

Hazard Analysis Critical Control Point (HACCP) Model for Frankfurters

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Introduction

Hazard Analysis Critical Control Point (HACCP) is a process control system. This preventative system is designed for the safe production of food by applying controls at any point in production where hazards occur or where previously introduced hazards can be controlled before consumption. The application of HACCP is based on technical and scientific principles that assure safe food. An ideal application of HACCP would include all processes in food production from the farm to the table.

The food industry has embraced HACCP as the best system for preventing food safety problems. HACCP has been used as early as the late 1950's when the Pillsbury Company used HACCP to assist with the production of foods for the space program. Recently numerous meat and poultry companies have utilized HACCP to address concerns with food safety. Additionally, in 1996 the USDA Food Safety and Inspection Service (FSIS) published the final rule for pathogen reduction and Hazard Analysis Critical Control Point (HACCP) Systems. Implementation of HACCP will be required for larger federally inspected meat and poultry operations by 1998 and very small establishments will need to comply by 2000.

The HACCP plan is specific for each production plant and the design and implementation of a HACCP plan should be conducted by a team of individuals from the company and the production facility. Many companies have the expertise available to develop and implement HACCP; however, some companies, especially the smaller business meat companies, will require assistance from extension, industry associations, consultants, and government for development of a HACCP plan. One form of assistance is the use of generic or model HACCP plans.

Model HACCP plans have been developed by the USDA, FSIS through a contract with the International Meat and Poultry HACCP Alliance. Teams of scientists, consumers and industry representatives developed ten model plans representing different product categories. The ten product categories represent most of the meat products produced. The model plans have been reviewed by a scientific and industry panel and are available from FSIS and are also at the International Meat and Poultry HACCP Alliance web site. Generic or model HACCP plans can serve as useful guidelines for a production facility; however, it is impossible for model plans

developed for a broad number of production systems to be readily applied to an individual meat processing facility or product.

Several additional points should be considered when using a model plan.

1. Many HACCP model plans were developed for a product category by using specific products for simplicity in developing the plan. A production facility developing a plan for a different product in the same category will need to consider changes in the flow charts, hazard analysis and critical control point analysis.
2. Model plans make the assumption that facilities have established sanitation Standard Operating Procedures (SOP's) and follow Good Manufacturing Practices (GMP's).
3. Critical limits and critical control points in models were developed with the best information available at that time. As knowledge of food safety hazards increases and new technology to measure hazards develops, the critical control points used to control a process may also change. Additionally, some plants may require more CCP's and some plants may require less CCP's to maintain control.
4. The method of record keeping is highly dependent on the systems in the individual plant. Some plants may be able to adjust current quality assurance records, while others will have no record keeping system. Additionally, some plants may be able to utilize computer record keeping.
5. Scientific and technical input into the HACCP plan will still be important. Production facilities may still need to seek outside input into the development, implementation and review of their HACCP plan.
6. The HACCP plan will change with time and adjustments to keep the process in control will need to be made.

Processing plants will find model HACCP plans a useful starting point but should not consider a model plan as the only answer for food safety hazards in their facility.

Frankfurter model HACCP plan

The frankfurter model HACCP plan is presented not only as a model for meat processors for HACCP development, but is also designed for group evaluation. Therefore, this plan includes details that may not be included with other model plans. The frankfurter model plan includes product descriptions, product ingredients, the CCP decision tree used in the model, the hazard analysis (Principle 1), the CCP determination (Principle 2), a table of critical limits, monitoring and corrective actions (Principles 3, 4 and 5), a table of record keeping and verification (Principles 6 and 7), and a HACCP plan. Sample record keeping forms and references that are useful in developing the plan are also included. Finally, a HACCP plan

checklist is included specifically for use with the group exercise, but could also be used to evaluate establishment HACCP plans.

Additionally the frankfurter model plan includes and excludes critical control points that can be debated. The group will need to review the plan with this in mind. A description of the CCP's identified follows.

Frankfurter model HACCP plan CCP's

CCP 1 addresses the risk of pathogen growth in the frankfurter and the potential carcinogenic risk of the ingredient nitrite. Residual nitrite in frankfurters and other cured meat products has antibacterial properties, especially for *Clostridium botulinum* and *Listeria monocytogenes*. The risk of adding too much nitrite is that it is a carcinogen and very high levels could be toxic. Nitrite is required in this product to meet the standards of identity by USDA FSIS, and the legal limit for nitrite in the frankfurter formulation is 156 ppm. However, the level needed for food safety protection may be debatable. Most of the nitrite added to the formulation is converted to nitrous oxide during processing and only the residual nitrite will provide the antibacterial activity. Including nitrite in the formulation at the proper levels should minimize the risk of the carcinogen and maximize the antibacterial benefit.

CCP 2 addresses the risk of pathogen growth during the tempering of frozen meat. Since most sources of meat contain some level of pathogen contamination, including controls for thawing temperature and thawing time should assist with controlling the growth of pathogens during this processing step.

CCP 3 also addresses the risk of growth of pathogen due to inappropriate storage conditions of too high temperature and too long of time that could occur before the product enters the establishment. The plant can use established good manufacturing practices (GMP's) to control pathogen growth in their facility, but the control is placed on incoming product to encourage the suppliers and transportation providers to also use GMP's.

CCP 4 is an important pasteurization step for the production of frankfurters. Thermally processing to a proper end point temperature will result in a significant reduction in pathogens in the product.

