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 aw 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 aw 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 32ºF 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 rocks. 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).

<table>
<thead>
<tr>
<th>Temperature ºF</th>
<th>Time, 5D</th>
<th>Time, 6.5D (roast beef)</th>
</tr>
</thead>
<tbody>
<tr>
<td>165</td>
<td>1.5 seconds</td>
<td>instant</td>
</tr>
<tr>
<td>160</td>
<td>5.2 seconds</td>
<td>&gt;157ºF, instant</td>
</tr>
<tr>
<td>155</td>
<td>15 seconds</td>
<td>21 seconds</td>
</tr>
<tr>
<td>150</td>
<td>52 seconds</td>
<td>67 seconds</td>
</tr>
<tr>
<td>145</td>
<td>2.7 minutes</td>
<td>3.5 minutes</td>
</tr>
<tr>
<td>140</td>
<td>11.2 minutes</td>
<td>11.2 minutes</td>
</tr>
<tr>
<td>135</td>
<td>27 minutes</td>
<td>35 minutes</td>
</tr>
<tr>
<td>130</td>
<td>112 minutes</td>
<td>112 minutes</td>
</tr>
</tbody>
</table>
Use a thermometer to check internal cooking temperatures.

**Microwave cooking.** Cover and cook food to ≥165°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°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°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 (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°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°F or cooled to below 41°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°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 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°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°F so that, when combined, the temperature is less than 50°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°F, which controls the toxin production by Staphylococcus aureus. When preparing these items, always wash hands before starting and use sanitized utensils and containers.

**Fruit, vegetable, legume, and cereal products.** Store these foods cold (less than 41°F) or packaged to allow air exchange.

**Reheating for hot holding**  
1. Heat food to 165°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°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°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 consumed. All unpackaged food left with the customer must be consumed.

**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>n</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**

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

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

- **Supplier made safe**
  - Not shelf stable
  - Receive, store 0°F-thaw, 41°F

- **Supplier made safe**
  - Shelf stable (pH <4.6 / 4.2, aw <0.92, additive)
  - Receive, store 70°F

## Cook Makes Safe

- **Raw, wash makes safe**
  - Receive, store 41°F

- **Thick food >2"; oven (low / high humidity); smoked**
  - Raw meat, fish, poultry, 41°F

- **Thin food, <2 inches; grill, griddle, fry, pH >4.6**
  - Raw ingredients, 41°F

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

- **Sauces, soups, pH >4.6; kettle, pot, boil**
  - Meat, fish, poultry, 41°F

- **Bakery (bake, fry)**
  - Ingredients

- **Cold / hot combination**
  - Anything from above; meat, starch, vegetables, sauce, 41°F

---

### Raw Oysters, Raw Beef, Raw Fish

- Sprouts, berries, nuts, mushroom, fresh herbs, spices, parsley

### Meat, Fish, Fruits, Vegetables, Juice

- Washed fruits and vegetables, dairy, eggs, cheese

### Salad dressings, marinades, acid beverages, fruit soup

(Use a container made of acid-safe materials)

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

### Wheat, pasta, rice, bread, crackers, cakes

---

**CCP Cool**

- 150°F / 41°F

---

**Garnish, combine**

- Serve

---

**Cut / chop / slice**

- Wash

- Heat 150°F

- Serve, 150°F

---

**Plate / combine, 41°F**

- Serve, 150°F

---

**Plate / combine**

- Serve, 70°F
FIVE RETAIL USDA-BASED PROCESS FLOWS

I. Not heat treated, not shelf stable

<table>
<thead>
<tr>
<th>CCP</th>
<th>Raw, grown safe, refrigerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw ingredients, refrigerated and frozen</td>
<td></td>
</tr>
</tbody>
</table>

RAW, GROWN SAFE
Meat, fish, shellfish, oysters
Mushrooms
Berries
Sprouts
Sashimi

RAW, WASHED TO MAKE SAFE
Lettuce, cabbage
Vegetables for salad
Fruit for salad

SPOILS SAFE
Raw fish
Soft cheese

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

<table>
<thead>
<tr>
<th>CCP</th>
<th>Shelf stable and not shelf stable, refrigerated (eggs, milk)</th>
</tr>
</thead>
</table>

