DaBomb inside

Publisher: Chen Wei-Chen
Editor-in-Chief: Chen Wei-Chen
Address: No. 52, Industry Rd. 3, Annan District, Tainan City 709, Taiwan
Tel: +886-6-384-0771

Official LINE

DaBomb Protein Biotech Corp.

ISO 22000

FAMIQS

DaBomb Protein Biotech Corp.
DaBomb inside,the best inside.
Taiwan | Tel:+886-6-384-0771 | Fax:+886-6-384-1770
service@dabombprotein.com | www.dabombprotein.com

2026–DaBomb Nutrition Insight_01journal en _L1

DaBomb *Nutrition Insight*

DaBomb inside,the best inside.

The New Era of Postbiotics

P.04 [Cover Story]
Global Trends in Postbiotics

P.06 [Case Studies]
Postbiotics in Immunity, Livestock & Aquaculture

P.20 [Pet Column]
Emerging Trends in Companion Animal Health

DaBomb inside

2026 No. 01

CONTENTS

Technical Column
The Science and Mechanisms of Postbiotics 2

Cover Story
Global Trends in Postbiotics 4

Case Studies
Practical Applications of Postbiotics in Immunity, Livestock & Aquaculture 6

Corporate Spotlight
ESG, Quality Management & Manufacturing Excellence 17

Pet Column
Emerging Trends in Companion Animal Health 20

Special Issue
The New Era of DaBomb 25

Expert Interview
Applications and Prospects of *Bacillus velezensis* Postbiotics in Animal Health 27

Conclusion
The New Generation of Postbiotics 30



Technical Column

The Science and Mechanisms of Postbiotics

BY CHEN CHI-CHEN | ILLUSTRATION BY WANG LING-HUI

Definition of Postbiotics

In 2021, the International Scientific Association for Probiotics and Prebiotics (ISAPP) formally defined postbiotics as: *"a preparation of inanimate microorganisms and/or their components that confers a health benefit on the host."*

The English term *"Postbiotics"* is derived from Greek roots: the prefix *post-*, meaning "after," and *biotic*, meaning "living things" or "life" – together conveying the concept of "after life" or "inanimate." Accordingly, a postbiotic preparation must contain cellular material derived from non-viable microorganisms, which may include: intact inactivated cells; cellular fragments such as cell wall components, membrane lipids, peptidoglycans, teichoic acids, and other macromolecular structures; and/or their accompanying microbial metabolites, such as organic acids, peptides, and enzymes.

The microbial starter strains employed in postbiotic production – whether bacteria or yeasts – must be legally approved in accordance with regulatory positive lists of permissible edible microbial strains for human and/or animal use, and must have undergone safety evaluation at the strain level. Throughout the manufacturing process, these organisms must be subjected to deliberate and controlled inactivation techniques – including, but not limited to, heat treatment, ultraviolet (UV) irradiation, ionizing radiation, high-pressure processing, ultrasonication, or physical/chemical lysis – to permanently terminate their biological viability.





If microbial metabolites generated through fermentation – such as short-chain fatty acids (SCFAs), vitamins, or purified bacteriocins recovered from fermentation broth – undergo extensive purification (e.g., purified butyric acid, purified gamma-aminobutyric acid [GABA]) such that the final preparation contains absolutely no residual cellular biomass or cellular components, these purified chemical entities cannot, per the ISAPP consensus statement, be classified as postbiotics. They should instead be referred to exclusively by their specific chemical names.

Postbiotics are not simply "dead bacterial cells." Their capacity to confer meaningful health benefits to the host lies in the unique structural molecules released upon inactivation, which engage in highly specific biochemical interactions with cell membrane receptors or intracellular receptors of the host.

How Do Postbiotics Work?

Unlike conventional probiotics, postbiotics do not need to "colonize" or "survive" within the gastrointestinal tract. Upon entering the body, they are capable of exerting their biological effects immediately and directly, primarily through the following mechanisms:

Immunomodulation

Although cellular fragments – such as cell wall components – are derived from non-viable microorganisms, their conserved structural features are still recognized by gut-associated immune cells, including dendritic cells and macrophages. This recognition triggers the host's innate defense mechanisms and modulates downstream inflammatory responses.

Barrier Function

Metabolites present in postbiotic preparations – particularly short-chain fatty acids (SCFAs) – serve as a primary energy substrate for intestinal epithelial cells, upregulate the expression of tight junction proteins, and facilitate the repair of intestinal permeability defects. This collectively prevents the translocation of pathogenic bacteria and toxins into the bloodstream, thereby ameliorating a condition commonly referred to as leaky gut syndrome.

Microbiome Modulation

Postbiotics contain naturally occurring antimicrobial compounds – most notably bacteriocins – that directly suppress the growth and proliferation of harmful bacteria, thereby creating a more favorable ecological niche for the survival of resident beneficial microorganisms within the gut.