CCP 5 provides control over the hazard of metal fragments in the product. Metal detection at other locations in the product flow would be important for quality assurance and for reducing the expense of equipment breakdown, but does not need to be controlled as a hazard until the finished product is produced.

HACCP PLAN CHECKLIST

| | YES | NO |
|---|-----|----|
| A. DESCRIBE THE PRODUCT | | |
| 1. Does the HACCP plan include: | | |
| a. The producer/establishment and the product name? | | |
| b. The ingredients and raw materials used along with the product receipt or formulation? | | |
| c. The packaging used? | | |
| d. The temperature at which the product is intended to be held, distributed and sold? | | |
| e. The manner in which the product will be prepared for consumption? | | |
| 2. Has a flow diagram for the product of the product been developed that is clear, simple and descriptive of the steps in the process? | | |
| 3. Has the flow diagram been verified for accuracy and completeness against the actual operating process? | YES | NO |
| B. CONDUCT A HAZARD ANALYSIS | | |
| 1. Have all steps in the process been identified and listed where hazards of potential significance occur? | | |
| 2. Have all hazards associated with each identified step been listed? | | |
| 3. Have safety concerns been differentiated from quality concerns? | | |
| 4. Have preventive measures to control the identified hazard been identified, if they exist, and listed? | YES | NO |
| C. IDENTIFY CRITICAL CONTROL POINTS | | |
| 1. Has the CCP Decision Tree been used to help determine if a particular step is a CCP for a previously identified hazard? | | |
| 2. Have the CCPs been entered on the forms? | | |
| 3. Have all significant hazards identified during the hazard analysis been addressed? | YES | NO |
| D. ESTABLISH CRITICAL LIMITS | | |
| 1. Have critical limits been established for each preventive measure at each CCP? | | |
| 2. Has the validity of the critical limits to control the identified hazard been established? | | |
| 3. Were critical limits obtained from the regulations, processing authority, etc? | | |
| 4. Is documentation attesting to the adequacy of the critical limits maintained on file at the establishment? | YES | NO |
| E. ESTABLISH MONITORING PROCEDURES | | |
| 1. Have monitoring procedures been developed to assure that preventive measures necessary for control at each CCP are maintained within the established critical limits? | | |
| 2. Are the monitoring procedures continuous or, where continuous monitoring is not possible, is the frequency of monitoring sufficiently reliable to indicate that the hazard is under control? | | |
| 3. Have procedures been developed for systematically recording the monitoring data? | | |
| 4. Have employees responsible for monitoring been identified and trained? | | |
| 5. Have employees responsible for reviewing monitoring records been identified and trained? | | |
| 6. Have signatures of responsible individuals been required on the monitoring records? | | |
| 7. Have procedures been developed for using the results of monitoring to adjust the process and maintain control? | YES | NO |
| F. ESTABLISH CORRECTIVE ACTIONS | | |
| 1. Have specific corrective actions been developed for each CCP? | | |
| 2. Do the corrective actions address: | | |
| a. Reestablishment of process control? | | |
| b. Disposition of affected product? | | |
| c. Procedures to correct the cause of non-compliance and to prevent the deviation from recurring? | | |
| 3. Have procedures been established to record the corrective actions? | YES | NO |
| 4. Have procedures been established for reviewing the corrective action records? | | |
| G. ESTABLISH RECORDKEEPING PROCEDURES | | |
| 1. Have procedures been established to maintain the HACCP plan on file at the establishment? | | |
| 2. Do the HACCP records include: | | |
| Description of the product and its intended use? | | |
| Flow diagram for the process, indicating CCPs? | | |
| Preventative measures? | | |
| Critical limits? | | |
| Monitoring system: | | |
| Corrective action plans for deviations from critical limits? | | |
| Recordkeeping procedures for monitoring? | | |
| Procedures for verification of the HACCP system? | YES | NO |
| H. ESTABLISH VERIFICATION PROCEDURES | | |
| 1. Have procedures been included to verify that all significant hazards were identified in the HACCP plan when it was developed? | | |
| 2. Have procedures been included to verify that the critical limits are adequate to control the identified hazards? | | |

| | | |
|--|--|--|
| 3. Are procedures in place to verify that the HACCP system is functioning properly? | | |
| 4. Are procedures in place to reassess the HACCP plan and system on a regular basis or whenever significant product, process or packaging changes occur? | | |

