



Lesson Plan

Unit 3: Lesson 1 of 3

Hazard Analysis and Critical Control Points (HACCP)

Created: 08/2022 by the National FFA Organization

This lesson will address the importance of Hazard Analysis and Critical Control Points (HACCP) and the seven principles of HACCP.

Student Learning Objectives:

After completing these activities, students will ...

1. Define and describe Hazard Analysis Critical Control Point (HACCP).
2. Define and describe critical control points (CCP).
3. Identify the seven principles of Hazard Analysis Critical Control Point (HACCP).
4. Develop a process flow diagram for a food product.
5. Model food industry procedures.

Suggested Grade Level:

Grades 9 and 10 (This lesson is written so instructors can scale up or down based on class needs.)

Suggested Time: 240 minutes in four sessions (*Time requirements may vary based upon student understanding and class schedule.)

Resources/References:

1. Website: AgExplorer (2019), AgExplorer.FFA.org
2. Video: HACCP Introduction, <https://youtu.be/5I4f2WL7bwo>
3. Video: extended learning video clip, <https://www.youtube.com/watch?v=4itQHsg57qc>

Related Resources:

1. FFA.org/my-toolbox/instructor/educator-resources/ (lesson plan idea/concepts posted here)

Lesson Preparation:

1. Follow-up: Seek permission and arrange a “field trip” to the school cafeteria. This field trip should be done after completion of this lesson. Ask a cafeteria staff member to serve as a guest speaker while students tour the cafeteria.

Equipment and Supplies Needed:

1. Computer with internet
2. Chalk or dry erase board/SMART board
3. Projector hooked to computer with internet
4. One copy of student worksheet “HACCP Introduction Video” for each student
5. “Hazard Analysis and Critical Control Points” PowerPoint
6. Students need a notebook or way to take notes (computer, etc.)
7. One copy of student worksheet “Creating an HACCP Plan” per student
8. One copy of student “HACCP Exit Ticket” per student
9. For Activity 1: Real food items may be used (practice safe food handling if using real food items), OR pictures of the products may be used. If using pictures, be sure to include images of all sides of the packaging. Real food items OR pictures of the following are needed:
 - a. Frankfurters (fully cooked sausage)
 - b. Summer sausage (fully cooked sausage)
 - c. Ground beef patties (raw ground beef)

- d. Chicken patties (raw chicken patties)

Vocabulary:

1. HACCP (Hazard Analysis and Critical Control Point)
2. Foodborne infection
3. Foodborne intoxication
4. CCP (critical control points)
5. Hazard analysis

Cross-Curricular Connections:

Science	English/Language Arts	Technology
Activity 1 requires students to consider potential food contamination conditions that may result from poor planning or poor processing procedures (example: bacteria spoilage).	- The lesson introduction challenges students' abilities to listen effectively and respond when prompted. - Activity 1 requires students to think critically and write a detailed HACCP plan using correct grammar, spelling, etc.	Activity 1 requires students to use the internet to research additional information regarding food processing procedures.

Virtual Instruction Ideas:

This entire lesson can be taught virtually or online. Students need access to proper materials, which can all be shared electronically.

Student Activity Sheets:

Direct access to student activity sheets without lesson plan or answer key for easy upload to a learning management system or printing for classwork.

<https://ffa.box.com/s/e7kth9t0uib20tpqx3xanzpj9z26nj0k> (Word)

<https://ffa.box.com/s/ku8aaj3wxpl2718ogk1ggffccqjaefjb> (PDF)

<https://ffa.box.com/s/pamepajqjd1ohihani0e3r7osoj8n7bq> (Non-Designed)

https://docs.google.com/document/d/1g2j-V7bRNhn6DC87i0SrxVaaVj8QsH_EhIRSnqEpgQ/copy (Google)

These Activities are Aligned to the Following Standards:

AFNR Performance Element

- FPP.01. Develop and implement procedures to ensure safety, sanitation, and quality in food product and processing facilities.

FFA Precept

- FFA.PL-A.Action: Assume responsibility and take the necessary steps to achieve the desired results, no matter what the goal or task at hand.
- FFA.PL-C.Vision: Visualize the future and how to get there.
- FFA.PG-J.Mental Growth: Embrace cognitive and intellectual development relative to reasoning, thinking and coping.
- FFA-CS-M.Communication: Effectively interact with others in personal and professional settings.
- FFA-CS-N.Decision Making: Analyze a situation and execute an appropriate course of action.
- FFA.PL-E.Awareness: Understand personal vision, mission and goals.

