



# GUT HEALTH

## TRIPLE CHECK



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In today's livestock production environment, gut health is increasingly synonymous with animal health. The Kemin Gut Health Solutions program encompasses many health priorities, such as nutrient digestion and absorption, metabolism and energy generation and more. Proper gut health promotes the absence and prevention of disease, leading to optimal performance.

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UP  
TO **70%**  
OF THE IMMUNE  
SYSTEM IN PIGS  
RESIDES IN THE  
GASTROINTESTINAL  
TRACT.\*



Kemin has been a proactive leader within the gut health industry. By using decades of scientific research, thorough testing and customer feedback, Kemin created its multi-faceted **Gut Health Triple Check** approach to provide a broad platform of solutions.

## GUT HEALTH BEGINS IN THE NURSERY

A long-term, comprehensive approach to swine gut health is crucial — Kemin solutions support and protect pigs from nursery to finish. Proper gut health support will strengthen intestinal integrity, ensure a healthy microbial balance and support immune function.

**The interaction of these factors determines the optimal nutrient utilization of the animal and helps promote the following:**

- Better nutrient digestion and absorption
- Proper weight gain and management
- Healthy metabolism response for energy generation
- Absence, prevention and avoidance of disease
- Bone and joint health

## HEALTH CHALLENGES CREATE GUT INFLAMMATION

When gut health is compromised, inflammation often occurs. Triggers such as oxidative stress, mycotoxins, social and environmental stress, fast growth rates and dysbiosis of the microbiome can spark this process. Many of these triggers also impact one another (e.g., social stress leading to dysbiosis), which can lead to a cycle of inflammation — ultimately, leaving animals more susceptible to illness. This can result in poor quality of life for the animal and a shrinking profit margin for producers.

### **Pathogens Impacting Swine Gut Health:**

- |                           |  |
|---------------------------|--|
| ■ Circovirus              | ■ Porcine Epidemic Diarrhea virus (PEDv) |
| ■ <i>Escherichia coli</i> | ■ Rotavirus                              |
| ■ <i>Clostridia</i>       | ■ <i>Salmonella</i>                      |

# GUT HEALTH

## TRIPLE CHECK

Recently, intestinal health has been elevated to the same level of importance as other management practices. The Kemin Gut Health Triple Check helps you to establish the intestinal integrity and protection your pigs need.

This program serves as a support system to **CLEAN UP** contaminants in feed and water prior to animal exposure, **BUILD UP** intestinal strength and immunity to reduce leaky gut and **KNOCK OUT** harmful pathogens for healthier and better performing pigs.

Over the years, Kemin has researched alternatives to antibiotic use, creating gut health solutions for swine — positively impacting beneficial bacteria and optimizing feed efficiency. Improving swine gut health involves a comprehensive focus on the feed going into the animal, integrity of the intestinal wall and pathogen reduction. Each of these elements are interconnected and all must be checked to optimize efficiency.



A COMPREHENSIVE FOCUS  
ON CONTAMINANT MITIGATION,  
INTESTINAL INTEGRITY AND  
PATHOGEN REDUCTION.

**CLEAN UP • BUILD UP • KNOCK OUT**

# CLEAN UP

With the continued industry-wide reduction in antibiotic usage, producers are discovering an entirely new set of management challenges which impact animal health and performance. When using medications, quality problems can be disguised in fat, grain, water and finished feed. However, in today's production systems, those previously low-priority concerns can become major problems.

## HEALTHY PIG

When gut integrity is uncompromised, contaminants from feed and water move through the animal with little negative impact to the animal or its performance.

## COMPROMISED PIG

If contaminants from feed and water get into the animal and the gut is NOT healthy (due to strain from stressors like heat, feed changes, disease, etc.), contaminants have the ability to invade the gut lining and potentially move into the bloodstream, going systemic and causing major production and health issues.

## HELP PREVENT THE PREVENTABLE

Safeguarding feed and water quality starts with protecting raw materials as they arrive at the feed mill and continues through manufacturing and storage.

**Target specific profit-robbing contaminants in fat, grain, water and finished feed using the following Kemin Gut Health Solutions:**

ENDOX<sup>®</sup>

KALLSIL<sup>™</sup>

CURB<sup>®</sup> AF

Acid LAC<sup>™</sup>

Myco CURB<sup>®</sup>

RENDOX<sup>®</sup>

CURB<sup>®</sup> RM Extra

Ammo CURB<sup>®</sup> 85

# SAFEGUARD

YOUR FEED AND WATER QUALITY



# BUILD UP


Intestinal integrity is all about maintaining the strength of the intestinal barrier in order to maximize nutrient absorption within the pig. The intestinal barrier is made up of a layer of epithelial cells, which prevent harmful pathogens and toxins from entering the system (e.g., leaky gut), and are critical for fluid and electrolyte secretion. The intestinal barrier is regularly exposed to up to 10 trillion microorganisms, making it extremely important to keep it functioning properly.<sup>1</sup>

To strengthen the barrier, the focus is on the tight junctions and minimizing cell damage. By upregulating the proteins making up the tight junctions, the barrier is built stronger, reducing toxin transfer. The barrier can also be stronger and can maintain proper absorption if lesions are reduced or can heal quicker after a challenge has occurred.