Product Category Description

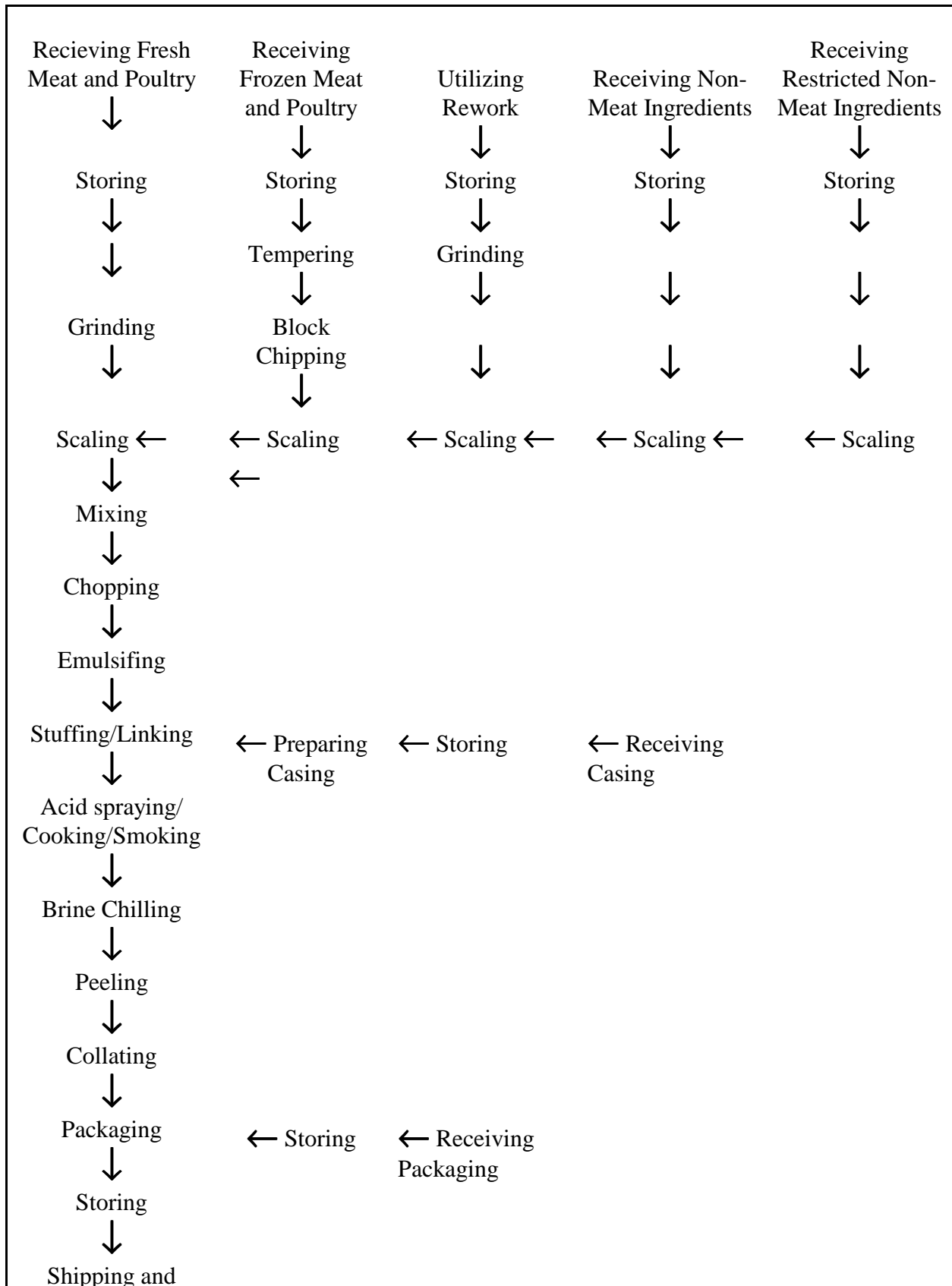
| | |
|--|--|
| Product: | Frankfurters |
| The following areas need to be defined when developing the product category description: | |
| 1. Common Name/Description: | A small diameter comminuted, semi-solid sausage prepared from meat or meat and poultry, seasoned and cured. Defined in regulations under Sausage, Cooked §319.180 Definitions and Standards of Identity or Composition, Subpart G, Cooked Sausage. |
| 2. How is it to be used? | As a sandwich item, a meat item by itself, or as an ingredient in other foods. |
| 3. Type of Package? | Vacuum package for retail, bulk vacuum package for Foodservice, bulk packaged in lined boxed for Foodservice. |
| 4. Length of Shelf Life; at what temperature? | Varies with packaging of product and storage temperature. Usually stored at refrigeration but may be frozen |
| 5. Where will it be sold? | Retail Foodservice |
| 6. Labeling instructions: | Sell by date, Lot number, Julian code. "Keep refrigerated" or "Keep frozen" depending upon the intended customer and use. |
| 7. Is special distribution control needed? | Yes, refrigerated conditions are required. |
| | |

