

Preliminary Analysis of PED Epidemiologic Survey

Data: Survey data were collected by veterinarians associated with swine herds affected by PED. Veterinarians were requested to complete questionnaires for case and control herds. Control herd data were proposed to be matched with case herds on certain characteristics. The final data included several matched case and control herds. Data on the full population affected by the outbreak were not available, so an evaluation of the representativeness of the sample is not possible.

Updated Method: Univariate logistic regression models, adjusted for clustering by company, were evaluated for each individual predictor on the outcome of the probability of a farm being a case. A herd was considered a case based on a fecal sample confirmed positive for PEDv via fecal PCR. Despite the screening nature of this initial analysis, a p -value of $\leq 05\%$ was applied as a cutoff for declaring an association significant between a predictor variable and the increased probability of being a case. This was because more than 100 variables were tested and a more liberal p -value would likely admit more sporadic associations. Initially, state, company and system were included in each univariate model to adjust for the structure of the data and account for non-independence between farms. However, using all three levels coupled with the small number of observations (25 cases, 18 controls) led to model instability. Ultimately, company was chosen alone to account for non-independence between farms.

Results: Seven feed related variables were associated with higher odds of PED (“risk factors”): using sow feed that was custom mixed off-farm in the last 90 days, how many meal/mash rations were fed to nursery or finishers in the last 90 days, the total number of different rations fed to finisher pigs in the 90 days prior to the administration of the questionnaire, the contents in terms of supplementation that was in the premix for the most recent finisher diet and what type of grain mix was used for sow or finisher feed in the past 90 days. Although data were collected on companies that supplied supplement, base mix, and premix, none of the companies were associated with being a case farm during preliminary analysis.

[AASV Note on Interpretation: These seven risk factors were associated with the process of feeding the animals. The questions were broad in scope and did not implicate any specific finished feed, feed ingredient, feed manufacturer or ingredient supplier. The results of this initial survey should not be over-interpreted. The sample size was small, with many common on-farm practices and potential biases.]

To date, all feed and ingredient samples tested for PEDv have tested negative. There is no diagnostic indication that feed was in any way related to the introduction of PEDv into the U.S. swine herd. The feed industry has been, and continues to be, fully cooperative with all efforts to identify any possible sources of viral introduction. We want to stress that we do not have any evidence that any feed ingredient, finished feed or feed manufacturer was associated with the introduction of PEDv.]

Seven variables were associated with lower odds of PED (“protective factors”): higher swine farm density in a 3 mile radius, the percent of replacement animals that came from the same state as the farm surveyed, vaccination of breeding females for Ileitis or PCV2 in the previous 6 months, the three month average mortality in the nursery unit, vaccination of weaned market pigs for *Salmonella* in the previous 6 months and number of pelleted rations fed to sows.

Brief Implications: Due to the limited sample size it is unlikely that any of these risk factors point directly to the source of the PED outbreak. However, a number of feed practices may be indicators of risk. The origin of sow feed as well as the type, premix contents and number of different rations fed to weaned market pigs in the last 90 days increases the odds of being a case as much as three and a half times. Use of a “grain mixed with amino acid source and a base mix” was associated with an increased risk of PED for both sow feed and finisher feed. This type of grain mix may warrant further investigation as a possible source of PED. However, increasing the number of pelleted rations fed to sows appears to have a protective effect, and the reason for this is unclear.

Barring contamination, vaccinating sows or weaned market pigs for specific agents is unlikely to cause a decrease in the odds of PED. It could be that vaccination is a signal indicating higher health herds with higher biosecurity and less chance for pathogen entry. Additionally, odds ratios approaching one, such as farm density and percent of new entries can be ignored despite significance.

PRELIMINARY