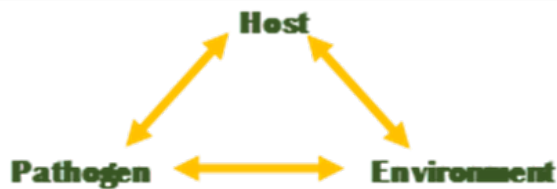


“A healthy gut will enable a pig to better cope with stress and fight off pathogens.”

The topic of gut health is commonly associated with nursery pigs. However, all pigs need a healthy and properly functioning gut to perform at their best. Gut health should not become an afterthought once the pigs exit the nursery; it should be a priority all the time. Fighting, out-of-feed events, marketing and temperature fluctuations are all examples of some of the stressors a pig will encounter during their time in the finishing barn. How a pig responds to various stressors can be attributed to their gastrointestinal tract's health status.

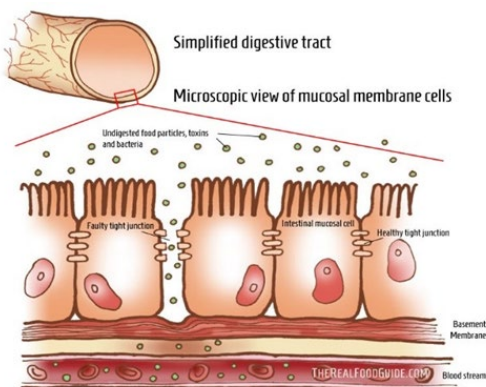
A single layer of cells, called enterocytes, lines the wall of the intestine. Those cells are responsible for aiding with digestion, nutrient uptake and water absorption and for preventing pathogens and toxins from crossing the epithelium and gaining access to the body and bloodstream. A robust and properly functioning gastrointestinal tract is imperative to optimizing pig growth and performance and feed efficiency.

Figure 1. The disease triangle



This point is illustrated through the disease triangle concept, which states that disease requires interactions between the pathogen, the host and the environment (ex. stress; Figure 1). Therefore, stressful situations, such as out-of-feed events, can have a negative impact on a pig's GI tract, consequently decreasing its barrier functions and increasing the pig's susceptibility to disease. "Barrier function" refers to the tight junctions between the intestinal epithelium. These tight junctions and the enterocytes can be thought of in the same way as tile and grout. Grout is applied between tiles to protect the tile from water and other substances that could get behind the tile and create damage. The same concept applies to the GI tract: If the tight junctions between the enterocytes remain closed, pathogens cannot pass through and enter the body. However, if these tight junctions open and become "leaky," pathogens and toxins can pass through and enter the body, eliciting an immune and inflammatory response. Subsequently, diverting nutrients away from growth will decrease performance.

Figure 2. Example of tight junctions and leaky gut.



There are several ways that we can positively influence gut health on the farm, including those listed below:

- **Adding fiber to the diets** — such as wheat midds, DDGS or soy hulls — at inclusion rates as low as 1–5% may positively impact gut health. Fiber has a prebiotic effect, whereby it acts as a substrate for the bacteria, improving the gut’s micro-environment and immune system.
- **Eliminating out-of-feed and water events** is one of the easiest ways to improve gut health. When pigs do not have access to water or experience an out-of-feed event, several stressors are being placed on them. Pigs become more aggressive towards their pen mates. They do not have enough nutrients to sustain efficient growth. Once pigs do get access to feed or water, they may overconsume it and predispose themselves to a twisted gut.
- **Use supplemental, natural, plant-based products**, such as polyphenols, the building blocks of cellular repair in plants. Polyphenols promote rapid tissue healing by blocking the attachment of toxins and pathogenic bacteria to cells, lowering inflammation and swelling and promoting the healing and repair of damaged mucosal cells.
- **Feed additives** such as copper chloride, yeast products and essential oils can aid in creating and maintaining a healthy gut environment. Additional information can be found in the Feed Additives section of this guide.
- **Avoid feeding pellets**, since pelleting raises the risk of stomach ulcers and usually decreases feed intake among pigs that are coping with health challenges. The feed conversion improvements gained by feeding pellets to health-challenged pigs in the grow-finish stage will be completely negated by the expected increase in death and sort losses.

Finally, no gut health discussion is complete without covering hemorrhagic bowel syndrome (HBS) and ileitis.

- **Hemorrhagic bowel syndrome (HBS)** is an elusive condition in the finisher that often strikes sporadically in seemingly healthy 4-to-6-month-old finishing pigs. Pigs are diagnosed with HBS postmortem when the pig dies suddenly without any indication of illness. The pig will present with pale skin, a distended abdomen, a thin-walled small intestine with both clotted and unclotted blood present, tarry fecal material in the large intestine, and no lesions or ulcerations of the gastrointestinal tract. Little is known about what causes the onset of HBS, but several nutritional and management strategies — such as the inclusion of fiber, reducing out-of-feed events and maintaining consistent access to feed — may prove helpful in the face of or for preventing an HBS outbreak. Other factors, such as appropriately stocking the barn, properly ventilating facilities and providing sufficient feeder access, can help diminish the occurrence of HBS.
- **Ileitis** is a gastrointestinal disease caused by the bacteria *Lawsonia intracellularis*. Some common symptoms of ileitis are diarrhea, reduced average daily gains and decreased feed efficiency. However, the symptoms that manifest are dependent on the type of ileitis: subclinical, clinical/chronic or acute.
 - **Subclinical:** There are no discernable symptoms with subclinical ileitis, aside from decreasing average daily gains and feed efficiency in the affected pigs. Additionally, environmental stressors, such as weather or commingling, could progress the disease from subclinical to clinical.
 - **Clinical/chronic:** This type of ileitis usually affects growing pigs and can result in pasty/watery diarrhea, along with reductions in weight gain and feed efficiency in affected pigs, resulting in an uneven weight distribution among a flow of pigs.
 - **Acute:** Acute ileitis appears in finishing pigs and is marked by bloody/black diarrhea, lethargy and weakness. Sudden death may also be a result of acute ileitis.