Date: _____ Approved by: _____

Product and Ingredients

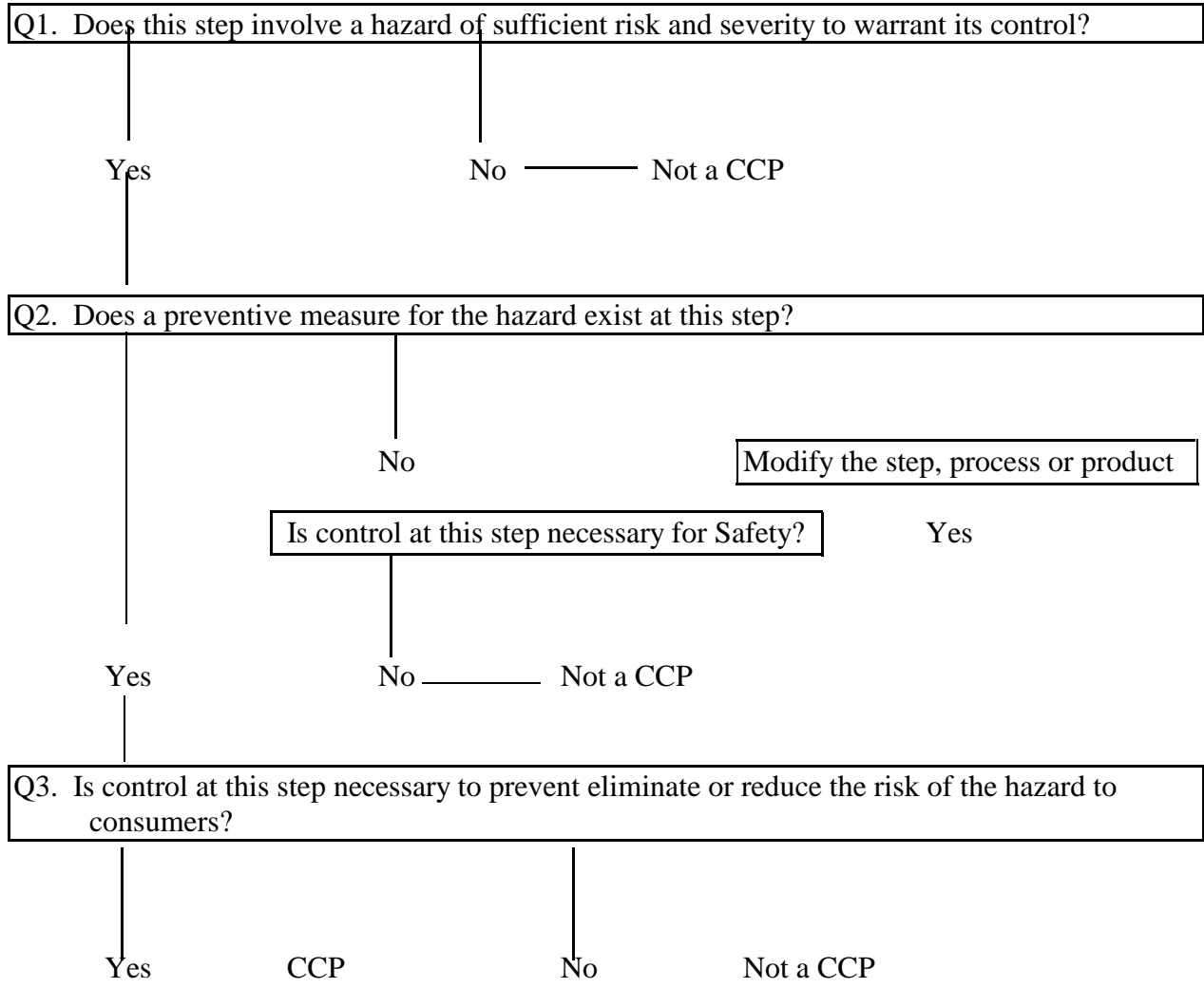
| |
|--|
| Product: Frankfurters |
| Meat Ingredients: |
| Raw meat Raw poultry Product rework |
| Non-Meat Ingredients: |
| Salt |
| Water/ice Sugar |
| Dextrose Corn syrup Spices and flavorings Liquid smoke |
| Nonfat dry milk |
| Restricted Ingredients: |
| Potassium or sodium nitrite |
| Ascorbate or erythorbate Phosphate |
| Packaging Materials: |
| Roll stock oxygen barrier film for vacuum package Box liner film and box for bulk package |
| Casing: |
| Cellulose casing |
| Collagen casing Natural |

Frankfurter Production Flow Chart



distributing

CCP Decision Tree



Hazard Analysis

Product: Frankfurters

| Process Step | Potential hazard introduced, controlled or enhanced at this step B= Biological C= Chemical P= Physical | Is the potential food safety hazard significant? | Justification for decision | What control measures can be applied to prevent the significant hazards? |
|---|---|--|---|--|
| Receiving and storing restricted non-meat ingredients | B - Not applicable C - Nitrite/cure P - Foreign material | C - No P - No | C - Not likely to occur as plant GMP's include letter of guarantee P - Not likely to occur | |
| Scaling of restricted non-meat ingredients | B - Pathogens C - Nitrite P - Foreign material | B - Yes C - Yes P - No | B - Residual nitrite provides control for Colstridium botulinum and Listeria monocytogenes C - Excessive levels of nitrite may be carcinogenic | B,C = Proper weighing and correct product formulation. |
| Receiving and storing non-meat ingredient | B - Pathogen C - Allergens P - Foreign material | B-No C- No P-No | B - Not likely to occur and will be controlled at later processing steps. C - Not likely to occur | |
| Receiving and storing casings | B - Pathogen C - Not applicable P - Foreign material | B - No C - No | N - Not likely to occur P - Plant GMP's control | |

Hazard Analysis

Product: Frankfurters

| Process Step | Potential hazard introduced, controlled or enhanced at this step B= Biological C= Chemical P= Physical | Is the potential food safety hazard significant? | Justification for decision | What control measures can be applied to prevent the significant hazards? |
|---|---|--|--|--|
| Receiving storing packaging material | B - Not applicable C - Not applicable P - Foreign material | P - No | P - Not likely to occur due to plant GMP's | |
| Utilizing rework, storage, scaling and grinding | B - Pathogen C - Not applicable P - Foreign material | B - No P - No | B - Not likely to occur with plant GMP's addressing storage temperature and cross contamination | |
| Receiving frozen meat and poultry | B - Pathogen C - Antibiotics P - Foreign material | B - No C - No P - No | B - Raw meat is a known source of pathogen C - USDA and producer program control P - Low incidence | |
| Tempering of frozen meat and poultry | B - Pathogen C - Not applicable P - Not applicable | B - Yes | Pathogen growth if time and temperature are not controlled | Temper meat at 40°F and block chip while still frozen |
| Block chipping of | B - Pathogene C - Sanitizer and cleaner | B - No C - No | Plant sanitation SOP's and GMP's control | B - |

