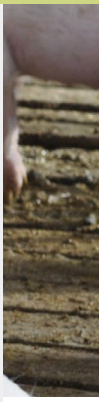

E. Coli Interventions

Matt Finch, *DVM*

Amber Stricker, *MS, DVM*

Escherichia coli (E. coli) is a common cause of post-weaning diarrhea in pigs. It often comes on very quickly and can result in high morbidity and mortality if left untreated. The disease may also come on so quickly that death occurs before diarrhea even develops. The swine industry has seen an increase in E. coli challenges recently and this article is aimed to inform you how to better handle this frustrating disease.

Enterotoxogenic *E.coli* (ETEC) produce fimbria, which are like little fingers, that allow the bacteria to adhere to receptors lining the gut. Once adhered these bacteria elaborate various toxins that cause secretory diarrhea leading to acute dehydration and death. The most common ETEC isolates are referred to as F4(K88) and F18. The ISU VDL has seen an increase in ETEC cases recently, especially F18 cases, and these cases are showing more toxin gene involvement.[1] To make matters worse, antibiotic sensitivity reports have shown that very few, if any, approved antibiotics are effective in most of these ETEC cases. Given the lack of success with antibiotic intervention, many other interventions strategies have been explored with varying results. Success is often the result of a combination of interventions rather than a single intervention.

The first intervention step is to properly diagnose the disease. With the often rapid onset of *E. coli*, it is important to involve a veterinarian who can diagnose the disease and prescribe a treatment that will be most effective. Samples should be submitted to a diagnostic lab to confirm the diagnosis and evaluate antibiotic sensitivity. Antibiotic therapy is typically the next step and may involve mass injection or oral administration of the appropriate drug. If oral therapy is administered, individual identification and treatment of the pigs most affected is always needed, since they will not be drinking enough water to receive the proper treatment dose.

The best intervention is prevention, and several preventative steps have shown to help prevent *E. coli*. Some important areas to consider would be water quality analysis, use of competitive exclusion vaccines, diet modification, and environmental management.

[1]Hess, A. (2022, April 21). *Why are we seeing more F18 now?* National Hog Farmer. https://www.nationalhogfarmer.com/animal-health/why-are-we-seeing-more-f18-now

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Our Philosophy

To provide our clients with the highest professional service. To achieve this we invest in our employees and instill in each of them a strong sense of customer service and commitment. We believe this personal relationship allows us to work with our clients to the best of our abilities, and is the foundation of Suidae Health and Production.

'E. Coli Interventions' cont...

Competitive exclusion inoculants have been effective tools in the field. These live inoculants are made by isolating a non-toxogenic F18 or F4 E.coli strain and culturing it in growth media in a lab. The inoculant works by adhering to the cells of the intestine, thereby blocking the attachment of the ETEC. Success is heavily dependent on the timing of administration and in certain cases it may be useful to inoculate the same group of pigs more than once. A general recommendation is to administer the inoculant 3-5 days prior to when the pigs are normally exposed to the F18/F4.

Diet modification is another tool to consider. Step up rations can help tailor diets to match the maturity of the pig gut. Limiting crude protein levels in nursery diets to <20% has helped control *E. coli* challenges in the field. Increasing zinc in nursery diets to 2500-3000 ppm has been shown to increase ADG and reduce the occurrence of diarrhea. Adding non-fermentable fiber to the diet in the form of rolled oats (200 lbs/ton) is another intervention that has been applied in the field with some success.