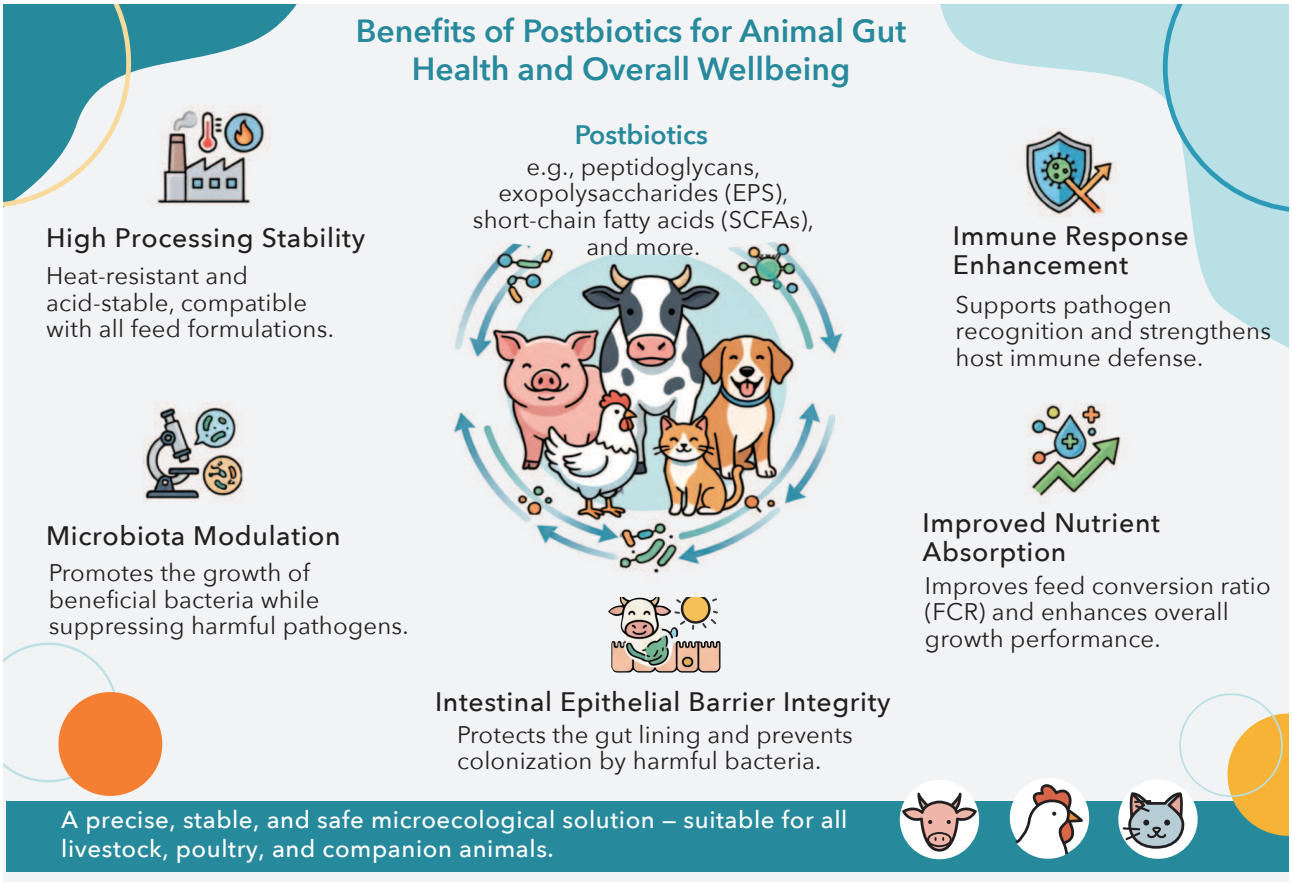
Cover Story

Global Trends in Postbiotics

BY CHEN CHI-CHEN | ILLUSTRATION BY WANG LING-HUI

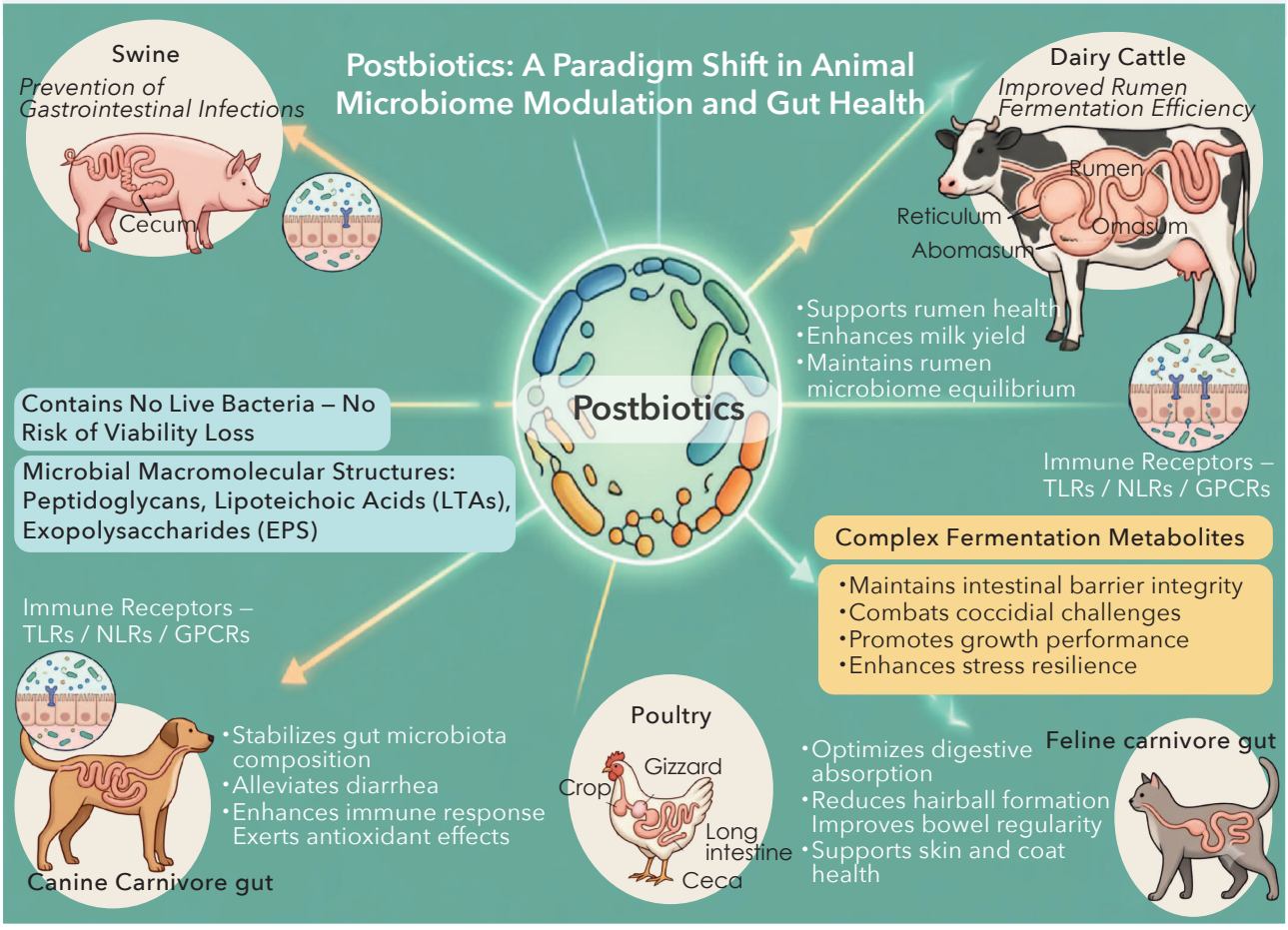
In recent years, breakthrough advances in microbiome science and gut microbiota research have driven a fundamental paradigm shift in the fields of functional foods and biopharmaceuticals – from a conventional focus on live microorganism supplementation toward more precise and stable modulation of bioactive components. Within this evolving landscape, postbiotics have rapidly emerged as a focal point of innovation, attracting growing attention from the global biotechnology and nutritional medicine communities.

Against the backdrop of increasingly stringent international regulations restricting or phasing out the use of antibiotic growth promoters (AGPs) in animal feed, the livestock industry faces mounting pressure to develop effective strategies for controlling enteric infections while maintaining feed conversion efficiency. Postbiotics – characterized by the absence of viable microorganisms, retained bioactivity under the high-temperature conditions inherent to feed pelleting processes, and the elimination of concerns regarding the horizontal transfer of antimicrobial resistance genes (ARGs) to animals or the surrounding environment – have emerged as a gold-standard alternative to conventional antibiotic use in modern animal production.



The emergence of postbiotics represents a fundamental paradigm shift in host microbiome modulation – transitioning from a "live-organism colonization model" to one of "precision biochemistry." Rather than depending on the physical viability and proliferation of living cells, postbiotics exert their biological effects through highly conserved microbial macromolecular structures – including peptidoglycans, lipoteichoic acids (LTAs), and exopolysaccharides (EPS) – alongside the complex metabolites generated through fermentation. These bioactive components engage in precision molecular-level crosstalk with the host epithelial barrier and innate immune receptors, including Toll-like receptors (TLRs)[1], NOD-like receptors (NLRs)[2], and G protein-coupled receptors (GPCRs)[3].

From an industrial application standpoint, postbiotics elegantly resolve the critical technical bottlenecks that have long constrained conventional probiotics – namely, thermal inactivation, acid degradation, enzymatic hydrolysis, and limited shelf life – fundamentally removing the formulation barriers that have historically restricted the application of functional feed and food products.



[1] TLRs (Toll-like Receptors): TLRs are critical protein sensors of the mammalian innate immune system. Located on the surface or within the interior of immune sentinel cells – such as macrophages and dendritic cells – TLRs are responsible for recognizing conserved molecular structures unique to invading pathogens, including bacteria and viruses, thereby triggering downstream inflammatory and defensive immune responses.

[2] NLRs (Nucleotide-binding Oligomerization Domain-like Receptors): NLRs are a family of intracellular receptors primarily responsible for detecting invading pathogens or endogenous danger signals arising from cellular damage, initiating innate immune responses from within the cytoplasm.

[3] GPCRs (G Protein-Coupled Receptors): GPCRs constitute the largest and most functionally diverse family of cell-surface membrane receptor proteins in the human body, playing a central role in transducing a wide range of extracellular signals into intracellular responses.

DaBomb Lactic Acid Bacteria Postbiotics in Livestock and Aquaculture: Science, Production, and Applied Practice

BY JIANG JHIH-JIE, ZHAO JUN-YI



Building upon over two decades of accumulated expertise in advanced lactic acid bacteria (LAB) fermentation technology, DaBomb initiated a dedicated research program in LAB-derived postbiotics between 2022 and 2023. This program progressed systematically through multiple stages — from early-phase laboratory validation studies and small animal clinical efficacy trials, through to field verification trials conducted in swine, poultry, and aquatic species. This comprehensive research pipeline ultimately led to the development of the "Postbiotic DBT-100" product series, which integrates LAB-derived postbiotics with a proprietary antimicrobial formulation. The series has delivered measurable performance improvements for clients, generating a compounded benefit of enhanced efficacy and meaningful reduction in overall production costs.

Clinical and Field Validation of Postbiotics as an Emerging Anti-inflammatory Tool in Swine Production

In piglet production, multiple compounding stressors — including weaning, dietary transitions, environmental changes, and pathogenic challenges — can trigger systemic inflammatory responses that adversely affect feed intake, nutrient utilization efficiency, and overall growth performance. As a result, mitigating the negative impact of inflammation on production outcomes has long been a central priority in nursery pig nutritional management.

In DaBomb's early-stage research, lactic acid bacteria (LAB)-derived postbiotics were found to exhibit pronounced anti-inflammatory properties — a discovery that has since served as the foundational cornerstone of the DaBomb LAB Postbiotic DBT-100 product series.

1.1 Reduction of Inflammatory Markers and Growth-Promoting Effects of Postbiotics in Nursery Pigs

In a lipopolysaccharide (LPS)-induced inflammatory challenge trial, piglets received continuous dietary supplementation of DBT-100 LS at an inclusion rate of 500 g/MT for two weeks prior to LPS challenge, and continued receiving the same supplementation for an additional two weeks following LPS administration. Results demonstrated that, compared to the negative control group, DBT-100 LS effectively maintained growth performance in challenged piglets, with weight gain trajectories closely mirroring those observed in the unchallenged healthy control group (Figure 1). These findings suggest that LAB-derived postbiotics hold considerable potential for mitigating the adverse effects of LPS-induced inflammatory responses on growth performance in nursery pigs.

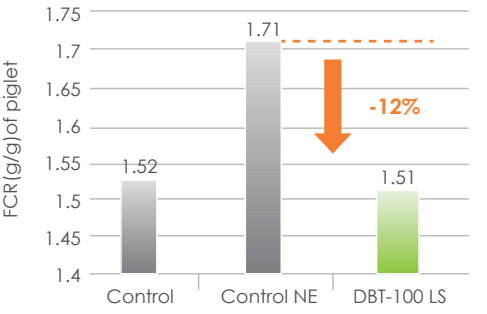


Figure 1. Growth performance of nursery pigs in the control, negative control, and DBT-100 LS groups following two weeks of pre-challenge dietary supplementation, LPS-induced inflammatory challenge, and two additional weeks of continued feeding post-challenge.