SHELF STABLE
Flour
Honey butter
Cheese
Nuts
Spices, herbs
Salt, sugar
Oil, lard
Cake icing
Vinegar, food acids
Salad dressing

III. Fully cooked, not shelf stable

<table>
<thead>
<tr>
<th>Raw ingredients, refrigerated and frozen</th>
</tr>
</thead>
</table>

Roast beef, ham, poultry
Vegetables, fruit
Carbohydrates
Eggs

RTE meals
Soup

| CCP | Cook for 5D Salmonella kill; if low-temp. dry cook, <250°F, then steam for 1st hr.; spores survive |

| CCP | Hold, serve / package for spore control |

| CCP | Refrigerate / freeze for spore control |

Serve or store

Shelf stable because of pH <4.1 or aw <0.92 or combination
IV. Fully cooked, with inhibitors to make shelf stable

Raw ingredients, refrigerated and frozen ➔ Wash fruits and vegetables

CCP Wash; mix, inject, add inhibitors

(acid, aw)

CCP Blanch / pasteurize / smoke

5D Salmonella kill ➔ Hold, serve / package ➔ Serve or store

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

SMOKE AND DRY
Jam, jelly
Syrup
Peanut butter
Bread, pretzels
Salt
Spices, herbs

V. Commercially sterile, shelf stable

Raw ingredients, refrigerated and frozen ➔ Pre-prep-mix

Hermetically package ➔ CCP Sterilize, low-

acid pH, 9D proteolytic

Clostridium botulinum reduction ➔ Serve or store

Shelf stable

CANNED
Spaghetti products
Vegetables
Tuna, meat, poultry

A. CONTROL
Salt
Spices, herbs
QA RECIPE FLOW EXAMPLE: CHICKEN CACCIATORE

**Preparation**

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.

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

3. **CCP** Place quarters, one layer deep in shallow roasting pan. 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.**
   
   Ti >165°F To 155°F t 15 min.

5. **Cover chicken quarters with sauce.**
   
   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.**
   
   Ti 150°F To 175°F t 45 min.

7. **Check.** Is the temperature 175°F?
   
   I If not, continue to cook.
   
   Yes
   
   No

8. **Cover and transfer to 150°F hot holding unit.**
   
   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., ≤2 inches deep or <1-gallon container.
    
    Ti 135°F To <41°F t <6 hr.

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

---

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.

