper leaves and put the vegetables in the first wash sink with a lot of cold water. Agitate for 1 minute to loosen dirt. Remove from the first sink and put in the second sink with clean water and scrub / agitate again. Drain dry.

**Serving raw foods.** All raw food has some degree of pathogenic microorganism and chemical contamination. There is always a question as to the safety of raw food. The best prevention strategy is to buy from a safe source. A safe source can best be defined as one where personnel are knowledgeable about the hazards of the product and know the process used to assure the safety of the food they sell. They can tell you what they have done to assist you in removing dirt and bacteria from the raw food.

**Hard foreign objects.** Be very careful to keep hard and foreign objects out of food. Keep can openers dull. Wrap spice and herb seeds in cheesecloth bags so they can be removed. Watch for bones. Remove all packaging material. Do not use staples or twist-ties. Always sort through dry beans, lentils, etc. to remove rocks.

**Ingredient control.** Observe all ingredients as they are used in food preparation and reject any that are off-color, have strange odors, appear to have bubbles when they should not, show evidence of insects or rodents, or in any other manner appear to be below standard. If you have any doubt, throw it out. Before disposing of the food, record it on the waste control sheet and show it to your supervisor. Never use taste or smell to judge safety. Very hazardous food can smell and taste fine. Do not add fresh food to old food.

**Allergenic ingredient control.** The final step before any product is produced is to verify that the ingredients being used are exactly the ingredients that are specified; that the equipment food contact surfaces are clean; and there will be no ingredient cross-contamination from the last item produced.

**Separate raw and cooked food preparation equipment.** Keep raw and cooked food separate. Use separate cutting boards and knives for working with raw and cooked foods. Equipment with raw food contamination must not contact cooked food without first being cleaned and sanitized. **Never** store a raw product above a cooked product.

## FOOD PREPARATION HAZARD AND CONTROL RULES

**Pasteurization and quality temperatures.** The following times and temperatures will be used for pasteurization to destroy *Salmonella* 100,000 to 1 (5D) for all foods except roast beef, which is 3,160,000 to 1 (6.5D).

Temperature °F	Time, 5D	Time, 6.5D (roast beef)
165	1.5 seconds	instant
160	5.2 seconds	>157°F, instant
155	15 seconds	21 seconds
150	52 seconds	67 seconds
145	2.7 minutes	3.5 minutes
140	11.2 minutes	11.2 minutes
135	27 minutes	35 minutes
130	112 minutes	112 minutes

## Cooking temperatures

Food Item	Cook to this Temperature or Hotter
Poultry	165°F, 15 sec.
Ground/punctured meat, fish, pooled eggs	155°F, 15 sec.
Solid cuts of meat, fish, eggs to order	145°F, 15 sec.
Roast Beef	130°F, 112 min.

Use a thermometer to check internal cooking temperatures.

Microwave cooking. Cover and cook food to  $\geq 165^{\circ}\text{F}$  (stir or rotate the food during the cooking process), then let the food stand with cover on for 2 minutes.

**Food tasting.** Use a fresh, sanitized utensil each time food is tasted so that contaminants from the mouth will not get into the food.

**Roasts and thick foods.** Once cooked, these food items will be kept at  $>130^{\circ}\text{F}$ .

**Sauté and thin foods.** A thin-stem, tip-sensitive, calibrated, digital thermometer will be used to assure that center temperatures meet pasteurization standards.

**Sauces, soups, and beverages.** Hollandaise and other egg and heavy cream sauces do not tolerate continuous  $150^{\circ}\text{F}$  holding. Make hollandaise, béarnaise, and mayonnaise sauces with 1 tablespoon of vinegar or lemon juice per egg yolk, and they will have a pH of less than 4.1 and be safe.

**Fruits, vegetables, legumes, and cereals.** Many fruits are high-acid foods ( $\text{pH} < 4.6$ ) and are not a food safety problem unless mixed with meat, fish, or poultry items. Cereals and raw vegetables (carrots, potatoes, onions, cabbage, mushrooms, etc.) are contaminated with spores and before cooking and must be kept cold (less than  $41^{\circ}\text{F}$ ) or packaged to allow air exchange. After cooking, all vegetables, such as green beans, baked or boiled potatoes, and cereals, such as rice, will have activated spores and must be maintained above  $135^{\circ}\text{F}$  or cooled to below  $41^{\circ}\text{F}$  within 6 hours.

**Bread, batters, and pastry.** Bread and pastry dough are not as hazardous as other foods, because normally they are moderately dry. Care must be taken if a very moist product is produced. Icing and protein (milk and egg) fillings can be hazardous. These fillings must be cooled to  $41^{\circ}\text{F}$  in 6 hours before using in items such as éclairs or custard pies. When a hazardous topping, such as an egg white meringue, is baked or browned, the center temperature of the meringue and temperature at the interface of the pie and meringue must reach  $165^{\circ}\text{F}$  to kill *Salmonella*. The pie and meringue must be safely cooled to  $41^{\circ}\text{F}$ . Cooked mixtures should be placed in cakes, shells, crusts, or other baked goods while still hot, above  $165^{\circ}\text{F}$ , then the topping added, and the item baked or cooked. This controls contamination on the surface of the product.

Batters (such as pancake batter) held at room temperature shall be discarded after 4 hours of use.