Furthermore, in a collaborative piglet trial conducted by DaBomb in partnership with the Agricultural Technology Research Institute (ATRI) , DBT-100 LS was shown to significantly reduce intestinal Clostridium perfringens populations and alleviate the incidence of diarrhea in nursery pigs (Figures 2 and 3). Concurrent with improvements in fecal consistency, concentrations of noxious gases within the livestock housing facility – including hydrogen sulfide (H_2S) – were also correspondingly reduced, contributing to a more favorable rearing environment.

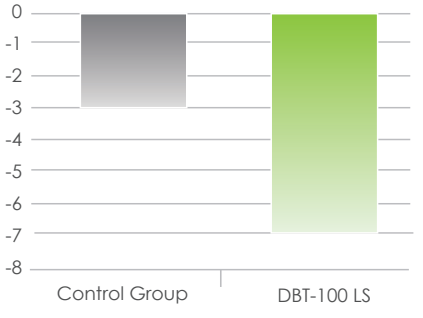


Figure 2. *Clostridium* inhibition rates in nursery pigs administered the control diet or DBT-100 LS over a six-week feeding period.

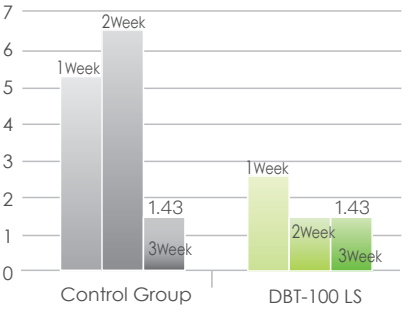


Figure 3. Diarrhea incidence rates in nursery pigs administered the control diet or DBT-100 LS over a three-week feeding period.



1.2 On-Farm Integration of Postbiotics for Disease Prevention and Nursery Management: Case Studies

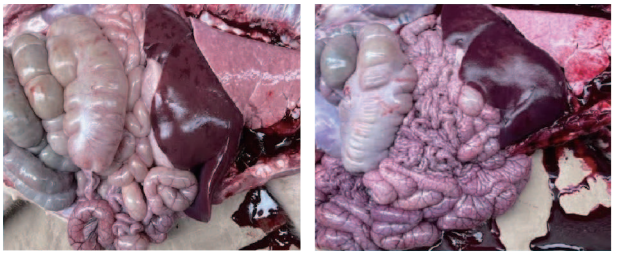
1.2.1 Case Study: Managing Swine Dysentery *(Brachyspira hyodysenteriae)* Infection in Nursery Pigs

During the early stages of product development, DaBomb collaborated with Professor Kuo Hung-Chih and his research team at National Chiayi University to conduct a validation trial, the results of which demonstrated that DBT-100 LS possesses the capacity to inhibit the growth of Brachyspira hyodysenteriae. Building upon these findings, field testing was subsequently conducted at a commercial pig farm in Yunlin County. Following three weeks of DBT-100 LS supplementation, a marked improvement in bloody diarrhea was observed, accompanied by a notable reduction in fecal moisture content, which contributed to maintaining a drier and more hygienic livestock housing environment (Figure 4). Concurrently, Professor Kuo's veterinary team conducted systematic necropsy examinations. The results revealed that after three weeks of DBT-100 LS supplementation, gastrointestinal distension was significantly reduced, and the macroscopic appearance of lung tissue was observably healthier (Figure 5). These findings collectively indicate that LAB-derived postbiotics not only contribute to improvements in intestinal health, but may also enhance overall production stability during the nursery period by reducing diarrhea incidence and improving animal health status.



Before After

Figure 4. Comparative photographs of the livestock housing environment at the Mailiao pig farm before and after three weeks of DBT-100 LS supplementation.



Before After

Figure 5. Necropsy images of piglets from Mailiao pig farm before and after three weeks of DBT-100 LS supplementation.

1.2.2 Case Study: Use of DBT-100 LS on a Grower-Finisher Pig Farm

DaBomb currently supplies a grower-finisher pig farm customer that routinely incorporates DBT-100 LS into feed throughout the entire rearing cycle. According to feedback from the farm manager: "Overall growth rate and feed-to-meat conversion have improved compared with previous production batches, and growth uniformity has also improved." Compared with the farm's prior experience using live-microbial products, the postbiotic product demonstrated a more pronounced and stable effect on growth promotion and production efficiency.

Beyond growth performance, the farm owner also observed a marked reduction in fecal odor within the barns, suggesting that the postbiotic may help improve gut microbiota balance and nutrient utilization efficiency, thereby reducing the generation of harmful metabolites. In addition, the farm had previously experienced frequent diarrhea in pigs during the plum rain season or under high-humidity conditions; after adding the postbiotic, the incidence of diarrhea decreased significantly. Even in the occasional sporadic case of diarrhea, the pigs responded more quickly to treatment and recovered in a shorter time, indicating that the postbiotic may help enhance gut health and maintain overall herd health stability.



Figure 6. Field application of DaBomb's DBT-100 LS on a grower-finisher pig farm.

> **From experimental-scale trials to field applications, results demonstrate that DaBomb's lactic acid bacteria postbiotic DBT-100 LS delivers comprehensive benefits, including growth promotion, improved gut health, reduced environmental odor, and enhanced herd health stability.**

Antibiotic-Free Solutions for Poultry Farming

Necrotic enteritis (NE) caused by Clostridium perfringens is one of the most significant diseases affecting the broiler industry. It not only causes intestinal damage but can also lead to reduced growth performance and impaired feed efficiency, ultimately compromising overall production output. Amid the global trend toward antibiotic-free or antibiotic-restricted farming, the use of traditional antibiotic growth promoters (AGPs) is increasingly limited. Lactic acid bacteria postbiotics offer a new-generation solution that combines safety, stability, and efficacy—helping to mitigate intestinal inflammatory responses, improve gut health, and ensure that production performance remains unaffected.

2.1 Efficacy Validation of Postbiotics Against Necrotic Enteritis

In a Clostridium perfringens challenge trial conducted by DaBomb in collaboration with government research institutions, results showed that DBT-100 LS effectively mitigated the negative impact of C. perfringens infection on broiler growth. Compared with the challenged control group, broilers supplemented with DBT-100 LS maintained better weight-gain performance, with growth rates comparable to those of the healthy, unchallenged group (Figure 7). In addition, intestinal histological examination showed that the DBT-100 LS group exhibited more intact intestinal villus structure and greater villus height (Figure 8), indicating that the postbiotic helps preserve intestinal absorptive function. Analysis of blood inflammatory markers further revealed that levels in the DBT-100 LS group were significantly lower than those in the challenged control group (Figure 9), demonstrating that the lactic acid bacteria postbiotic can effectively reduce the inflammatory response triggered by C. perfringens infection.

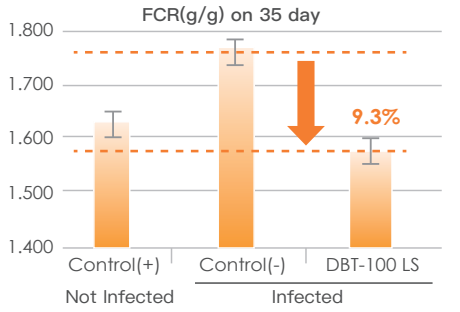


Figure 7. Feed conversion ratio (FCR) of broilers in the control, Clostridium perfringens-challenged, and DBT-100 LS groups over 5 weeks.

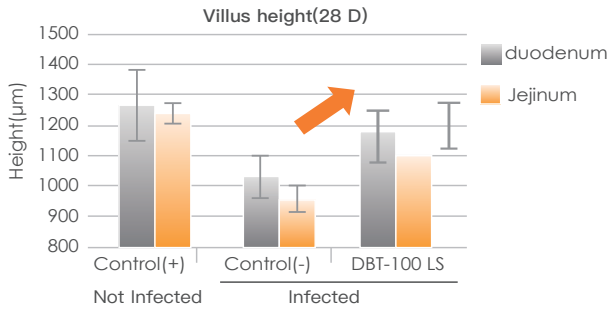


Figure 8. Intestinal villus height in broilers from the control, Clostridium perfringens-challenged, and DBT-100 LS groups at 4 weeks.

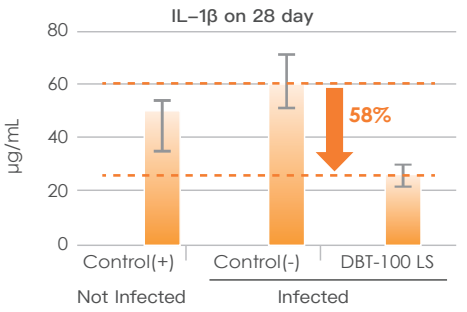


Figure 9. Serum inflammatory marker IL-1β concentration in broilers from the control, Clostridium perfringens-challenged, and DBT-100 LS groups at 4 weeks.

Taken together, these experimental results indicate that DBT-100 LS not only helps maintain intestinal health and digestive-absorptive capacity but also reduces the impact of necrotic enteritis on production performance, demonstrating its potential as an intestinal health management tool in antibiotic-free farming environments.

