

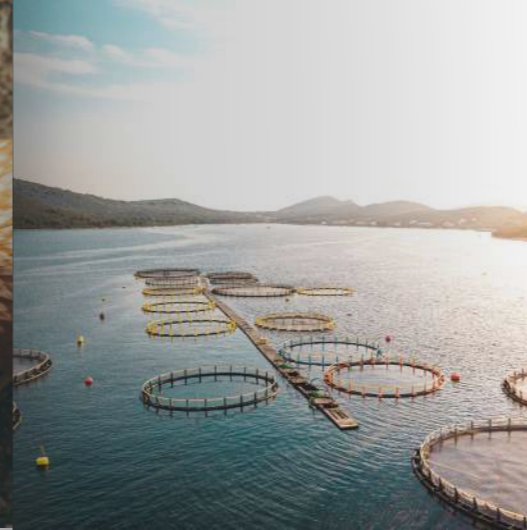
# FEED UPDATE

MAY 2025

**TOWARDS MORE SUSTAINABLE MILK  
PRODUCTION SYSTEMS WITH  
INTEGRATED FARM  
ECOSYSTEMS**

*Plus* : Ultrasound for Hen Performance • From Stress to Balance • Heat Support for Sows • Swine Feed Efficiency • Clean Silage Strategies





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## Lallemand Animal Nutrition In the Wild



- International Symposium on Digestive Physiology of Pigs (Lake Geneva, WI, USA) – May 20-23, 2025
- Equine Science Society Symposium (Fort Collins, CO, USA) – June 3-6, 2025
- ADSA2025 (Louisville, KY, USA) – June 22-25, 2025
- European Symposium on Poultry Nutrition (Maastricht, The Netherlands) – June 23-26, 2025
- SPACE (Rennes, France) - September 16-18, 2025



## QUICK PULSE



### Lallemand Joins Industry Leaders in Highlighting the Benefits of Advanced Biotechnology

Lallemand and 12 other industry leaders in the AB4S coalition have published « Harnessing the Economic and Environmental Benefits of Advanced Biotechnology. » The report shows how biotechnology can significantly reduce greenhouse gas emissions, conserve water resources and improve products across agriculture, chemicals, personal care and biofuels sectors. With potential to cut 4 gigatons of CO<sub>2</sub> emissions and save 500 billion cubic meters of water annually, the coalition urges collaborative action between industry, investors and policymakers to accelerate sustainable biotechnology adoption.



# TOWARDS MORE SUSTAINABLE MILK PRODUCTION WITH INTEGRATED FARM

**W**ith growing demands from customers for improved environmental performance and transparency throughout the food chain, the pressure is on farmers to reduce emissions at a farm level and strive towards a more sustainable dairy farm.

In the pursuit of net-zero and better dairy sustainability, the ambition of many farmers is to improve production efficiency by producing from less, creating financial gains too. The first step towards achieving more sustainable dairy farms is often identifying ways to use available resources more efficiently, thereby improving productivity, and as a result increasing dairy farm sustainability.

## An Integrated Approach Delivers More Sustainable Dairy Farming

Taking an integrated approach to reducing emissions across the whole farming business is the best way to progress towards net-zero and dairy farming sustainability. Rather than relying on a single solution, like using feed additives to improve feed efficiency, farms can achieve multiple emission reductions by taking a more comprehensive approach. This could involve better managing the microbial environment of bedding and manure or producing higher-quality silage using specific inoculants, such as MAGNIVA, which help maintain overall silage quality while reducing dry matter losses and waste.

## Feed Management Is the Key to Improving Sustainability of Milk Production

Producing higher quality forage can be one piece of the jigsaw in reducing the carbon footprint of dairy production, helping agriculture to meet its net-zero targets.

Feed rate per liter of milk is another driver that can help reduce greenhouse gas (GHG) emissions, therefore incorporating products into rations that improve feed efficiency is another easy win. Feed wastage through poor feed conversion efficiency is a big cost to a farm business. Addressing feed wastage can be a core element in moving to a more sustainable dairy farm.