**Hot combination dishes.** When cooked or precooked ingredients are combined and reheated, they must reach a center temperature of  $165^{\circ}\text{F}$  in less than 2 hours.

**Cold combination dishes.** These foods are always a potential hazard. Wash, cook, cool, and prepare all ingredients separately and start with them at a temperature such as  $41^{\circ}\text{F}$ , so that, when combined, the temperature is less than  $50^{\circ}\text{F}$ . Adding the flavoring and spices in the sauce or dressing before mixing ingredients will help provide uniform flavor distribution. You can prepare large batches if the temperature is always below  $50^{\circ}\text{F}$ , which controls the toxin production by *Staphylococcus aureus*. When preparing these items, always wash hands before starting and use sanitized utensils and containers.

## **FOOD TRANSPORT, HOLDING, AND SERVING HAZARD AND CONTROL RULES**

**Hot holding.** To keep food at  $135^{\circ}\text{F}$  or hotter, preheat equipment to  $135^{\circ}\text{F}$  or hotter before adding food.

**Food serving temperatures.** All foods served to customers shall be above  $135^{\circ}\text{F}$  ( $57.2^{\circ}\text{C}$ ) [ $150^{\circ}\text{F}$  ( $65.6^{\circ}\text{C}$ ) for quality] or below  $41^{\circ}\text{F}$  ( $5^{\circ}\text{C}$ ) when they leave the service area. Improperly cooked, warmed, or held food, or food that shows signs of deterioration, is rejected.

**Serving, packaging, transporting.** Keep hot food covered as much as possible to maintain surface temperatures and prevent surface dehydration. Hot food must be above  $135^{\circ}\text{F}$  or, if between  $135$  and  $41^{\circ}\text{F}$ , served within 4 hours. If food is open on a steam table, buffet, or service line, the surface temperatures will be below  $130^{\circ}\text{F}$  unless the pan is covered. Check on individual portions every 20 minutes, and casseroles at least every hour. Open, hot food should be discarded if not used within 4 hours.

### **Reheating for hot holding**

1. Heat food to  $165^{\circ}\text{F}$  or hotter in 2 hours or less.
2. Use a thermometer to check the temperature.

**Beverage dispensing equipment.** Make sure all beverage dispensing equipment is cleaned regularly, according to manufacturer's instructions.

**Milk product dispensers.** Thoroughly clean milk and milk product dispensers, such as soft-serve machines (especially the gaskets and O-rings.) Always sanitize them before they are put into use each day, and replace gaskets when damaged.

**Salad bar.** Ice in non-refrigerated salad bars shall be filled to the level of food in the containers. Ice is not needed in mechanically refrigerated salad bars. Cold food items must be cold ( $41^{\circ}\text{F}$  or less) before being placed in the salad bar, because salad bar units are not designed to cool food. Cold food items will slowly warm to about  $55^{\circ}\text{F}$  in the top layers in most salad bars. Therefore, leftover salad bar product shall never be added to fresh product beyond the safe time-temperature allowed. Some leftover salad bar items (e.g., carrot sticks, chopped onions, celery sticks) may be used in a recipe (stews or soups) in the kitchen.

**Dispensing tableware and flatware.** Tableware and flatware (both multiple use and single service) shall be dispensed in a sanitary manner so that surfaces that come into contact with food or the mouth are protected from contamination. Handles of

flatware shall be presented to the user. No unnecessary tableware is left on the table with the customer. All tableware left with the customer is washed before it is reused.

Sanitary straw dispensers are used for dispensing straws, or wrapped straws shall be used. Sanitary, disposable cup dispensers are used for customer service.

**Self-service food, dishes, and utensils.** The customer must not be allowed to return to a salad bar or buffet line for refill with used dishes. Take the dirty dishes and utensils, and give the customer fresh tableware and a clean plate for additional food. They can return with a used cup or glass for more of a beverage.

**Food exposed to the customer.** Serve customers only the amount of jelly, butter, bread, cream, etc. that they are likely to consume. All unpackaged food left with the customer must be thrown out. Packaged food such as crackers and jelly can be reserved. No unnecessary open food is left on the table with the customer.

**Table condiments.** Condiment containers shall be clean and uncontaminated, not open or abused, and shall be discarded replaced if they appear to be below standard. Individually portioned condiments may be provided for table service or counter service. Condiment bins shall be kept clean. Commercially packed condiment containers shall not be refilled. Ingredients in partially filled condiment containers may be sent to the kitchen for use in cooking.

**Ice.** Use tongs or a plastic or metal scoop to fill glasses with ice so that there is never a chance of a chip of glass getting mixed in the ice. Keep all glass (such as coffee pots) and other breakable ceramic tableware away from the ice bins or machine. Never reuse ice that has been in contact with food packages or used for displays. If you think that any glass or other contaminating material has gotten into the ice, throw it out.

**AFTER SERVICE HAZARD AND CONTROL RULES**

**Food removed from temperature control.** Ready-to-eat cooked food that has remained between 42 and 139°F for 4 hours must be discarded according to FDA Food Code recommendations.

**Returned food.** If a customer returns food or if it is taken from the department by a customer and left somewhere else in the store, it is never to be reused. Throw it out.

