

TECHNICAL BULLETIN

Non-Antibiotic Solutions

To Support: Immunity, Health, Performance, and Food Safety Naturally

How does nutrition impact health?

Modern animal nutrition is evolving to incorporate other fields of study such as physiology, microbiology, and immunology. The animal's diet can have a significant effect on its health by altering the gut microbiome and affecting the immune system. The immune system protects animal health and contributes to overall well-being. Nutrition is an important modulator of immune function and under typical animal production challenges can often tip the balance between health and disease. Immunology is critical in the advance of nutrition because it helps explain how various challenges affect animal health and production.

We often encounter terminology such as "immune stimulation" or "immune activation" associated with the use of feed additives. However, stimulating, activating, or "boosting" the immune system only occurs at a cost to the animal requiring nutrients that could otherwise be used for production. Rather, the goal should be "balanced immunity." If the immune response is too extreme, dramatic reductions in animal growth and even death can occur. On the other hand, a weak or inadequate immune response may not eliminate the pathogen and can lead to systemic infection and other health problems.

The nutritional strategy should allow the animal's immune system to perform its normal function — to recognize a pathogen and respond efficiently in order to eliminate the challenge without causing excessive tissue damage or reductions in performance. This strategy provides a **"balanced immune response"** that includes a shift in the microbiota of the gut and extends to support both innate and adaptive immunity. With a balanced immune system, an animal can efficiently overcome health challenges that would otherwise decrease its wellness and productivity. We call this Balanced Immunity.

Nutritional Health Solutions™

Diamond V leads in the research, development, and marketing of natural, nutritional health products that support digestive health and balanced immunity.

These products include: Original XPC™, NutriTek®, SmartCare®, NaturSafe™, and SynGenX®. Diamond V products do not treat or prevent diseases. Rather, they support health and wellness naturally.

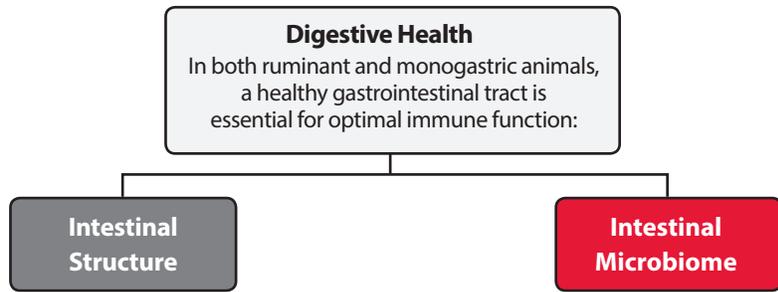
Diamond V research shows our products support digestive health by helping balance the immune system and microbiota of the digestive tract while optimizing its morphology. In both ruminants (such as dairy and beef cattle) and monogastrics (such as poultry and pigs), the bioactive metabolite compounds in our products help promote a healthy balance of bacteria in the gastrointestinal tract, while the antioxidant activity supports immune function.

Improved digestive health translates into better performing livestock — animals that are more capable of reaching their genetic potential. Diamond V's extensive challenge-type research demonstrates the power of a healthy immune system.

Research shows that Diamond V technologies demonstrate efficacy through multiple modes of action, which work together in the following biological systems:

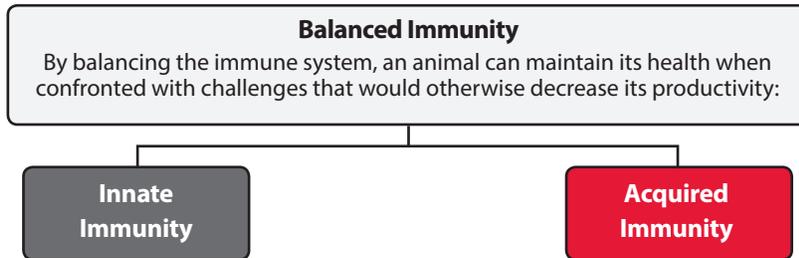
- Immunity
- Microbiota
- Morphology





The intestinal mucosal barrier serves as the first line of immune strength. Healthy villi provide optimal surface area for nutrient absorption. Tight junctions between epithelial cells of the intestinal wall control permeability of fluids and digested nutrients and support cell integrity, controlling bacteria across the intestinal lining.

The intestinal microbiome refers to the microbiota or populations of competing microorganisms in the gastrointestinal tract, their genetic information, and their environmental interactions. A balanced microbiome, with large populations of beneficial commensal bacteria, helps maintain intestinal structure and promotes overall health and immunity.



All living organisms possess innate or natural immunity. Innate immunity provides general or non-specific protection and serves as the first response. Innate immunity also is active in external barriers such as the skin or mucous membranes of the respiratory and digestive tracts.

Acquired or adaptive immunity develops over time, resulting from exposure to pathogens and immunization through vaccination. The acquired immune system reacts by producing immune cells and antibodies. Over time, acquired immunity becomes more efficient due to its "memory" of specific antigens.

Extensive research shows that Diamond V's nutritional health products provide natural support for digestive health and immune function.

Other research shows that antibiotics do not adversely affect the efficacy of Diamond V products and that our products work in both conventional and antibiotic-free production systems. In animal production systems, our products support immunity, health, performance, and food safety naturally.

Diamond V products provide research-tested, performance-proven support for the stewardship of antibiotics and other antimicrobials in modern livestock and poultry production. It is vital to preserve the efficacy of current therapeutic treatments for both human medicine and animal agriculture around the world. Our nutritional health products can play an important role.

References

Published research studies on the effects of Diamond V technologies on innate immunity, acquired immunity, intestinal structure, and the intestinal microbiome are available upon request.

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The Trusted Experts In Nutrition & Health[®]