Common Career Technical Core

- AG-FD1 Develop and implement procedures to ensure safety, sanitation, and quality in food product and processing facilities.

NASDCTEc

- AGPA01.01 Design and implement procedures and plans that demonstrate application of food processing principles to manage quality control in the food product and processing industry.
- AGPA01.04 Identify and apply food processing, handling, and storage factors to demonstrate their impact on product quality and safety.

AFNR Cluster Skills

- CS.03. Examine and summarize the importance of health, safety and environmental management systems in AFNR workplaces.

Common Core – Writing

- CCSS.ELA-Literacy.W.9-10.2 Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

Common Core – Speaking and Listening

- CCSS.ELA-Literacy.SL.9-10.1.A Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
- CCSS.ELA-Literacy.SL.9-10.1.C Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
- CCSS.ELA-Literacy.SL.9-10.4 Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

Common Core – Science & Technical Subjects

- CCSS.ELA-Literacy.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
- CCSS.ELA-Literacy.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

Common Core – Literacy in Science & Technical Subjects: Writing

- CCSS.ELA-Literacy.WHST.9-10.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
- CCSS.ELA-Literacy.WHST.9-10.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- CCSS.ELA-Literacy.WHST.9-10.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
- CCSS.ELA-Literacy.WHST.9-10.9 Draw evidence from informational texts to support analysis, reflection, and research.

Common Core – Math Practices

- CCSS.MATH.PRACTICE.MP3 Construct viable arguments and critique the reasoning of others.
- CCSS.MATH.PRACTICE.MP6 Attend to precision.

Next Generation Science

- HS-PS1-5 Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
- HS-ETS1-3 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Green/Sustainability Knowledge and Skill Statements

- Systems Pathway, Statement 2 Analyze the impact of various food production and processing practices and policies on ecological and public health.
- Manufacturing Career Cluster-Maintenance, Installation and Repair Pathway Statement 4 Understand the principles of preventive and predictive maintenance and demonstrate their use in a manufacturing setting.

AFNR Career Ready Practices

- CRP.02. Apply appropriate academic and technical skills. Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive.
- CRP.04. Communicate clearly, effectively, and with reason. Career-ready individuals communicate thoughts, ideas and action plans with clarity, whether using written, verbal and/or visual methods.
- CRP.05. Consider the environmental, social and economic impact of decisions. Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organizations and the environment.

- CRP.06. Demonstrate creativity and innovation. Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization.
- CRP.07. Employ valid and reliable research strategies. Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies.
- CRP.08. Utilize critical thinking to make sense of problems and persevere in solving them. Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem.
- CRP.09. Model integrity, ethical leadership and effective management. Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem.
- CRP.11 Use technology to enhance productivity. Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems.

Partnership for 21st Century Skills

- Critical Thinking and Problem Solving
- Flexibility and Adaptability
- Implement Innovations
- Information Literacy
- Productivity and Accountability
- Think Creatively

Lesson Plan:

1. Bell Ringer:

- a. Have written on the board before students enter the classroom: "HACCP — what do the letters stand for and what does it do?" Instruct students to write their responses on scrap paper and sit quietly when finished.
- b. Once class begins and all students have recorded their responses, ask for volunteers to share what they wrote. Allow students time to share their thoughts.
- c. If no one gets the correct answer, tell students, *HACCP is Hazard Analysis and Critical Control Point. But what does that really mean?*
- d. Tell students, *HACCP, or the Hazard Analysis Critical Control Point system is a process control system that identifies where hazards might occur in the food production process and puts into place stringent actions to take to prevent the hazards from occurring. By strictly monitoring and controlling each step of the process, there is less chance for hazards to occur.*
- e. Move into the Introduction section of the lesson.