Lastly, environmental management is crucial to preventing *E.coli*. Ensure the environment is kept clean and comfortable. Pre-warm the barn at least 24 hrs prior to the arrival of the pigs. Set points should be appropriate for the age of the pig (84-85 degrees Fahrenheit for weaned pigs) and gradually dropped over time. Tight regulation of minimum ventilation is needed to reduce drafts but still get rid of humidity. Cold stress and high humidity can trigger an *E.coli* outbreak. Appropriate barn cleaning and disinfection protocols need to be followed with an all-in-all-out schedule. Foaming on a degreaser/detergent prior to washing the barn allows for better cleaning, especially if you are not able to use hot water. The barn should be completely dry before pigs are moved in. Standing water in cup waterers and feed pans should be removed using a leaf blower as these areas are often overlooked and not allowed to dry completely. On continuous flow sites an occasional de-pop and clean-up of the nursery has proven to be effective not only in eliminating *E.coli* from the environment, but also in breaking disease cycles caused by other pathogens such as PRRSv. Additional steps such as removing nipple waterers and soaking them in bleach, or another cleaner may be necessary especially if you find that the disease continues to reoccur in subsequent turns.

E. coli can be very challenging to control and most often requires a combination of several interventions. Situations where ETEC is present but does not respond to any of the above interventions may require additional diagnostic investigation as additional pathogens may be present.

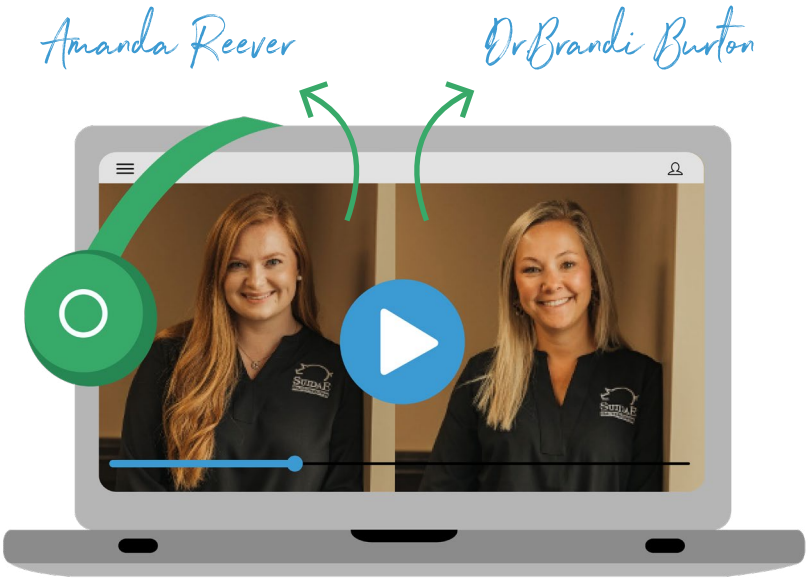
Talkin' PRRS

Popular Pig Podcast featuring Drs. Brandi Burton and Amanda Reever

Drs. Burton and Reever recently sat down with Matthew Rooda, host of the Popular Pig Podcast to have a discussion about the always important topic, PRRS.

What can you expect to learn from this episode?

- How the industry needs to discuss PRRS status and health between vets, producers, caretakers, allied partners, etc.
- The difference of RFLP vs lineage vs phylogenetic trees and dendrograms.
- The technologies in use to better compare PRRS sequences.
- What the future of PRRS strains and discussions look like.
- Dr. Reever & Dr. Burton's "golden nuggets"



Check out this podcast at https://popularpig.com/2022/12/01/talkin-prrs-dr-brandi-burton-dr-amanda-reever/#more-2282 or scan this QR code with your cellphone camera

Evaluating the performance of grueling pull pigs in a nursery setting

Carly Bates, BS; Brandi Burton, DVM; Amanda Reever, MS, DVM; Jeff Okones, DVM

Introduction

Proper nutrition is crucial for pigs that have experienced the stress of weaning and environmental changes, which is why you will see gruel feed methods being used. Gruel is a mixture of water and feed that can be fed to nursery age pigs to aid in the transition of weaning from a milk-based diet to a solid feed diet. Many producers have adapted gruel feeding into the nursery flow as a daily chore, mostly for pull pen or hospital pen pigs. Grueling is not well documented and overwhelmingly under fed by most caretakers in the industry today. As this practice becomes more incorporated in daily nursery settings, there is very little information and documentation available for producers as a guideline of when to gruel, the proper gruel ratios, amount of gruel, pig space per gruel feeder and the economic impact grueling will have on pigs (weight, health, days on feed, survivability, etc). The objective of this study was to evaluate performance differences, as measured by weight and mortality, in pull pen pigs when fed gruel using two different protocols or not fed at all.