**Leftovers.** Progressive food preparation shall be used to minimize leftovers whenever possible. Leftover food is never mixed with fresh food. Cooked, pasteurized leftovers that have a pH of less than 4.6 or a<sub>w</sub> of less than 0.92 (for spore control) are not hazardous foods.

**Cooling food**

Cooling hot foods

1. Cooked / prepared food shall be cooled from 135°F to less than 41°F in 6 hours or less (*from 135°F to 70°F within 2 hours followed by cooling to 41°F or below within a total cooling time of 6 hours - FDA Food Code*).
2. Use a thermometer to check this.

Quick cooling methods

1. Use shallow pans (for soups, sauces, gravies, etc.): This method can also be used for small-to-medium-sized pieces of meat.
  - a. Put a 2-inch layer of food in a shallow, metal pan.
  - b. Do not cover.
  - c. Put the pan in the cooler where cold air can blow across it.
  - d. Cover, label and date the food after it has cooled.
2. Ice bath
  - a. Put the food container into an ice bath.
  - b. Stir the food every 30 minutes—more often if possible.
3. Add ice instead of water (to soups, stews, etc.)
  - a. Add only half the water before cooking.
  - b. After cooking, add the other half as ice.
4. Use chilling wands or paddles (for large containers)
  - a. Place the clean, frozen wand in the food and stir.
  - b. Use another rapid-cooling method to finish, such as the shallow pan method described above.

**Storage time.** Food spoilage microorganisms can grow and continue to reduce the quality of cooked, cooled, ready-to-eat food while it is refrigerated. All stored food must be dated and rotated. The longer it is held, the lower the quality and customer satisfaction.

The values in the *HITM Maximum Holding Times at Specified Temperatures* chart are based on anticipated contamination of food and indicate the estimated time necessary for a 10-generation multiplication (1:1,024) of pathogenic bacteria in food.

**HITM Maximum Holding Times at Specified Temperatures**

°F	<b>Maximum Holding Time SAFETY LIMIT</b> 10 multiplications of pathogens <i>(Eat or throw out)</i>
125	31.0 hr.
120	5.6 hr.
110	4.7 hr.
60	1.2 da.
55	1.7 da.
50	2.4 da.
45	4.0 da.
41	6.5 da.
40	7.5 da.
35	19.3 da.
30	123.8 da.
<30	Safe chilled food holding
28.5	Meat, poultry, fish thaw
23	Spoilage bacteria begin to multiply
14	Yeasts and molds begin to multiply

These values have been derived by comparing actual bacterial growth with FDA Food Code holding guidelines for ready-to-eat food that allows 7 days if the food temperature is at 41°F (5°C) or less, 4 days at 45°F, and 4 hours, for example when food is at 112°F.

**Storage containers.** Single-use items such as plastic bread bags, seamed metal cans, ketchup bottles, crimped aluminum pie tins, and glass jars shall not be reused after original contents have been removed. Food (particularly high-acid food) shall never be stored, prepared, and cooked or processed in containers that contain toxic materials such as galvanized metal, chipped enamelware, lead and lead glazes, or copper.

### **Cold holding**

Temperature. Keep food at 41°F or cooler at all times.

#### Time

1. Foods prepared in the establishment: These foods can be served for up to 7 days after preparation if they are date labeled (see below) and stored below 41°F.
2. Foods purchased in ready-to-eat form (e.g., sliced sandwich meat and hot dogs): These foods can be served for up to 7 days after opening if they are date labeled (see below) and stored below 41°F.

Date labeling. Label a food with its preparation date if it is going to be held longer than 24 hours.

#### Freezing

1. This stops the 7-day clock, but does not set it back to zero.
2. Before freezing a food, label it with the number of days it was held after cooking or opening.
3. After thawing, the food can be served for the rest of the original 7 days.
4. If the food was not date labeled before it was frozen, serve it within 24 hours after thawing or throw it away.

**Waste products.** Waste products are not stored in any storage area.

## **CARRY-OUT, CATERING, AND BANQUETS HAZARD AND CONTROL RULES**

Be especially careful to provide the cleanest possible food with the lowest bacterial counts for carry-out, catering, and banquet service. Note food temperatures at the beginning of, and when possible, throughout, service. Have a plan for the disposition of the leftovers.

Depending on the food, tell the customer to keep the food above 135°F or below 41°F or to eat it within 4 hours. If they cannot eat it promptly, it must be refrigerated less than 2 inches thick within 2 hours.

## **TRACEABILITY OF PRODUCTION LOTS**

We will maintain traceability of all ingredients in a product so that if a customer asks us about an ingredient, we can provide an accurate answer, or if an ingredient is identified for a recall, we can find and return the ingredient.

## MENU ITEMS HACCP

### Supplier Makes Safe

**Raised safe, no treatment  
Raw, not shelf stable**

Receive, store  
41°F

Raw oysters, raw beef, raw fish  
Sprouts, berries, nuts, mushroom, fresh herbs, spices, parsley

→ Chop / Sort → Garnish, combine / Serve

**Supplier made safe  
Not shelf stable**

Receive, store  
0°F-thaw, 41°F

Meat, fish, fruits, vegetables, juice; Washed fruits and vegetables, dairy, eggs, cheese

→ Cut / chop / slice → Wash → Heat 150°F → Plate / combine, 41°F / Serve, 150°F

**Supplier made safe  
Shelf stable (pH <4.6 / 4.2,  
a<sub>w</sub> <0.92, additive)**

Receive, store  
70°F

Condiments, cake, pie, bread, dry cereal

→ Plate / combine / Serve, 70°F

### Cook Makes Safe

**Raw, wash makes safe**

Receive, store  
41°F

Celery, cabbage, lettuce, fruit

→ CCP Double wash (2-log *Salmonella* reduction), chemical dip? Dry. → Plate / combine / Serve, 41°F?