2. Introduction:

- a. Give each student the worksheet "HACCP Introduction Video."
- b. Read the directions to students; *We will be watching a short informational video on HACCP. Please follow along during the video and answer the questions on your worksheet. No talking or sharing information.* Teacher Note: You may wish to tell students this will be taken as a grade, etc.
- c. Show the following video clip on HACCP: <https://youtu.be/5I4f2WL7bwo>.
 - i. Teacher Note: Decide if you are collecting the worksheet or going over answers together as a class. See the provided answer key for answers.
- d. After going over answers or collecting worksheets, begin the PowerPoint "Hazard Analysis and Critical Control Points." Direct students to take notes as you go over the PowerPoint.
 - i. Teacher Note: You may wish to give students a copy of the PowerPoint either on paper or electronically.
- e. Move into the Activity section of the lesson.

3. Activity 1: "Creating an HACCP Plan"

- a. Each student needs a copy of the worksheet "Creating an HACCP Plan."
- b. Divide students into four groups.
- c. Give each group one of the four different foods listed below. Real food items may be used (practice good handling procedures if using real food products), or pictures of the items may be used. Be sure to have pictures of all sides of the packaging, so students can get the information they need.
 - i. Frankfurters (fully cooked sausage)
 - ii. Summer sausage (fully cooked sausage)
 - iii. Ground beef patties (raw ground beef)
 - iv. Chicken patties (raw chicken patties)
- d. Read directions for the activity with students. Ask, "What questions are there?" Allow students to ask questions. Note the space at the bottom of each page stating "Date, Approved by." This is standard procedure for companies when creating HACCP plans. Ask students to sign off on each sheet when they are finished. This is good practice for modeling realistic procedures.
- e. Allow ample time for students to work on the HACCP plan. Move about the classroom to be sure students stay on task; make yourself easily available to answer questions. Note: An example answer key is provided. The example answer key can be helpful in answering student questions and addressing struggles.
- f. Hand out the "HACCP Gallery Walk" worksheet to each student. Have students share their plans with the class and collect plans once students are finished. Hang the plans up and have student conduct a gallery walk to view each group's HACCP plan.
- g. Students who finish early or before others can move on to the "Extended Learning Activity."
- h. Note: This activity may take two days to complete.

4. Follow-up:

- a. Field Trip/Guest Speaker! Arrange for a "field trip" to the school cafeteria. Seek permission from the cafeteria and other staff as needed. Ask the cafeteria staff ahead of time if your class can see their HACCP plan or written safety regulations they have in place. Ask the cafeteria staff if they are willing to share (as a guest speaker) what they do to keep themselves and the students/staff safe while

handling and preparing food at the school. Note: This activity may take one entire class period to complete.

5. **Optional – Extended Learning Opportunities (Not factored into time requirement):**

- a. This video (11:20 minutes) is a good activity to have students watch after they finish the HACCP plan creation: <https://www.youtube.com/watch?v=4itQHsg57gc>.

6. **Exit Ticket:**

- a. After completion of all lesson components, give students a copy of the worksheet “HACCP Exit Ticket.”
- b. Read directions with students. Ask students, “What questions do you have?”
- c. Tell students, *Once you are finished, please hand in your exit ticket and sit quietly.*
- d. Allow students time to work. Collect exit tickets once students finish.

Name: _____

HACCP Introduction Video

Directions:

As you watch a quick video on “HACCP,” answer the following questions.

1. What does HACCP stand for?

H _____ A _____ C _____ C _____ P _____

2. HACCP is only followed in the United States. True or False (Circle one)

3. What is the purpose of having HACCP?

4. The CDC reports that _____ million people get sick from various pathogens.

5. Of those people that get sick, how many are hospitalized? _____

6. How many people die annually? _____

7. The average food recall in the United States costs _____ million.

8. HACCP was originally designed by what popular company? _____

9. How many principles does HACCP have? _____

10. What temperature in Fahrenheit is the “danger zone”? _____

11. GMPs and SOPs: Provide two examples. _____

Aligned to the following standards: FPP.01; FFA.PL-A.; FFA.PL-C.; FFA.PG-J.; FFA-CS-M.; FFA-CS-N.; FFA.PL-E.; AG-FD1; AGPA01.01; AGPA01.04; CS.03; CCSS.ELA.W.9-10.2; CCSS.ELA.SL.9-10.1.A; CCSS.ELA.SL.9-10.1; CCSS.ELA.SL.9-10.4; CCSS.ELA.RST.9-10.1; CCSS.ELA.RST.9-10.3; CCSS.ELA.WHST.9-10.2; CCSS.ELA.WHST.9-10.4; CCSS.ELA.WHST.9-10.8; CCSS.ELA.WHST.9-10.9; MP3; MP6; HS-PS1-5; HS-ETS1-3; Systems Pathway, Statement2; Manufacturing Career Cluster-Maintenance, Installation and Repair Pathway Statement4; CRP.02; CRP.04; CRP.05; CRP.06; CRP.07; CRP.08; CRP.09; CRP.11

