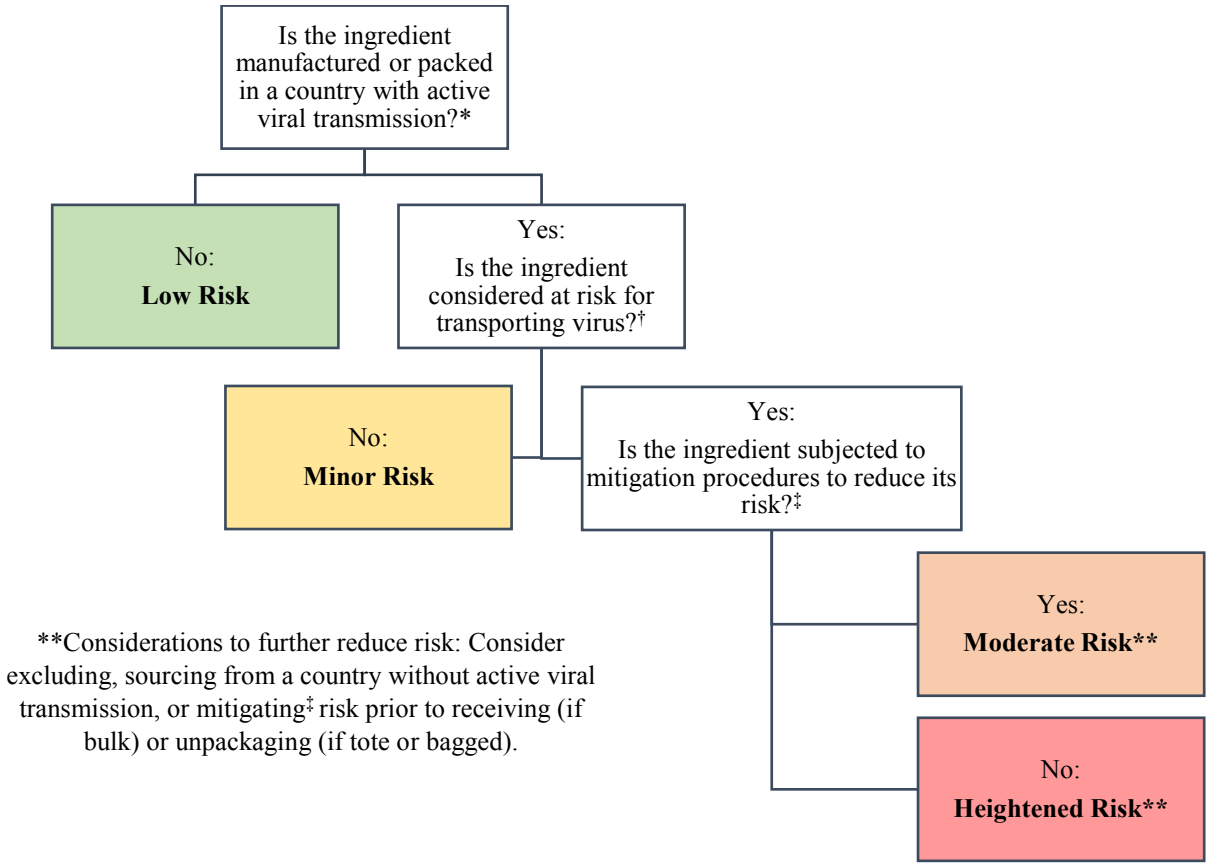
FEED INGREDIENT SAFETY

Introduction: Research has demonstrated the ability for certain feed ingredients to support viral survival during conditions modeled after either trans-Atlantic or trans-Pacific shipping to U.S. ports and on to locations likely to manufacture feed for swine. This has increased interest in assuring feed ingredient safety from viruses. The below decision tree and questions were developed to help pork producers work with their feed suppliers to minimize risk from feed ingredients.

Decision Tree Matrix to Minimize Viral Transmission Risk from Feed Ingredients



**Considerations to further reduce risk: Consider excluding, sourcing from a country without active viral transmission, or mitigating‡ risk prior to receiving (if bulk) or unpackaging (if tote or bagged).

*The Swine Health Information Center maintains and publishes monitoring reports for diseases on its Swine Disease Matrix, on www.swinehealth.org, which includes: foot and mouth disease virus, classical swine fever virus, African swine fever virus, and pseudorabies virus. Official country-specific disease status is also available from the World Organization for Animal Health (OIE) at http://www.oie.int.

†The science on viral transmission through feed and feedstuffs is still relatively young, but one study has shown the theoretical ability for pathogenic swine viruses to survive transport to the United States in imported feedstuffs. The feedstuffs studied that have shown the potential to support virus survival include: conventional soybean meal[1], DDGS[1], lysine hydrochloride[1], choline chloride[1], vitamin D[1], pork sausage casings[1], dry and moist dog food[1], organic soybean meal[1], soy oil cake[1], moist cat food[1], and porcine-based ingredients[2]. There may be other feed ingredients that were not tested that could support survival of pathogenic viruses. Scientific study and proof-of-concept work in this area continues. To date, without an organized surveillance program, pathogenic swine viruses have not been identified in imported feedstuffs.

‡Mitigation research is ongoing and available data is limited and depends upon both the ingredient and mitigation, but options may include: extended storage times, irradiation, thermal processing, or chemical treatment (formaldehyde- or medium chain fatty acid-based liquids, etc.).

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[1]Dee., S., F. Bauermann, M. Niederwerder, A. Singrey, T. Clement, M. DeLima, C. Long, G. Patterson, M. Shehan, A. Stoian, V. Petrovan, C.K. Jones, J. De Jong, J. Ji., G Spronk, J. Hennings, J. Zimmerman, B. Rowland, E. Nelson, P. Sundberg, D. Diel, and L. Minion. 2018. Survival of viral pathogens in animal feed ingredients under transboundary shipping models. PLoS ONE. 13(3): e0194509. https://doi.org/10.1371/journal.pone.0194509

[2]Cochrane, R., S. S. Dritz, J. C. Woodworth, and C. K. Jones. 2015. Evaluating chemical mitigation of PEDv in swine feed and ingredients. J. Anim. Sci. 92(E2)090.

Discussion Points to Consider When Assessing Supplier and Feed Ingredient Safety

These questions are designed to start the discussion about feed ingredient safety. Some questions will apply to producers' immediate feed suppliers and some will apply to feed ingredient suppliers.

- Describe the facility's biosecurity program to minimize the spread of pathogens from people, vehicles, and ingredients.
- Describe the facility's employee training on feed safety.
- Describe the facility's pest control program.
- Describe the facility's traceability program.
- Describe the facility's supplier approval program.
- Is the facility certified by a 3rd party certification body for food safety? Third party certification programs may include FAMI-QS, ISO, SQF, Safe Feed/Safe Food, etc.
- Does the facility utilize ingredients that were manufactured or packaged outside the United States?
    - If yes, was the ingredient imported following the FDA Foreign Supplier Verification Program to help control risk?
    - If yes, does the supplier consider the risk of swine viruses potentially transported in feed ingredients, such as foot and mouth disease virus, classical swine fever virus, African swine fever virus, and pseudorabies virus?
        - What mitigation strategies are used for ingredients sourced from countries of heightened viral risk to prevent or minimize risk of transmission?
        - Are there alternative suppliers and/or ingredients available?

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