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Diagnosis and control of common weaned pig gut diseases

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The swine industry in the US continues to struggle with postweaning scours despite improvements in nutrition and changes in management such as all in/all out production, multisite production, improved sanitation, and older wean ages. Many of the pathogens that create problems have been around for a long time such as K88 E. coli, Rotavirus, Salmonella, and TGE. F18 E. coli is a relatively new problem in the Midwest where we have been having widespread problems for only the last several years. When a problem is recognized the first step in controlling it is to make an accurate diagnosis. Once the disease has been diagnosed, another problem is to determine where the pathogen is coming from: is it coming with the weaned pig or is it present in the barn? Finally, prevention and control measures need to be put in place.

Diagnosis

Diagnosis in the barn is often based on the timing of onset of disease, clinical signs, and response to treatment. The initial clinical diagnosis can then be supported with submissions to the diagnostic lab.

K88 E. coli often breaks 1-3 weeks post weaning. Clinical signs include watery diarrhea, dehydrated pigs, and high mortality with both sudden deaths and chronic scouring pigs that die later. Some cases will respond to antibiotic therapy, but isolates with a high degree of resistance are fairly common.

F18 E. coli is more commonly seen 3-4 weeks into the nursery, although I have seen F18 as early as 1 week postweaning and as late as 2 weeks after placement into finishing. While there is some scouring involved, the more dramatic observation is a relatively high percentage of pigs with CNS signs. Mortality is typically quite high; 10-20% is not surprising. Many of these F18 E. coli isolates are highly resistant to antibiotics. Even antibiotics that would appear to be helpful, based on a sensitivity profile, often are marginally beneficial at best.

Rotavirus is commonly seen the first week postweaning and may continue for several weeks. Clinical signs range from mild to severe looseness. Death loss is typically not high initially, but it often leads to an increased number of off-quality, emaciated pigs.

Salmonella can occur at any point in production. Clinical signs are systemic in the case of cholerasuis (coughing, loose stools, discoloration of the skin on the extremities-"purple ears"). Mortality is variable but can reach double digits in severe cases complicated with additional pathogens such as PRRS.

TGE is thought of, traditionally, as a rapid onset of severe diarrhea and vomiting that can be accompanied by high mortality, especially in younger pigs. Recently, cases of TGE have been diagnosed that were relatively mild and not obviously TGE based on clinical signs alone. A possible explanation for this is partial cross protection from PRCV antibodies.

Prevention and Control

An epidemiological investigation is helpful to determine where the pathogen is coming from in order to prevent future outbreaks. Repeated outbreaks in a system on multiple sites would indicate the disease is coming with the pigs from the sow farm or that the pigs are becoming infected during transportation. Biosecurity protocols and practices need to be reviewed and modified in the case of transportation breakdowns.

Often the cause is previously exposed piglets coming from the sow farm. In this case control measures would include vaccinating sows prefarrowing and using feed back to increase colostral antibody production, ensuring adequate colostrom intake, vaccinating piglets, and the use of effective antibiotics at strategic times.

In some cases pathogens are present in weaned pigs only occasionally (or at least are not always apparent clinically) and become clinical due to excessive stress. They may not be displayed in all groups of pigs or on all sites, but once they become a problem on a given site, they can be very difficult to get out of the environment. The result is sites that rebreak when future groups of pigs are received. F18 E. coli is a good example of this.

Conventional cleaning protocols (including power washing, inspection, disinfection, and drying) are typically not good enough to reduce the level of these enteric pathogens enough to prevent future breaks. Additional steps

that have shown to be helpful include "flaming" and fumigation.

Flaming is done with the use of a brush or weed "flamer" that can be purchased at home improvement stores. They run off of propane. They are used for both heating and drying. If the nursery has metal floors (woven wire or tribar) they can be used to heat the floor up to 160° F to kill pathogens on the flooring. Stainless water cups and feeders are also flamed after blowing out excess water with a leaf blower. In this case the goal is thorough drying. Flamers are also being used on the rubber comfort mats used for starting weaned pigs. This has led to a dramatic drop in bacterial counts on these mats due to drying the mat and from burning off the frayed cords that hang off the mat after it has been used and washed multiple times.

Fumigation with formaldehyde is another additional step that appears to improve the odds of getting a pathogen out of a site. Options include commercial application of formaldehyde using large volumes of water as a carrier and the older method of combining formaldehyde and potassium permanganate. While fumigation is effective at killing pathogens, it also creates serious safety issues for the people involved.

An unusual method being used to prevent rebreaks of F18 in contaminated sites is the use of live non-toxigenic F18 E. coli cultures. They are typically administered orally shortly after arrival in the nursery or, in some cases, at the sow farm. The mechanism of action has not been clearly documented but could be due to stimulating an immune response and/or competitive exclusion. A commercially available vaccine has recently become available as well.

Other prevention measures that may contribute to a successful prevention program include acidification of the water and diet modifications.

Treating outbreaks can be frustrating in the case of viruses and antibiotic- resistant bacterial infections. Supportive therapy such as electrolytes help somewhat in minimizing losses. Another relatively new option for treating these cases is the use of pathogen-specific egg antibodies from hyperimmunized chickens that are combined with probiotics. An example is the Optipig brand that is available in either a water soluble form for group treatment or a paste form for individual dosing.