2.2 Trial Results of Postbiotics as a Replacement for Enramycin

Building on the results of the aforementioned *Clostridium perfringens* challenge trial, DaBomb further commissioned the Agricultural Technology Research Institute (ATRI) to conduct a comparative trial between the lactic acid bacteria postbiotic DBT-100 LS and the growth-promoting antibiotic enramycin, in order to evaluate its potential as an antibiotic-reduction or antibiotic-replacement solution. Results showed that the feed conversion ratio (FCR) of the DBT-100 LS group outperformed that of the 125 ppm enramycin group (Figure 10), indicating that the lactic acid bacteria postbiotic delivers a favorable improvement in feed conversion. In addition, fecal microbial analysis revealed that the DBT-100 LS group exhibited superior inhibitory effects against both *E. coli and C. perfringens* (Figure 11).

As the levels of harmful bacteria in the feces decreased, this was also found to further reduce the generation of harmful gases such as ammonia in the litter, helping to maintain better barn environmental quality. Taken together, these trial results demonstrate that the lactic acid bacteria postbiotic holds strong potential as an antibiotic-reduction management tool, by improving intestinal health, maintaining growth performance, and lowering the burden of harmful bacteria.

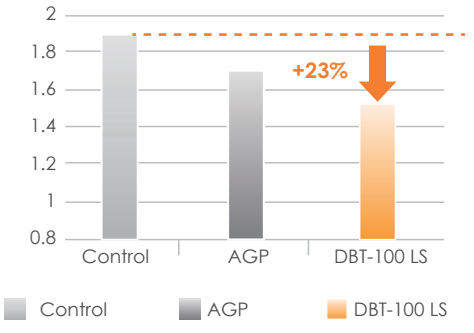


Figure 10. Feed conversion ratio (FCR) of broilers in the control, enramycin, and DBT-100 LS groups over 5 weeks.

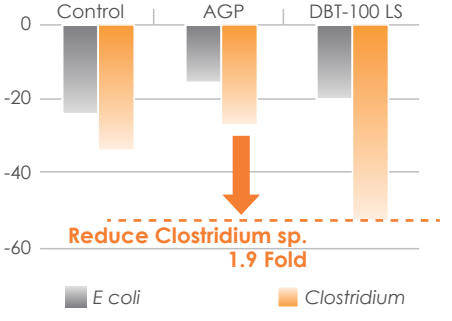


Figure 11. Inhibition rates of *E. coli* and *Clostridium perfringens* in broilers from the control, enramycin, and DBT-100 LS groups over 5 weeks.

2.3 Commercial Broiler Farm Case Study and Benefit Analysis

India is one of the world's major poultry meat producers. In recent years, driven by the industry-wide shift toward antibiotic reduction and antibiotic-free rearing, demand for alternatives to antibiotics has been steadily increasing. In response, DaBomb and its Indian partner conducted a field validation of DBT-100 LS at a commercial broiler farm in India, evaluating its performance under actual production conditions.

Trial results showed that, under commercial rearing conditions, the DBT-100 LS group achieved superior growth performance compared to the enramycin group; as the inclusion level was increased, broilers' average daily gain showed a further improving trend (Figure 12). This result is consistent with previous laboratory and research institute trial findings, indicating that the lactic acid bacteria postbiotic maintains stable efficacy under actual production conditions.

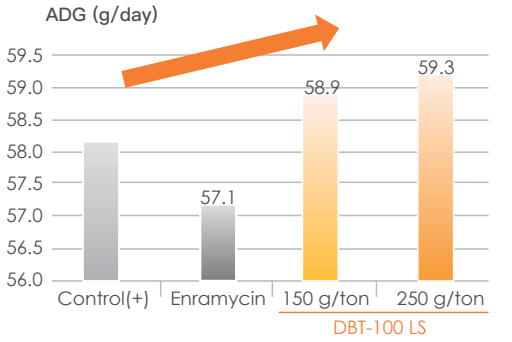


Figure 12. Average daily gain (g/day) of broilers over 5 weeks fed the control diet, enramycin diet, and diets supplemented with different concentrations of DBT-100 LS

2.4 Overall Efficacy of DaBomb DBT-100 LS in Livestock and Poultry Applications

Findings from multiple studies and commercial validations spanning weaned piglets to broiler chickens confirm that DaBomb's DBT-100 series of lactic acid bacteria postbiotics comprehensively enhances intestinal health and growth efficiency by modulating gut microbiota, reducing inflammatory responses, and inhibiting the proliferation of harmful bacteria. Consistent and outstanding results have been demonstrated across weaned piglets, Clostridium-challenged broilers, and antibiotic-free rearing environments alike—not only reducing disease and management risks, but also helping customers decrease antibiotic dependency and improve production efficiency, thereby creating a farming model that delivers both economic and sustainable value.

Heat-Stable Growth Promoter for Aquaculture

Recently, the sharp rise in prices of fish meal and other animal protein raw materials has subjected the aquafeed industry to unprecedented cost pressure. To maintain product competitiveness, feed manufacturers have been compelled to explore alternative protein sources and adopt more flexible formulation strategies in order to control production costs while sustaining animal growth performance. However, reducing fish meal inclusion has increasingly given rise to critical challenges for the industry, including diminished growth performance, reduced feed utilization efficiency, weakened immunity, and insufficient disease resistance.

Although functional feed additives such as probiotics and enzymes have been widely adopted in the feed industry, they commonly suffer from insufficient heat stability. Because aquafeed production typically involves high-temperature conditioning and pelleting processes, the viability of many live bacteria and the activity of many enzymes are readily compromised, thereby affecting the efficacy and stability of the final product. This has significantly limited feed manufacturers' options when selecting functional additives.

DaBomb has developed DBT-100 HT, a heat-stable lactic acid bacteria postbiotic. Unlike conventional probiotics, its efficacy is not constrained by live bacterial survival rates, allowing it to withstand the high-temperature conditions of feed processing while maintaining stable product performance. In addition, DBT-100 HT effectively addresses the reduced growth performance, weakened immunity, and elevated disease risk associated with low-fish-meal formulations, helping farmed aquatic animals sustain healthy growth.

3.1 Postbiotics Enhance Immunity and Resistance to White Spot Syndrome in Whiteleg Shrimp: Empirical Evidence

In a shrimp trial conducted in collaboration with National Cheng Kung University, whiteleg shrimp were fed a diet containing DBT-100 HT continuously for eight weeks, after which they were subjected to a challenge test with White Spot Syndrome Virus (WSSV). Results showed that, within 72 hours post-challenge, viral copy numbers in shrimp fed DBT-100 HT were significantly lower than those in the control group (Figure 13), indicating that DBT-100 HT effectively enhances shrimp's early defense capacity against viral infection and suppresses rapid viral replication in vivo.

Further observation of cumulative mortality over the seven days following challenge showed that the DBT-100 HT group exhibited a significantly lower mortality rate than the control group (Figure 14), confirming that DBT-100 HT effectively improves shrimp resistance to WSSV.

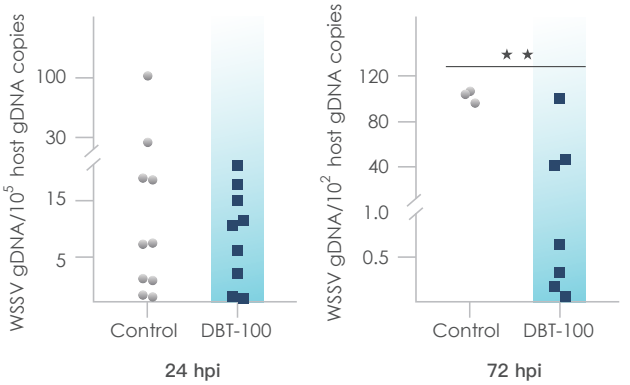


Figure 13. Viral DNA copy number in whiteleg shrimp at 24 and 72 hours after WSSV challenge

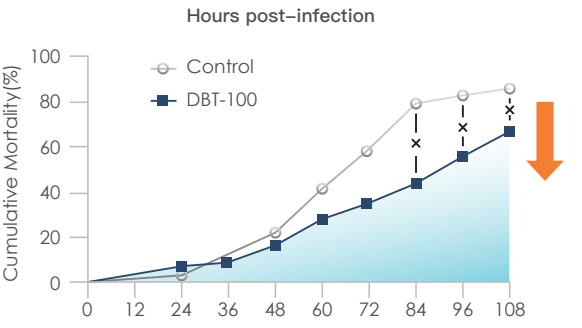


Figure 14. Mortality rate of whiteleg shrimp fed the control diet or DBT-100 HT for eight weeks, following WSSV challenge

3.2 Postbiotic Regulation of Molting-Related Genes and Its Synergistic Effect on Yield Enhancement in Whiteleg Shrimp

In addition, results showed that after eight weeks of continuous feeding with DBT-100 HT, whiteleg shrimp exhibited significantly higher expression levels of the molting-related genes Endochitinase and Ecdysone-inducible gene compared to the control group (Figure 15). Molting is a critical physiological process in crustacean growth, and elevated expression of these related genes is generally closely associated with an active growth and metabolic state.

