



# GUT HEALTH

## TRIPLE CHECK





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, prevention and avoidance of disease to support maximum performance.

UP TO **70%**  
OF THE IMMUNE  
SYSTEM IN  
LIVESTOCK  
RESIDES IN THE  
GASTROINTESTINAL  
TRACT.<sup>1</sup>

1. Vighi, G., Marcucci, F., Sensi, L., Cara, G. D., & Frati, F. (2008). Allergy and the gastrointestinal system. *Clinical & Experimental Immunology*, 153, 3-6. doi:10.1111/j.1365-2249.2008.03713.x



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 WITH CALVES

A long-term, comprehensive approach to ruminant gut health is crucial — Kemin solutions support and protect calves from birth to the end of production. 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:**

- 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 ruminant gut health:**

- *Escherichia coli*
- *Clostridia*
- *Salmonella*



# 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 establish the intestinal integrity and protection your ruminants 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 livestock.

For years, Kemin has researched alternatives to antibiotic use, creating gut health solutions for livestock — positively impacting beneficial bacteria and optimizing feed efficiency. Improving livestock gut health involves a comprehensive focus on the feed going into the animal, integrity of the intestinal wall, immunity 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, IMMUNITY  
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, 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 LIVESTOCK

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

### COMPROMISED LIVESTOCK

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:

Ultra CURB<sup>®</sup>

ENDOX<sup>®</sup>

Myco CURB<sup>®</sup>

RENDOX<sup>®</sup>

Ammo CURB<sup>®</sup>

KALLSIL<sup>™</sup>

KEM SAN<sup>®</sup>

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 animal. 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 livestock for a challenge is imperative.<sup>2</sup> By building up immune cells, the animal can improve its ability to fight off disease and maintain performance during challenges.

**Strengthen the intestinal barrier and immune system to maximize nutrient absorption and inhibit harmful pathogens or toxins with the following Kemin Gut Health Solution:**

**KemTRACE<sup>®</sup>  
CHROMIUM**  
*Essential to you and your operation.*

**LYSOFORTE**

# KNOCK OUT

A healthy balance of microbiota provides protection against pathogen colonization and contributes to the overall well-being of livestock. 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>3</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 livestock. 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:**

