Feed Safety and Feed Processing Questions from 2020 KSU Swine Day – Day 2

#	Question	Answers(s)
1	When batches of feed are contaminated with virus how do you know how many tons of feed it has infected? do you have to throw it all away?	We do not know how much feed has been infected. This is why it is so important to focus on prevention. Things to consider are to use flushing procedures and retest to determine if it is still contaminated. You do not want to feed contaminated feed to animals at risk to the pathogen. You either need to dispose of the feed or find a way to direct to other species that are not at risk to the pathogen of concern. However, you do not want to rework contaminated feed through the mill.
2	What method was used to detect ASF? PCR?	Thanks for the question - yes, we evaluated ASFV DNA presence by PCR at the p72 gene.
3	Were the non-contact surfaces cleaned between the 4 sequencing batches or is the contamination carried over from the initial contamination?	Paul, there was no cleaning or disinfection between batches of feed. These were subsequent batches to test the impact of feed sequencing to prevent ASFV transmission.
4	Can a combination of organic acids (formic, phosphoric, citric, lactic) help to reduce the efficacy of ASF in milled feed? What dose of organic acids would be most effective?	Unfortunately we don't have sufficient research to answer this question, but I agree, it's important.
5	Was the facility disinfected after the positive batch?	The facility was NOT disinfected after the positive batch. We were testing the ability for sequencing to impact prevalence of ASFV in a conventional manufacturing conditions.
6	on average how many recalls/contaminations do feed mills usually have per year	Tyler, the FDA tracks Reportable Food Registry reports, which are when a facility has a 'reasonable probability that they have distributed feed that may cause a serious or adverse health consequence to humans or animals.' Based on these data, the U.S. feed supply is VERY safe. Only 18 in the most recent annual report that was released. While the risk of feed contamination is not very high, it can be very consequential because of the multiple epidemiological links that a single mill can have to multiple farms and animals.
7	How much time between the batches? Are there time and temperature/environmental conditions that you can recommend to reduce contamination? Feed additive mitigants might not be immediately effective, but shorten the time for persistence - is that correct thinking?	Great question. We batched as close to normal as in regular conditions. This was a temperature- and humidity-controlled environment, with 5 minute dry mix times and about 4 minutes to discharge batches before adding ingredients to the mixer for the next batch.
8	Presence of genetic material does not necessarily mean there is viable virus present. How do we make the distinction, or should we just assume viable virus is present?	Great question, and one of the biggest issues we have when trying to understand risk in natural contamination setting, such as what Jordan is talking about in Vietnam. In our case, presence of ANY genetic material is considered to be a risk.

9	The use of SCFA has not been shown to be effective on ASF. MCFA on the other hand do have some impact it appears. More data is starting to emerge on this topic fortunately	Yes, this is exactly right. We think that some of the C6, C8, and C10 medium chain fatty acids and monoglycerides have strong efficacy vs. ASFV in feed and ingredients, but the organic acid aspect may be important to maximize their impact.
10	What would be the impact of pelleting on persistence of ASFv in the feed?	Excellent question. Based on theoretical modeling, the time and temperature of steam conditioning and pelleting SHOULD be capable of inactivating ASFV. It can be considered a hurdle to reduce contamination, but I also caution against considering a true 'kill step' because we do not protect the product from recontamination post-processing. For example, immediately after pelleting, we cool pellets using ambient air that is typically from within the facility, and just blow virus back on, albeit in a lower level. This can be avoided with sanitation controls and HEPA-filtered air, but in most mills, that is impractical.
11	How long does the ASF virus can live/survive in the various contaminated surfaces in the feed mill? Once feed mill detected positive, what steps should be taken to get rid of the virus?	This is another part of the research question from this same experiment. We will be analyzing data regarding survival and persistence over time over the next several months.
12	C12 and GML should be added to your list as well.	Yes, I was referring to GML as the primary monoglyceride that has some preliminary data showing promise for viral reduction. However, the data on C12 is more variable. While it has efficacy in bacteria, we have not seen significant reduction in virus levels using C12.
13	Are Formaldehyde base products effective to inactivate Virus like ASFV and PEDV on feed contact surface zone 1 ????	We have not evaluated formaldehyde-based products directly on feed contact/Zone 1 surfaces for ASFV. However, our data from PEDV paired with data on the efficacy of these products in ingredients to prevent ASFV infection would suggest efficacy on Zone 1 surfaces.
14	Thank you for the presentation. Could be better use qPCR instead conventional PCR?	Yes, sorry, we should have clarified - this was completed using qPCR.
15	Have you evaluated how effective disinfecting of truck cabs is under very cold conditions? Looks like it is working well in Vietnam, but are there some guidelines for cleaning cabs in cold climates and effectiveness? Good job.	Great question. That is a big challenge for many areas of pig production including the US where freezing temperatures are common. Dr. Elijah will be working on some work in the near future focused on truck cab decontamination. We won't be able to evaluate the effectiveness in freezing temperatures...but hopefully some of this work will be a foundation and future work can be incorporated to address this big challenge.
16	Assuming that the space in the mill will allow extended period of raw material staging, how long is your recommend raw material staging?	Great question, there have been some helpful holding time recommendations from Swine Health Information Center (https://www.swinehealth.org/updated-feed-holding-time-calculation-inform-biosecurity-processes/). It's important to keep in mind that this should be just ONE of the many hurdles we are implementing as a prevention strategy.
17	What is your Idea on disinfection in temperatures of -10° C	Freezing temperatures poses a big challenge for disinfection of many surfaces such as truck cabs because many of the disinfectants are diluted in H20. We don't have a great answer today, but hope to