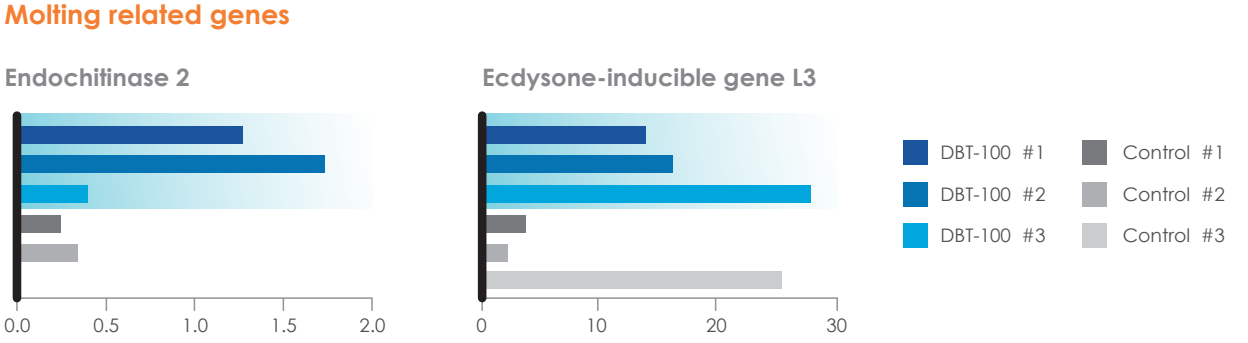


Figure 15. Expression of molting-related genes in whiteleg shrimp fed the control diet or DBT-100 HT for eight weeks

Furthermore, under low-fish-meal formulation conditions, the DBT-100 HT group also showed significant improvement in the feed conversion ratio (FCR) deterioration caused by reduced fish meal inclusion (Figure 16), demonstrating that DBT-100 HT can effectively mitigate the negative impact of fish meal replacement on growth performance.

Accordingly, DBT-100 HT serves as an important growth-support solution for low-fish-meal formulations, effectively reducing the adverse effects of fish meal reduction and helping farmers balance cost control with production efficiency.

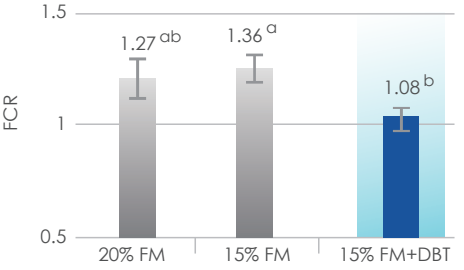


Figure 16. Feed conversion ratio (FCR) of whiteleg shrimp fed the control diet or DBT-100 HT for eight weeks

3.3 Summary of Aquaculture Performance Benefits

The lactic acid bacteria postbiotic DBT-100 HT not only enhances whiteleg shrimp resistance to white spot syndrome but also significantly increases the expression of molting-related genes and improves feed conversion ratio under low-fish-meal formulation conditions. These findings indicate that, beyond its immunomodulatory function, the postbiotic also supports normal growth performance in whiteleg shrimp by promoting molting- and growth-related physiological mechanisms.

For the aquafeed industry, the greatest advantage of postbiotics lies in their heat stability: unaffected by the high-temperature conditions of feed processing, they maintain product stability and ease of use. Moreover, the shift toward low-fish-meal, high-plant-protein formulations in aquafeed is now an irreversible trend. How to use functional additives to compensate for the nutritional gaps and health risks arising from such formulation adjustments will become a critical consideration in future feed design.

Taken together, the results of this trial demonstrate the application potential of lactic acid bacteria postbiotics in improving adaptability to low-fish-meal formulations, enhancing disease resistance, and sustaining growth performance, positioning them as an important tool for future aquafeed formulation optimization and aquaculture management strategies.

Field Application Strategies for Postbiotics

DaBomb's DBT-100 series of lactic acid bacteria postbiotics is tailored to different animal species and divided into two products: DBT-100 LS for livestock and poultry, and DBT-100 HT for aquaculture. The recommended usage levels are as follows:

Application	Species	Dosage (g/mt)
DBT–100 LS	Piglets	300–500
	Grower–Finisher Pigs / Sows	150–300
	Poultry	150–250
DBT–100 HT	Fish / Shrimp	1,000

DBT-100 LS

Dual-Action, Heat-Stable Growth Promoter



120°C

probiotics
postbiotics

DBT-100 LS Comprehensive Benefits

Maximize Benefits, Minimize Costs

- Broad-spectrum inhibition of pathogenic bacteria, including *E. coli* and *Salmonella spp*.
- Effectively inhibits *Clostridium spp*. and *Brachyspira hyodysenteriae*.
- Synergistically modulates immune response and blocks inflammation to enhance animal growth performance
- Substantially improves the post-recovery economic returns of compromised animals

The Best Cost-Optimized Formulation Solution !

DBT-100 HT

Dual-Action, Heat-Stable Growth Promoter



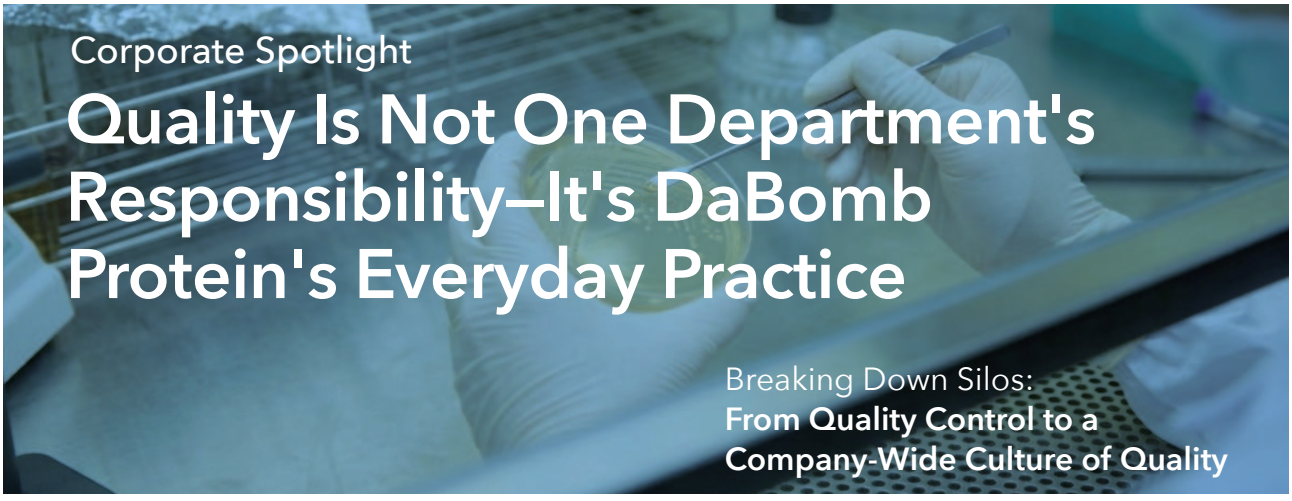
120°C

probiotics
postbiotics

DBT-100 HT Comprehensive Benefits

Maximize Benefits, Minimize Costs

- Stimulates Molting-Related Genes in Shrimp to Optimize Growth Performance
- Modulates the Immune System to Reduce Stress and Enhance Disease Resistance
- Optimizes Growth Performance, Enabling Greater Flexibility in Low-Fish-Meal Formulations



Corporate Spotlight

Quality Is Not One Department's Responsibility—It's DaBomb Protein's Everyday Practice

Breaking Down Silos: From Quality Control to a Company-Wide Culture of Quality

BY TSAI YA-WEN | ILLUSTRATION BY WANG LING-HUI

We firmly believe: "Quality is built into the product, not inspected into it."

Excellence Begins with Every Employee's Sense of Ownership

For many years, DaBomb Protein has been deeply committed to the field of fermented proteins and functional raw materials, with products widely applied across the livestock, aquaculture, and related industries. We understand that the stability and safety of every batch of product is not merely a matter of regulatory compliance—it also carries our customers' trust in animal health and food safety.

In many companies, quality is regarded as the last line of defense belonging to the Quality Research & Development Center or the Quality Control section.

The deeper meaning behind our approach is that quality should not be a single department's "KPI," but rather a "daily habit" for every member of DaBomb. From the rigorous eye Procurement applied when selecting raw materials, to Warehouse Management's minute-by-minute control of temperature and humidity, to the careful attention production-line staff pay to fermentation parameters, quality has already permeated every corner of the company's operations. When quality becomes a culture, it is no longer a tedious checklist—it becomes a spontaneous commitment to our customers.

The "Three No's" Culture of Quality Management

In our daily culture, we put into practice the principle of "Do not accept defective products, do not create defective products, do not pass on defective products." This is more than a slogan—it is a standard deeply embedded in employee behavior. When production-line staff detect abnormal data, their ability to proactively halt the line and report the issue immediately is the clearest demonstration of a "culture of quality" prevailing over "production schedule."

In the biotechnology and feed additive raw materials industry, "quality" has never been the outcome of a final inspection alone—it is the cumulative result of raw material selection, production planning, process control, and final delivery.

For DaBomb, quality is not a slogan; it is a commitment carried out in day-to-day operations.