**Thick food >2"; oven (low /  
high humidity); smoked**

Raw meat, fish,  
poultry, 41°F

Roasts, casseroles, smoked meats

→ CCP Cook / pasteurize → Slice, cut → CCP Cool → Plate, serve / 150°F / 41°F

**Thin food, <2 inches; grill,  
griddle, fry, pH >4.6**

Raw ingredients,  
41°F

Raw meat, fish, poultry, rice, lentils, vegetables  
Batters (pancakes, waffles), eggs

→ Batter / bread → CCP Cook to >150°F, 1 min. (5-log *Salmonella* reduction) → CCP Cool → Plate, serve / 150°F / 41°F

**Sauces, soups, pH <4.6 /  
4.2; acid makes safe**

Ingredients

Salad dressings, marinades, acid beverages, fruit soup  
(Use a container made of acid-safe materials)

→ CCP Mix, pH <4.2, 70°F → Hold 2 days for *Salmonella* kill or use pasteurized eggs → Plate / combine / Serve 70°F

**Sauces, soups, pH >4.6;  
kettle, pot, boil**

Meat, fish, poultry,  
41°F

Soups (hot / cold), sauces (hot / cold), gravy, glaze, aspics, candy

→ CCP Cook to >150°F (5-log *Salmonella* reduction) → CCP Cool → Plate, serve / 150°F / 41°F

**Bakery (bake, fry)**

Ingredients  
70°F and 41°F,  
pH, a<sub>w</sub>

Bread (fermented, flat), cake, pastry

→ Combine / mix ingredients; 70°F, ferment → CCP Cook / pasteurize, dry → Slice, cut → Cool → Plate, serve / 150°F / 41°F

**Cold / hot combination**

Anything from above; meat, starch,  
vegetables, sauce, 41°F

Salads, casseroles, sandwiches (hot or cold)

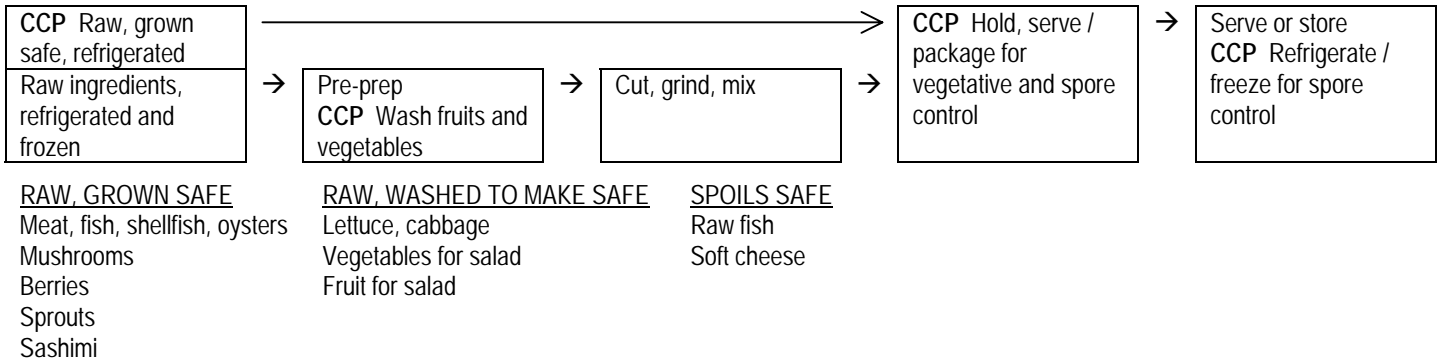
→ Combine (ingredients have been pasteurized) → Cold / Heat → Plate, serve / 150°F / 41°F