Hazard Analysis

Product: Frankfurters

| Process Step | Potential hazard introduced, controlled or enhanced at this step B= Biological C= Chemical P= Physical | Is the potential food safety hazard significant? | Justification for decision | What control measures can be applied to prevent the significant hazards? |
|--|---|--|--|--|
| tempered meat and poultry | F - Foreign material | P - No | | |
| Receiving fresh meat and poultry | B - Pathogen C - Antibiotics P - Foreign material | B - Yes C - No P - No | B - Raw meat is a known source of pathogen | B - Product age, receiving temperature, and organoleptic evaluation |
| Storing of fresh meat and poultry | B - Pathogen C - Not applicable P - Not applicable | B - Yes | B - Presence of pathogen | Appropriate time/temperature monitoring and plant GMP's |
| Grinding fresh meat and poultry | B - Pathogen C - Sanitizer and cleaner P - Foreign material | B - No C - No P - No | Sanitation SOP for sanitation and plant GMP for foreign material control | |
| Scaling of fresh and frozen meat and poultry | B - Pathogen C - Sanitizer and cleaners P - Foreign material | B - No C - No P - No | Sanitation SOPs and plant GMPs | |

Hazard Analysis

Product: Frankfurters

| Process Step | Potential hazard introduced, controlled or enhanced at this step B= Biological C= Chemical P= Physical | Is the potential food safety hazard significant? | Justification for decision | What control measures can be applied to prevent the significant hazards? |
|-----------------------|---|--|--------------------------------|--|
| Mixing | B - Pathogen C - Sanitizers and cleaners P - Not applicable | B - Yes C - No | Proper addition of Nitrite | |
| Chopping and Grinding | B - Pathogen C - Sanitizer and cleaner P - Foreign material | B - No C - No P - No | Sanitation SOPs and plant GMPs | |
| Emulsifying | B - Pathogen C - Sanitizer and cleaner P - Foreign material | B - No C - No P - No | Sanitation SOPs and plant GMPs | |
| Stuffing and Linking | B - Pathogen C - Not applicable P - Not applicable | B - No | Sanitation SOPs and plant GMPs | |

Hazard Analysis

Product: Frankfurters

| Process Step | Potential hazard introduced, controlled or enhanced at this step B= Biological C= Chemical P= Physical | Is the potential food safety hazard significant? | Justification for decision | What control measures can be applied to prevent the significant hazards? |
|---------------------------------------|---|--|---|--|
| Acid spraying/ cooking/ smoking | B - Pathogen C - Cleaners and Sanitizers P - Not applicable | B - Yes C - No | Improper cooking Temperatures allow growth of pathogen | Time and temperature to control pathogens |
| Brine chilling | B - Not applicable C - Not applicable P - Not applicable | B - No C - No P - No | Sanitation SOPs and plant GMPs | |
| Peeling | B - Pathogen C - Not applicable P - Foreign material | B - No C - No P - No | Sanitation SOPs and plant GMPs | |
| Collating | B - Pathogen C - Sanitizers and cleaners P - Foreign material | B - Yes C - No P - No | Cross contamination form environment or personnel | Plant SOP's for sanitation |

Hazard Analysis

Product: Frankfurters

| Process Step | Potential hazard introduced, controlled or enhanced at this step B= Biological C= Chemical P= Physical | Is the potential food safety hazard significant? | Justification for decision | What control measures can be applied to prevent the significant hazards? |
|--------------|---|--|--------------------------------------|--|
| Packing | B - Not applicable C - Not applicable P - Foreign material | P - Yes | Metal | Metal detection |
| Storing | B - Pathogen C - Not applicable P - Foreign material | B - No P - No | Proper time and temperature GMP's | |
| Shipping | B - Pathogen C - Not applicable P - Not applicable | B - No | Proper time and temperature GMP's | |
| Distributing | B - Pathogen C - Not applicable P - Not applicable | B - No C - No P - No | Proper time and temperature GMP's | |

Principle 2 - CCP Determination

Product: Frankfurters

A critical control point is defined as a point, step or procedure at which control can be applied and a food safety hazard can be prevented, eliminated or reduced to acceptable levels.

| Process step | Hazard Biological = B Chemical = C Physical = P | Q1. Does this step involve a hazard of sufficient risk and severity to warrant its control? | Q2. Does a preventive measure for the hazard exist at this step? | If Q2. is no: Is control at this step necessary for safety? | Q3. Is control at this step necessary to prevent, eliminate or reduce the risk of the hazard to consumers? | #CCP |
|--|--|---|--|---|--|--------|
| Receiving & storing restricted non-meat ingredient | B - Not applicable | | | | | |
| | C - Nitrite | No | | | | |
| | P - Foreign material | No | | | | |
| Scaling of restricted non-meat ingredients | B - Pathogens | Yes | Yes | | Yes | CCP-1B |
| | C - Nitrite | Yes | Yes | | Yes | CCP-1C |
| | P - Foreign material | No | | | | |
| Receiving and storing non-meat ingredient | B - Pathogen | No | | | | |
| | C - Allergens | No | | | | |
| | P - Foreign material | No | | | | |
| Receiving and storing casings | B - Pathogen | No | | | | |
| | C - Not applicable | | | | | |
| | P - Foreign material | No | | | | |