From "Post-Hoc Inspection" to "Preventive Control" Deep Implementation of HACCP

At DaBomb, quality management is never a matter of "spot-checking" finished products—it is a system of "precision prevention" that eliminates risk before it can take shape. We fully implement the principles of HACCP, breaking down the production process into countless discrete steps for rigorous hazard analysis and monitoring:



Scientific Safeguarding of Critical Control Points (CCPs)

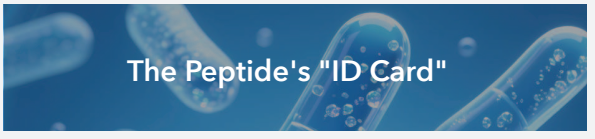
We have established stringent critical limits for parameters such as temperature and pH throughout the fermentation process. Each fermentation tank functions not merely as production equipment but as a round-the-clock monitoring station. Through real-time data transmission, any deviation from expected process parameters immediately triggers corrective action, ensuring that every batch of product remains in its most stable state in terms of both biosafety and functional activity.

Blocking Biological Hazards at the Source

As a leader in biotechnology, we enforce rigorous control over microorganisms at every stage. Through standardized operating procedures (SOPs), we have built a multi-layered protection network spanning incoming raw material quality, cleanliness of the production environment, and finished-product testing, ensuring that our products maintain the highest standard of "zero contamination" from the laboratory all the way to our customers' hands.

Precision R&D CDMO-Grade Quality DNA

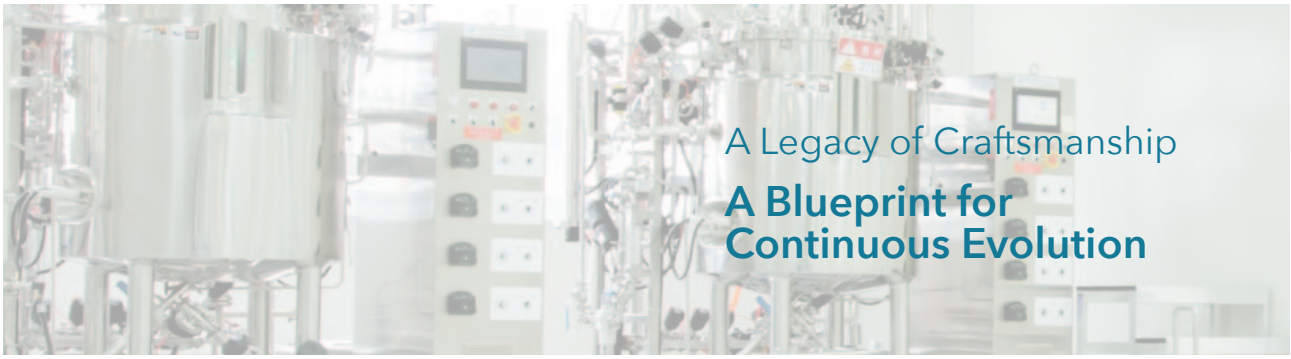
We have internalized CDMO (Contract Development and Manufacturing Organization) standards as part of our everyday practice. On the technical level, our culture of quality is expressed through an uncompromising pursuit of precision at the "microscopic level":



We monitor not only crude protein content but also pursue precise control over the molecular weight distribution of functional peptides in every batch. This demands close coordination between our R&D and production teams to push precision fermentation technology to its fullest potential, ensuring products with high bioavailability.



Through big data analysis of historical process parameters, we have established a "preventive maintenance" mechanism that extends the preventive spirit of HACCP beyond biosafety to the stability of equipment and processes.



A Legacy of Craftsmanship

A Blueprint for Continuous Evolution

- Experience
- Belief
- Talent
- Future

From Accumulated Experience to a Belief in Quality

Quality is built through a long-term commitment to detail, while its continuity depends on a belief that is constantly refined. Over the years, DaBomb Protein has accumulated extensive process experience, progressively transforming practical knowledge into a stable management foundation—so that quality exists not only in our results, but is deeply embedded in our daily operations.

Not Just Maintaining, But Continuously Evolving

While reinforcing its established quality system, DaBomb Protein continuously reviews its processes and procedures to respond to evolving industry trends and market demands. Through process optimization, risk management, and cross-departmental collaboration, we ensure our quality system is not merely about "following standards," but functions as a dynamic mechanism that adapts and evolves alongside a changing environment.

People Are the Heart of Sustaining Craftsmanship

True quality stems from people's understanding of and commitment to their work. DaBomb Protein places strong emphasis on knowledge transfer and talent development, translating quality principles from policy into action, so that they become a natural attitude every employee brings to their work—not an added burden.

Rooted in Quality, Moving Forward Together

Facing the challenges ahead, DaBomb Protein will continue to build on quality as its foundation, combining expertise, experience, and innovative thinking to advance with confidence. We believe that only by continuously deepening our culture of quality can we, together with our customers and partners, build a trustworthy, long-term vision amid an ever-changing industry landscape.

Pet Column

Emerging Trends in Companion Animal Health

How Postbiotics Are Transforming the Pet Nutrition Market?

BY CHIANG YI-HSUAN | ILLUSTRATION BY WANG LING-HUI

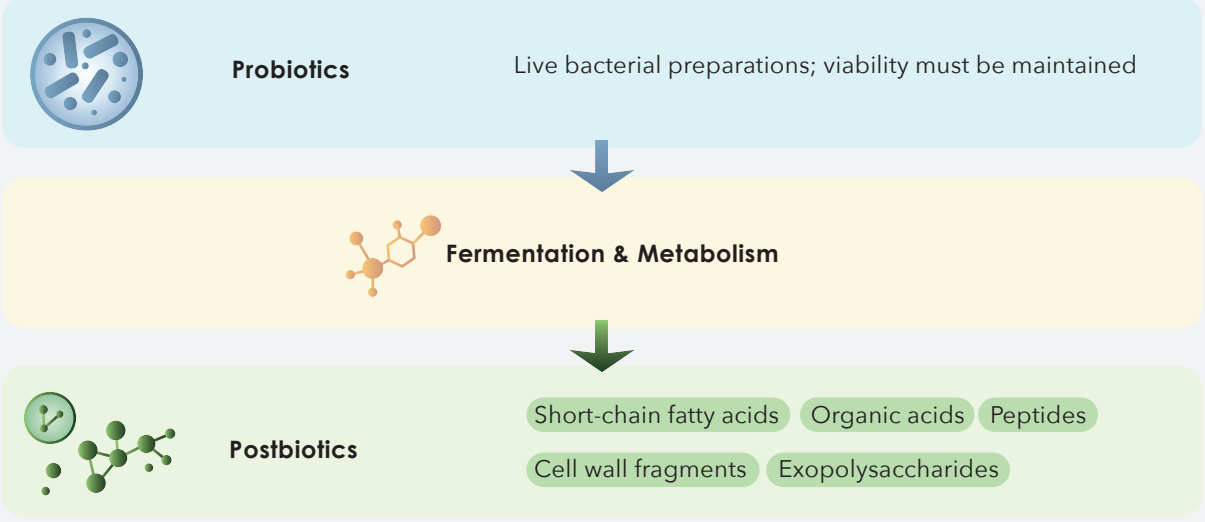
Why Are Postbiotics Gaining Attention?

As pet owners place increasing emphasis on their companion animals' health, the pet wellness market is quietly undergoing a shift. In the past, probiotics were the standard approach to maintaining a balanced gut microbiota; now, a new concept is gaining traction—postbiotics.

Postbiotics are the bioactive substances generated by probiotics during fermentation and metabolism, including short-chain fatty acids (SCFAs), organic acids, peptides, cell wall fragments, and exopolysaccharides (EPS).

Compared with probiotics, the greatest advantage of postbiotics is that they contain no live bacteria, giving them superior stability. They retain their functional efficacy even under conditions such as high-temperature processing and extended storage, making them far easier to incorporate into the formulation of a wide range of pet foods and health supplements.

Schematic of Postbiotic Composition



*Postbiotics contain no live bacteria and offer high stability, making them suitable for use in a wide range of food and health supplement formulations.

After Probiotics, Why Postbiotics?

Probiotics have built up years of application experience in the pet market, but the stability of live bacteria themselves has long been a concern within the industry. Bacterial counts can readily decline due to heat, humidity, or processing stress, requiring relatively strict storage conditions. Postbiotics are different—centered on the metabolic byproducts of bacteria rather than the need to maintain live bacterial viability, they can be stored stably at room temperature, making them more convenient for both manufacturers and pet owners.

Probiotics and postbiotics are not competing approaches but complementary ones operating at different levels: probiotics supply active bacterial populations, while postbiotics directly provide their metabolic products—each with its own application scenarios and functional focus.