**MENU ITEMS HACCP (Blank)**  
**Supplier Makes Safe**

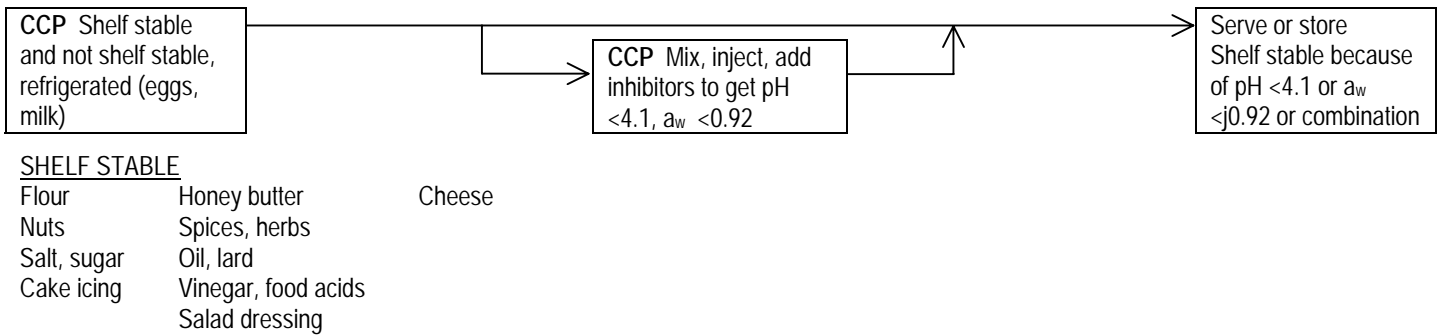
**Cook Makes Safe**

## FIVE RETAIL USDA-BASED PROCESS FLOWS

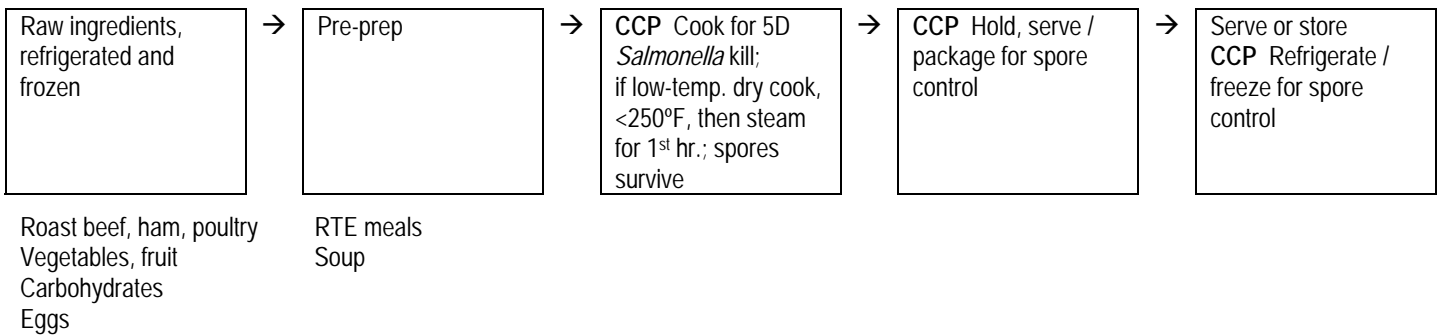
### I. Not heat treated, not shelf stable



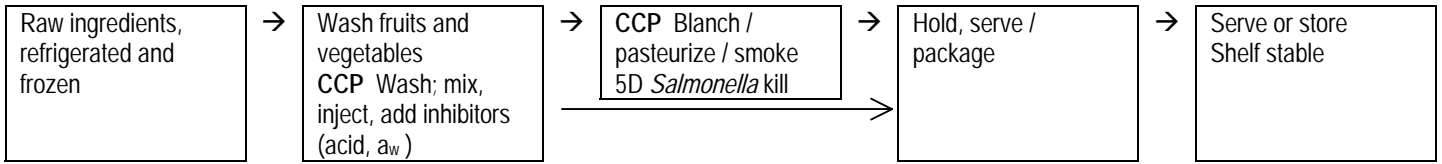
### II. Not heat treated, with inhibitors to make shelf stable



### III. Fully cooked, not shelf stable



#### IV. Fully cooked, with inhibitors to make shelf stable



ACID CONTROL

Salad dressings, ketchup  
Soy, fermented sauces  
Sauerkraut, pickles, kimchee  
Sushi rice  
Pickled meat, dairy, eggs, vegetables  
Pepperoni, salami, ham  
Salted fish, meat  
Beer, wine, soda pop

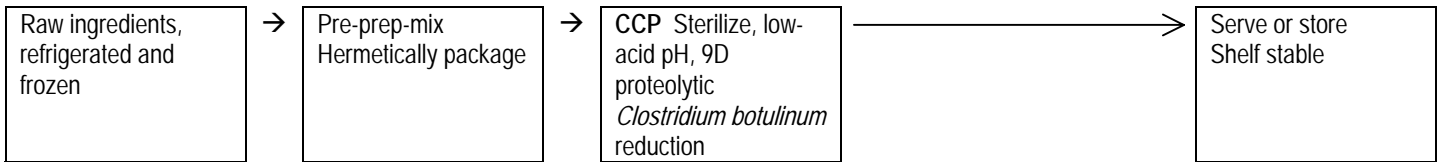
A<sub>w</sub> CONTROL

Jam, jelly  
Syrup  
Peanut butter  
Bread, pretzels  
Salt  
Spices, herbs

SMOKE AND DRY

Country ham  
Salted fish

#### V. Commercially sterile, shelf stable



CANNED

Spaghetti products  
Vegetables  
Tuna, meat, poultry

### QA RECIPE FLOW EXAMPLE: CHICKEN CACCIATORE

**Preparation**

1. Prepare sauce. Get chopped onions, mushrooms, green peppers, minced garlic.  
**O** Sauté in oil. Add crushed tomatoes, juice, wine, and seasoning. Bring to a simmer.  
 Ti 40°F To 205°F t 20 min.



1a. Hold in bain marie.  
**D**  
 Ti 205°F To 165°F t 20 min.



2. Get chicken quarters from refrigerator.  
**O** Remove rib bones.  
 Ti 40°F To 45°F t 10 min.



3. **CCP** Place quarters, one layer deep in shallow roasting pan.  
**O** Bake (brown) in convection oven at 350°F to >165°F, >15 sec.  
 Ti 45°F To >165°F t 30 min.