Name: _____

Activity 1: Creating an HACCP Plan

Directions:

You and your teammates will be creating an HACCP plan for processing one of the four products listed below. Complete the following charts and information on your product:

- Circle the product you have selected or have been assigned:
 - Frankfurters (fully cooked sausage)
 - Summer sausage (fully cooked sausage)
 - Ground beef patties (raw ground beef)
 - Chicken patties (raw chicken patties)

HACCP STEPS

Conduct a hazard analysis to identify potential hazards that could occur in the food production process.

Identify the critical control points (CCPs), those points in the process where the potential hazards could occur and can be prevented and/or controlled.

Establish critical limits for preventive measures associated with each CCP. A critical limit is a criterion that must be met for each CCP. Where appropriate, critical limits may reflect relevant FSIS regulations and FDA tolerances.

Establish CCP monitoring requirements to ensure each CCP stays within its limit. Monitoring may require materials or devices to measure or otherwise evaluate the process at CCPs.

Establish corrective actions if monitoring determines a CCP is not within the established limits. In case a problem occurs, corrective actions must be in place to ensure no public health hazard occurs.

Establish effective record-keeping procedures that document the HACCP system is working properly. Records should document CCP monitoring, verification activities and deviation records.

Establish procedures for verifying that the HACCP system is working properly. Verification procedures may include reviewing the HACCP plan, CCP records and critical limits as well as conducting microbial sampling. Both plant personnel and FSIS inspectors will conduct verification activities.

Aligned to the following standards: FPP.01; FFA.PL-A.; FFA.PL-C.; FFA.PG-J.; FFA-CS-M.; FFA-CS-N.; FFA.PL-E.; AG-FD1; AGPA01.01; AGPA01.04; CS.03; CCSS.ELA.W.9-10.2; CCSS.ELA.SL.9-10.1A; CCSS.ELA.SL.9-10.1; CCSS.ELA.SL.9-10.4; CCSS.ELA.RST.9-10.1; CCSS.ELA.RST.9-10.3; CCSS.ELA.WHST.9-10.2; CCSS.ELA.WHST.9-10.4; CCSS.ELA.WHST.9-10.8; CCSS.ELA.WHST.9-10.9; MP3; MP6; HS-PS1-5; HS-ETS1-3; Systems Pathway, Statement2; Manufacturing Career Cluster-Maintenance, Installation and Repair Pathway Statement4; CRP.02; CRP.04; CRP.05; CRP.06; CRP.07; CRP.08; CRP.09; CRP.11

Name: _____

Directions:

Using the product assigned or given to your team, list the product name and ingredients below.

PRODUCT AND INGREDIENTS

PRODUCT:

DATE: _____ APPROVED BY: _____

Name: _____

Directions:

Using the product assigned or given to your team, create a process flow diagram for your item. Assume you receive the meat in bulk shipment (raw).

PROCESS FLOW DIAGRAM	
PRODUCT(S):	

DATE: _____ APPROVED BY: _____

Directions:

NOTE: Specify the potential hazard: chemical, biological, physical (refer to previous lessons on hazard descriptions).

DATE: _____ **APPROVED BY:** _____

Name: _____

HACCP Gallery Walk

Directions:

Walk around the room to view each group's HACCP plan. Complete the following as you walk around the classroom.

Product 1: _____	Product 2: _____	Product 3: _____
1. What were the hazards identified in the production of this food product?	1. What were the hazards identified in the production of this food product?	1. What were the hazards identified in the production of this food product?
2. How are the hazards identified similar and/or different from the product your group analyzed?	2. How are the hazards identified similar and/or different from the product your group analyzed?	2. How are the hazards identified similar and/or different from the product your group analyzed?
3. Why are the hazards identified important to be aware of?	3. Why are the hazards identified important to be aware of?	3. Why are the hazards identified important to be aware of?
4. How does identifying these hazards impact the consumer of this product?	4. How does identifying these hazards impact the consumer of this product?	4. How does identifying these hazards impact the consumer of this product?
What would happen if HACCP plans did not exist in the food industry?	How has what you have learned about HACCP plans impacted your opinion of the food industry?	

