

Part IV: Food Safety

What is HACCP and Why it is Important?

HACCP stands for Hazard Analysis Critical Control Points. It was developed in the 1960's by the National Aeronautics and Space Administration (NASA) in association with food safety specialists to create a system in which astronauts would be safe from contracting food-borne illnesses when in orbit. HACCP plans are now implemented by businesses to put in place a high standard of safety to manage and control risks associated with food safety. The main purpose of an HACCP plan is to identify and control physical, chemical, and biological hazards associated with the storage, transportation, use, preparation, and sale of perishable goods.¹ HACCP plans are created and put in place to limit and mitigate food contamination risks and avoid associated subsequent legal and financial issues caused by foodborne illnesses. These plans put in place safeholds to prevent food poisoning, or a food-borne illness outbreak and allergic reactions from improperly handled foods and cross contaminating with food allergens. Each plan contains 7 steps which include; conducting a hazard analysis, identifying critical control points, establishing critical limits, monitoring critical control points, establishing corrective actions, establishing record keeping procedures, and establishing verification procedures.¹

If there is deviation in any step of the HACCP plan that prevents safety goals from being met, immediate action is taken to prevent consumers from being affected. Ultimately, an HACCP plan is extremely important for numerous reasons, and it takes a strong management team to create and properly execute the plan. Keeping an HACCP implemented and up to date is important for maintaining a good reputation in business, as well as for financial and legal

reasons. Customer and brand loyalty is a vital aspect in regards to maintaining monthly sales and the integrity of the company. In the food industry, a large aspect of this is done through achieving and maintaining notoriety for proper food safety and sanitation. A single instance of an outbreak or having unhygienic practices within the restaurant environment could ruin customer retention, the company's reputation, potentially shut down the business permanently, or result in hospitalization or death of consumers. A proper HACCP plan prevents outbreaks of this sort and ensures safety of our business to prevent this.² Food-borne illness outbreaks, food poisoning and the negligence of addressing food allergens can also lead to dire financial and legal consequences.

Potential Food Hazards

Improper food handling in our restaurant may lead to potential biological, chemical, and physical hazards. Biological hazards, which contain bacteria, molds, viruses, and parasites are microscopic, tend to grow and multiply rapidly, and can not be identified with the unaided eye. To prevent the spread and growth of pathogens, we must ensure that proper conditions are monitored and guidelines are strictly adhered to by all staff and vendors. This includes internal temperature, operating temperatures of equipment within the restaurant, level of pH, awareness of a product's time in the danger zone (not to exceed 4 total hours), and water activity.

A bacterium that threatens the health of 70,000 Americans each year and raises concern for featured menu items at Fusion House is the enterohemorrhagic form of *E. coli*. It is typically found in contaminated water, fruits, vegetables, unpasteurized milk, and raw/undercooked ground beef. While *E. coli* is naturally present in the GI tract of mammals and humans, it is virulent when ingested, and one strain of this bacterium that is especially harmful and a more

potent toxin is *E. coli* O157:H7.³ Our menu contains a wide variety of fresh vegetables, fruits, and meats, therefore, we must ensure that everything is properly washed, sanitized, and cooked thoroughly to its appropriate internal temperature when tested with a thermometer. Although our team is trained to keep all fruits and vegetables stored in the refrigerator before serving and separate from raw meat, *E. coli* is able to thrive in the temperature range of 39 degrees fahrenheit to 113 degrees fahrenheit; refrigerators are commonly operating within this range as *E. coli* is not only able to survive refrigerated and freezing but it can withstand highly acidic environments, this is concerning and could potentially pose a risk for some of our food items. Ground beef is used in an array of our dishes such as the *Bulgogi Dolma*, *Albondigas* and *Lentil Soup*, the *Korean BBQ Burger*, and our children's sized burger.

Salmonella is another bacterium that poses a threat to our restaurant. *Salmonella* can be found in raw/undercooked meat, seafood, poultry, eggs, raw dairy, and melons. Dishes like the *Chicken/Beef Shawarma Tacos* contain undercooked meat or poultry, which can be infected by *Salmonella*. *Salmonella* grows in body or room temperature and in low acidic foods with a pH level from 4.6-7.5.

Chemical hazards exist as well: cleaning products, perfumes, pest control agents, additives, preservatives, metal-lined containers, and toxic metals are risk factors for potential hazard. Naturally occurring chemicals, or chemicals produced by plants, present a high-risk and additives are on the lower end of the spectrum.

Physical hazards may also occur in the restaurant. These include accidents in the kitchen, such as broken dinnerware, foreign objects like glass fragments inside the food, nail polish, and hair. These are usually accidental, so our team must be aware of what is going on during the

cooking and serving process. Bioterrorism, or a purposeful act of poisoning food to spread illness or death, is another hazard we need to watch out for; our team has been properly educated of this threat and will inform management if they suspect intentional tampering with food items or suspicious behavior.