Methods & Materials:

Pigs were placed in a 3 room, 3,600 head nursery. There were 3 treatment groups in this study. Pigs that were allotted to treatment 1 pull pens were only with pigs pulled that day, there was no continuous addition, they were given a total of 0.1 lbs feed/pig/day, 3 times a day with proper water ratios in the gruel that declined until 7 days in the pull pen, this gruel was fed in a 4ft trough that allowed a minimum of 3 inches per pig. Whereas treatment 2 had continuous addition of pigs each pull day and only received gruel 1 time a day with a 50:50 feed to water ratio (0.1 lbs/pig/day), gruel was fed in a circular feeder with 10 spaces, when more than 40 pigs were added to the pen another feeder was added. Treatment 3 also had continuous addition of pigs but received no gruel. In each room 7 pens were left open for pull pens. Each pen was designated for its treatment. on day 1,3,7 and 10 all pigs in the generalw population were thoroughly evaluated to determine pull pigs. The criteria for a pull pig were as followed: one that showed lameness, had a low body condition score, unthrifty or pigs that were noticeably smaller than pen mates. Each pig was pulled and had a LeeO tag placed in the ear. A random list application was used to determine which treatment that pig was allotted too. A second pen was added once the pen size reached 55 pigs. At the end of the nursery phase pigs enrolled in the study were weighed and average daily gain was calculated and evaluated. Pigs enrolled in the study that died had the ear tag cut out with the date recorded through the end of the turn. Pigs determined to be a cull were individually identified and the percentage of full-value pigs, which refers to animals that survived until the pre-market weight time point, was calculated for each treatment group. All treatments, vaccine and daily production was performed on trial pigs as the caretakers normally would.

Results & Discussion:

Treatment 1 and 2, mortality was 13.54% and 8.31% lower than treatment 3 respectively (Figure 1). There were no significant trends between treatment groups and average daily gain. There was a numerical trend of increasing percentage full-value pigs based on treatment group; the “appropriate” gruel treatment had over 10% more full-value pigs than the control group (Figure 2). With the lack of documentation on proper gruel protocols, this study will impact guidelines that producers are able to incorporate in daily production to impact time, economics and overall productivity of pigs throughout their lifetime.

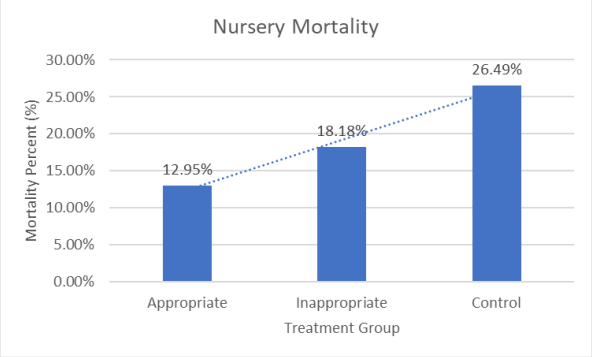


Figure 1

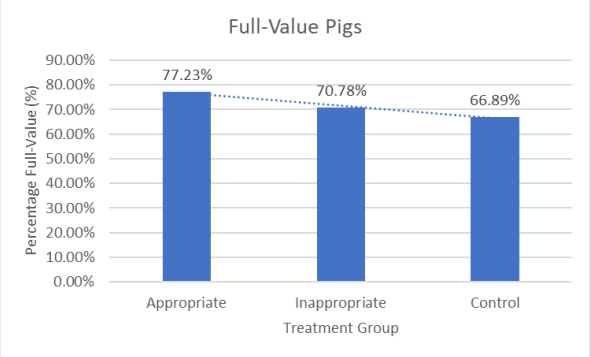


Figure 2

FEATURED FARMER:

Holy Sow!

