



Feed Mill & Biosecurity Webinar

September 1, 2021

Hosted by PIC and Kansas State University's Feed Science and Management Program

Frequently Asked Questions

Overview of Feed Manufacturing Guidelines - Kara Dunmire, Kansas State University

Is mycotoxin recommended to be regularly tested for received raw ingredients?

Mycotoxins should be included in regular QA testing procedures, but the frequency will depend on tonnage coming into the facility. To create a testing schedule specific to your mill it is encouraged to consult weekly mycotoxin reports for the area you are sourcing the ingredient. A baseline recommendation can be found in the new quality feed manufacturing guidelines:

<https://bit.ly/KStateFeedGuidelines>

What is the common mycotoxin level of Dried Distillers Grains (DDGS) in the United States?

There is not a "common" level of mycotoxins, however, the processing of corn into DDGS will further concentrate mycotoxins if present in the corn.

Are aflatoxins in feed checked on by ELISA? Are there other methods that aflatoxins should be tested as well?

There are quick tests available that are recommended for regular screening of incoming ingredients. However, ELISA tests are recommended for follow-up testing.

BioShield Feed Section Update – Jason Pooley, PIC

With high turnover and difficulty finding labor is there any new technology or recommendations that can be made to help complete quality and biosecurity procedures?

That is a double-edged sword. It is one thing to say we are going to complete our audits and our checklists and ensure those things are getting done. Then we say, on the other hand, we are short on labor and those things don't always get completed. I understand, it is tough, and many operations are struggling to maintain employees at the moment. I think you have to weigh out: are you willing to sacrifice the health of the mill, of the feed, or of the pigs you're feeding? Simply because you are short-handed today? You've got to be creative and figure out ways to ensure the processes are getting done. If there are materials or processes or new devices out there that help expedite that human element, then I would encourage you to investigate those.

How can suppliers guarantee that their ingredients are free from any exotic disease?

It is tough to guarantee this; however, the important piece is to make sure that we have involvement from the nutritionist and the veterinarian in the discussion process around where you are sourcing ingredients. That is part of why, as we do our feed mill audits and the veterinarians are going through asking questions about ingredient sourcing, it allows them to have a broader conversation about where this ingredient is coming from. It allows them to look at labels, look at test procedures, and understand what is being done to validate that decision process around whether or not you can truly guarantee that.

Do you have an effective way to train the mill personnel to follow SOPs?

Creating a level of culture with employees around the importance of following SOPs is an important step in getting employees to effectively carry out SOPs. It should be a daily process and requires a fair amount of training and repetitiveness. It is important to focus on key SOPs and make sure they are carried out correctly. It is a mindset, and it requires some follow up to ensure that culture is truly going on and being implemented.

It is very common to have trucks returning from production units entering the same bays that bulk ingredient deliveries enter. Are you seeing any mills in North America cleaning undercarriages before entering these bays? Especially during weather that causes heavy mud and snow contamination?

While it is difficult to speak about what is going on across all mills in North America, it is safe to assume that there is a lot of traffic that goes in and out of a feed mill. You've got ingredient trucks moving in and out with deliveries; you have feed trucks returning from farms and picking up a second or tertiary load to head back out. It is important to understand what those traffic patterns are and to have designated areas with as little cross-traffic as possible to reduce your risk. Part of the evaluation process is to ask a lot of questions around what those traffic patterns are and to try to find solutions on where we can minimize [risk]. In terms of undercarriage management, there are certain times of the year where it gets more difficult, such as during the winter with mud and slush built up underneath the trucks. It is one thing to say we will spray disinfectant on the truck, but if you haven't got down to the core undercarriage of the truck then you are truly just spraying ice. So, there are certainly systems out there that people are using for these instances to add additional defenses against what you are dragging back into a feed mill. However, it hasn't been largely incorporated across many feed mills yet.

Latest Research in Feed Mill Biosecurity - Dr. Jordan Gebhardt, Kansas State University

How many cycles were used on the PCR test?

The PCR test used went up to 40 cycles.

What products can be included in the feed to mitigate the risk of pathogens such as ASF?

Specifically looking at ASF data, there is data indicating that several products may have efficacy at reducing detection of ASFV as well as reducing virus survival including formaldehyde (SalCurb), medium chain fatty acids, and several other commercially available products.

Are there other pathogens/contaminants that you might recommend using for (routine) testing and verification of biosecurity procedures?

General indicators of sanitation can be very helpful including Enterobacteriaceae and Rotavirus, both would be indicators of potential fecal contamination.

What best practices guidance is available to begin testing ingredients for PEDv?

The key to ingredient sampling is making sure that you pull a representative feed or ingredient sample. However, it is also recommended to consider collecting environmental samples where feed dust accumulates as we generally believe dust is a better indicator of risk due to the ability to monitor presence of contamination over time instead of a single point sample.

How common are trailers that serve a dual purpose of hauling bulk ingredients, bulk finished products, and bagged products that require people and carts to enter the trailer?

There are some situations where this does occur, but much of the swine feed industry in the US uses dedicated vehicles for these purposes. If a vehicle is used for multiple purposes, it is recommended to minimize foot traffic and cross-contamination as much as possible. If a driver must enter the mill, they should wear boot covers when entering the mill.

Which test was used to test for the presence of ASF virus in the environment and clothing? Was the virus isolation done on the PCR positive cases and could they determine if the virus was an intact "live virus"?

All testing done with this case report in Southeast Asia was done with PCR-testing. There was no further testing performed to determine infectivity such as a bioassay or cell-based assay. Yes, to further understand the risk of these contaminated surfaces causing infection to naive animals this would be necessary. However, even PCR-based results can be very powerful indicators that surface contamination is present, and if there would be an opportunity to improve biosecurity to avoid detection of the virus in the first place.

