MINERALwrites

Q2 2026

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Strategies for Calf Health, Livability, and Future Production

When we look at the financial side of rearing replacement heifers, early-life health challenges are a major drain on a dairy's long-term profitability. Information presented at this year's American Dairy Science Association (ADSA) annual meeting by the Council on Dairy Cattle Breeding (CDCB) highlighted that diarrhea and respiratory disease are the two primary causes of calf mortality in the dairy industry. The data underscored how genetics is a core piece of the puzzle, alongside targeted strategies to support gut health, boost immunity, and improve long-term feed efficiency and production. This issue of *Minerals Writes* will discuss a snapshot of the calf's early life, with a focus on proactive gut health.

Rather than concentrating solely on immediate livability, hidden costs impose a lifelong tax on the animal's future potential. Heifers that get sick early in life often pay a permanent price. They produce over 1,500 lbs. less milk during their first lactation, calve later, and leave the herd much earlier. On an individual basis, a single case of respiratory disease costs about $60 for immediate treatments and labor. Still, it ultimately reduces the heifer's lifetime profitability by around $300 due to growth delays. A case of diarrhea averages $25 in immediate clinical costs, but if that calf dies before weaning, the farm loses a gross investment of $600.

According to the CDCB data, a wide gap exists between the top and bottom tiers of calf health genetics, creating a significant divide in disease resistance and operational profitability. Herds with the poorest health genetics (the bottom 25%) experience twice the incidence of diarrhea and more than 30% more respiratory disease cases than the top 25% of genetically resistant herds. This genetic difference carries a heavy financial burden, adding $2,100 in immediate treatment and labor costs for every 100 calves raised on a farm. To close this gap and protect long-term investments, the dairy industry is shifting away from reactive medical treatments for sick animals and moving toward proactive nutritional strategies that support the calf's internal environment.

A calf's growth timeline is highly dynamic, shaped by the ongoing interaction between genetics, environment, and management. Early health risks can even vary by breed and housing system; pairs or groups with Holsteins have about a 12% chance of developing diarrhea compared with about 17% for Jerseys. At the same time, genetic selection can support health, future milk production, early-life nutrition, and the development of the intestinal microbiome. This microbiome helps translate genetic potential into real-world performance by shaping early microbial communities and supporting immune development.

The first weeks of life are critical for establishing this framework. Colostrum is the essential starting point because calves are born without active immunity and depend entirely on passive transfer to obtain early protection. More colostrum helps, but only when the quality is there. At the same time, bacteria begin to settle in different areas of the gut, shaping digestive and structural development.

Three main microbial groups are especially important as the calf moves from digesting milk to fermenting starter feed. *Proteobacteria* tend to arrive first because they can tolerate low oxygen levels and help clear it from the newborn gut. That action creates the strictly anaerobic, low-oxygen environment needed for other useful microbes to take hold. From there, *Firmicutes* and *Bacteroidetes* become more established, supporting rumen development. *Firmicutes* ferment starches and sugars into butyrate, an important fuel source for the growth of the rumen wall. Meanwhile, *Bacteroidetes* help the calf begin utilizing plant fiber by producing enzymes that break down tougher cell-wall material as solid starter intake increases.

As a calf moves from a liquid milk diet to a starter ration and forage, along with water, the microbiome must pivot from an intestinal focus to a forestomach focus. In pre-weaned calves around 42 days of age, *Bacteroidetes* heavily dominate the rumen microbiota. The intake of solid feed triggers a massive successional shift. Post-weaning, there is a natural increase in *Firmicutes* and *Proteobacteria*, and a decrease in *Bacteroidetes*, regardless of weaning age. While *Prevotella* remains the dominant genus in both pre- and post-weaned rumen environments, solid feed intake drives key functional shifts, including increases in *Ruminococcus* and *Fibrobacter* to aid cellulose digestion and a significant rise in rumen carbohydrate metabolism.

Introducing live probiotics like *Saccharomyces cerevisiae* helps maintain a stable, balanced environment by scavenging oxygen. This supports beneficial, anaerobic bacteria and optimizes overall fermentation activity. At the same time, postbiotics supply a direct source of short-chain fatty acids (SCFAs), particularly butyrate, which is the preferred energy source for the cells lining the rumen. This targeted fuel directly influences epithelial cell turnover, enhances gut barrier integrity, and drives the physical elongation of the rumen papillae. By expanding this functional surface area, we directly scale up the calf's ability to absorb macro minerals, trace elements, and energy-yielding volatile fatty acids.

Since diarrhea and respiratory diseases are the single biggest threats to a calf's life, keeping the gut healthy is a must. Think of a healthy gut lined with tiny, finger-like villi that soak up all the nutrients from feed. When bad bugs attach to that lining, they release toxins that cause severe inflammation, flattening the villi completely and causing a "leaky gut" in which the barrier between the digestive tract and the bloodstream breaks down.

When the microbiome is in balance, it does more than support digestion. High concentrations of beneficial microbes, such as *Faecalibacterium prausnitzii*, are vital for mitigating this disease risk because they promote targeted anti-inflammatory responses and produce the protective SCFA butyrate, which directly maintains gut barrier integrity. This is where probiotics and prebiotics play a useful role. When beneficial microbial substrates are present, synbiotics support a more stable microbial community along the gut lining.