<table>
<thead>
<tr>
<th>Process Step, Procedure, and Control</th>
<th>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</th>
</tr>
</thead>
<tbody>
<tr>
<td>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. <strong>Ti 40°F To 205°F t 20 min.</strong></td>
<td>Supplies are obtained from reputable sources; sauce has low pH and is heated sufficiently to destroy vegetative pathogens.</td>
</tr>
<tr>
<td>1a. Hold in bain marie. <strong>D Ti 205°F To 165°F t 20 min.</strong></td>
<td>No pathogenic microbial growth in sauce at &gt;130°F.</td>
</tr>
<tr>
<td>2. Get chicken quarters from refrigerator. Remove rib bones. <strong>Ti 40°F To 45°F t 10 min.</strong></td>
<td>Vegetative pathogens and spores are controlled by low temperature. Inspect to assure that all bones are removed</td>
</tr>
<tr>
<td>3. CCP Place quarters, one layer deep, in shallow roasting pan. Bake (brown) in convection oven at 350°F to &gt;165°F, &gt;15 sec. <strong>Ti 45°F To &gt;165°F t 30 m.</strong></td>
<td>Cooking temperature &gt;165°F, &gt;15 sec. assures a &gt;7D salmonellae kill.</td>
</tr>
<tr>
<td>4. Remove pan(s) of chicken from oven. Pour off excess liquid. Save for chicken stock. <strong>Ti &gt;165°F To 155°F t&lt;15 m.</strong></td>
<td>Temperature &gt;130°F controls spores and kills vegetative cells.</td>
</tr>
<tr>
<td>4a. CCP Cool liquid from 135 to 41°F in D &lt;6 hr., &lt;2 inches deep or &lt;1-gallon container. (Save for chicken stock.) <strong>Ti ≥135°F To &lt;41°F t &lt; 6 hr.</strong></td>
<td>Cooling chicken stock from 135 to 41°F, &lt;6 hr., controls spore outgrowth.</td>
</tr>
<tr>
<td>5. Cover chicken quarters with sauce. <strong>O Ti 155°F To 150°F t&lt;10 min.</strong></td>
<td>Temperature &gt;130°F controls spores and kills vegetative cells.</td>
</tr>
<tr>
<td>6. Bake at 300°F in convection oven until chicken reaches a temperature of 175°F. <strong>Ti 150°F To 175°F t 45 min.</strong></td>
<td>Temperature &gt;130°F controls spores and kills vegetative cells.</td>
</tr>
<tr>
<td>7. Check. Is the temperature 175°F? <strong>I If not, continue to cook. No</strong></td>
<td>Temperature &gt;130°F controls spores and kills vegetative cells.</td>
</tr>
<tr>
<td>8. Cover and transfer to 150°F hot holding unit. <strong>T Ti 175°F To 150°F t 5 min.</strong></td>
<td>Temperature &gt;130°F controls spores and kills vegetative cells.</td>
</tr>
<tr>
<td>9. Hold. Serve 1/4 chicken and 3 oz. sauce. Use within 2 hr. <strong>D Ti 150°F To 150°F t &lt;120 min.</strong></td>
<td>Temperature &gt;130°F controls spores and kills vegetative cells.</td>
</tr>
<tr>
<td>10. CCP Cool from 135 to &lt;41°F, 6 hr., &lt;2 inches deep or &lt;1-gallon container. <strong>O Ti 135°F To 41°F t &lt;6 hr.</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
**HACCP PLAN EXAMPLE: CHICKEN CACCIATORE**

<table>
<thead>
<tr>
<th>Process Steps and Controls: GMPs and prerequisites are in place (T=temp. in; To=Temp. out; t=Time to do the step)</th>
<th>B, C, P, Potential Hazards and Risk Analysis</th>
<th>Control</th>
<th>Monitoring &amp; Record; (What, How, Frequency, Who)</th>
<th>Corrective Action &amp; Record</th>
<th>Verification &amp; Record (Procedures and Frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>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. B: Not significant. C: None. P: None. Ti 40°F to 205°F t 20 min.</td>
<td>Supplies are obtained from reputable sources; sauce has low pH and is heated sufficiently to destroy vegetative pathogens.</td>
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<tr>
<td>1a. Hold sauce in Bain Marie. D Ti 205°F To 165°F t 20 min. B: Not significant. C: None. P: None.</td>
<td>No pathogenic microbial growth in sauce at &gt;130°F.</td>
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<tr>
<td>2. Get chicken quarters from O refrigerator. Remove rib bones. Ti 40°F To 45°F t 10 min. B: Not significant. C: None. P: Not significant.</td>
<td>Vegetative pathogens and spores are controlled by low temperature. Inspect to assure that all bones are removed</td>
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<tr>
<td>** CCP Place quarters, one layer deep in shallow roasting pan. Bake (brown) in convection oven at 350°F, &gt;165°F, &gt;15 sec. Ti 45°F To165°F t 30 min. B: Vegetative pathogens and spores C: None. P: None. Cooking temperature &gt;165°F, &gt;15 sec. assures a &gt;7D salmonellae kill.</td>
<td>Assigned worker takes lowest temperature of center of food in each lot and records on production sheet for each lot.</td>
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<tr>
<td>4. Remove pan(s) of chicken from oven. O Pour off excess liquid. Save for chicken stock. Ti &gt;165°F To 155°F t 15 min. B: Not significant. C: None. P: None. Temperature &gt;130°F controls spores and kills vegetative cells.</td>
<td>If temperature is not &gt;165°F, continue to cook. Supervisor initials the production log each shift.</td>
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<tr>
<td>4a. CCP Cool liquid from 135 to 41°F, D &lt;6 hr., &lt;2 inches deep or &lt;1-gallon container. (Save for chicken stock). Ti ≥135°F To 41°F t &lt;6 hr. B: Pathogenic spores C: None. P: None. Cooling chicken stock from 135 to 41°F, &lt;6 hr., controls spore outgrowth. Use clean, sanitized container and refrigerator that is validated for safe cooling</td>
<td>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.</td>
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<tr>
<td>5. Cover chicken quarters with O sauce. Ti &gt;155°F To 150°F t 10 min. B: Not significant. C: None. P: None. Temperature &gt;130°F controls spores and kills vegetative cells.</td>
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<tr>
<td>6. Bake at 300°F in convection oven until O chicken reaches a temperature of 175°F. Ti &gt;150°F To 175°F t &gt;45 min. B: Not significant. C: None. P: None. Temperature &gt;130°F controls spores and kills vegetative cells.</td>
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<tr>
<td><strong>Check. Is the temperature</strong></td>
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<tr>
<td>7. I 179°F? If not, continue to cook.</td>
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<tr>
<td>8. Cover and transfer to 150°F hot holding T unit. Ti 175°F To 150°F t 5 min. B: Not significant. C: None. P: None. Temperature &gt;130°F controls spores and kills vegetative cells.</td>
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<tr>
<td><strong>HoldServe</strong></td>
<td>9. Hold. Serve 1/4 chicken and 3 oz. sauce. D Use within &lt;2 hr. Ti 150°F To 150°F t &lt;120 min. B: Not significant. C: None. P: None. Temperature &gt;130°F controls spores and kills vegetative cells.</td>
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<tr>
<td><strong>Leftovers</strong></td>
<td>10. CCP Cool from 135 to &lt;41°F, &lt;6 hr., D ≤2 inches deep or &lt;1-gallon container. Ti 135°F To &lt;41°F t &lt;5 hr. B: Pathogenic spores. C: None. P: None. 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.</td>
<td>Assigned worker makes sure the food is at the proper depth to cool to &lt;41°F in 6 hours. This is recorded on production sheet for each lot.</td>
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**B.C.P = biological, chemical, physical hazard**