Probiotics vs. Postbiotics

The two are not opposing approaches, but complementary functional nutrition strategies operating at different levels

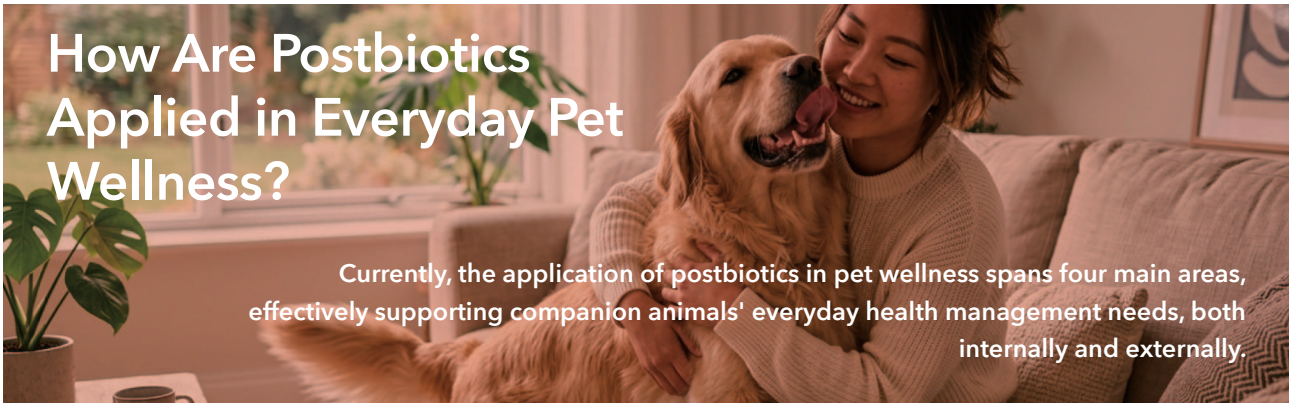
Probiotics

Composition	Live Bacteria	Active, living microorganisms
Stability	Requires Maintaining Viable Bacterial Counts	Sensitive to temperature and humidity
Mode of Action	Live Bacterial Colonization of the Gut	Functions through bacterial proliferation
Application Format	Requires Refrigeration or Special Packaging	More stringent formulation requirements
Market Development	Long Application History, Well-Established Market Awareness	

Postbiotics

Composition	Bacterial Metabolites (Non-Living)	
Stability	No Need to Maintain Bacterial Viability	Stable at room temperature, withstands processing conditions
Mode of Action	Direct Action via Metabolites	Does not depend on live bacterial colonization
Application Format	Broadly Applicable Across Product Formats	Suitable for treats, powder sachets, and staple foods alike
Market Development	Emerging Concept, Rapidly Growing	Growing global market attention

Closing Note The two are not competing, but complementary: probiotics provide support through live bacterial populations, while postbiotics directly supply metabolic products. Each has its own application scenarios, and together they reinforce one another.



How Are Postbiotics Applied in Everyday Pet Wellness?

Currently, the application of postbiotics in pet wellness spans four main areas, effectively supporting companion animals' everyday health management needs, both internally and externally.



Gut Health

Currently, the application of postbiotics in pet wellness spans four main areas, effectively supporting companion animals' everyday health management needs, both internally and externally. The short-chain fatty acids and organic acids found in postbiotics help maintain a healthy balance of gut microbiota, support normal digestive tract function, and help pets maintain good digestive health and regular bowel movements.

Everyday Immune Support

Specific peptides and polysaccharide components found in postbiotics help support companion animals' everyday health status, representing an important nutritional direction for supporting their overall health management.





Skin and Coat Health

Certain postbiotic components help maintain a healthy skin environment, supporting coat shine and skin barrier function, allowing pets to radiate health and vitality from the inside out.

Daily Stress Management and Quality of Life

Research indicates that gut health is associated with companion animals' daily mood and quality of life (the Gut-Brain Axis). By supporting a healthy gut environment, postbiotics help pets maintain their day-to-day quality of life and overall comfort.



※ The applications described above refer to the everyday wellness use of postbiotic ingredients in pet food; they are not pharmaceutical products and no therapeutic claims are made.

Postbiotics Are Reshaping the Pet Wellness Market

Global pet wellness trends are moving rapidly toward "preventive care" and "science-based wellness." Pet owners are no longer satisfied with basic nutrition alone; they are increasingly seeking more functional, scientifically grounded wellness solutions.

The Notable Shift in Taiwan's Pet Market



Pet owners are placing increasing emphasis on preventive health care, driving steady growth in demand for pet health supplements.



The population of aging companion animals is expanding, driving a corresponding increase in demand for everyday nutritional management.



The population of aging companion animals is expanding, driving a corresponding increase in demand for everyday nutritional management.

Against this backdrop, postbiotics—with their high stability, strong safety profile, and ease of incorporation—are steadily emerging as a major trend in the pet wellness market. Postbiotics can be broadly applied across product formats such as treats, powder sachets, and staple foods, making it easier to integrate functional wellness into pets' everyday diets.

The Future Direction of Taiwan's Pet Market



Precision Nutrition

Individualized formulations tailored to different breeds, ages, and health needs of dogs and cats



Functional Wellness

Shifting from single-ingredient supplementation toward the application of multi-functional, compound bioactive ingredients



Science-Based Gut Health

Advances in gut microbiota research are driving demand for postbiotic ingredients

Postbiotics represent more than just a new wellness term—they embody a new generation of nutritional concepts that extend from gut health to overall quality of life. As the pet market continues to move toward greater precision and scientific rigor, postbiotics are steadily becoming an important direction for the next generation of pet nutrition.

POSTBIOTICS L022



Comprehensive Benefits of Postbiotic L022:



- Enhances immune support and helps reduce tear staining
- Soothes skin-inflammation-related conditions and improves coat color
- Soothes inflammatory responses, supports faster post-surgical wound recovery, and helps improve body odor
- A heat-stable, next-generation postbiotic compatible with high-temperature feed production processes, enhancing the wellness value of pet food

LACTOTIDES

LINE

DaBomb Protein Biotech Pioneers and Advances a New Era of Animal-Specific Postbiotics

COMPILED BY CHIANG YI-HSUAN

Partnering with National Chung Hsing University on a Technology Transfer Agreement to Comprehensively Drive Green, Antibiotic-Free Farming Technology



Caption: DaBomb Protein Biotech team and representatives from National Chung Hsing University pose together following the signing of the technology transfer agreement

Global livestock and aquaculture industries are rapidly moving away from reliance on antibiotics, with "green antibiotic reduction" and environmental sustainability emerging as shared challenges of the era for the animal nutrition fermentation industry. As a pioneer in this field, DaBomb Protein Biotech Co., Ltd. (stock code: 6578) formally signed a technology transfer agreement with National Chung Hsing University (NCHU) this past July, writing a new chapter in the company's antibiotic-replacement technology portfolio and setting a fresh milestone for the global animal-specific postbiotics industry.

At the signing ceremony, DaBomb Protein Biotech Chairman Chen Wei-Chen personally signed the agreement together with Professor Li Tzu-Tai of NCHU's Department of Animal Science and the university's Industry-Academia-Research Liaison Center, announcing the exclusive licensing of a probiotic application technology recognized with the 22nd National Innovation Award and protected by multiple patents. This marks not only a new starting point in DaBomb Protein's history of industry-academia collaboration, but also the company's formal entry into an era-defining new chapter in the fields of antibiotic-free feed additives, green farming, and precision nutrition.

> "Safeguarding animal health and environmental sustainability is DaBomb Protein's unwavering mission. The addition of National Chung Hsing University's research achievements not only strengthens our competitive moat in antibiotic-replacement technology, but also creates a perfect synergy with our existing DBT-100 series (probiotics and postbiotics) products. With this green technology capability, we will comprehensively help our customers reduce costs and improve efficiency as we move toward a new era of global antibiotic-free farming."
>
> **DaBomb Protein Biotech Chairman Chen Wei-Chen**

Technology Achievements and Industry Applications

Mature Microbial Ecology Fermentation Technology

DaBomb Protein Biotech possesses deep, well-established core fermentation technology in microbial ecology and has long been committed to the R&D and production of fermented plant protein products. This technology transfer will be deeply integrated with the company's two existing flagship product lines: DBT-100 LS (the livestock series), which targets the economic animal market, and DBT-100 HT (the aquaculture series), the rising star that recently drew strong attention at World Aquaculture 2026, Singapore. The high heat stability of the transferred technology allows the products to fully withstand the demanding high-temperature pelleting conditions of feed processing, ensuring that probiotic activity effectively reaches the animal gut and delivers its intended function.

Integration with Flagship Product Technology

By combining this R&D achievement with functional prebiotics, postbiotics, and high-quality fermented plant proteins, DaBomb Protein Biotech is comprehensively helping leading feed manufacturers at home and abroad implement "high-efficiency, antibiotic-free" rearing standards. This represents not merely a technological upgrade, but a paradigm shift for the industry—from traditional antibiotic-dependent farming toward a green, sustainable model centered on precision nutrition and microbial ecology technology.

Strategic Positioning in Functional Postbiotics

Standing at this new starting point, DaBomb Protein Biotech will continue to deepen its foundation of academic collaboration, translating laboratory innovations into practical, industry-ready solutions, and leading the global animal health industry toward a new era defined by antibiotic-free, green, and sustainable practices.







Caption: DaBomb Protein Biotech team and representatives from National Chung Hsing University pose together following the signing of the technology transfer agreement

Applications and Prospects of *Bacillus velezensis* Postbiotics in Animal Health



Prof. Lee Tzai-Tai, Ph.D.

INTERVIEWEE LEE TZAI-TAI |
COMPILED BY CHIANG YI-HSUAN

Distinguished Professor, Department of Animal Science, National Chung Hsing University

[Abstract]

Postbiotics have emerged as a frontier area of probiotic research, attracting considerable attention from the livestock and pet food industries in recent years. *Bacillus velezensis* has been identified as a promising candidate for postbiotic applications, owing to its exceptional environmental tolerance, prolific extracellular enzyme secretion, and multifaceted intestinal protective mechanisms. Drawing on recent field trial data and mechanistic research, this article examines the scientific basis of B. velezensis postbiotics, their efficacy across multiple livestock species, and their potential role in antibiotic-free farming transitions and the growing companion animal health market.