4. Remove pan(s) of chicken from oven.  
**O** Pour off excess liquid. Save for chicken stock.  
 Ti >165°F To 155°F t 15 min.



4a. **CCP** Cool liquid from 135 to 41°F in <6 hr.,  
**D** <2 inches deep or <1-gallon container. (Save for chicken stock).  
 Ti ≥135°F To <41°F t < 6 hr.



5. Cover chicken quarters with sauce.  
**O**  
 Ti 155°F To 150°F t <10 min.



6. Bake at 300°F in convection oven until chicken reaches a temperature of 175°F.  
**O**  
 Ti 150°F To 175°F t 45 min.



7. **Check.** Is the temperature 175°F?  
**I** If not, continue to cook.

No

↓ Yes

8. Cover and transfer to 150°F hot holding unit.  
**T**  
 Ti 175°F To 150°F t 5 min.

**Hold/Serve**



9. Hold. Serve 1/4 chicken and 3 oz. sauce.  
**D** Use within <2 hr.  
 Ti 150°F To 150°F t <120 min.

**Leftovers**



10. **CCP** Cool from 135 to <41°F, <6 hr.,  
**D** ≤2 inches deep or <1-gallon container.  
 Ti 135°F To <41°F t <6 hr.

- D = Delay
- I = Inspect
- O = Operate
- S = Store
- T = Transport

- Ti = Temp. in
- To = Temp. out
- t = Time to do the step

CCP = Critical Control Point

## QA RECIPE FLOW WITH FULL HACCP (EXAMPLE): CHICKEN CACCIATORE

**Product Specification:** A fully cooked product of chicken and sauce.

**Assumptions:** Prerequisite programs are in place, effective and control ingredients, supplies, environment, personal hygiene, and equipment.

Process Step, Procedure, and Control	Hazard and Control Analysis: a. hazard identification, expected level / size, tolerable limit; b. control effectiveness; c. monitoring procedure / frequency and person, data recording; d. verification-who, when, how
<p>1. Prepare sauce. Get chopped onions, mushrooms, green peppers, minced garlic.  <b>O</b> Sauté in oil. Add crushed tomatoes, juice, wine and seasoning. Bring to a simmer.                      Ti 40°F                      To 205°F                      t 20 min.</p>	<p>Supplies are obtained from reputable sources; sauce has low pH and is heated sufficiently to destroy vegetative pathogens.</p>
↓	
<p>1a. Hold in bain marie.  <b>D</b>                      Ti 205°F                      To 165°F                      t 20 min.</p>	<p>No pathogenic microbial growth in sauce at &gt;130°F.</p>
↓	
<p>2. Get chicken quarters from refrigerator.  <b>O</b> Remove rib bones.                      Ti 40°F                      To 45°F                      t 10 min.</p>	<p>Vegetative pathogens and spores are controlled by low temperature. Inspect to assure that all bones are removed</p>
↓	
<p>3. <b>CCP</b> Place quarters, one layer deep, in shallow roasting pan. Bake (brown) in convection oven at 350°F to &gt;165°F, &gt;15 sec.  <b>O</b>                      Ti 45°F                      To &gt;165°F                      t 30 m.</p>	<p>Cooking temperature &gt;165°F, &gt;15 sec. assures a &gt;7D salmonellae kill.</p>
↓	
<p>4. Remove pan(s) of chicken from oven. Pour off excess liquid. Save for chicken stock.  <b>O</b>                      Ti &gt;165°F                      To 155°F                      t 15 m.</p>	<p>Temperature &gt;130°F controls spores and kills vegetative cells.</p>
↓	
<p>4a. <b>CCP</b> Cool liquid from 135 to 41°F in &lt;6 hr., &lt;2 inches deep or &lt;1-gallon container. (Save for chicken stock.)  <b>D</b>                      Ti ≥135°F                      To &lt;41°F                      t &lt; 6 hr.</p>	<p>Cooling chicken stock from 135 to 41°F, &lt;6 hr., controls spore outgrowth.</p>
↓	
<p>5. Cover chicken quarters with sauce.  <b>O</b>                      Ti 155°F                      To 150°F                      t &lt;10 min.</p>	<p>Temperature &gt;130°F controls spores and kills vegetative cells.</p>
↓	
<p>6. Bake at 300°F in convection oven until chicken reaches a temperature of 175°F.  <b>O</b>                      Ti 150°F                      To 175°F                      t 45 min.</p>	<p>Temperature &gt;130°F controls spores and kills vegetative cells.</p>
↓	
<p>7. Check. Is the temperature 175°F?  <b>I</b> If not, continue to cook.                      No</p>	<p>Temperature &gt;130°F controls spores and kills vegetative cells.</p>
↓ Yes	
<p>8. Cover and transfer to 150°F hot holding unit.  <b>T</b>                      Ti 175°F                      To 150°F                      t 5 min.</p>	<p>Temperature &gt;130°F controls spores and kills vegetative cells.</p>
↓ Hold/Serve	
<p>9. Hold. Serve 1/4 chicken and 3 oz. sauce.  <b>D</b> Use within 2 hr.                      Ti 150°F                      To 150°F                      t &lt;120 min.</p>	<p>Temperature &gt;130°F controls spores and kills vegetative cells.</p>
↓ Leftovers	
<p>10. <b>CCP</b> Cool from 135 to &lt;41°F, 6 hr., ≤2 inches deep or &lt;1-gallon container.  <b>O</b>                      Ti 135°F                      To 41°F                      t &lt;6 hr.</p>	<p>Cooling to &lt;41°F in 6 hours assures safety. The presence of pathogenic microorganisms from cross-contaminated products is controlled by GMPs and SSOPs.</p>