Food allergies are an immune response to a protein and play a big role in how we designed our menu. The eight major allergens are peanuts, tree nuts, wheat, soy, eggs, fish, shellfish, and milk. With these being common allergens, we have coded our menu to be easily read by customers, so they are confident when ordering. All of our wait staff are trained to be very knowledgeable and familiar with the menu in case our customers are confused on a dish or would like substitutions. A food allergy contains an immune response like a rash, swelling, or difficulty breathing, unlike a food intolerance, which has no immune response.

Critical Limit

Critical limits are the maximum and/or minimum parameter that ensures a biological, chemical, or physical hazard is controlled at a critical control point to prevent, eliminate, or reduce a food safety hazard to an acceptable level. Critical limits are divided into three different categories: chemical, physical and biological.⁴ A few examples of chemical critical limits that we monitor are water activity, pH levels, and salt content. Physical critical limits include temperature, oxygen and moisture content. When observing food, knowing that pathogens often grow in temperatures between 41 degrees Fahrenheit and 135 degrees Fahrenheit is something to keep in mind. For example, a critical limit for handling our lettuce during the receiving process (CCP) would be to maintain the temperature at 32 degrees Fahrenheit. Each critical control point

must have at least one critical limit. Critical limits may have a combination of factors such as time and temp during the cooking phase.

Potential for Foodborne Illness

Foodborne illnesses are diseases transmitted to humans by food, therefore, proper food handling, proper sanitization, practice of food safety and making sure reporting any cases of food poisoning is crucial. Bacterial intoxications are illnesses caused by toxins coming from the food in which the toxins have accumulated prior to human consumption. This is where it is essential for kitchen employees to make sure they efficiently wash their hands often and not come in contact with food if they experience any symptoms of diarrhea, vomiting, and/or are sneezing, as this can contaminate the food and spread the pathogenic matter to others. The onset of bacterial intoxications may show symptoms as soon as 18 hours and up to 8 days of bodily contamination.

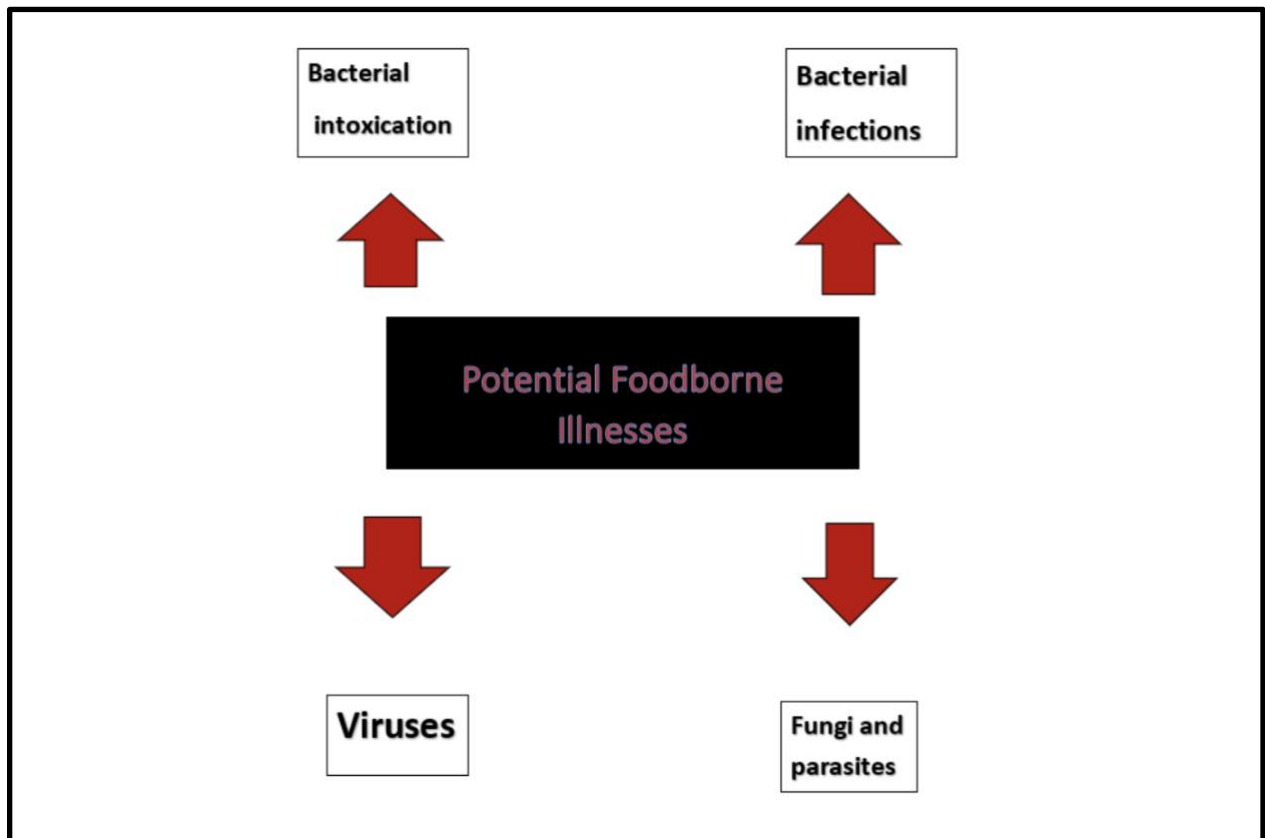
Bacterial infections differ: the bacteria will enter the gastrointestinal tract and will multiply causing a terrible amount of pain and discomfort. To avoid this kind of infection permeating the food of our clients, we must make sure our restaurant holds food at proper temperatures and pH levels. The temperature danger zone is from 41 degrees Fahrenheit to 135 degrees Fahrenheit, while proper pH levels are from 0.85 to 1.0 pH. We keep a log of necessary requirements for food reheating and to avoid cross contamination. At Fusion House, our employees are trained to know which foods present a higher risk for bacterial incubation as it is one of our main concerns to prevent foodborne illness.