Probiotics such as *Lactobacillus* and *Bifidobacterium* help reduce the risk of diarrhea and support feed efficiency by competing with opportunistic pathogens for nutrients and attachment sites. Through this process, known as competitive exclusion, beneficial microbes make it harder for organisms such as *E. coli* and *Salmonella* to attach, multiply, and disrupt gut function.

When a calf suffers from diarrhea or severe stress, it doesn't just fail to absorb the nutrients in its feed; it actively purges its own stored resources. As the inflamed intestinal lining sloughs off, the calf's body dumps a massive amount of its own systemic zinc and copper into the stool. Supplemental strategies, such as adding zinc oxide, have been shown to directly reduce diarrhea, boost immunity, and increase beneficial bacteria. Maintaining a highly resilient mucosal barrier stabilizes the gut microbiome, preventing this trace-mineral "dumping" and helping the calf thrive during a health challenge.

A recent study published in the journal *Animals*, titled *"Saccharomyces cerevisiae Fermentation-Derived Postbiotics Supplementation to Dairy Calves: Effects on Growth, Metabolism, Immune Status and Preliminary First Lactation Outcomes"* (Sfulcini et al., 2025), provided concrete validation for these internal defense concepts. The trial investigated the effects of supplementing dairy calves with *Saccharomyces cerevisiae* fermentation-derived postbiotics (SCFP) on their growth, metabolism, immune function, rumen development, and future productivity.

Eighteen Holstein heifer calves were divided into two groups: one received SCFP supplementation from 3 to 70 days of age, while the control group received no supplementation. The results showed that SCFP-supplemented calves had improved post-weaning growth, greater body weight, enhanced rumen development, and a more robust immune response compared to controls. Notably, these calves also exhibited higher plasma concentrations of key metabolic markers and volatile fatty acids, indicating superior nutrient absorption and heightened rumen activity.

Importantly, the benefits of early-life SCFP supplementation extended directly into adulthood. During their first lactation, cows that received SCFP as calves produced more milk with higher protein yields and greater energy-corrected milk (ECM), despite a slightly lower fat percentage. The study concludes that early supplementation with SCFP supports healthier growth, improved immune and metabolic function, and effectively enhances long-term milk production in dairy cows.

The takeaway is that genetics set the baseline potential, but early-life management determines how much of it is ultimately realized. By supporting colostrum quality, stabilizing early gut and immune development, and smoothing the critical transition through weaning, operations can help calves achieve healthier growth, better overall livability, and stronger future production potential.

References

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Senator Chuck Grassley Visits ILC Resources During Annual 99 County Tour

(Urbandale, Iowa) ILC Resources, a Midwest-based producer of calcium carbonate products that supports animal agriculture and various industrial sectors, welcomed U.S. Senator Chuck Grassley to its Alden, Iowa facility on June 19 as part of his annual 99 County Tour.

For 46 consecutive years, Grassley has visited all 99 Iowa counties to hear directly from Iowans where they live and work. The longstanding tradition provides opportunities for conversations with employees, business leaders, educators, healthcare providers and community members across the state.

“Dialogue is the essence of representative government. You can’t have representative government without speaking to your constituents,” Grassley said of his annual county meetings. “I appreciate the opportunity to meet directly with Iowans in all 99 counties, answer their questions and hear what’s important to them.”

During Friday’s visit, Grassley asked questions about the business and policy issues affecting the organization before conducting his traditional question and answer session with those in attendance.

Headquartered in Urbandale, Iowa, ILC Resources has supplied high-quality calcium carbonate products for more than a century. The company's products help customers grow, build, and improve communities throughout Iowa and the Midwest, supported by a dedicated workforce and calcium carbonate resources that will serve generations to come.

"We appreciated the opportunity to welcome Senator Grassley to our Alden facility and share more about the role ILC Resources plays in supporting animal agriculture and industry across the region," said Tim Makens, President and CEO of ILC Resources.

ILC Resources concluded the visit by presenting Grassley with a company hat and a bottle of honey produced at all its locations to support pollinators. “Is this my present?” Grassley asked, prompting laughter. “I’ll take it!"

In Memoriam: Remembering the life, faith, and lasting agricultural legacy of Richard H. Bristol

Richard H. Bristol, an animal nutritionist who dedicated his 40-year career to the agricultural industry and his family, passed away in Superior, Nebraska, on June 13, 2026, at the age of 78. Born into a family of educators in Mankato, Minnesota, Bristol earned his degrees in animal science from the University of Arizona before launching a highly respected career that spanned roles at Farmland Industries, Aurora Cooperative, and ultimately ILC Resources, where he served as the Director of Nutrition and Technical Services. He was a trusted advisor to farmers, a guest lecturer, and a pioneer in leading his company to Safe Feed/Safe Food compliance. Outside of his professional achievements—which included formulating diets for major livestock operations and even zoo animals—Bristol was a devoted family man who embraced his wife Joanna's five children as his own upon their marriage in 1976 and remained steadfastly committed to his faith and family throughout his life. He is survived by his wife of nearly 50 years, two children, a brother, two granddaughters, and three great-grandchildren.

Recognizing Linda Morris-Dowie, Vice President of Finance, Secretary, and Treasurer

A retirement tribute honoring Linda's 47-year career with ILC. Linda began in July 1978 as a typist preparing price lists and went on to become an influential leader in the company. During her tenure, she earned her degree, became a CPA, learned to write code, helped modernize systems and IT infrastructure, and played a major role in the company's growth and evolution. Thank you, Linda, for your storied career and blazing a path for the women of this company.

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