

Hazard Analysis of the Beef Slaughter Process

In this section, we want to discuss the hazard analysis in beef slaughter. Keep in mind that for every hazard identified, the establishment must determine if the hazard is **reasonably likely to occur** in its operation. If a hazard is identified as likely to occur in the operation, there must be a CCP **somewhere** in the process to address the hazard. The CCP does not have to be at the location at which the hazard is identified.

Now let's have a look at specific steps in the beef slaughter process and the food safety considerations the establishment could use in performing a thorough hazard analysis.

Receiving/Holding Cattle

When cattle arrive at the slaughterhouse they carry mud, manure, bedding, and other materials that contain a load of microorganisms on their hides and hooves, and may carry microorganisms internally as well. Pathogens such as *E. coli* O157:H7 may be among the microorganisms; therefore, cattle may pose a **biological hazard** at this point.

Is this hazard reasonably likely to occur?

No—The establishment may judge that this hazard is not reasonably likely to occur because of sanitary procedures to address pathogens carried by animals during receiving and holding. The establishment should have supporting documentation to support this decision. The GMPs or SOPs could be written to include control measures applied to prevent a significant hazard at receiving (e.g., proper feed withdrawal, washing of animals).

Yes—If the answer is yes, there must be a CCP to address it. The CCP may be at this location or it may be further in the process. The establishment may choose to address this hazard here with a CCP if an intervention exists at receiving that would eliminate, prevent, or reduce the hazard to an acceptable level. For example, a chemical dehairing and wash methodology might be used as a CCP at receiving if it could be shown effective in reducing pathogens. The establishment may choose to address the hazard with a CCP later in the process. For example, the establishment may address this hazard with a CCP at the pre-evisceration antimicrobial rinse.

Cattle may pose a **chemical hazard** if presented for slaughter with violative levels of chemical residues. The chemicals present in live animals may include antibiotics, pesticides, and environmental contaminants among others.

Is this hazard reasonably likely to occur?

No—The establishment may judge the chemical hazard is not likely to occur in its process because it has not been a problem historically in the type of cattle it slaughters. For example, FSIS monitoring has shown that feedlot animals have a very low incidence of residues. Establishments may confirm this with their own data from residue testing over a period of time. Establishments may judge that the chemical hazard is not likely because it requires producers to adhere to a quality assurance program, including strict controls for chemicals. Establishments should be able to provide supporting documentation for their decisions.

Yes—Establishments slaughtering classes of cattle that have historically had residue violations may judge that it is likely to occur in its process. For example, bob veal and cull cows have had a higher rate of violative chemical residues. If judged to be reasonably likely to occur, the hazard must be addressed in the HACCP plan.

Cattle may be received that pose a **physical hazard** due to the presence of foreign material, such as needles or shot.

Is this hazard reasonably likely to occur?

No—Establishments may judge that this hazard is not likely to occur in their process because it has not been a problem historically, or the establishment may choose to obtain animals from suppliers that adhere to a quality assurance program that prevents it. Again, the establishment must be able to support this decision with scientific or technical documentation.

Yes—If the establishment has a history of foreign material, such as lead shot, it may be prudent in choosing to address it with a CCP somewhere in the process. For example, the establishment may use a metal detector step in boning that is used to address this hazard.

Stunning/Sticking/Bleeding

If the potential for hide contaminants being introduced into tissues is judged negligible at **stunning, sticking, and bleeding**, the establishment may choose not to identify any hazards at this step. Some establishments may use SSOPs to justify their decision.

Head Removal/Dehiding

The hide is one of the most significant sources of pathogens; therefore, the step of **dehiding** could be judged to pose a **biological hazard**. In addition, **head removal** may result in the spread of ingesta contamination if the esophagus is not closed properly.

Is this hazard reasonably likely to occur?

No—If the establishment judges this hazard is not likely to occur in its process, it should have documentation to support this decision. Some establishments may justify this decision based upon SOPs that they have in place to prevent the transfer of hide contaminants to the carcass.

