

# FEED MILL BIOSECURITY FOR FEED MILL MANAGERS

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Research and Extension

Reducing the risk of biological hazards in feed manufacturing facilities is an important part of a complete biosecurity plan for livestock and poultry producers. The type of feed manufactured is going to determine which biological hazards are of greatest concern. Examples of hazards include pathogenic bacteria, such as *Salmonella* spp. and *Escherichia coli*, and viruses, such as porcine epidemic diarrhea virus (PEDV), African swine fever virus (ASFV), sene-cavirus A (SVA), classical swine fever virus (CSFV), pseudorabies virus (PRV), and foot and mouth disease (FMD).

Research in the past several years has demonstrated the ability of these pathogens to survive in feed and feed ingredients. This is of particular concern when considering the risk of introducing foreign animal diseases, such as ASFV; therefore, the overall goal of feed mill biosecurity is to prevent contamination of feed with infectious pathogens. In addition to pathogen prevention, if a mill or ingredient does become contaminated, it can be almost impossible to control because most feed manufacturing facilities were not designed with hygiene in mind.

The next step would be pathogen mitigation. Pathogen mitigation could include strategies such as thermal processing or decontamination via chemical additives. Although these mitigation steps can be included in one's feed mill biosecurity plan, managing a facility to focus on preventing the entry of a pathogen into the feed system is key to reducing risk of disease spread. To do so, feed mill managers should focus on ingredient sourcing, receiving practices, delivery procedures, finished feed separation, human traffic, employee training, and creating a culture around producing safe feed. For

additional details please refer to resources, such as AFIA's *Developing Biosecurity Practices for Feed and Ingredient Manufacturing* (<https://www.afia.org/pub/?id=E348BF9F-98ED-09DB-A45D-504737FE7AE2>), which provide recommendations for feed manufacturing biosecurity practices.

## Ingredient sourcing

Ingredient sourcing is a key step to prevent biological hazards from entering the feed manufacturing facility via ingredients. Areas experiencing disease outbreaks may be at a higher risk for carrying pathogens through ingredients. Because of this, supplier identification is important to maintain transparency across the feed supply chain. To accurately identify ingredient risk, knowledge of the ingredient supply chain should extend from the point of ingredient manufacture through transportation to the feed mill, including any intermediaries or blending locations.

It is also important to identify biosecurity practices that may be implemented throughout this supply chain. Some of these practices include heat-treating the ingredients or feed or holding the ingredient outside of the mill long enough that the virus or bacteria becomes inactive. Regardless of where an ingredient is being sourced, each step of the shipping and transportation process from manufacturing to the feed mill should be tracked. Identified biological hazards will depend on the species for which feed is being manufactured; however, the entire feed mill needs to be considered as opposed to species-specific diets. To prevent mill contamination via ingredients, quality, feed safety, and procurement areas of the mill to all need to work together on ingredient sourcing.

## Receiving practices

In addition to ingredients, the movement of trucks and people through receiving poses a significant biosecurity risk. In terms of biosecurity, the main goal of the feed mill should be to prevent contaminated material from entering the receiving pit. Ensuring the underside of the truck is clean before entering the receiving bay helps reduce the chance of debris entering the pit. Instituting a tire and undercarriage wash before trucks enter the mill helps minimize contaminants being brought into the receiving bay. In addition, using pit covers while trucks are entering and leaving the receiving bay helps to prevent any debris from falling into the pit and contaminating ingredients. Avoid sweeping spilled ingredients into the pit. Due to the nature of trucks entering and leaving, the ground in the receiving area cannot be considered “clean” or safe for biosecurity, and sweeping spilled ingredients into the pit is a risk for introducing diseases into the mill.