Principle 2 - CCP Determination

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|--|--|---|--|---|--|--------|
| Receiving & storing packaging material | B - Not applicable | | | | | |
| | C - Not applicable | | | | | |
| | P - Foreign material | No | | | | |
| Utilizing rework storing and grinding | B - Pathogen | No | | | | |
| | C - Not applicable | | | | | |
| | P - Foreign material | No | | | | |
| Receiving frozen meat and poultry | B - Pathogen | Yes | Yes | | Yes | |
| | C - Antibiotics | No | | | | |
| | P - Foreign material | No | | | | |
| Tempering of frozen meat and poultry | B - Pathogen | Yes | Yes | | Yes | CCP-2B |
| | C - Not applicable | | | | | |
| | P - Not applicable | | | | | |
| Block | B - Pathogen | No | | | | |

Principle 2 - CCP Determination

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|----------------------------------|--|---|--|---|--|--------|
| chipping of tempered meat | C - Sanitizers and Cleaner | No | | | | |
| | F - Foreign Material | No | | | | |
| Receiving fresh meat | B - Pathogen | Yes | Yes | | Yes | CCP-3B |
| | C - Antibiotics | No | | | | |
| | P - Foreign material | No | | | | |
| Storing of fresh meat | B - Pathogens | No | | | | |
| | C - Not applicable | | | | | |
| | P - Not applicable | | | | | |
| Grinding fresh meat | B - Pathogen | No | | | | |
| | C - Sanitizer and cleaner | No | | | | |
| | P - Foreign Material | No | | | | |
| Scaling of fresh and frozen meat | B - Pathogen | No | | | | |
| | C - Sanitizer and cleaners | No | | | | |

Principle 2 - CCP Determination

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|-----------------------|--|---|--|---|--|------|
| frozen meat | P - Foreign material | No | | | | |
| Mixing | B - Pathogen | No | | | | |
| | C - Sanitizers and cleaners | No | | | | |
| | P - Not applicable | | | | | |
| Chopping and Grinding | B - Pathogen | No | | | | |
| | C - Sanitizer and cleaner | No | | | | |
| | P - Foreign material | No | | | | |
| Emulsifying | B - Pathogen | No | | | | |
| | C - Sanitizer and cleaner | No | | | | |
| | P - Foreign material | No | | | | |
| Stuffing and linking | B - Pathogen | No | | | | |
| | C - Not applicable | | | | | |
| | P - Not applicable | | | | | |

Principle 2 - CCP Determination

Product: Frankfurters

A critical control point is defined as a point, step or procedure at which control can be applied and a food safety hazard can be prevented, eliminated or reduced to acceptable levels.

| Process step | Hazard Biological = B Chemical = C Physical = P | Q1. Does this step involve a hazard of sufficient risk and severity to warrant its control? | Q2. Does a preventive measure for the hazard exist at this step? | If Q2. is no: Is control at this step necessary for safety? | Q3. Is control at this step necessary to prevent, eliminate or reduce the risk of the hazard to consumers? | #CCP |
|---------------------------------------|--|---|--|---|--|--------|
| Acid spraying/ cooking/ smoking | B - Pathogen | Yes | Yes | | Yes | CCP-4B |
| | C - Cleaners and sanitizers | No | | | | |
| | P - Not applicable | | | | | |
| Brine chilling | B - Not applicable | | | | | |
| | C - Contaminants in brine | No | | | | |
| | P - Not applicable | | | | | |
| Peeling | B - Pathogen | No | | | | |
| | C - Not applicable | | | | | |
| | P - Foreign material | Yes | Yes | | No | |
| Collating | B - Pathogen | No | | | | |
| | C - Sanitizers and cleaners | No | | | | |
| | P - Foreign material | Yes | Yes | | No | |

Principle 2 - CCP Determination

Product: Frankfurters

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|--------------|--|---|--|---|--|--------|
| Packing | B - Not applicable | | | | | |
| | C - Not applicable | | | | | |
| | P - Foreign material | Yes | Yes | | Yes | CCP-5P |
| Storing | B - Pathogen | No | | | | |
| | C - Not applicable | | | | | |
| | P - Not applicable | | | | | |
| Shipping | B - Pathogen | No | | | | |
| | C - Not applicable | | | | | |
| | P - Not applicable | | | | | |
| Distributing | B - Pathogen | No | | | | |
| | C - Not applicable | | | | | |
| | P - Not applicable | | | | | |

Principles 3, 4 and 5
Critical Limits, Monitoring and Corrective Actions

Product:

| Process Step/ CCP | Critical Limits | Monitoring Procedures (Who/What/When/How) | Corrective Actions |
|--|---|---|---|
| Scaling of restricted non-meat ingredients CCP-1B | 120 ppm or greater nitrite added to the product formulation. The weight of cure added will depend on nitrite concentration in cure. | Scale master for cure ingredients will weigh out the correct weight for each batch and check the weight against the formulation sheet. Quality assurance personnel will verify the weight before addition to the batch. | Curing ingredients will be reweighed and the amount corrected as needed. |
| Scaling of restricted non-meat ingredients CCP-1C | 156 ppm or less nitrite added to the product formulation. The weight of cure added will depend on nitrite concentration in cure. | Scale master for cure ingredients will weigh out the correct weight for each batch and check the weight against the formulation sheet. Quality assurance personnel will verify the weight before addition to the batch. | Curing ingredients will be reweighed and the amount corrected as needed. |
| | | | |
| Tempering of frozen meat. CCP-2B | Less than 40°F or plant established time and temperature requirements to preclude the growth of | A thermometer with a recorder will monitor the tempering room on a constant basis. Tempering room manager will monitor the room temperature twice per production shift | Refrigeration will be adjusted. Product will be placed on hold for further evaluation of significance. Established procedures will be used for product disposition. |

