


Safeguarding Brazil's swine and poultry production

*Organic acids and derivatives
for animal gut health*





Protecting your production and reputation

Good gut health helps animals overcome production challenges and, consequently, optimizes performance. A healthy gastrointestinal tract contributes to efficient feed digestion, nutrient absorption, and performance. It's also critical to protein utilization, immune response, and disease resistance.

Organic acids and their derivatives can have beneficial effects on animal gut health. They are widely recognized as viable controls against pathogens such as *Salmonella*, *E. coli*, and other pathogenic bacteria. They also help improve gut integrity and achieve a balanced gut microbiome.

Good gut health not only protects your animals but also your reputation for delivering consistent results.

Choosing the right acids

Choosing the right acids—in the right proportions—to create synergistic blends is crucial in promoting gut health. You can find the right solution in Eastman's portfolio of organic acids, based on thorough research and deep industry expertise on the efficacies of optimized concentrations and combinations/blends.

As a global manufacturer of animal nutrition solutions, Eastman offers a wide portfolio of organic acids—a growing spectrum of proven solutions that ensure the safety and efficacy of your enterprise. Our unique backward-integrated model allows us to develop unique additive blends using in-house raw ingredients. With a keen understanding of how organic acids and their salts work, we are developing novel and robust organic acid-based solutions to help swine and poultry producers optimize performance and, eventually, reduce their reliance on antibiotic growth promoters through improved gut health.

Our focus

With innovative solutions, specialty products, and robust technical support, Eastman Animal Nutrition helps swine and poultry producers achieve:

- Optimal acidification
- Reduced feed buffering capacity
- Gut health

Organic acids and their salts

Organic acids are weak aliphatic (mono-, di-, tri-, alpha-hydroxy) or aromatic carboxylic acids. Their molecular weight, dissociation constant (pKa), acidity, physical form, and solubility determine their functionalities and applications in animal feed.

Various salts of organic acids are also widely used in animal feed, e.g., calcium and sodium salts of acids. Salts generally are easy to handle and less corrosive. Both organic acids and their salts can reduce the buffering capacity of feed, inhibit the growth of pathogenic bacteria and, consequently, improve nutrient digestibility and growth performance of swine and poultry. In addition, synergistic effects have been proven when using blends of different organic acids and salts.

	Short-chain fatty acids (SCFA)	Medium-chain fatty acids (MCFA)	Aromatic acids
Acid/salt type	Formic, lactic, citric acids Calcium/sodium salts	Caprylic, capric, lauric acids	Benzoic acid Sodium benzoate
pKa range of the organic acids	3 ~ 5	~ 5	4.20
Mode of action	<ul style="list-style-type: none"> • Lower pH in feed and gastrointestinal tract via the acids • Reduce acid buffering capacity via both acids and salts • Inhibit pathogenic bacteria (e.g., <i>Salmonella</i>, <i>E. coli</i>) • Improve digestibility • Improve palatability (e.g., lactic acid) 	<ul style="list-style-type: none"> • Inhibit pathogenic bacteria (e.g., <i>Clostridium</i>, <i>Salmonella</i>, <i>E. coli</i>) • Energy source 	<ul style="list-style-type: none"> • Lower pH in feed and gastrointestinal tract via the acids • Reduce acid buffering capacity via both acids and salts • Inhibit pathogenic bacteria (e.g., <i>Salmonella</i>, <i>E. coli</i>) • Reduce urine pH and ammonia emission • Prevent urinary tract infection in sows

The Eastman Animal Nutrition portfolio

In swine, especially at the nursery stage, organic acids are proven solutions to ameliorate postweaning diarrhea by reducing stomach pH, inhibiting pathogens (e.g., *E. coli*), and promoting protein digestibility and, consequently, inhibiting pathogens such as *E. Coli*. In addition, organic acid salts can be used to adjust feed buffering capacity. When combined, they improve overall piglet performance and health.

In broilers, synergistic blends of organic acids combined with good management practices have shown benefits in controlling and ameliorating diseases such as clostridiosis and salmonellosis, which can result in poor productivity and high mortality.

To help, Eastman offers:

For swine

- **Eastman ProGIT SF2**, a solid blend of organic acid calcium salts that reduces feed buffering capacity (B value) and provides an organic calcium source for pigs
- **Eastman Protural**, a sodium salt of benzoic acid (99%) used as a preservative with acidifying effects for pigs and sows
- **Eastman Protural BA**, a benzoic acid (99%) grade that is used as a preservative with acidifying effects for pigs and sows



For both swine and poultry

- **Eastman ProGIT SF3**, a solid blend of organic acid salts and medium-chain fatty acids shown to be a synergistic microbial inhibitor for pigs and broilers



Let's talk about how organic acids can help you achieve your gut health targets.

Contact your Eastman representative or visit eastman.com/animalnutrition.

Our **global** production facilities



In a global market threatened by pathogens, vulnerable to climate change, challenged by market fluctuations, and regulated by evolving legislation, animal nutrition is an industry beleaguered with unknowns. It helps to partner with an industry leader.

Working in strategic partnership, poultry and swine producers can leverage Eastman's formulation expertise and decades of industry experience—steeped in scientific know-how and a collaborative approach. Eastman provides best-in-class technical expertise focused on innovation that meets customer needs, a broad and well-

documented portfolio of acidification and gut health additives, and a shared sense of stewardship for animals and our environment.

Together, we can develop solutions that safeguard animal health, promote performance, and reduce costs. Our regional teams and technical experts have a deep understanding of local conditions and challenges. And with a wide organic acids portfolio, Eastman offers a secure supply of much-needed solutions, shared expertise throughout the value chain, and on-site support for seamless integration.

EASTMAN
The results of insight™

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