Additionally, since up to 70% of the immune system resides in the intestine, preparing the pig for a challenge is imperative.<sup>2</sup> By building up immune cells, the pig can improve their ability to fight off disease and maintain performance during challenges.

**Maintain intestinal barrier strength of your pigs to maximize nutrient absorption and prevent harmful pathogens and toxins from entering the system with the following Kemin Gut Health Solution:**

KemTRACE®  
**CHROMIUM**  
*Essential to you and your operation.*



THE INTESTINAL  
BARRIER IS REGULARLY  
EXPOSED TO UP TO  
**10 TRILLION**  
MICROORGANISMS<sup>1</sup>

# KNOCK OUT

A healthy balance of microbiota provides protection against pathogen colonization and contributes to the overall well-being of the pig. In order to achieve a healthy balance, knocking out potentially harmful pathogens is necessary. Controlling and inhibiting pathogens can encourage the microbiota to produce metabolic substrates like vitamins and short-chain fatty acids.<sup>2</sup>

## **BENEFITS OF PATHOGEN KNOCK OUT IN THE GASTROINTESTINAL TRACT:**

- Improved host nutrition
- Reduced intestinal pathogen colonization leading to sickness
- Development of proper intestinal morphology
- Enhanced immune function

Balancing microbiota to promote gut health diversifies the complex community of microorganisms living in the digestive tract of pigs. Knocking out harmful bacteria to encourage beneficial bacteria promotes a healthy gastrointestinal (GI) tract by stimulating the immune system and protecting against pathogens.

**Support intestinal balance to inhibit or eliminate harmful pathogens from infiltrating the body with the following Kemin Gut Health Solutions:**