Principles 3, 4 and 5
Critical Limits, Monitoring and Corrective Actions

Product:

| Process Step/ CCP | Critical Limits | Monitoring Procedures (Who/What/When/How) | Corrective Actions |
|---|---|--|---|
| | pathogens. | and verify this reading with the reading of the recording thermometer. | |
| Receiving fresh meat and poultry CCP-3B | Internal temperature of fresh meat should be less than 40°F and less than three days from fabrication or plants specifications for product age. | Temperature of each combo of fresh meat will be checked by the receiving clerk using a calibrated thermometer. Product age and organoleptic evaluation will be recorded. | Product will be placed on hold by the receiving clerk and further evaluated by quality assurance. Quality assurance personnel will either reject the product or conduct further evaluations for disposition of the product. |
| Acid Spraying/ Cooking/ Smoking CCP-4B | Internal temperature of the finished product of 160°F or greater. | At the end of the cooking cycle, the internal frankfurter temperature will be checked in three separate house locations for each smokehouse batch. Temperature will be monitored with a calibrated thermometer by the smokehouse operator. | Continue cooking until frankfurters reach 160°F. |
| Packaging CCP-5P | No foreign material. Metal detection set for the maximum sensitivity of the metal detector | Each package will be checked for metal by an in-line metal detector that will automatically reject packages. Visual inspection for other foreign material will be preformed by the | Packages identified to have foreign material will be reverified and if possible the source of foreign material identified. Product will be retained and reworked or discarded. |

Principles 3, 4 and 5
Critical Limits, Monitoring and Corrective Actions

Product:

| Process Step/ CCP | Critical Limits | Monitoring Procedures (Who/What/When/How) | Corrective Actions |
|----------------------|-----------------|--|--------------------|
| | | packaging operator and periodically by quality assurance personnel. | |

**Principles 6 and 7
Record Keeping and Verification**

Product:

| Process Step/CCP | Records | Verification Procedures |
|--|--|---|
| Scaling restricted non-meat ingredients CCP-1B, C | Formulation sheets for each batch. Scale weights for cure. Incident report forms of deviations and corrective actions. | Audit of the formulation and scale weight log. Review of incident report. Daily calibration of scales by quality assurance. HACCP coordinator will observe on-site implementation on a periodic basis. |
| Tempering of frozen meat. CCP-2B | Daily strip chart log from tempering room temperature monitor. Tempering room temperature log by quality assurance. Incident report of deviations and corrective actions taken. | The plant HACCP coordinator will audit the daily temperature logs and will calibrate the thermometers on a periodic basis. HACCP coordinator will review the deviations and corrective actions and will periodically observe implementation of monitoring and records. |
| Receiving fresh meat and poultry CCP-3B | Receiving log that includes the date, product, producer, date of production, temperature of meat and the organoleptic observations. Incident report of deviations and corrective actions taken. | The plant HACCP coordinator will audit the daily receiving log. Thermometers will be calibrated daily. Plant HACCP coordinator will review the log of deviations and corrective actions. HACCP coordinator will perform periodic onsite observations of records and implementation. |

**Principles 6 and 7
Record Keeping and Verification**

Product:

| Process Step/CCP | Records | Verification Procedures |
|---|---|---|
| Acid spraying/ cooking/ smoking CCP-4B | Smokehouse log of product internal temperature. Incident report of deviations and corrective actions taken | HACCP coordinator will audit the daily smokehouse log. Thermometers will be calibrated daily. Plant HACCP coordinator will review the log of deviations and corrective actions. HACCP coordinator will perform periodic on-site observations of records and implementation. |
| Packaging CCP-5P | Foreign material log that includes a description of the metal or other foreign material found. Incident report of deviations and corrective actions. | Metal detector will be calibrated every shift by quality assurance. HACCP coordinator will review the log of foreign material and the incident report of deviations and corrective actions. HACCP coordinator will perform periodic on-site observations of records and implementation. |

UNL

Process Category: Summer Sausage

| Process Step | Hazard Description | CCP Description | Critical Limit | Monitoring Procedures | Corrective Action/ Person Responsible | HACCP Records | HACCP Verification Procedures |
|--|--------------------|--|---|---|---|--|--|
| Scaling of restricted non-meat ingredients | CCP-1B | B - Residual nitrite provides control for Colstridium botulinum and Listeria monocytogenes | 120 ppm or greater nitrite added to the product formulation. The weight of cure added will depend on nitrite concentration in cure. | Scale master for cure ingredients will weigh out the correct weight for each batch and check the weight against the formulation sheet. Quality assurance personnel will verify the weight before addition to the batch. | Curing ingredients will be re weighed and the amount corrected as needed. | Formulation sheets for each batch. Scale weights for cure. Incident report forms of deviations and corrective actions. | Audit of the formulation and scale weight log. Review of incident report. Daily calibration of scales by quality assurance. HACCP coordinator will observe on-site implementation on a periodic basis. |
| | | | | | | | |
| Scaling of restricted non-meat ingredients CCP-1C | C - Nitrite | C - Excessive levels of nitrite may be carcinogenic | 156 ppm or less nitrite added to the product formulation. The weight of cure added will depend on nitrite concentration in cure. | Scale master for cure ingredients will weigh out the correct weight for each batch and check the weight against the formulation sheet. Quality assurance personnel will verify the weight before addition to the batch. | Curing ingredients will be reweighed and the amount corrected as needed. | Formulation sheets for each batch. Scale weights for cure. Incident report forms of deviations and corrective actions. | Audit of the formulation and scale weight log. Review of incident report. Daily calibration of scales by quality assurance. HACCP coordinator will observe on-site implementation on a periodic basis. |
| Tempering of frozen | B - Pathogen | Pathogen growth if | Less than 40°F or | A thermometer with | Refrigeration will be | Daily strip chart log | The plant HACCP |