**CCP = Critical Control Point**

**Approved (QC) ___________________________ Date ___________________________**

**Approved (Process Authority) ___________________________ Date ___________________________**
## FOOD HACCP PLANS

<table>
<thead>
<tr>
<th>Process Steps and Controls: GMP's and prerequisites are in place</th>
<th>B, C, P, Potential Hazards and Risk Analysis</th>
<th>Control Limit (CL) for each Hazard Control</th>
<th>Monitoring &amp; Record; (What, How, Frequency, Who)</th>
<th>Corrective Action &amp; Record</th>
<th>Verification &amp; Record (Procedures and Frequency)</th>
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</table>

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:

<table>
<thead>
<tr>
<th>Gp #</th>
<th>Ing #</th>
<th>Ingredients and Specifications</th>
<th>Lot # / Rec</th>
<th>Amt</th>
<th>EP Wt %</th>
<th>Verif</th>
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</table>

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

<table>
<thead>
<tr>
<th>Process step #</th>
<th>Start food ctr. temp., ºF</th>
<th>Thickest food dimension (in.)</th>
<th>Container size HxWxL (in.)</th>
<th>Cover</th>
<th>Temp. on/around food</th>
<th>End food ctr. temp., ºF</th>
<th>Process step time, hr./min.</th>
</tr>
</thead>
</table>
| #.  Take (food) at ___ºF, (inches) thick, in a ___-inch pan, (un)covered (Y/N), and put in the (equipment) at ___ºF for (process time) until the center temperature is ___ºF.

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 150ºF, 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, >125ºF. 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 55ºF, 6 hours (14.2 hours to 40ºF); <2 inches deep or 1-gallon pot.
8. If making cold mixed salad, get all ingredients to 55ºF before mixing. Mix and package and finish cooling to 40ºF.
9. CCP. For allergen control, do not combine / mix leftovers (rework). Clean food contact surfaces before the next food is prepared.
### PROCESS TEMPERATURE CHART

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