THE TRUTH ABOUT GUT HEALTH

With so much buzz surrounding gut health, producers may ask themselves what exactly is involved. Is it more than just a place to absorb and digest nutrients? Or could it be the key to increased health and profitability? Gastrointestinal expert Adam Moeser, D.V.M., Ph.D., has conducted gut health research in swine and provides insights producers may overlook when it comes to overall herd health.

Dr. Moeser, a Michigan State University associate professor and Matilda R. Wilson endowed chair, developed a research program focused on understanding how swine practices like weaning affect overall gut health and how the gut responds to stress and the underlying biology behind it.

"Understanding how the gastrointestinal tract functions is critical because it impacts every organ system in the pig," Dr. Moeser says. "The epithelial cells lining the gut represent the largest interface between the pig and the outside world. It's the major site of interaction with potential pathogens in the environment."

In addition to its surface area and the interaction with the outside world, the gut also serves many critical functions. If it becomes impaired, producers may see major and very rapid changes in the pig's health and performance.

GUT FUNCTIONS

According to Dr. Moeser, there are many functions of the gut, including its ability to digest and absorb nutrients. Without a properly functioning gut in the pig, producers could potentially suffer huge losses in feed efficiency and average daily gain, which is one of the primary economic determinants in swine production.

A first line of defense, the gut also serves as a barrier. Any compromise in its ability to limit pathogens or toxins from entering the pig will lead to other potential consequences, including inflammation in the gut, which will impact the overall systemic health of the pig.

"If the ability of the gut epithelial cells to form a barrier becomes impaired, which is known as "leaky gut," the immune system will become activated, resulting in inflammation and potentially death. Because the energy and nutrient needs of the immune system can be significant, chronic gut inflammation can divert nutrients away from lean muscle growth, which is the major economic end product of the pig."

> "UNDERSTANDING HOW THE GASTROINTESTINAL TRACT FUNCTIONS IS CRITICAL BECAUSE IT IMPACTS BASICALLY EVERY ORGAN SYSTEM IN THE PIG. THE EPITHELIAL CELLS LINING THE GUT REPRESENT THE LARGEST INTERFACE BETWEEN THE PIG AND THE OUTSIDE WORLD. IT'S THE MAJOR SITE OF INTERACTION WITH POTENTIAL PATHOGENS IN THE ENVIRONMENT."
>
> *– Adam Moeser, D.V.M., Ph.D., associate professor and Matilda R Wilson Endowed Chair, Michigan State University*

CONTRIBUTING FACTORS TO POOR GUT HEALTH

Dr. Moeser's research indicates that many factors in the environment can cause altered or compromised gut health, including stress.

"Stress is common and part of every stage of the production cycle. There are different types of stressors that can impact pigs in different ways, including social stressors and environmental stressors like heat stress," says Dr. Moeser. "Precisely how each type of production stress impacts gut health remains a big gap in knowledge for the industry. Without this knowledge, targeted strategies to improve gut health will remain limited."

Dr. Moeser adds that "we have known about the relationship between the gut and the brain through studies with anxiety and stress, but we are now just beginning to understand the biology of these connections, which will be important for understanding and designing interventions to limit the negative impacts of stress on gut health."

Other factors affecting gut health are quality of diet, diet changes and disease pressures in the environment. "We know a lot of pathogens can cause disease and potentially impact the gut directly and are pathogenic, like *Lawsonia* and *Salmonella*," says Dr. Moeser. "Which is why it's important for producers to use a comprehensive approach to prevent these environmental stressors."

PREVENTIVE SOLUTIONS

On many operations, enteric pathogens like *Lawsonia* and *Salmonella* are already part of the environment and can emerge at any time. This mostly affects young pigs, especially after weaning.

"The gastrointestinal system is undergoing the most development during the first three months of the pig's life," says Dr. Moeser. "During this time, the gut is being programmed for its function and how it's going to perform for the pig's life span. It's a critical period, and any injury, stress or pathogen challenge that affects the pig during the first several months of life is going to have long-lasting impacts."

Merck Animal Health provides a comprehensive portfolio of gut health solutions to help protect pigs against these profit-robbing pathogens. With a 20-week duration of immunity, Porcilis® Ileitis provides *Lawsonia* protection early in post-weaning pigs and allows pigs to remain on feed- and water-delivered antibiotics during this challenging phase.

To help producers in the fight against stomach *Salmonella*, Argus® SC/ST aids in the prevention of pneumonia, diarrhea, septicemia and mortality caused by *Salmonella choleraesuis* and aids in control of disease and shedding of *Salmonella typhimurium*. Argus SC/ST has also been proven to reduce levels of *Salmonella* in ileo-cecal lymphnodes of pigs at slaughter.[1]

Dr. Moeser suggests producers work closely with industry experts and their veterinarians to determine which environmental or social stressors are impacting their operation most. "The key to moving forward is understanding your production system and where stress and pathogens have the potential to cause the most harm," he says. "The production environment is very complex, and there are multiple factors that can impact overall gut health."

For more information about the Porcilis Ileitis and Argus SC/ST vaccines, talk to your local Merck Animal Health representative or visit www.merck-animal-health-usa.com.

[1]Data on file, Merck Animal Health.