**FORMYL**

**KEM-GEST®**

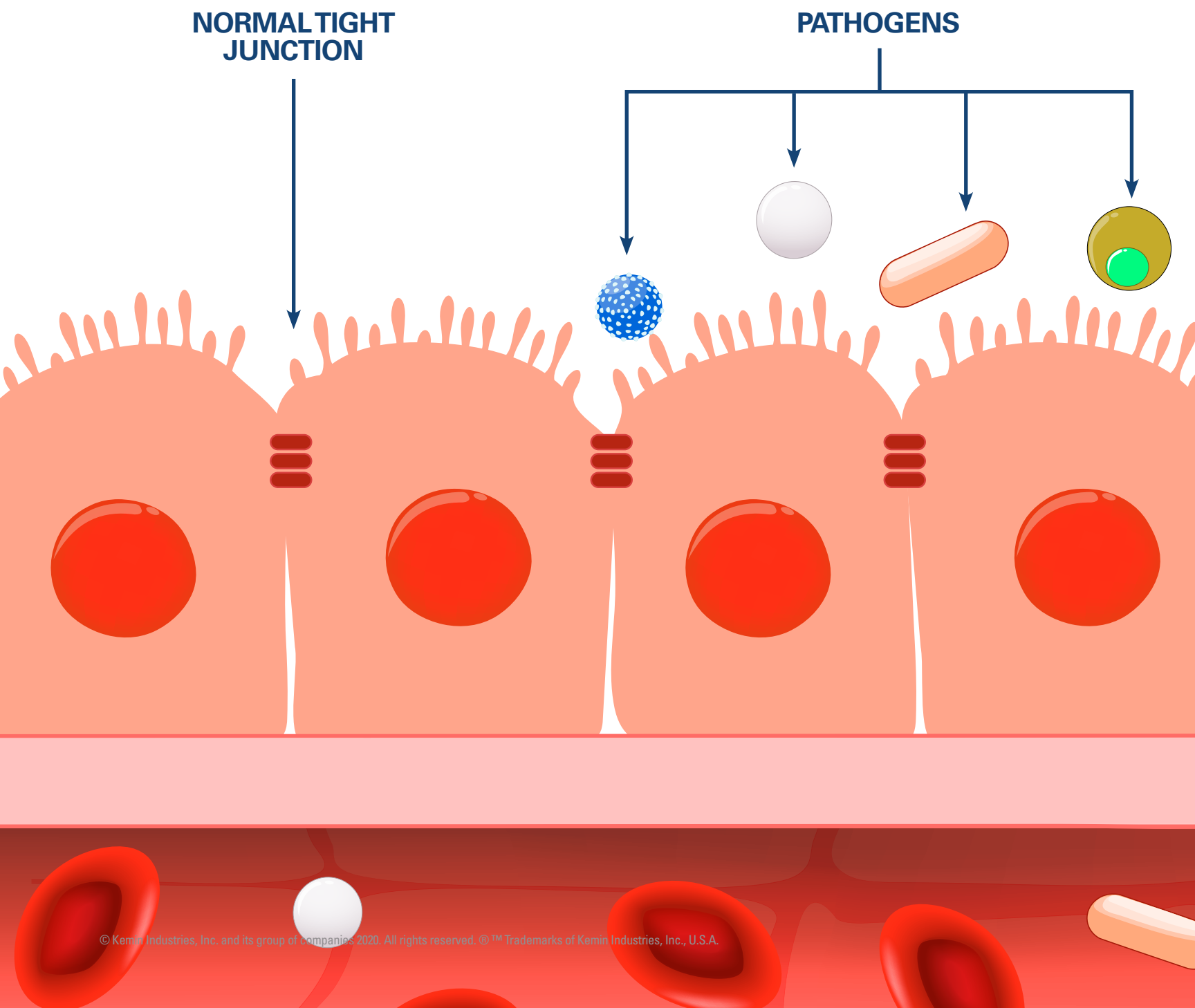
**Acid LAC**

A photograph of a pig in a pen, overlaid with a yellow gradient. The pig is looking towards the camera.

# PROTECT AGAINST PATHOGENS

# BUILD A BARRIER AGAINST LEAKY GUT

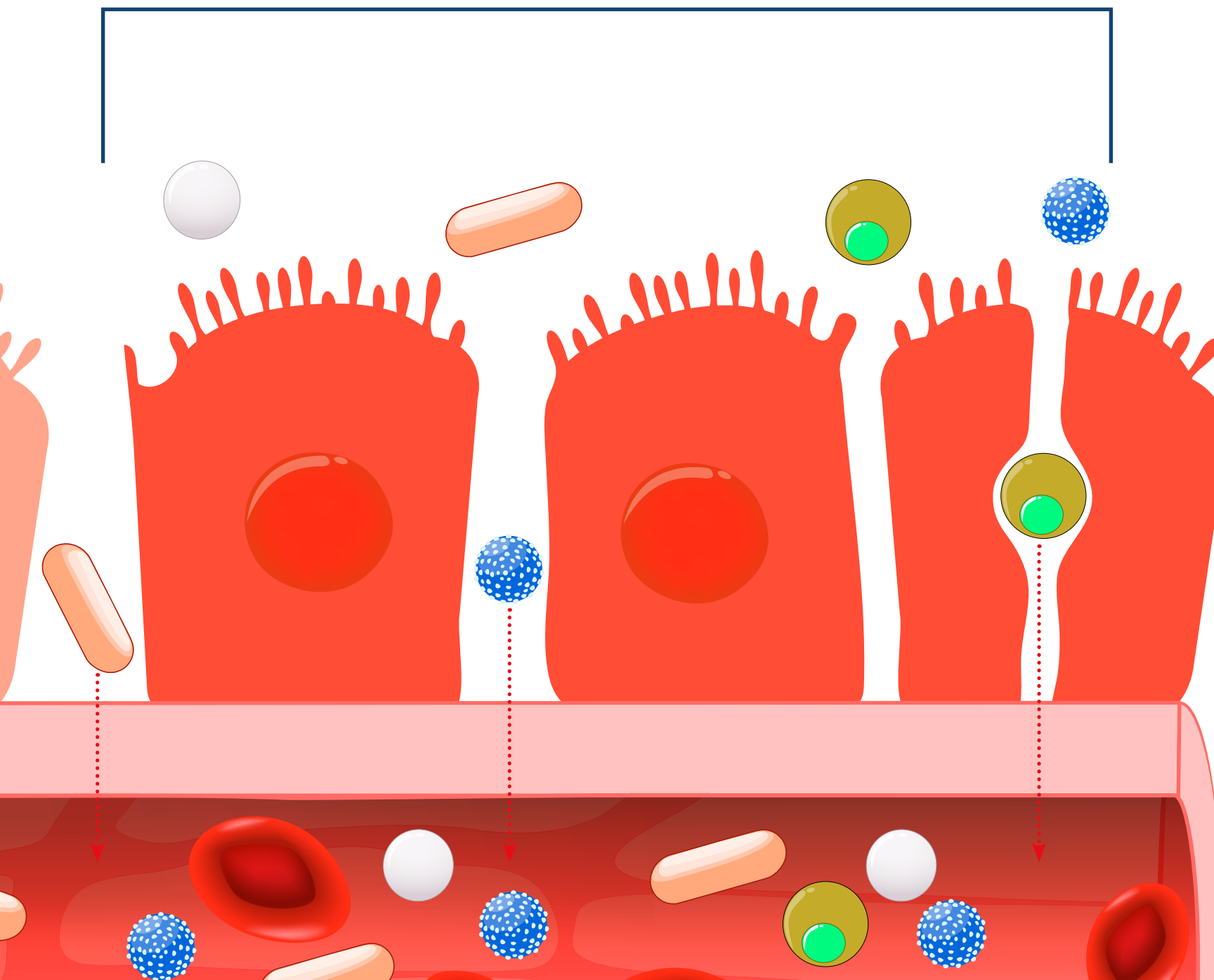
THE INTESTINAL BARRIER IS REGULARLY EXPOSED  
TO UP TO 10 TRILLION MICROORGANISMS.