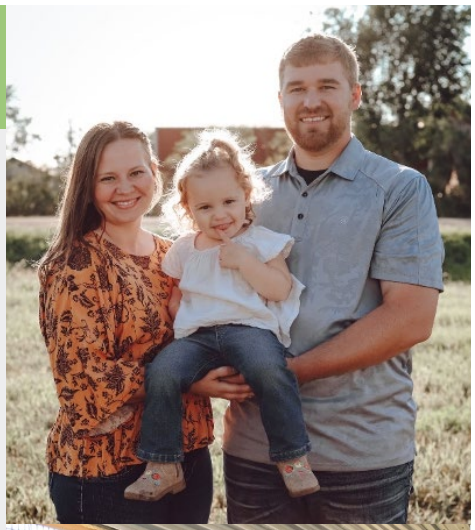
This picture comes courtesy of Kurtis Finn, farrowing manager at HC Feeders, a 1700 sow breed-to-wean farm in Iowa. This PIC sow, affectionately referred to as '2061', is on her 17th litter and recently weaned her 204th pig! She entered the farm on 4/1/2016 and during her lifetime she has averaged 5 days wean-to-first service and has never returned after being served despite several encounters with PRRS, including the dreaded 1-4-4 L1C.

Let's just say 2061 has earned her keep at HC Feeders and who knows…maybe they will even retire her number when her natural life is through!

If you have a farm story you would like to share, please reach out to matt_finch@suidaehp.com to have your story heard!

Employee Spotlight

Meet Beth Kittleson



Beth is from Ceylon, which is a small town located in Martin County, Minnesota. If you know of Martin County, you know being around swine is nothing new to her.

In addition to being surrounded by pigs, it was something she also grew up knowing a little about at home. Her dad has worked in the swine industry for a total of 34 years with 25 of those years as a gestation manager at the same sow farm, and her mom worked 12 years in the swine industry also.

Prior to joining Suidae 4 years ago, Beth had worked in 2 sow farms during and after college and done some contract growing. Today you will see her doing a little bit of everything but focusing her time mainly in Suidae Innovative Research and health and production!

When Beth is not with the pigs you can find her at home being a mom, wife, and owner/operator to a farm. She and her husband, Nolan, have a daughter Andi (2), and are expecting in March. They raise corn and soybeans, put up a large hay crop, cornstalks, background feeder calves out of their hoop barn, and have several farm pets and dogs.

If there is any spare time after all that, Beth enjoys decorating/ organizing, horses, hunting, and just being on the farm!

Happy Holidays!

The Suidae Crew recently got together at River Valley Orchards for a holiday celebration. It was a fun evening full of good company and good food.

We hope everyone reading this had a Merry Christmas and a Happy New Year! We wish you good health and prosperity in 2023!

PORK RECIPE

Candied Bacon

If you haven't tried candied bacon yet, make this recipe a priority! This candied bacon recipe will give you bacon that is sweet and crispy with a hint of heat. It is perfect as an appetizer, for breakfast or brunch, or whenever you want!

Ingredients:

- 1 pound thick-cut bacon
- ½ cup brown sugar
- ½ tsp. cracked black pepper
- ¼ tsp. cayenne pepper
- ½ Tbsp. crushed red pepper flakes

Cooking Directions:

1. Preheat oven to 375 degrees F.
2. Line a baking sheet pan with a silicone liner, parchment paper or foil. Lay the uncooked bacon slices onto the pan in a single layer.
3. In a small bowl, combine the brown sugar, cracked black pepper, cayenne pepper, and crushed red pepper flakes. Stir to combine.
4. Sprinkle the sugar mixture over the bacon slices, fully coating all of the slices on both sides. Using your hands, gently pat the sugar down onto the slices of bacon.
5. Bake for ~30 minutes or until brown and crispy. Remove from oven and let cool for 10 minutes.
6. Carefully transfer the bacon from the baking sheet pan to a cooling rack and let cool for another 10 minutes.

Find this recipe and more at https://sundaysuppermovement.com/candied-bacon-recipe/.