Strategies to Reduce Contamination

When samples from surveillance or suspected disease contamination come back as positive for the pathogen of interest, there are strategies that can be implemented to reduce contamination. These strategies can be implemented at any time that a feed mill or production system are concerned about potential pathogen contamination. This resource will discuss potential risk mitigation techniques and examples of these techniques.

- **Limiting entry of potential pathogens into the receiving pit.**
  - Utilizing receiving pit covers
    - Constructing a pit cover that lays flat while not receiving bulk ingredients but can be lifted up and constructed into a funnel shape to help reduce shrink during unloading of bulk feed ingredients.
    - Covering the receiving pit with a rubber mat, or something similar, when not in use.
  - Discarding spilled feed into the trash instead of adding it back into the receiving pit.

- **Chemical feed additives**
  - Addition of chemical feed additives to feed intended for livestock has been shown to potentially decrease the risk of cross-contamination during feed manufacturing or feed delivery.
    - Common chemical additives include organic acids, formaldehyde, essential oils, medium chain fatty acids, or dietary acidifiers (Huss et al., 2018).
    - More information on chemical feed additives can be found here.

- **Implementing point-in-time mitigation techniques.**
  - Point-in-time mitigation techniques are strategies implemented during a time point of feed manufacturing. These techniques do not prevent the possibility that feed may become contaminated again during further feed manufacturing or delivery.
    - Thermal Processing
      - Addition of heat to the feed manufacturing process to reduce potential infectivity of the pathogen of interest (Huss et al., 2018).
      - For livestock feed, pelleting is considered the traditional method of thermal processing.
    - Feed Batch Sequencing
      - Requires the order of production, storage, and distribution to be planned to reduce the carryover of high-risk ingredients to sensitive diets (Huss et al., 2018).
    - Flushing
      - Consists of running an ingredient, usually with abrasive material, through the system between batches to flush out any residual material (Huss et al., 2018).
    - Holding or quarantining feed ingredients
      - Consists of storing ingredients in a low foot traffic areas for a specified amount of time between manufacture and used to give an opportunity for viral contamination to naturally degrade so as not to be infectious.
      - More information on how to calculate holding times can be found here.

- **Zoning**
  - Restricting employees to certain locations within a feed mill to limit the spread of pathogen

Houston, Grace E., Gebhardt, Jordan T., Jones, Cassandra K., Woodworth, Jason C., Paulk, Chad B., and Dritz, Steve S. 2022. Kansas State University Feed Safety Sampling Resources: *Strategies to Reduce Contamination*.

- **Implementing downtime**
  - Require a specific amount of time that employees, after having recent contact with animals, must wait to return to the feed mill.

- **Limiting the amount of contaminated objects**
  - Requiring shoe covers for feed truck drivers and ensuring they wear and change them during deliveries.
  - Providing feed mill specific uniforms.
  - Scheduling or restricting deliveries to certain production sites on certain days.
  - Requiring showers before entering or exiting the feed mill.

- **Implementing usage of disinfectants**
  - Liquid or dry boot baths at the entrances or exits into the feed mill.
  - Applying disinfectants to semi-truck cabs after deliveries.
  - Combining disinfectant application with heat treatment like baking trailers after power washing with disinfectant.
  - More information regarding disinfectants can be found here.

References

Huss A., Cochrane R., Muckey M., and Jones C. 2018. Chapter 4: Animal Feed Mill Biosecurity: Prevention of Biological Hazards. Food and Feed Safety Systems and Analysis: 63-81. doi:10.1016/B978-0-12-811835-1.00004-X