Name: _____

Exit Ticket

NAME: _____

1. Describe 2 new concepts you learned today while on our “field trip” to the school cafeteria.
2. What surprised you about the HACCP plan you learned about on your field trip?
3. How do HACCP plans impact you. Give a specific example.

Name: _____

KEY: HACCP Introduction Video

1. Hazard Analysis Critical Control Point
2. False, internationally recognized
3. To prevent food contamination, food borne illness and identify possible dangers in the food system
4. 48
5. 128,000
6. 3,000
7. 10
8. Pillsbury, NASA
9. 7
10. 40 to 140
11. Training, pest control, supplier controls, personal hygiene, cleaning and sanitation, allergen control, chemical control, receiving/storage, food handling practices

Name: _____

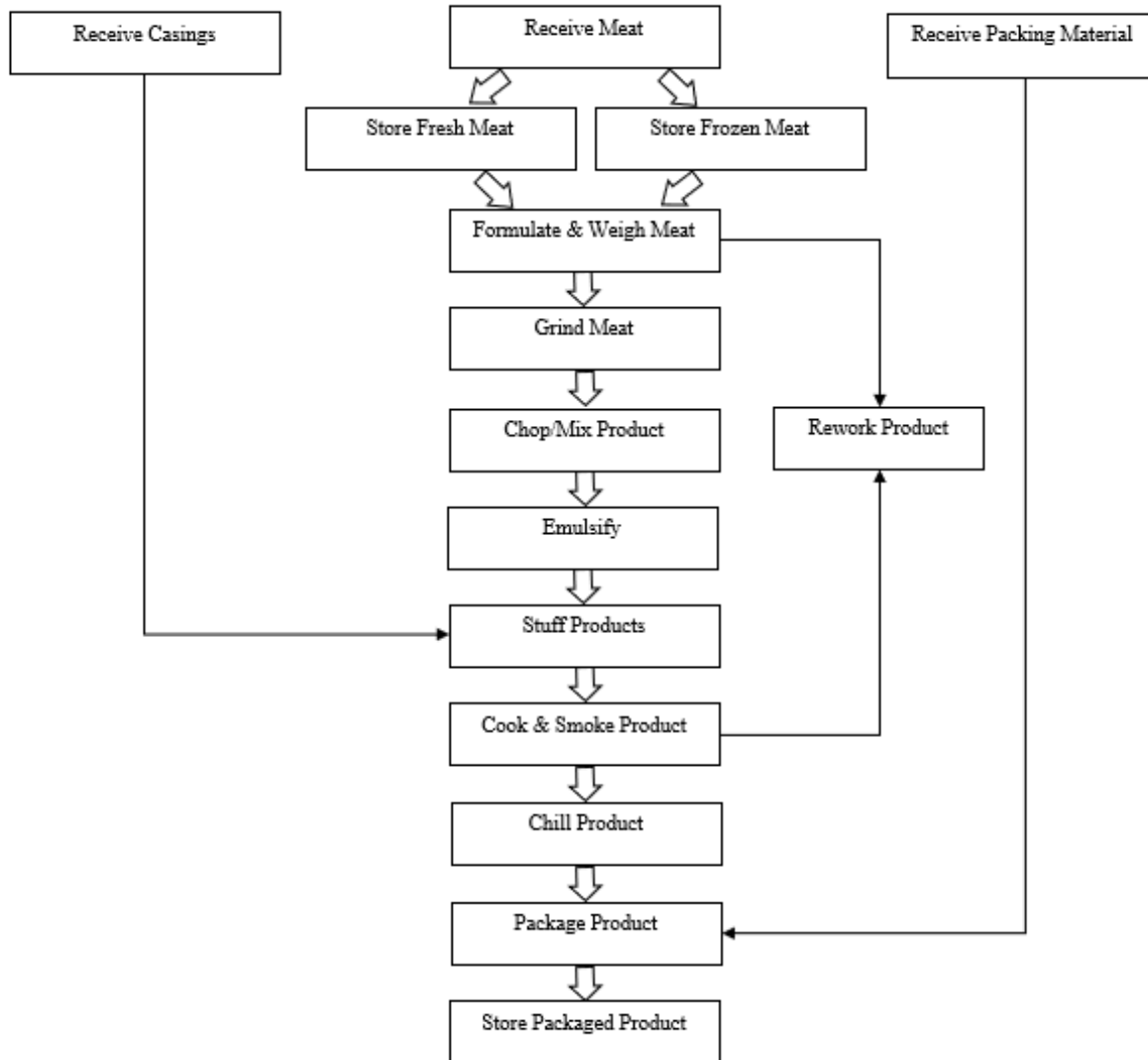
KEY: Activity 1: HACCP PLAN (Example key)