We have a very proactive establishment that is vigilant about the safety and wellbeing of our guests. The general managers will be responsible for checking in with all staff upon arrival to their shift as it is paramount that they appear clean, healthy, and prepared to work. If a staff

member shows up to work with a dirty uniform, visible wounds or skin infections, appears to be generally unwell, or is exhibiting symptoms of an illness they will be sent home. All staff is required to keep fingernails short, keep hair tied up, and come to work presentable. Staff will be tested on food handling procedures sporadically while employed with Fusion House; in addition, they will be closely monitored throughout their shift to ensure they will perform proper hand washing techniques and maintain food handler safety at all times per the CDC and Servsafe regulations; this is essential in order to prevent bacterial recolonization, cross contamination, and foodborne illnesses among the patrons of Fusion House.

Appendix A:

Types of foodborne illnesses: Bacterial Intoxication, bacterial infections, viruses, fungi, and parasites.



Appendix B:

Potential Foodborne Illnesses and common pathogens.

Bacterial Intoxication <i>Staphylococcus aureus</i> <i>Clostridium botulinum</i> <i>Clostridium perfringens</i> <i>Bacillus cereus</i>	Bacterial Infection <i>Salmonella</i> <i>Listeria monocytogenes</i> <i>Campylobacter jejuni</i> <i>Vibrio parahaemolyticus/ Vibrio vulnificus</i> <i>Shigella</i> <i>Escherichia coli</i>
Viruses Hepatitis A Norowalk	
Parasites Tapeworms (Anisakiasis) Trichinella Spiralis Protozoa	Fungi Mold Yeast

Appendix C:

HACCP Plan for Lettuce:

Lettuce is a common source of foodborne infections. There is a high level of growth of bacteria such as *E.coli* and *Salmonella*.

Process	Potential Hazard	Critical Limit	Monitoring Procedure	Corrective Action
Receiving	Potential for bacterial growth from the soil or spoilage.	Maintaining temperature during the transport of product at 32°F.	Check the temperature of the product, as well as if there is any spoilage.	Return or exchange anything that does not look appropriate.
Storing	Storage conditions greatly affect bacterial growth. Inappropriate storing of wrong temperature.	Maintenance of cold storage temperatures.	Ensure cool and dry storage conditions for the product.	Temperature is monitored and checked every time.
Cleaning	Using contaminated water to wash the product.	Use clean water for washing the lettuce.	Ensure the amount of time and the temperature when cleaning the product	Measure the quality of the water, if it's contaminated as well as the sink.
Preparing	Using unsanitized cutting boards, knives, or other equipment.	Use a very well sanitized vegetable cutting board and knife.	Cutting and handling the lettuce by well trained employees.	Everything must be washed with flowing procedures as well as hands.
Serving	Cross contamination and growth of surviving bacteria.	Wash hands by flowing procedures.	Wash hands and wear gloves when and before serving.	Make sure to discard anything that looks damaged or contaminated.

Works Cited

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4. MyHACCP. Principle 3: Establish the Critical Limits. <https://myhaccp.food.gov.uk/help/guidance/principle-3-establish-critical-limits>. Published November 19, 2020. Accessed November 23, 2020.