

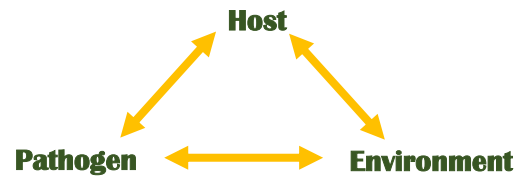
The topic of gut health is commonly associated with nursery pigs. However, all pigs need a healthy and properly functioning gut to perform at their best. Gut health shouldn't become an afterthought once the pigs exit the nursery, it should be an all the time deal. Fighting, out of feed events, marketing, 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 in part be attributed to the health status of their gastrointestinal tract.

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

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

This point is illustrated through the disease triangle concept which states that disease requires interactions between the pathogen, host, and environment (stress; Figure 1). Therefore, stressful situations, such as out of feed events, can have a negative impact on a pig's GI tract, and consequently decreases barrier function and increases susceptibility to disease. Barrier function refers to the tight junctions between the intestinal epithelium. The tight junctions and enterocytes can be thought of 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 cause 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 and decreasing performance.

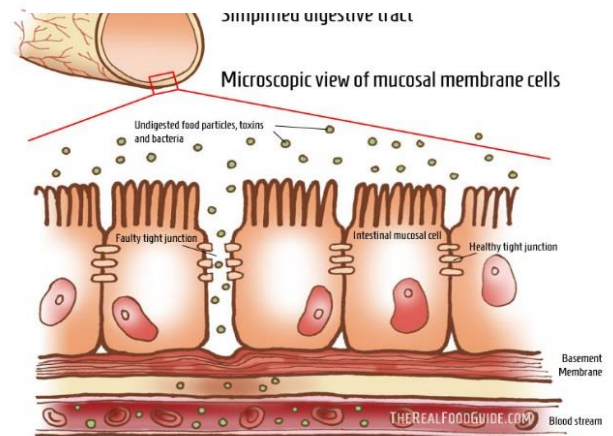
Figure 1. The disease triangle



A few ways that we can positively influence gut health on the farm are:

- **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, where it acts as a substrate for the bacteria, improving the gut 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 taking place. Pigs become more aggressive towards their pen mates. They do not have enough nutrients to sustain efficient growth. Once the pigs do get access to feed or water, they may over consume and predispose themselves to a twisted gut.

Figure 2. Example of tight junctions and leaky gut.



- **Feed additives** such as copper chloride, yeast products, and essential oils can aid in creating and maintaining a healthy gut environment.
 - **Copper chloride** provided at pharmacological levels acts as an anti-microbial and helps to decrease the growth of disease causing bacteria in the gut.
 - **Yeast products** are added to diets as a food source for the beneficial bacteria within the gut. By providing a food source for the good bugs, we are creating a favorable bacteria balance in the gut and in turn positively impacting gut health.
 - **Essential oils**, such as oregano, cinnamon, thyme, and capsicum, help to promote good gut health by stimulating the growth of the beneficial microbes while suppressing their competitors.

Finally, no gut health discussion is complete without covering Hemorrhagic Bowel Syndrome (HBS) and Ileitis.

- **Hemorrhagic bowel** is an elusive disease in the finisher that seems to strike sporadically and seemingly healthy 4-6 month old finishing pigs. Pigs are diagnosed with HBS post mortem when the pig dies suddenly without out any indication of illness. The pig will present with pale skin, distended abdomen, thin walled small intestine with clotted and unclotted blood present, tarry fecal material in the large intestine, and no lesions or ulcerations of the GIT. Little is known about what causes the onset of HBS but several nutritional and management strategies, such as fiber and reducing out of feed events, may prove helpful in the face of or preventing an HBS outbreak.
- **Ileitis** is a gastrointestinal disease caused by the bacteria *Lawsonia intracellularis*. Common symptoms of ileitis are diarrhea, reduced average daily gain and feed efficiency. However, symptoms are dependent on the type of ileitis: subclinical, clinical/chronic, or acute.
 - **Subclinical** – There are no discernable symptoms, aside from decreasing average daily gain and feed efficiency in the affected pigs. Additionally, environmental stressors such as weather or commingling, could move the disease from subclinical to clinical.
 - **Clinical/Chronic** – 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** - Generally appears in finishing pigs and is marked by bloody/black diarrhea, lethargy and weakness. Sudden death may also be a result of acute ileitis.



Figure 3. Pictured to the left 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 is from a normal pig and you can see fingers through the lining.

Gut Health FAQ's

- **What can I do to reduce HBS from happening in finishing?**
 - HBS is very unpredictable and it seems as though anything can cause HBS ranging from genetics to certain times of the year. Hemorrhagic Bowel Syndrome is a multifactorial issue which makes understanding and treating the costly problem particularly difficult. The best advice in preventing a HBS problem is to focus on positively affecting the factors we can control. This would include aspects both outside and inside the pig. Outside of the pig, focus should be placed on appropriately stocking the barn, eliminating out of feed events, and properly ventilating facilities. Efforts inside the pig should be focused on building better gut health, which will ensure that microbial populations do not become unbalanced. Achieving the aforementioned can be accomplished through the measured use of yeasts, essential oils, and antimicrobial products. The most important concept to understand regarding HBS is that your best line of defense is to be proactive and not reactive in preventing outbreaks.
- **I'm facing health challenges in my barn, should I be feeding pellets in finishing?**
 - Pelleted diets should be fed to generally healthy pigs only. That's because pelleting raises the risk of stomach ulcers and usually decreases feed intakes among pigs that are coping with health challenges. The reason why pelleted feeds increase death loss and sort loss in health challenged pigs is largely unknown. In general, the feed conversion improvement gained by feeding pellets to health challenged pigs in grow finish will be completely negated by the expected increase in death loss and sort loss.
- **At what micron size should my feed be to optimize gut health and performance?**
 - The general rule of thumb is grind feed as fine as possible without causing flowability issues in the bin or the feeder. A complete feed particle size of 500-700 microns are common recommendations for grow finish feed. Grinding feed very fine can benefit feed conversion but the positive effects are negated by the potential out of feed events. Out of feed events caused by fine grinding will increase death loss and reduce average daily gain.
- **What are some products I can use to improve the gut health of my herd?**
 - Assist
 - A combination of yeast culture product and copper chloride that has been shown to increase weight gain in grow-finish pigs. Copper chloride helps decrease the growth of disease causing bacteria and the yeast culture promotes the growth of favorable bacteria.
 - Opti-Remedy
 - A blend of essential oils designed to reduce harmful bacteria and promote good gut health. Opti-Remedy stimulates the growth of beneficial bacteria.
 - Skycis
 - An ionophore used to promote weight gain and feed efficiency in growing pigs. Ionophores decrease the growth of gram positive bacteria and promote the growth of gram negative bacteria. Gram negative bacteria increase the energy status of growing pigs.
- **What role do Mycotoxins play in gut health**
 - Mycotoxins in general can reduce feed intake or cause feed refusal. The effects of having inconsistent intake can cause and increase in HBS, ulcers, and acute ileitis.
- **How do I prevent or treat Ileitis?**
 - The use of fiber and gut health products, like essential oils, has been suggested to reduce the incidence of ileitis. A proper medication and/or vaccination protocol should be developed with a veterinarian if your herd is experiencing clinical Ileitis.