Yes—If judged to be a likely occurrence in its process, the establishment must address it with a CCP somewhere in the process. For example, the establishment may address it with a CCP at a steam pasteurization step prior to chilling.

Evisceration/Viscera Processing

Evisceration may result in carcass contamination with feces or ingesta containing pathogens, so this step may be judged to be a **biological hazard** by the establishment.

Is this hazard reasonably likely to occur?

No—The establishment may judge that it is not likely to occur in its process; however, there should be supporting documentation to justify the decision. Again, the establishment may choose to use SOPs to justify this decision.

Yes—If judged likely to occur in its process, the establishment must address it with a CCP somewhere further in the process. For example, the establishment may address this hazard with a CCP at an antimicrobial rinse prior to chilling.

Splitting/Trimming

The splitting and trimming step may present a carcass with pathogens that could be spread by the processes, and therefore may pose a **biological hazard** at this point. Keep in mind that FSIS will enforce zero tolerance for feces, ingesta, and milk at the rail inspection station just past the trimmers.

Is this hazard reasonably likely to occur?

No—If no, the establishment should have supporting documentation to justify the decision. Operational SSOPs may address prevention of cross-contamination by the splitting saw and trimmers. The establishment may be able to show support for the determination that since all visible contaminants are trimmed at this point that it is not reasonably likely to occur.

Yes—If yes, the establishment must address the hazard with a CCP somewhere in the process. For example, the establishment may designate the antimicrobial rinse prior to chilling as a CCP to address this hazard.

Final Carcass Wash

The final wash step may spread pathogens on the carcass surface; therefore, this step may pose a **biological hazard**.

Is this hazard reasonably likely to occur?

No—If no, the establishment should have supporting documentation to justify the decision.

Yes—If yes, the establishment must address the hazard with a CCP somewhere in the process. For example, the establishment may designate the antimicrobial rinse prior to chilling as a CCP to address this hazard.

Chilling

At the **chilling** step, carcasses may still have pathogens on them that could multiply if not controlled and a **biological hazard** may result.

Is this hazard reasonably likely to occur?

No—If no, the establishment should have supporting documentation to justify the decision.

Yes—If yes, the establishment must address the hazard with a CCP somewhere in the process. For example, the establishment may elect to have a CCP at chilling to ensure the proper lowering of product temperatures immediately after slaughter to inhibit the growth of pathogens.

Product Storage

Product storage may pose a **biological hazard** since product may still contain some pathogens that could multiply.

Is this hazard reasonably likely to occur?

No—If no, the establishment should have supporting documentation to justify the decision.

Yes—If yes, the establishment must address the hazard with a CCP. For example, the establishment may have a CCP for finished product storage to maintain proper storage temperature to inhibit growth of pathogens.

The information we just covered should have given you an idea of the thought process the establishment uses in its hazard analysis. Keep in mind that this hazard analysis is only an **example** and it is not meant to represent what the hazard analysis in any particular establishment will look like. Now let's look at a recent notice that may affect the beef slaughter establishment's hazard analysis and HACCP plan.

Reassessment Requirement for *E.coli* O157:H7

In October of 2002, FSIS published a notice in the Federal Register that requires all establishments producing raw beef to reassess their HACCP plans in light of new data that shows *E.coli* O157:H7 to be more prevalent than previously thought (FSIS Notice 44-02, 11-04-02). FSIS believes that the new data could affect an establishment's hazard analysis, or alter its HACCP plans for raw beef products. Establishments must reassess their plans to determine whether *E. coli* O157:H7 is a hazard reasonably likely to occur in their production process. If reassessment results in a determination that *E.coli* O157:H7 is a food safety hazard reasonably likely to occur, the establishment must address it in the HACCP plan. If reassessment does not result in a change in the establishment's HACCP plan, there should be documentation that gives valid reasons why the plan was not changed. A plant may reassess and not modify the HACCP plan

because they have already recognized *E. coli* O157:H7 as a hazard likely to occur. Large plants are required to have completed the reassessment by December 6, 2002, small plants by February 4, 2003, and very small plants by April 6, 2003.