UNL

Process Category: Summer Sausage

| Process Step | Hazard Description | CCP Description | Critical Limit | Monitoring Procedures | Corrective Action/ Person Responsible | HACCP Records | HACCP Verification Procedures |
|---|--------------------|--|---|--|---|---|--|
| meat. CCP-2B | | time and temperature are not controlled | plant established time and temperature requirements to preclude the growth of pathogens. | a recorder will monitor the tempering room on a constant basis. Tempering room manager will monitor the room temperature twice per production shift and verify this reading with the reading of the recording thermometer. | adjusted. Product will be placed on hold for further evaluation of significance. Established procedures will be used for product disposition. | from tempering room temperature monitor. Tempering room temperature log by quality assurance. Incident report of deviations and corrective actions taken. | coordinator will audit the daily temperature logs and will calibrate the thermometers on a periodic basis. HACCP coordinator will review the deviations and corrective actions and will periodically observe implementation of monitoring and records. |
| Receiving fresh meat and poultry CCP-3B | B - Pathogen | B - Raw meat is a known source of pathogen | Internal temperature of fresh meat should be less than 40°F and less than three days from fabrication or plants specifications for product age. | Temperature of each combo of fresh meat will be checked by the receiving clerk using a calibrated thermometer. Product age and organoleptic evaluation will be recorded. | Product will be placed on hold by the receiving clerk and further evaluated by quality assurance. Quality assurance personnel will either reject the product or conduct further evaluations for disposition of the product. | Receiving log that includes the date, product, producer, date of production, temperature of meat and the organoleptic observations. Incident report of deviations and corrective actions taken. | The plant HACCP coordinator will audit the daily receiving log. Thermometers will be calibrated daily. Plant HACCP coordinator will review the log of deviations and corrective actions. HACCP coordinator will perform periodic on-site observations of records and implementation. |
| Acid Spraying/ Cooking/ Smoking CCP-4B | B - Pathogen | Improper cooking Temperatures allow growth of pathogen | Internal temperature of the finished product of 160°F or greater. | At the end of the cooking cycle the internal frankfurter temperature will be checked in three separate house | Continue cooking until frankfurters reach 160°F. | Smokehouse log of product internal temperature. Incident report of deviations and corrective actions | HACCP coordinator will audit the daily smokehouse log. Thermometers will be calibrated daily. Plant HACCP |

UNL

Process Category: Summer Sausage

| Process Step | Hazard Description | CCP Description | Critical Limit | Monitoring Procedures | Corrective Action/ Person Responsible | HACCP Records | HACCP Verification Procedures |
|---------------------|----------------------|-----------------|--|---|--|--|---|
| | | | | locations for each smokehouse batch. Temperature will be monitored with a calibrated thermometer by the smokehouse operator. | | taken | coordinator will review the log of deviations and corrective actions. HACCP coordinator will perform periodic on-site observations of records and implementation. |
| Packaging CCP-5P | P - Foreign material | Metal | No foreign material. Metal detection set for the maximum sensitivity of the metal detector | Each package will be checked for metal by an in-line metal detector that will automatically reject packages. Visual inspection for other foreign material will be performed the packaging operator and periodically by quality assurance personnel. | Packages identified to have foreign material will be reverified and if possible the source of foreign material identified. Product will be retained and reworked or discarded. | Foreign material log that includes a description of the metal or other foreign material found. Incident report of deviations and corrective actions. | Metal detector will be calibrated every shift by quality assurance. HACCP coordinator will review the log of foreign material and the incident report of deviations and corrective actions. HACCP coordinator will perform periodic on-site observations of records and implementation. |

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Critical Control Point Record

CCP# 1B, 1C

Nitrite Weight Log

Critical Limit: Acceptable level to maintain product safety as established by USDA regulations.

Corrective Actions: 1) Adjust to correct weight before nitrite enters the product, 2) Place unacceptable product on hold and follow protocol for product disposition, 3) Evaluate cause of deviation and take action to prevent further occurrence.

| Date | Lot ID | Product Batch Size | Nitrite Required for Batch Size | Actual Nitrite Weight | Deviation, Corrective Action | QA Verification (Initials) | Supervisor (Initials) |
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Reviewed by:

Date: _____

Critical Control Point Record

CCP# 3B

Check Temperature Log Chart in Tempering Room

Critical Limit: Acceptable temperature to maintain product safety as established by GMP's.

Corrective Actions: Adjust temperature to acceptable level as established by GMP's.

| Date | Time | Temperature Recorded on Log | Corrective Action | Verification (Initials) |
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Reviewed by:

Date: _____

Critical Control Point Record

CCP# 4B

Cooking Temperature Log

Critical Limit: Acceptable internal temperature of product to maintain product safety as established by GMP's.

Corrective Actions: Adjust cooking temperature to acceptable level as established by GMP's.

| Date | Time | Cooking Temperature | Corrective Action | Verification (Initials) |
|------|------|---------------------|-------------------|-------------------------|
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