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The National Federation of Dairy Cooperative Associations
Hiroshima University
Mitsubishi Chemical Corporation

Study shows that spore-forming lactic acid bacteria, probiotics, reduce diarrhea and improve growth performance

The National Federation of Dairy Cooperative Associations (Main Office: Shibuya-ku, Tokyo; Chairperson: Hiroshi Kumabe), Hiroshima University (Main Campus: Higashihiroshima city, Hiroshima; President: Mitsuo Ochi) and Mitsubishi Chemical Corporation (Head Office: Chiyoda-ku, Tokyo; President: Manabu Chikumoto) showed that *Heyndrickxia coagulans* SANK70258[*1] (*H. coagulans*), a spore-forming lactic acid bacterium known as a probiotic, reduce diarrhea due to an increased intake of starter feed[*2] after weaning and improve growth performance. We presented this study result at the 133rd Annual Meeting of Japanese Society of Animal Science (September 12 to 15, 2025). In this study, the National Federation of Dairy Cooperative Associations led the breeding management, Mitsubishi Chemical Corporation provided spore-forming lactic acid bacterium, and both parties designed an experiment based on their expertise. The data reliability was confirmed primarily by Hiroshima University in collaboration with the aforementioned two parties.

The livestock industry is facing numerous challenges of breeding management, including an increase in feed prices, dependence on imports, risk of infections, and concerns over antibiotic use. For cattle breeding, diarrhea in calves with an underdeveloped intestinal barrier function is one of the serious health problems, and poor growth performance and increased mortality caused by diarrhea have a serious negative impact on livestock operations.

Unlike other common lactic acid bacterium, spore-forming *H. coagulans* is resistant to acid and heat, thereby allowing it to reach the intestine alive where it can germinate and proliferate. Previous studies have shown that the administration of *H. coagulans* enhances the intestinal barrier function, contributing to weight gain in broiler chickens and pigs.[*3]

In this study, we examined the effects of feeding *H. coagulans* to calves on their growth performance and incidence of diarrhea. Holstein male calves were divided into two groups: a group where *H. coagulans* was added to a milk replacer[*4] (treatment group) and a group where no *H. coagulans* was added (control group). The calves were fed milk replacer until 8 weeks of age and then reared until 13 weeks.
As a result, calves in the treatment group consumed more starter feed after weaning and gained more body weight than those in the control group. In general, an increased intake of starter feed induces hindgut acidosis[*5], which raises the risk of diarrhea. However, while the control group had 1.0 days of diarrhea per week, the treatment group fed *H. coagulans* had only 0.4 days per week, indicating that higher starter intake did not increase the incidence of diarrhea.
These results suggest that the feeding *H. coagulans* to calves may reduce diarrhea due to an increased intake of starter feed[*2] after weaning and improve growth performance.

The outcome of this study suggests the feeding *H. coagulans* to calves may become a new breeding management technique supporting the growth performance. With respect to this study, we will continue to investigate the detailed mechanism and evaluate the efficacy.

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*1*Heyndrickxia coagulans* SANK70258
Heyndrickxia coagulans is a spore-forming lactic acid bacterium discovered by Professor Ooki Nakayama (Professor Emeritus of University of Yamanashi) in 1949 and has been used as a probiotic over the years. It has the ability to survive the stomach acid and reach the intestine alive. It has been reported that *H. coagulans* improves bowel movements, alleviates cold-like symptoms, and improves the condition of skin in humans. *H. coagulans* has also been reported to contribute to somatic growth, antiinflammation, and infection control in livestock. The scientific name for *Bacillus coagulans* was changed to *Weizmannia coagulans* in 2020 and *Heyndrickxia coagulans* in 2023, and *Bacillus coagulans* SANK70258 and *Weizmannia coagulans* SANK70258 are the same strains as *Heyndrickxia coagulans* SANK70258.

*2Starter feed
Compound feed for calves mainly composed of highly fermentable grain. It is the source of nutrition for calves second to liquid feed (bovine whole milk and milk replacer) and makes an underdeveloped calf's rumen grow.

*3Relevant articles
The effect of supplementation with *Weizmannia coagulans* strain SANK70258 to coccidia-infected broilers is similar to that of a coccidiostat administration. Vet Sci. 2022 Aug 3;9(8):406. doi: 10.3390/vetsci9080406

Dietary *Weizmannia coagulans* strain SANK70258 ameliorates coccidial symptoms and improves intestinal barrier functions of broilers by modulating the intestinal immunity and the gut microbiota. Pathogens. 2023 Jan 6;12(1):96. doi: 10.3390/pathogens12010096

Heyndrickxia coagulans SANK70258 supplementation improves growth performance, gut health, and liver function in growing pigs. Front. Vet. Sci. 2025 May 12:1537913. doi: 10.3389/fvets.2025.1537913
https://www.mcgc.com/english/news_release/pdf/02365/02636.pdf

Exploring spore-forming lactic acid bacterium Heyndrickxia coagulans SANK70258 as a promising probiotic for red sea bream (Pagrus major). Front. Aquac. 3:1450537. doi: 10.3389/faquc.2024.1450537
https://www.mcgc.com/english/news_release/02173.html

*4Milk replacer
Artificially produced liquid feed that is given instead of breast milk in the juvenile period in domestic and other animals.

*5Hindgut acidosis
Decreased pH in the gastrointestinal tract due to excessive production of acid after the

fermentation of carbohydrates in the solid feed. Its effect is more significant than rumen acidosis and diarrhea and resulting growth reduction occur in calves.

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