**CLOSTAT<sup>®</sup>**

**KEM SAN<sup>®</sup>**

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

**PROTECT**  
AGAINST PATHOGENS

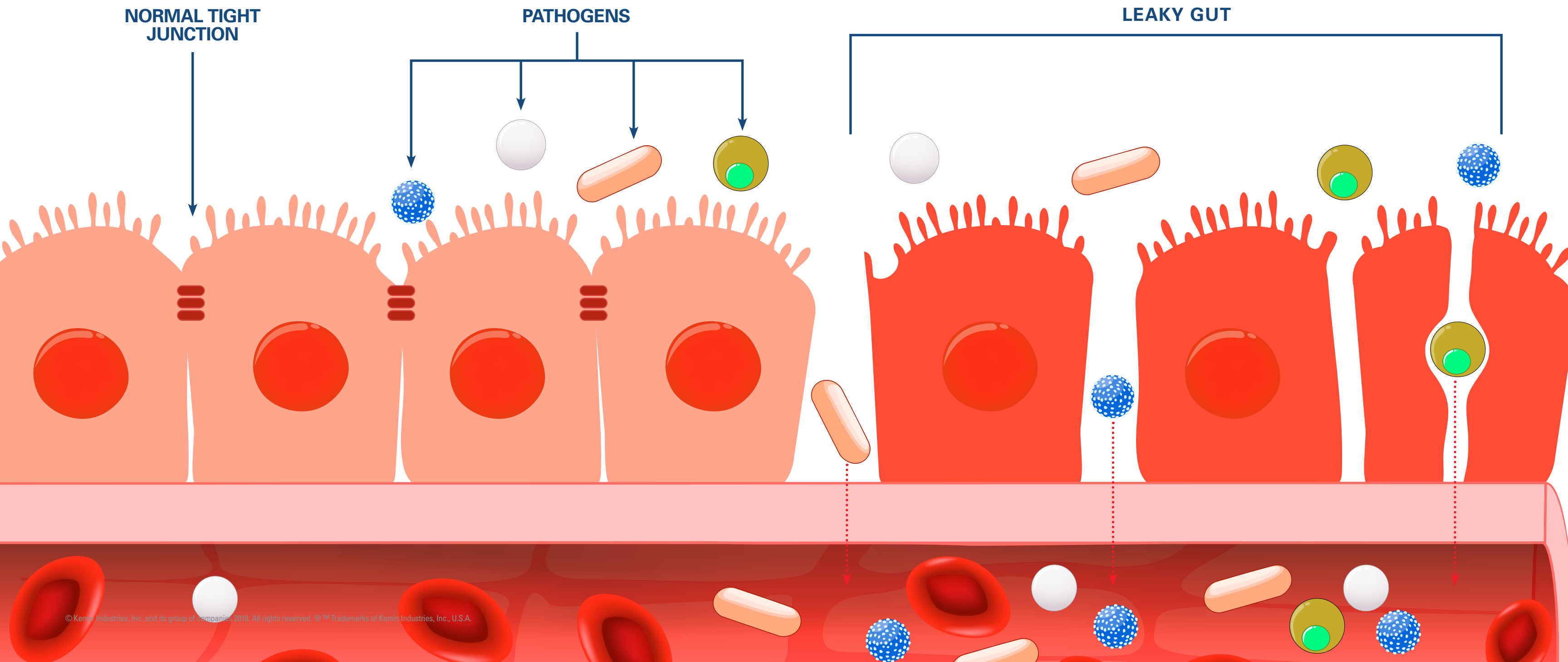
# BUILD A BARRIER AGAINST LEAKY GUT

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.

By upregulating the proteins making up tight junctions, the barrier is built stronger, reducing toxin transfer and inflammation, and helping to maintain proper nutrient absorption for optimal animal performance.



# GUT HEALTH TRIPLE CHECK SOLUTIONS

Help your livestock perform at the highest level and improve their overall health. Establish the intestinal integrity and protection your animals need by using our Gut Health Triple Check program.



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.

## CLOSTAT®

CLOSTAT contains a proprietary, patented strain of *Bacillus subtilis*, PB6 to support intestinal balance. PB6 is a unique, naturally occurring, spore-forming microorganism. Kemin internal research has shown PB6 can inhibit *C. difficile* as well as other pathogens.<sup>1</sup>

## Ultra CURB®

Ultra CURB is a proprietary blend of four powerful organic acids — propionic, acetic, benzoic and sorbic. It is specifically formulated to control mold and wild yeast species in feed ingredients, texturized feed and total mixed rations (TMR).

## Myco CURB®

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

## Ammo CURB®

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 TMR to help maintain stability during short-term storage.

## LYSOFORTE®

LYSOFORTE is a nutritional emulsifier designed to improve fat emulsification, increase fat hydrolysis and enhance digestion and absorption of energy-rich feed ingredients, including fats, oils and fat-soluble nutrients. Lysolecithins in LYSOFORTE help to improve fat digestion and absorption thereby improving milk fat yield and milk fat percentage.

## 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.

## RENDOX®

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

## KALLSIL™

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



KEM SAN is a unique combination of effective organic acids. It has been proven to inhibit and kill a broad spectrum of pathogenic bacteria in drinking water. By reducing the pathogen load in the water, there are fewer challenges presented to livestock, which helps maintain gut health.

Visit [Kemin.com/GutHealth](https://www.kemin.com/GutHealth) to find out what gut health solutions will improve your dairy or feedlot operation.

1. Inhibitory Characteristics of *Bacillus subtilis*, PB6 on Clostridial Isolates From Poultry, BB-09-00010.





# GUT HEALTH SOLUTIONS

## A COMPREHENSIVE APPROACH TO GUT HEALTH

Help each animal reach its full production potential. Establish the intestinal integrity and protection your animals 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 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, gut health and pathogen control.

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

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