Teacher Note: All student work should closely resemble the following examples.

PRODUCT AND INGREDIENTS
PRODUCT: CHUNKED AND FORMED, BREADED CHICKEN PATTIE
CHICKEN <u>MEAT</u> <u>OTHER INGREDIENTS</u> SPICES PHOSPHATES BROTH SALT BREADING

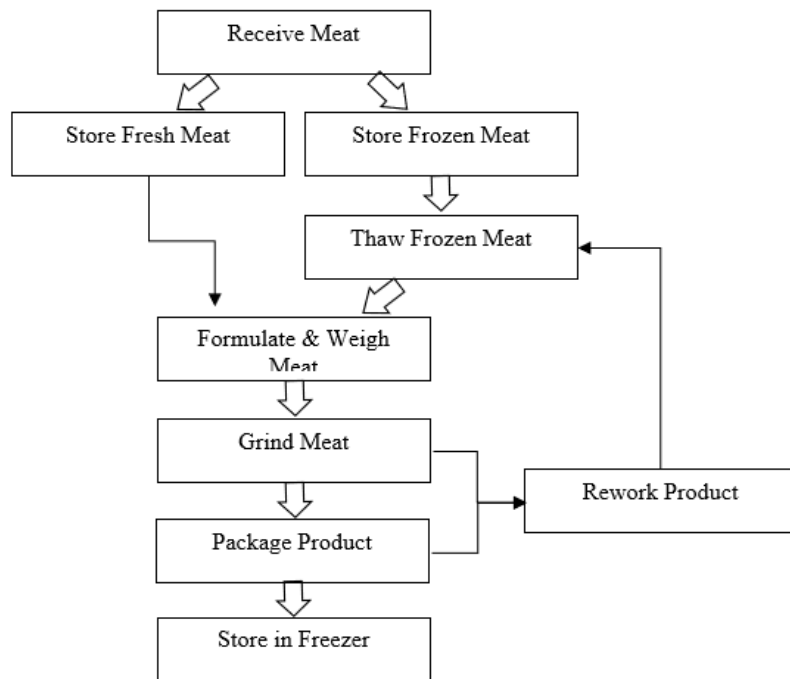
Name: _____

Cooked Sausage Flow Chart:



Name: _____

Ground Beef Flow Chart:



Name: _____

HAZARD IDENTIFICATION/PREVENTIVE MEASURES		
PRODUCT/PROCESS: <i>Ground Beef</i>		
PROCESS STEP	HAZARD	PREVENTIVE MEASURE(S)
<i>Receiving - Meat</i>	<i>B (Microbial Growth)</i> <i>Insufficient temp. control will result in unacceptable microbial proliferation</i>	<i>Maintain product temperature within specified limits.</i>
	<i>B (Mishandling)</i> <i>Integrity of immediate container compromised such that microbial growth could occur.</i>	<i>Visual inspection to ensure immediate container is not compromised.</i>
	<i>P (Foreign Material)</i> <i>Visible foreign material could compromise product</i>	<i>Visual inspection to ensure no foreign material.</i>
<i>Receiving - Non-meat</i>	<i>C (Deleterious Chemicals)</i> <i>Chemicals/non-meat ingredients/packaging materials are acceptable for this use. Food grade for intended use.</i>	<i>Verify letter of guarantee is on file and appropriate for product use.</i>
	<i>P (Foreign Material)</i> <i>Visible foreign material that could compromise product safety, insects, etc.</i>	<i>Visual inspection to ensure no foreign material is present.</i>