Pictured to the right are intestine samples from a pig infected with ileitis and a healthy pig. The intestine sample on the left is much thicker and indicative of ileitis, while the sample in the middle from a normal/healthy pig shows the finger through the lining.



Tail Biting

Vice behavior in swine production facilities is both a welfare concern and an economic problem for producers. Tail biting is one of the top vice behavioral problems in grow-finish pigs, leading to producer losses due to reductions in gains, secondary infections, death or carcass condemnations. Tail biting can sporadically affect either a single pig or the whole pen of pigs or can be a pervasive problem facing entire flows of pigs. Numerous factors — such as the environment, animal husbandry and nutrition — can play a role in triggering this negative behavior.

Anyone who has walked through a pig pen has observed individual pigs or even certain genetic lines exhibiting more aggressive behaviors than others. Studies have shown that pigs are naturally attracted to the taste and sight of blood. However, natural behavior is only a piece of the puzzle, and as previously stated, numerous other factors can increase the prevalence of tail biting, such as:



- Tail docking (too long and inconsistent)
- Barn management
- Nutrition (out-of-feed events, salt deficiency, etc.)
- Increased stocking density and overcrowding
- Extreme temperatures
- Poor ventilation (poor air quality, drafts, humidity)
- Light (too dim/too bright, less than 6 hours of darkness per day)
- Health challenges

Tail Docking

Properly docking tails is one of the best methods for reducing the incidence of tail biting. However, docked tails should be uniform in length, as it has been reported that herds with variable tail lengths have more incidences of tail biting.



Nutrition

Inadequate access to both quality feed and water can act as a trigger for tail biting. Some common feed quality issues associated with tail biting can include mycotoxins, low salt levels or improperly balanced diets.

Stocking Density

As the stocking density increases, so does competition at the feeder and waterer, which can result in increased ear and tail biting. In addition to higher stocking densities, mixing pigs or pens with greater size variations may also increase the risk of tail biting.

Environment

Several environmental factors within a barn can influence the incidence of tail biting, such as excessive heat or cold, improper ventilation, lighting, dust or noxious gases. In most current production systems, heat stress during the warm summer months is of greater concern than cold stress during the winter months. When pigs reach their upper critical temperature, they begin to experience heat stress, which can trigger negative behaviors, such as tail biting. It has been observed in some cases that misting pigs during hot weather has reduced tail biting. Greater daily temperature variations can result in increased tail biting compared to a consistent temperature outside of the pig's thermoneutral zone.

Drafts and increased humidity caused by improper ventilation can increase pig stress and tail-biting. Barn lighting — both when the barn is too bright or is dimly lit — or not enough hours of darkness may also impact the occurrence of tail biting. It is recommended that fluorescent lights emit 0.2 watts/ft², whereas incandescent lights should emit around 0.8 watts/ft², with at least 6 hours of darkness provided. Maintaining an optimal living environment through proper ventilation, lighting and temperature control will positively impact pig welfare and tail biting.

A Solutions Checklist

1. Properly Dock Tails

- Maintain a consistent mature length of 2–3 inches.

2. Nutrition

- Formulate to the proper digestible lysine levels in weight-appropriate phases.
- Budget for the correct pounds per pig with each diet.
- Manage mycotoxin ingestion by formulating diets with ingredients containing low levels of mycotoxins and by implementing toxin-mitigation products. Use 5–8 lbs. of magnesium oxide per ton.
- Add an additional 2–4 lbs. of salt.
- Add an additional 2–3 lbs. of potassium chloride.
- Ensure adequate access to good-quality water.

3. Stocking Density

- Do not exceed a pig density of less than 7.5 square ft. per pig.
- Evenly remove pigs from every pen during the initial marketing period.

4. Barn and Environmental Management

- Eliminate out-of-feed events.

- Adjust feeder settings so that the feeder will be more open during late finishing, when feeder competition is the highest.
- Consider increasing the minimum ventilation in the late finishing phase.
- Consider decreasing the set point in the late finishing phase.
- Provide environmental enrichment as needed.

5. Implement New Technology

- The AllBite vice mitigation block is a proven technology designed to combat tail biting. AllBite is a poured block containing biologically active ingredients that decrease aggression in pigs while providing a social stimulus. The AllBite block provides an enrichment tool that satisfies all four conditions for a good enrichment product: it is edible, chewable, destructive and manipulable. AllBite is a convenient and immediate solution for producers to combat vice behaviors.

