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New probiotic shown to improve digestion in poultry and swine

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Fast facts

- KENT Nutrition Group licenses technology for *Bacillus*-strain probiotic
- Heat-stable *Bacillus* strain offers non-GMO additive to break down anti-nutritional factors
- Probiotic shown to improve animal gut health by breaking down anti-nutritional factors

(684 words)

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FAYETTEVILLE, Ark. — A novel probiotic has been developed as a direct-fed microbial in both poultry and swine feed to improve gut health and weight-gain efficiency. Additionally, feed cost savings may be realized through greater utilization of soybean meal in diets.

The probiotic, which is a beneficial bacterium, is made from a *Bacillus*-strain isolated by poultry science researchers with the Arkansas Agricultural Experiment Station and is being co-developed by KENT Nutrition Group.

KENT licensed the patented technology from the University of Arkansas System Division of Agriculture and is currently making probiotic-infused poultry and swine feed with the *Bacillus* strain. The experiment station is the research arm of the Division of Agriculture.

“We are grateful for our second novel technology collaboration with UADA,” said Kale Causemaker, senior director of sales and business development for Innovative Solutions, a division of KENT. “These discoveries help improve animal agriculture sustainability and welfare. We are excited and optimistic to have this probiotic commercially available for producers in 2025.”

Bacillus-strain advantages

Advantages of a *Bacillus*-strain probiotic, compared to common probiotic microorganism of the *Lactobacillus* and *Bifidobacterium* species, include its ability to survive higher temperatures and lower pH environments.

The non-genetically modified *Bacillus* bacterium also eliminates the need for multiple genetically modified enzymes that are added to animal feeds to help the animal break down ingredients in protein sources such as soybean meal.

Being heat- and pH-stable improves survivability rate in the animal's gastrointestinal tract and feed processing such as the manufacture of pelleted feed. The strain was originally found to work well in poultry diets and preliminary data suggest the probiotic may also work well in swine.

Overcoming a problem

Billy Hargis, distinguished professor of poultry science, said experiment station studies on the *Bacillus* strain showed it increased the animals' ability to digest non-starch polysaccharides in protein sources such as soybean meal. Hargis is also director of the John Kirkpatrick Skeels Poultry Health Laboratory for the experiment station, the research arm of the Division of Agriculture.

Non-starch polysaccharides are difficult-to-digest carbohydrates found in soybean meal, which serves as the primary source of protein for both layer and broiler chickens, as well as turkeys and swine, Hargis explained.

"The problem with these non-starch polysaccharides is that they cannot be digested and utilized by the animal, but rather they feed detrimental populations of microbes within the gut, adding to intestinal inflammation and susceptibility to other causes of enteric disease," Hargis said.

The strain of *Bacillus* by KENT was isolated by former post-doctoral researcher Kyle Teague under the co-advisement of Hargis and Samuel Rochell. Teague is now the director of poultry nutrition at Life Products, Inc., in Nebraska, and Rochell is now an associate professor of poultry nutrition at Auburn University.

From lab to market

The Division of Agriculture's Technology Commercialization Office, or TCO, shepherded the *Bacillus*-strain's patent-pending status and commercial licensing to KENT.

"Translating research to commercial products is the name of the game," said Parker Cole, associate director of TCO. "We always enjoy working with industry and have enjoyed working with KENT. They've been a great partner to work with and collaborate with, so we're excited to see these products go into the marketplace."

Earlier this year, Innovative Solutions also released EFFICOR™, an *L. plantarum* probiotic for swine that was developed in conjunction with Division of Agriculture researchers. Research trials showed EFFICOR helped improve body weight gain and feed efficiency in growing and finishing pigs, with nearly \$2 per pig cost savings because of improved efficiencies at the time of the trials, Cole said. The foundational research for EFFICOR™ came from Jiangchao Zhao, former professor of animal science for the Division of Agriculture.

"Our office sits at the interface of academic innovation and commercialization," said Cole. "Being able to take a technology that was developed here, work with industry, confirm that it works in a particular product or formulation, and have that company excited about it to where they want to license it and implement it in their portfolio, I think that speaks to the research quality and to the inventors that we have within the Division of Agriculture."

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About the Technology Commercialization Office

The Technology Commercialization Office (TCO) commercializes world-class research to support a lasting knowledge-based economy to benefit Arkansas and the world. We help faculty and research scientists identify, protect, and commercialize intellectual property developed from their research or other university-supported activities. To contact the TCO, please email agritco@uada.edu.

About the Division of Agriculture

The University of Arkansas System Division of Agriculture's mission is to strengthen agriculture, communities, and families by connecting trusted research to the adoption of best practices. Through the Agricultural Experiment Station and the Cooperative Extension Service, the Division of Agriculture conducts research and extension work within the nation's historic land grant education system.

The Division of Agriculture is one of 20 entities within the University of Arkansas System. It has offices in all 75 counties in Arkansas and faculty on five system campuses.

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Since 1927, KENT has leveraged its core strengths of animal care and human nutrition resulting in the diversified company it is today. KENT is a worldwide leader in manufacturing and marketing ag-based specialty ingredients and consumer products. The award-winning and family-owned business is led by third-generation family member, Gage A. Kent. KENT is headquartered in Muscatine, Iowa, USA.

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