## HACCP PLAN EXAMPLE: CHICKEN CACCIATORE

Process Steps and Controls: GMPs and prerequisites are in place (Ti=temp. in; To=Temp. out; t=Time to do the step)	B, C, P, Potential Hazards and Risk Analysis	Control Critical Limit (CL) for each Hazard Control	Monitoring & Record; (What, How, Frequency, Who)	Corrective Action & Record	Verification & Record (Procedures and Frequency)
<b>Preparation</b> 1. Prepare sauce. Get chopped onions, mushrooms, green peppers, minced garlic. Sauté in oil. Add crushed tomatoes, juice, wine and seasoning. Bring to a simmer. Ti 40°F To 205°F t 20 min.	B: Not significant. C: None. P: None.	Supplies are obtained from reputable sources; sauce has low pH and is heated sufficiently to destroy vegetative pathogens.			
1a. Hold sauce in bain marie. D Ti 205°F To 165°F t 20 min.	B: Not significant. C: None. P: None.	No pathogenic microbial growth in sauce at >130°F.			
2. Get chicken quarters from refrigerator. Remove rib bones. Ti 40°F To 45°F t 10 min.	B: Not significant. C: None P: Not significant.	Vegetative pathogens and spores are controlled by low temperature. Inspect to assure that all bones are removed			
3. <b>CCP</b> Place quarters, one layer deep in shallow roasting pan. Bake (brown) in convection oven at 350°F, >165°F, >15 sec. Ti 45°F To >165°F t 30 min.	B: Vegetative pathogens and spores C: None P: None	Cooking temperature >165°F, >15 sec. assures a >7D salmonellae kill.	Assigned worker takes lowest temperature of center of food in each lot and records on production sheet for each lot.	If temperature is not >165°F, continue to cook.	Supervisor initials the production log each shift.
4. Remove pan(s) of chicken from oven. Pour off excess liquid. Save for chicken stock. Ti >165°F To 155°F t 15 min.	B: Not significant. C: None. P: None.	Temperature >130°F controls spores and kills vegetative cells.			
4a. <b>CCP</b> Cool liquid from 135 to 41°F, D <6 hr., <2 inches deep or <1-gallon container. (Save for chicken stock). Ti ≥135°F To 41°F t <6 hr.	B: Pathogenic spores C: None P: None	Cooling chicken stock from 135 to 41°F, <6 hr., controls spore outgrowth.	Use clean, sanitized container and refrigerator that is validated for safe cooling	If refrigeration goes off, move stock to a functioning refrigeration unit. If cooling is not within FDA recommendations, throw it out.	Supervisor initials the production log each shift.
5. Cover chicken quarters with sauce. Ti >155°F To 150°F t <10 min.	B: Not significant C: None. P: None.	Temperature >130°F controls spores and kills vegetative cells.			
6. Bake at 300°F in convection oven until chicken reaches a temperature of 175°F. Ti >150°F To 175°F t <45 min.	B: Not significant. C: None. P: None.	Temperature >130°F controls spores and kills vegetative cells.			
7. <b>Check.</b> Is the temperature 175°F? If not, continue to cook.	B: Not significant. C: None. P: None.	Temperature >130°F controls spores and kills vegetative cells.			
8. Cover and transfer to 150°F hot holding unit. Ti 175°F To 150°F t 5 min.	B: Not significant. C: None. P: None.	Temperature >130°F controls spores and kills vegetative cells.			
<b>Hold/Serve</b> 9. Hold. Serve 1/4 chicken and 3 oz. sauce. D Use within <2 hr. Ti 150°F To 150°F t <120 min.	B: Not significant. C: None. P: None.	Temperature >130°F controls spores and kills vegetative cells.			
<b>Leftovers</b> 10. <b>CCP</b> Cool from 135 to <41°F, <6 hr., D ≤2 inches deep or <1-gallon container. Ti 135°F To <41°F t <6 hr.	B: Pathogenic spores. C: None P: None	Cooling to <41°F in 6 hours assures safety. The presence of pathogenic microorganisms from cross-contaminated products is controlled by GMPs and SSOPs.	Assigned worker makes sure the food is at the proper depth to cool to <41°F in 6 hours. This is recorded on production sheet for each lot.	If refrigerator goes off, transfer to a functioning refrigeration unit. If containers are the wrong size, get the correct size.	The production schedule will be initiated by a supervisor once a shift, prior to transfer to refrigerator. The supervisor will initial that the CCP has been met.