## Drivers and delivery

In addition to the vehicles, truck drivers pose another entry point of contamination. Drivers delivering ingredients or picking up finished feed should not enter the mill beyond the receiving bay to prevent tracking contaminants to other areas. Implementing a degree of separation between feed delivery drivers and employees in the mill also prevents

contamination from trucks that have been on farms from entering the rest of the mill. Having drivers receive paperwork through a window or from the other side of a door at the office can create this separation.

Having drivers observe potential biosecurity risks at the farms they deliver to can help determine better delivery route options. Farms where exhaust fans are directed toward the feed bins or carcass disposal is near the driveway may need to receive feed later in the day to reduce the chance of bringing disease back to the mill. Placing a biosecurity kit in feed delivery trucks helps reduce the risk of contamination. This kit should contain disposable plastic booties for whenever the driver needs to exit their truck, disinfectant to wipe or spray down their cab, and a method to dispose of these items. In winter months, multiple sets of rubber overshoes could be used instead of the plastic booties, but each pair needs to be disinfected after use.

## Zones in the mill

Along with separating drivers from the general mill, feed mill managers should focus on ways to separate the mill into specific zones and limit employee crossover between zones. This helps prevent employees from carrying contaminants from their shoes or clothing through the mill. For instance, an employee may help in receiving and carry contaminated feed



dust on their shoes as they walk through the mill to change a die in pelleting. That contamination is no longer limited to the receiving area and now can come in contact with finished feed.

Having one zone designated for receiving, another for mixing and processing, and another at load-out helps to prevent this sort of cross-over by preventing employees from moving between areas without going through a decontamination process. This zoning of the mill also needs to cover tools and equipment that might be shared between areas. To have this process be effective, each zone needs its own sets of tools, brooms, ladders, etc. to prevent these items from carrying contamination through the mill as well.

## Feed handling

In addition to controlling the movement of people, preventing finished feed from contacting surfaces that also handle raw ingredients adds another layer of feed security. Disease mitigation measures like heat treatment (pelleting or extrusion) are effective at killing or inactivating bacteria and viruses in the feed but do not prevent recontamination. As a result, sharing equipment between finished feed and raw ingredients should be avoided.

When complete separation is not possible, equipment should be thoroughly disinfected before finished feed is run through it. Dust and screenings are also known to contain higher levels of pathogens than the bulk of the ingredient load. These residues should be discarded instead of being added back to ingredients or feed in order to prevent the accumulation of pathogens.

## Employee training

For any biosecurity plan to succeed, employees need to receive proper training. Ensuring that they are aware of the mill's biosecurity plan, FSMA regulations, and pathogen mitigation and prevention strategies helps encourage compliance. Proper disinfecting helps encourage compliance. Proper disinfecting procedures should not be overlooked. Many disinfectants require a certain amount of time in contact with a surface to kill pathogens. The presence of dust, grain, or other materials can limit the effectiveness of disinfectants. Adding procedures like truck washing or use of booties also requires additional training for employees to implement safely

and effectively. All of this should be communicated to employees and biosecurity refreshers should be implemented at intervals throughout the year to keep the plan up-to-date and fresh in employee's minds.

## Culture

Workplace culture is the most important aspect of a mill biosecurity plan. A strong employee culture encourages everyone to implement the procedures and follow them. If management does not take their policies seriously, there is little incentive for the rest of the employees to follow the policies. Encouraging employees to follow a biosecurity protocol starts with management and is strengthened with knowledge of why the plan matters.

Feed safety is not something that has immediate effects within the mill and safe practices come with added effort. Therefore, it can be easy to overlook during day-to-day operations. Introducing measures to prevent or minimize contamination at the mill is vital to protecting U.S. livestock from outbreaks of domestic and foreign animal diseases. Understanding the biosecurity practices of suppliers, movement of people and equipment, feed contact surfaces, and truck movement helps develop a strong biosecurity culture in the mill and develops a successful biosecurity plan. Developing and implementing a biosecurity plan at the mill helps producers feel confident in the safety of the feed they are receiving and promote positive client-mill relationships.



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