		learn more in this area to provide additional information for producers. The best approach at this time would be to apply disinfectants and have the surfaces stored in a building or other area above freezing temperatures to allow appropriate contact time.
18	Should we also be considering, or aware of, pathogens already existing in North America that have received less notoriety?	Yes, thank you for that question, Jon! While today we are so focused on ASFV, we must continue to be diligent about feed-based transmission of PEDV, deltacoronavirus, and other pathogens. The good thing about the hurdle strategy (eliminating high risk ingredients, implementing mill biosecurity, and using active mitigation) is effective for prevention of foreign animal diseases, but also our domestic pathogens. If you have additional questions about sampling and interpreting risk based endemic pathogens, check out our new feed safety bulleting for pork producers at ksufeed.org!
19	What sort of vacuum pressure are you using on the hammer mill's air assist?	Normally they are designed to have 1.25-1.5 CFM (cubic feet per minute) per square inch of screen area. The amount of CFM would be refined based on your screen size openings.
20	Are you placing your larger screen on the down or upsize of the hammer mill's rotation?	Upsize or opposite of impact. The challenge with using two different screens is that you have to replace screens when you change the hammer rotation.
21	Is the reported geometric mean particle size reported with the use of a sieve agent? Assume Rotap 13-sieve?	Yes, it was conducted using a Rotap 13-sieve with sieve agent.
22	Dr. Stark, regarding flowability, is there any guideline of the smallest particles (<150 microns) that we should look at in order to reduce flowability problems in the field? Many times in order to reduce particle size we fall into the trap of increasing the SD.	I am not aware of any data that has looked at complete diets, which is what really should be evaluated because it's not just fine corn particles but total fine particles. This would be a good research project."
23	Corn-SBM based diets (esp. with DDGS) are hard to pellet. What sort of conditioning time and temperatures should we be targeting to get a good PDI (<85%)? Is it even worth trying to pellet a corn-SBM diet since starch is corn takes so long to hydrate and gelatenize)?	When pelleting a corn-SBM diet you still observe an improvement in growth performance and handling characteristic of feed. When pelleting diets with DDGS, adjustments are going to need to be made on a case by case basis. Source of DDGS can have a large influence on pelleting. Making adjustments to factors such as conditioning temperature, retention time and die thickness can help improve PDI but the recommendations will vary.
24	You showed the effect of added fat on PDI. How is PDI affected as the total level of fat in the diet changes (ex. when you use low vs. high animal byproduct meal use)?	A good question, but I do not currently have an answer for you.
25	In formulation, what level of total dietary fat should we target to achieve a good to excellent PDI?	Typically we try to keep added fat in the mixer below 1.5 to 2% and add any additional fat post pellet.

26	Is there an effect on feed quality when the T° increase? If so, what are the trade between the quality of pellet and nutritional quality?	Great question, this is an area we plan to investigate in the coming year.
27	Relative to the work reported on naive soybean on pellet quality, how do you factor the impact of the increased oil level?	In this data set, the total fat concentration was balanced. Therefore, choice white great was increased in the soybean meal diets to balance for the difference in provided by the soybean. This leads to the question of is there a difference in fat within the soybean vs added fat. This needs to be further investigated.
28	For the SID Lys data set, was free/ reactive Lysine measured?	Available Lysine was measured and will be reported in the published report.
29	Hello Jason, What PDI % did the pellet feed have to gain that increase in amino acid digestibility?	The PDI's associated with each treatment will be reported in the swine day report.
30	What is the correlation between the melanoidin and SID-AA digestibility?	Currently we do not have data to answer this question. This area provides a good opportunity for future research.