B,C,P = biological, chemical, physical hazard

Approved (QC) \_\_\_\_\_ Date \_\_\_\_\_

CCP = Critical Control Point

Approved (Process Authority) \_\_\_\_\_ Date \_\_\_\_\_

### FOOD HACCP PLANS

Process Steps and Controls: GMP's and prerequisites are in place	B, C, P, Potential Hazards and Risk Analysis	Control Control Limit (CL) for each Hazard Control	Monitoring & Record; (What, How, Frequency, Who)	Corrective Action & Record	Verification & Record (Procedures and Frequency)
1.	B: C: P:				
2.	B: C: P:				
3.	B: C: P:				
4..	B: C: P:				
5.	B: C: P				
6.	B: C: P:				
7.	B: C: P:				
8.	B: C: P:				
9.	B: C: P:				

**B, C, P** = Biological, Chemical, and Physical

**CCP** = Critical Control Point

Approved (QC) \_\_\_\_\_ Date \_\_\_\_\_

Approved (Process Authority) \_\_\_\_\_ Date \_\_\_\_\_

Approved Plant Manager \_\_\_\_\_ Date \_\_\_\_\_

### QUALITY-ASSURED HACCP RECIPE PROCEDURES

Product: \_\_\_\_\_ Portion size (vol./wt.): \_\_\_\_\_ Preparation time: \_\_\_\_\_  
 Written by: \_\_\_\_\_ Date: \_\_\_\_\_ Number of portions: \_\_\_\_\_ Prepared by: \_\_\_\_\_  
 SA/QA by: \_\_\_\_\_ Date: \_\_\_\_\_ Final yield (AS): \_\_\_\_\_ Supervisor: \_\_\_\_\_

Gp #	Ing #	Ingredients and Specifications	Lot # / Rec	Amt	EP Wt %	Verif

**Management and Prerequisite Procedures (SSOP / GMP) are in place: personal hygiene, environment / facility / equipment cleaning and maintenance. Supplies are safe from chemical and physical hazard contamination.**

**Format for writing a recipe step**

Process step #	Start food ctr. temp., °F	Thickest food dimension (in.)	Container size HxWxL (in.)	Cover Yes/No	Temp. on/around food	End food ctr. temp., °F	Process step time, hr./min.
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#. Take (food) at \_\_\_°F, (inches) thick, in a \_\_\_-inch pan, (un)covered (Y/N), and put in the (equipment) at \_\_\_°F for (process time) until the center temperature is \_\_\_°F.

**Ingredients that could cause adverse allergic or intolerance reactions:**

**Pre-preparation** (Not a CCP. Washing fruits and vegetables for 2-log / blanch for 5-log reduction or center pasteurization for 5-log *Salmonella* reduction assures an ALOP.)

1. Get weighed and measured ingredients for recipe. Identify allergens.
2. Thaw, if required.
3. Trim / cut ingredients. Sort and remove physical hazards.

**Preparation** (CCP. 5-log reduction of *Salmonella*.)

4. **CCP.** Fruits and vegetables wash 2-log reduction or surface blanch / center pasteurize for 5-log *Salmonella* reduction assures an ALOP. Monitor.
5. **CCP.** Combine. Add preservatives. Pasteurize, 5-log reduction of *Salmonella*. Cook 150°F, 1 minute. Monitor – did the food get to correct time and temperature?

**Hold / Serve** (<1-log increase of *Clostridium perfringens*.)

6. **CCP.** Hot hold, transport, serve or package, >125°F. Monitor.

**Leftovers** (CCP. Cool for <1-log increase of *Clostridium perfringens*. Cold hold and prevent >3-log multiplication of *Bacillus cereus*. Prevent allergen cross-contamination.)

7. **CCP.** Cool. USDA 120 to 55°F, 6 hours (14.2 hours to 40°F); <2 inches deep or 1-gallon pot.
8. If making cold mixed salad, get all ingredients to 55°F before mixing. Mix and package and finish cooling to 40°F.
9. **CCP.** For allergen control, do not combine / mix leftovers (rework). Clean food contact surfaces before the next food is prepared.

<b>Verif</b>
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## PROCESS TEMPERATURE CHART

°F	Characteristic
250	Sterilization: <i>Clostridium botulinum</i> destroyed, 2.4 minutes
212	<i>Staphylococcus aureus</i> and <i>Bacillus cereus</i> toxin not destroyed
>170	Too hot – a hazard
165	Reheating, 15 seconds
160	7-log salmonellae, 0.121 minute (7.2 seconds)
150	Consumer-desired hot food; 7D salmonellae, 1.21 minutes (72 seconds)
135	FDA hot holding
130	Food is scientifically safe; 7-log salmonellae 121 minutes
127.5	<i>Clostridium perfringens</i> stops multiplying
122	<i>Staphylococcus aureus</i> and <i>Bacillus cereus</i> stop multiplying
115	Most vegetative cells stop multiplying
95-105	Most rapid multiplication
59	<i>Clostridium perfringens</i> begins to multiply
50	<i>Staphylococcus aureus</i> begins to make a toxin; <i>Clostridium botulinum</i> types A and B begin to multiply and make a toxin
43	<i>Staphylococcus aureus</i> begins to multiply
41	FDA cold holding; hold raw food until spoiled; RTE food, 7 days; some salmonellae begin to multiply
39.2	<i>Bacillus cereus</i> begins to multiply
38	<i>E. coli</i> and <i>Clostridium botulinum</i> type E begin to multiply
29.3	<i>Listeria monocytogenes</i> , <i>Yersinia enterocolitica</i> , and <i>Aeromonas hydrophila</i> begin to multiply
28.5	Meat and poultry thaw
23	Spoilage bacteria begin to grow
15	Mold and yeast begin to grow
0	Frozen storage
-40	Food stable