The global livestock industry is undergoing a profound transformation. The European Union's 2006 ban on growth-promoting antibiotics set a precedent that has since been followed by countries worldwide, placing antibiotic residues and antimicrobial resistance firmly at the center of animal production concerns. Taiwan's livestock sector faces this same reality: with characteristically high stocking densities and a hot, humid, and climatically variable environment, maintaining intestinal health and productive performance while reducing dependence on antimicrobials has become one of the most pressing challenges for both industry and academia. Against this backdrop, probiotics rose rapidly as a practical alternative, evolving from straightforward antibiotic substitution toward the more sophisticated paradigm of precision nutrition. The emergence of postbiotics—a concept that builds on and extends probiotic science—now offers this field a more stable and quantifiable scientific foundation.

Among the many probiotic genera, *Bacillus spp.* have established themselves as the preferred choice for livestock and feed applications, owing to their distinctive biological properties. Members of this genus form highly resilient endospores capable of surviving the high-temperature pelleting process central to commercial feed manufacturing, ensuring delivery of viable organisms to the animal. These endospores likewise retain their integrity under the acidic conditions of the stomach, the bile-salt-rich environment of the small intestine, and the variable pH encountered throughout the gastrointestinal tract—overcoming the fundamental limitation of conventional probiotics, which suffer substantial viable cell count losses during both processing and digestion. *Bacillus velezensis* is particularly notable for its prolific secretion of extracellular enzymes during fermentation—including proteases, amylases, and cellulases—conferring high degradation efficiency across a broad range of feed ingredients and agricultural by-products, and providing an abundant substrate base for postbiotic preparation.

The emergence of postbiotics provides a scientifically robust and more readily quantifiable foundation for advancing this goal.

The concept of postbiotics represents a departure from the traditional paradigm of evaluating probiotic efficacy solely on the basis of viable cell counts. As defined by the International Scientific Association for Probiotics and Prebiotics (ISAPP) in 2021, postbiotics are "preparations of inanimate microorganisms and/or their components that confer a health benefit on the host." Their active constituents are more precisely quantifiable and maintain greater process stability than live-cell preparations, being unaffected by temperature fluctuations, pH variability, or microbial culture aging—providing a more reliable basis for industrial quality control. The functional components of B. velezensis postbiotics encompass four principal categories: bioactive enzymes that facilitate the hydrolysis of macromolecular feed substrates; antioxidant peptides capable of scavenging reactive oxygen species and alleviating systemic oxidative stress; antimicrobial substances—most notably lipopeptides—that directly suppress the proliferation of pathogenic microorganisms; and cell wall components that stimulate intestinal epithelial cells to produce immunomodulatory cytokines, thereby activating innate immune responses. Together, these constituents form a comprehensive and synergistic intestinal protective system.

Intestinal health is fundamentally anchored in the integrity of the gut barrier. B. velezensis postbiotics upregulate the expression of tight junction proteins—including claudin, occludin, and zonula occludens-1 (ZO-1)—in intestinal epithelial cells, reinforcing paracellular sealing and effectively preventing the translocation of pathogens and toxins into systemic circulation, thereby reducing the risk of systemic inflammatory responses. Beyond barrier reinforcement, once colonizing the intestine, this strain continuously secretes cellulase complexes that degrade the non-starch polysaccharides (NSPs) of plant cell walls present in feed ingredients; the oligosaccharide products of this degradation in turn promote the proliferation of beneficial microorganisms such as lactic acid bacteria (LAB), establishing a positive feedback loop within the gut microbiota. The net result is the maximal utilization of dietary nutrients by the animal—the central objective of precision nutrition.

Systematic field trials have validated the broad-spectrum benefits of B. velezensis postbiotics across multiple livestock species, frequently yielding findings that exceed initial expectations. In laying hen trials, in addition to significant improvements in established gut health parameters, the research team unexpectedly observed a reduction in egg off-flavor—particularly the elimination of a characteristic fishy note—a phenomenon tentatively attributed to optimization of fatty acid metabolic pathways following gut microbiota remodeling. Preliminary industry testing has reported encouraging outcomes, and mechanistic studies are ongoing. The trials also documented a marked reduction in fecal stickiness, indicative of enhanced intestinal fermentation efficiency and carrying practical benefits for farm environmental management.

Findings from swine trials were equally noteworthy. Following postbiotic supplementation, barn odor scores declined substantially. Mechanistic analysis indicates that this effect operates through two synergistic pathways: first, the antimicrobial activity of the postbiotic preparation effectively suppresses environmental putrefactive bacteria and coliform populations, reducing aberrant fermentation and associated gas production from organic substrates; second, the systemic improvement in intestinal health directly attenuates enteric release of ammonia (NH_3) and hydrogen sulfide (H_2S). The combined action of these two mechanisms produces a fundamental improvement in barn air quality. Taken together, these field observations affirm that the benefits of postbiotics are not confined to discrete performance metrics, but instead exert broad and far-reaching effects on overall animal physiology through the systematic enhancement of gut health.

As companion animal ownership rates continue to rise across Taiwan and pet owners increasingly seek premium health solutions, the market for canine and feline health products is expanding rapidly. B. velezensis postbiotics offer particular suitability for companion animal applications. Cats, as obligate carnivores, have exceptionally high demands for protein digestibility; the proteases present in the postbiotic preparation effectively assist protein hydrolysis, improve amino acid bioavailability, and concurrently reduce the malodorous compounds generated by fermentation of undigested protein in the hindgut, thereby improving fecal quality. For juvenile dogs and cats, whose intestinal enzyme systems are not yet fully developed, postbiotic supplementation provides immunomodulatory support that helps establish a more robust intestinal barrier and protective immune response during this critical developmental window, laying a foundation for long-term health. Extending the healthy lifespan of companion animals represents the most compelling value proposition in the pet health market.



Postbiotic Mechanism of Action

Modulates gut microbiota composition, suppresses the proliferation of pathogenic bacteria, and maintains intestinal ecological balance.



Intestinal Barrier Reinforcement

Upregulates tight junction protein expression to strengthen the intestinal mucosal barrier and reduce the risk of pathogen invasion.



Research & Application

Efficacy validated across multiple field trials, with consistent and stable benefits demonstrated across diverse livestock species and production environments.

Broader adoption of postbiotics in commercial livestock production will require the continued accumulation of systematic, multi-species trial data and the refinement of precise dosing protocols, enabling producers to apply these preparations with greater confidence and accuracy. Taiwan's substantial research foundation in antibiotic-free animal production provides a solid scientific basis and favorable industry conditions for the practical deployment of B. velezensis postbiotics at scale. As national policy progressively restricts the use of growth-promoting antibiotics, fully validated postbiotic products of this kind are wellpositioned to serve as an indispensable tool for safeguarding animal health and sustaining productive performance—and a cornerstone of Taiwan's livestock industry's transition toward a more sustainable future.



The New Generation of Postbiotics DaBomb's Functional Nutrition Solutions

COMPILED BY CHIANG YI-HSUAN

How Are Postbiotics Making Their Way Into the Animal Nutrition Market?

The global animal nutrition market is entering a new phase. As antibiotic-free farming policies grow stricter, consumer awareness of food safety rises, and demand for functional feed additives grows rapidly, postbiotics—with their stability, safety, and ease of application—are steadily becoming an important raw material option in the animal nutrition field.

Postbiotics are the bioactive substances generated by probiotics during fermentation and metabolism, including short-chain fatty acids, organic acids, peptides, cell wall fragments, and exopolysaccharides. Because they do not require live bacterial viability to be maintained, postbiotics remain stable under conditions such as high-temperature processing, long-distance transport, and ambient-temperature storage, significantly reducing the complexity of supply chain management and formulation design—making them an ideal choice for modern composite animal nutrition formulas.

The application of postbiotics has expanded from human health foods to aquaculture, livestock and poultry feed, and pet wellness, addressing the diverse needs of different farming scenarios for gut health management, everyday health maintenance, and improved feed efficiency.

※ DaBomb continues to translate postbiotic research findings into practical product applications, providing science-based functional raw material solutions for a wide range of farming scenarios.

DaBomb's Concept of Composite Nutrition Formulation

DaBomb has been deeply engaged in the protein and functional raw materials field for many years, guided by the core philosophy of "composite nutrition formulation." By scientifically integrating probiotics, postbiotics, and fermentation nutrition technology, DaBomb applies this expertise across a range of animal nutrition products spanning aquaculture, livestock, and pet wellness. At the heart of this integrated approach is the synergistic action of multiple functional components, enabling DaBomb to offer customers more comprehensive animal health management solutions.

Gut Health Management
Maintaining balanced gut microbiota and normal digestive tract function

Nutrient Utilization Efficiency
Improving the utilization efficiency of protein and energy in feed

Everyday Health Management
Supporting the stable maintenance of animals' everyday health status

Functional Formulation Applications
Suited to modern rearing models such as antibiotic-free farming and precision nutrition