



Improving Nursery Pig Performance with Diet Acidification

What is KEM-GEST™?

KEM-GEST™ is a blend of organic and inorganic acids designed to provide an economical means to acidify swine feed. Swine producers have successfully used KEM-GEST™ for years to improve weaned pigs' ability to digest complex diets.

Features

- Cost-effective means of providing feed acidification to swine diets
- Contains a blend of acids, including lactic acid
- Flow-able, dry product, easy to handle and simple to add to feed
- Long history of industry use and positive results

Benefits

- Supports gut health through improved intestinal barrier function
- Improves activity of gastric enzymes post-weaning, enhancing digestion
- Helps reduce urine pH

Feeding Instructions

- 3-6 lbs. per ton of feed for nursery pigs up to 45 lbs. of body weight

Why KEM-GEST™?

MULTI-ACID APPROACH HELPS NURSERY PIG WITH:

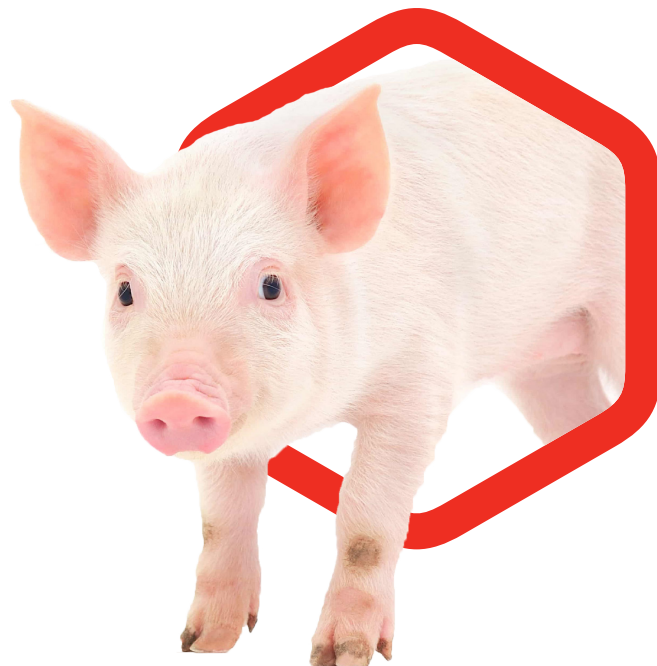
- Needed HCl (hydrochloric acid) production in stomach
- Helps protect gastrointestinal tract from growth-limiting pathogens
- Promotes production efficiency

Why Should I Use a Diet Acidifier?

Young pigs have limited ability to produce HCl in the stomach. HCl production is minimal at birth but increases with age. The greater the production of acid in the stomach, the lower the gastric pH. The pH in the stomach can regulate the movement of viable bacteria from the environment to the small intestine.

The Role of Acid Dissociation

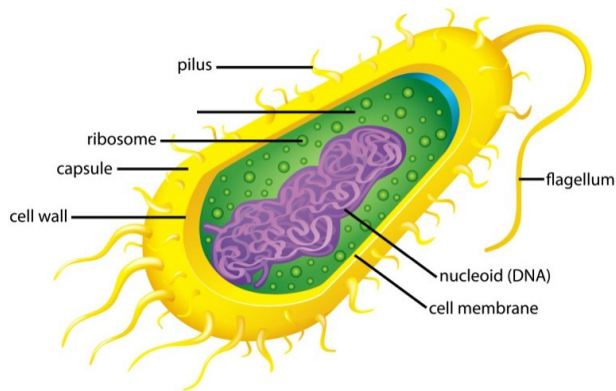
Every acid dissociates (loses its H⁺ ions) at its own rate. Inorganic acids dissociate quickly causing a rapid drop in pH to a solution. Organic acids are slower to dissociate. KEM-GEST™ provides the benefits of both.



How Organic Acids Kill Bacteria¹

- 1 | A blended solution of organic acids is placed into an environment where bacteria is present
- 2 | Intact acid molecules enter bacteria cell through the cell wall
- 3 | Intact acid molecules give up their H⁺ ions inside the bacteria cell to lower the pH
- 4 | pH of cytoplasm drops rapidly creating intracellular heartburn

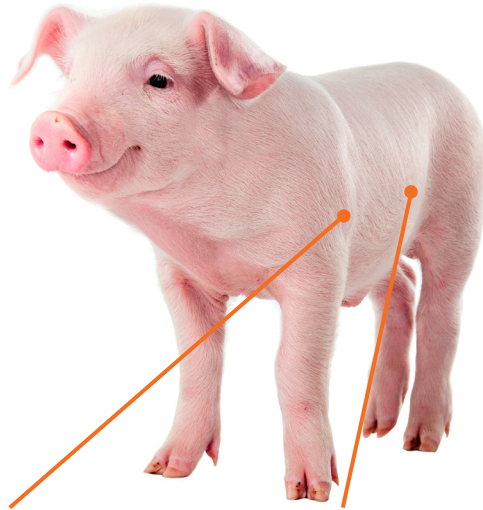
Bacteria Cell



Results

- Irregular cell function due to reduced intracellular pH
- The cell's energy is used up when attempting to pump H⁺ ions out of the cell
- Integrity of cell wall may weaken and rupture
- Bacteria dies – An acid with more intact acid molecules (more H⁺ ions available) at a given pH will have a greater ability to kill bacteria.

KEM-GEST™ IMPACTS NURSERY PIGS IN TWO WAYS.



IMPACT 1

- Phosphoric acid delivered to stomach of pig
- HCl (hydrochloric acid) production is stimulated, which is lacking at weaning

IMPACT 2

- Organic acids (fumaric, citric and lactic) are delivered to the hindgut for additional pathogen-inhibiting benefits

A Comprehensive Approach to Gut Health

The **Kemin Gut Health Triple Check** program helps establish intestinal integrity and protection. Kemin offers products 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.



KEM-GEST™ is part of the KNOCK OUT category by supporting intestinal balance to inhibit or eliminate harmful pathogens from infiltrating the body.

¹ Hirshfield, Irvin N., Stephanie Terzulli, Conor O'Bryne; "Weak organic acids: a panoply of effects on bacteria"; Science Progress; November 2003, vol 86, issue4; pp 245-269.