**The intestinal barrier is made up of a layer of epithelial cells, which prevent harmful pathogens and toxins from entering the system — also known as leaky gut.**

The intestinal barrier is regularly exposed to up to 10 trillion microorganisms, making it extremely important to keep it functioning properly. Additionally, up to 70% of the immune system resides in the gastrointestinal tract, so preparing the animal for a challenge is imperative.

### LEAKY GUT



# GUT HEALTH TRIPLE CHECK SOLUTIONS

## Acid LAC™

Acid LAC is a unique combination of effective organic acids. It has been proven to control a broad spectrum of pathogenic bacteria in drinking water. By reducing the pathogen load in the water, there are fewer challenges presented to the animal, which helps maintain gut health.

## Ammo CURB® 85

Ammo CURB is a low-cost feed preservative for processed feed ingredients, complete animal feeds and total mixed rations (TMR). It may be added directly to complete feed, feed ingredients and total mixed ration (TMR) to help maintain stability during short-term storage.

## CURB® AF

CURB AF is a formaldehyde solution that maintains quality of complete feed and ingredients.

## CURB® RM Extra

CURB RM Extra is a blend of formaldehyde and propionic acid designed to protect feed and feed ingredients from mold development.

## ENDOX®

ENDOX was formulated specifically to protect finished feeds by safeguarding fat-soluble vitamins against degradation, protecting complete feeds from fat oxidation, vitamin loss and more.

## FORMYL™

FORMYL is a free-flowing micro-encapsulated source of formic and citric acid. Formic acid, which helps reduce GI tract pH while reducing bacterial contamination.

## KALLSIL™

KALLSIL reduces caking in swine feed by absorbing moisture. This results in improved flow in feed ingredients to prevent feed from hanging to the sides of the bins or feeders.

## KEM-GEST™

KEM-GEST is a blend of organic and inorganic acids designed to provide an economical means to acidify swine feed. This multi-acid approach helps protect a pig's GI tract from growth-limiting pathogens. Inhibition of pathogens promotes better gut health and production efficiency.

## KemTRACE® CHROMIUM

KemTRACE Chromium — the first product of its kind on the market — is a safe, proven trace mineral. This highly bioavailable, organic source of chromium propionate helps to reduce the negative effects of stress and improve glucose utilization.

## Myco CURB®

Myco CURB is a mold inhibitor for feed, formulated to inhibit mold growth in processed feed ingredients, complete feed and TMR. Myco CURB contains propionic acid blended with sorbic and benzoic acids and is buffered for improved equipment and employee safety.

## RENDOX®

RENDOX stabilizes animal fats and protein meals during the rendering process with antioxidants to maintain product freshness, protect product quality, and increase product shelf life.

**Visit [Kemin.com/GutHealthSolutions](https://www.kemin.com/GutHealthSolutions) to find out what gut health solutions will improve your swine operation.**



# GUT HEALTH SOLUTIONS

## A COMPREHENSIVE APPROACH TO GUT HEALTH

Help each pig reach its full production potential. Establish the intestinal integrity and protection your pigs need using our Gut Health Triple Check.

Kemin offers a range of nutritional solutions for raising healthy animals. We understand your need to raise healthy livestock and poultry that give consumers the nutritional and health benefits they are looking for, while also returning a profit. Our products and services help you with nutrition, feed quality and gut health.

**[Kemin.com/GutHealthSolutions](https://www.kemin.com/GutHealthSolutions)**

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