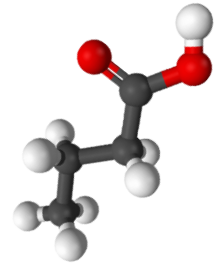




Improve gut integrity of your birds

Short chain fatty acids (SCFA) promote the growth of tissues lining the gastrointestinal (GI) tract in monogastric animals. Of these SCFA, butyric acid is considered the most efficient. Butyric acid is known to support the growth and development of the intestinal epithelium, which leads to an improvement in growth performance. However, when fed in an unprotected form, SCFA are less available at the distal portion of the GI tract.



ButiPEARL™, an embedded source of butyric acid encapsulated by spray freezing, allows a slow release in the digestive tract promoting efficient use of the butyric acid throughout the GI tract. The manufacturing process for ButiPEARL also greatly minimizes the pungent odor associated with butyric acids or salts. Additionally, compared to other encapsulated forms of SCFA, ButiPEARL yields a higher content of butyric acid using Kemin's proprietary MicroPEARLS™ spray freezing process. By having a higher butyrate concentration, lower inclusion rates in the feed can produce desired effects.



Research has shown butyric acid is necessary for normal development of epithelial cells. The absorptive epithelial cells found on the villi use butyric acid as an energy source, which stimulates villi growth. Increasing the height of the villi increases the surface area for other nutrients to be absorbed. Supplementing butyric acid can provide a positive impact for the animal, as they are able to utilize nutrients more efficiently.

Kemin's proprietary spray freezing process allows ButiPEARL to increase delivery of butyric acid to the lower GI tract, stimulating utilization along the small and large intestine and generating maximum positive impact. Technical data is available on ButiPEARL by emailing keminag@kemin.com.

Worldwide leader in spray freeze technology

Kemin constructed a \$3 million facility in Des Moines, Iowa, to manufacture MicroPEARLS, including the embedded source of butyric acid. The facility uses a proprietary the MicroPEARLS spray freezing technology to target the release of active materials in the animal's digestive system, allowing key nutrients to be absorbed more efficiently.





WHO IS KEMIN?

For more than 50 years, Kemin has grown into a global company providing innovative ingredients to the animal health and nutrition, pet health and nutrition, personal health, nutrition and beauty industries. Kemin is dedicated to exceeding customer expectations as a partner in the use of molecular science to improve the lives of people and animals around the globe.



**Worldwide Headquarters
Des Moines, IA - USA**

Kemin spent the past three years investing human and financial capital necessary to certify its Des Moines manufacturing facility for the Food Safety System Certification (FSSC) 22000:2010. FSSC 22000:2010 is recognized by the Global Food Safety Initiative (GFSI) as a rigorous food safety management system, certified by approved third-party organizations. The certification covers the manufacturing of food ingredients used in further processing and is designed to deliver greater confidence in food, fewer health risks, lower auditing costs, improved protection for brands and improved supply chain management. Although GFSI recognized certifications are considered a quality standard for the food industry, this recognition is unique for a feed ingredient manufacturer.



“Consumer safety is paramount,” shares Dr. Chris Nelson, president and CEO of Kemin Industries. “This certification gives our customers peace of mind that Kemin delivers on its promise to provide quality, safe ingredients. It also validates our role as a market leader in food safety.”

With proven scientific knowledge, dedication to quality and safety, reliable technology and personalized service, Kemin is your total solution provider and a trusted advisor - helpful, honest and proven.

WHAT IS TOTAL NUTRITION™?

Through TOTAL NUTRITION™, Kemin offers a range of nutritional solutions for raising healthy animals. Kemin understands you need to raise healthy livestock that gives consumers the nutritional and health benefits they are looking for, while also returning profit. We focus our products and services to help you achieve safe, healthy and efficient solutions.



TOTAL NUTRITION
SAFE - HEALTHY - EFFICIENT



INSPIRED MOLECULAR SOLUTIONS™



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