Do you know if there are any ASF outbreaks where the root cause of the outbreak was linked to contaminated feed or contamination in the feed mill?

To our best knowledge, there is no data currently available from the field to document that commercial feed mills have been an epidemiological link in the spread of ASFV. There is data to suggest that swill feed, or garbage feeding, is clearly associated with transmission of ASFV. This indicates that consumption of contaminated feedstuffs can cause infection, but to date there is no direct evidence that the commercial feed industry has been associated with ASFV outbreaks.

Can you explain how we should sample feed at the farm to monitor pathogen contamination?

Monitoring for pathogen contamination can take a variety of shapes and forms. We believe that environmental monitoring is generally preferred as opposed to point samples of feed or ingredients as it can give a better indication of potential contamination over time as opposed to a single point sample. In addition to using diagnostic testing to look for a specific pathogen, often general indicators of sanitation can be useful including Enterobacteriaceae or Rotavirus.

In an ASF-positive country, how often do you recommend doing a PCR test on the feed mill, and how many samples per batch?

The answer can depend greatly upon several different factors. One of the important considerations would be the regulatory guidance and if this testing would be permitted or not. In the US, testing of environmental surfaces, feed, or ingredients is currently not permitted. If sampling can be performed, focusing on high-risk areas such as vehicles and high foot traffic areas is generally recommended. Sample size calculations are fairly challenging due to limited knowledge of expected prevalence of detection and unknowns regarding the sensitivity and specificity of the diagnostic assays for these sample types. In general, I would recommend starting with 15-20 samples in high-risk areas, then interpret those results and determine the best sampling plan with the objectives of the system in mind.

With high turnover and difficulty finding labor is there any new technology or recommendations that can be made to help complete quality and biosecurity procedures?

To build on that a little further, not necessarily on the technology front, but within this whole discussion of biosecurity whether that be from a farm or feed mill perspective; think about the infrastructure we have in place. There are ways we can design facilities like Connor Livingston mentioned having a designed bench entry. Instead of biosecurity then becoming a hurdle in the sense that it adds a significant amount of work and time and effort to our employees; are there ways that we can incorporate biosecurity into our infrastructure to make everyone's job easier while still maintaining a high level of biosecurity. I think it is an important consideration to think about moving forward.

Feed mill facilities are potential foci of feed infection. Do you recommend a special protocol to disinfect the different areas of the Feed Plant if this situation is detected? Could you describe what you used in the feed mill after your ASF tests?

The work we have done at Kansas State University with ASF is in our highly secure BSL-3Ag facility. That facility is conducted to do that type of work with live animals, and so we were able to modify some equipment and bring it in to do that work. The decontamination procedures of that facility are extremely intensive! It starts with removing all organic material, such as feed, using high-pressure water, then it goes through a liquid disinfection step, and then after all of that, it goes into gas disinfection for a period over several days. It is a highly secure and very highly controlled research setting. You can take a little different perspective on some of the work we have done with PEDV or the PRRS virus more recently. The critical steps of mill disinfection are removing organic material using effective disinfectants in an effective amount of time. Then in a research setting, using heat to further reduce the ability of that virus to survive. With the way mills are designed, it is very difficult to pressure wash and very difficult to do thorough disinfection. I believe we need to think more about that and develop ways to practically decontaminate a mill while recognizing they are not designed to be pressure washed; moisture within this type of facility can be quite detrimental to the equipment.

So far there is no vaccine for ASF?

That is correct. No vaccine is currently approved for use. There are several candidates at various stages of development, but nothing currently available in the US today.

Given the level of ASF positive samples from your Bio-safety Level Three study with ASF in feed and the entire room, were you surprised at how relatively little you saw ASF positive samples in the Southeast Asia production system?

Yes, we were surprised by this observation and would like to understand further. There were questions whether ASFV would distribute within a mill in a similar manner to what has been shown with PEDV, and this data would indicate that yes in fact if inoculated into feed at a known concentration, the virus can be detected on feed and non-feed contact surfaces as well as transient surfaces such as shoes.

Do you clean the shoes after each batch during ASFV research shown?

Shoes were not cleaned or disinfected after each batch. Following each batch, the bottom of researcher boots were sampled and no further cleaning and disinfection of the boots was performed prior to the next batch of feed.

Industry Experience on Feed Mill Biosecurity – Connor Livingston, Livingston Enterprises Inc.

Is the bench disinfected in your feed mill as well?

We don't disinfect the bench at the end of each day because we disinfect the dirty zone, which is where all individuals would come into the feed mill from. We try to keep the dirty zone cleaned as much as we can and we also request a clothing change.

Any reason why you do not require visitors to shower in and out at the feed mill?

[We are] trying to implement something that would flow seamlessly each day with the traffic coming and going. We do everything you would on a farm except for showering in/out. When we set the biosecurity standards, we modeled the feed mill standards after what has already been implemented in our swine production facilities. [We] always want to make sure they are doing everything biosecurity-wise correctly, whatever comes from the feed mill goes directly to the farm. That is the biggest thing we want to make sure is understood; that all people at the feed mill influence the farm. We try to work together and do the best we can to keep the feed as low risk as possible.

Do you have an effective way to train the mill personnel to follow SOPs?

To focus on how we get all of this done while not interrupting day-to-day operations of the feed mill process. It comes back to getting everyone to understand why we do the things we do, but our #1 goal is to be a disease-free processing system. It's a lot easier to keep disease out than it is to deal with it. We try to approach it from that point of view; if we have no disease challenges at a production facility and we wash feed trucks regularly, then it makes it a lot easier on all of our employees. Less hours, not spending extra time in the wash, and paying special attention to each load is key for us.