There are many demands on farmers. For example, for dairy producers to be profitable they must produce good quality milk at the lowest cost achievable in their system, but now there is the added pressure to achieve this while having less impact on the environment. If farmer want to secure their business, they have to think about the future and the expectations of their buyers and governments to provide evidence of more sustainable milk production processes.

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## Impact of Live Yeast Diets on Dairy Farms

Manufacturers supplying agriculture can help farmers to respond to increasing market demands to reduce the impacts of dairy farms. For example, life cycle assessment (LCA) studies can provide precise environmental information about products used on the farm. Globally, LCA is the most widely accepted environmental assessment methodology used by businesses, governments and other stakeholders; including by Lallemand Animal Nutrition, which is committed to measuring the environmental footprint of its products.

**Pierre-Marie Guineheuc**, LCA expert at Lallemand Animal Nutrition, emphasizes the importance of trials that evaluate the impact of products within farming systems.

“While LCA examines every stage of production - including raw materials, energy use, transportation, and waste - and measures various environmental impacts to give us a complete picture; making improvements at the farm level remains vital,” he explains. “These farm-level changes are key to increasing efficiency and ultimately reducing the carbon footprint of dairy and meat products.”

For example, an LCA study on the use of Lallemand Animal Nutrition’s rumen-specific live yeast, LEVUCCELL SC, in dairy cow’s diet; showed that its contribution to the carbon footprint of 1kg of Fat Protein Corrected Milk (FPCM) was less than 0.05%.

The study further shows, in a dairy farming models typical of Northern Europe, by improving feed efficiency and milk production; feeding the live yeast can lead to a reduction in carbon footprint per kg of milk by at least 3% to 6%, compared to scenarios where no yeast was fed to the cows.

By optimizing rumen function and therefore feed efficiency, the trials showed that more milk and higher percentages of its fat and protein components could be produced per kilogram of dry matter consumed, as the yeast improves feed

## HOW RUMEN-SPECIFIC LIVE YEAST HELPS REDUCE MILK CARBON FOOTPRINT



*Saccharomyces cerevisiae* CNCM I-1077 (LEVUCCELL SC) improves feed efficiency by up to 7%



3-6% reduction in carbon footprint per kg of milk



< 0.05% contribution of LEVUCCELL SC to carbon footprint per kg of milk

LALLEMAND

## A Move Towards More Sustainable Dairy Farming

Many factors can help reduce emissions on dairy farms, from reducing age at first calving to maintaining animal health and in consequence reducing the risk of occurrence of some disease such as mastitis; though some may be more challenging for individual farms than others. By enhancing the value of the farm’s own resources and improving feed efficiency with scientifically proven interventions, more sustainable dairy farming is within every farmer’s reach, whatever their system.

# ULTRASONOGRAPHY: A WINDOW INTO HEN PERFORMANCE

In the precision-driven world of modern egg production, a novel application of ultrasonography is revolutionizing how producers evaluate laying hen potential. This non-invasive technology offers quantifiable insights into physiological parameters directly correlated with productivity, enabling producers to optimize performance while maintaining high welfare standards.

Keel bone fractures affect up to 90% of hens in aviary systems, significantly compromising welfare and laying performance. These injuries - often the result of collisions with equipment or long-term pressure from perching - are exacerbated in modern layers, which are selectively bred for high egg output at the expense of muscle mass and bone strength.



Figure 1 : Pectoralis muscle thickness in a well-muscled hen (left: thicker) and in an hen lacking muscle (thinner: right) obtained by ultrasonography. The keel bone is barely detected on palpation (left) or protruding (right).

## Beyond the Surface: Quantitative Tissue Assessment

Traditionally, producers rely on body weight measurements and manual palpation to assess pullet and hen development. While useful, these methods are subjective and lack precision. Fleshing score—already a benchmark in broiler breeder management—is increasingly recognized for its relevance to layers, as muscle development and protein retention are essential to sustaining a productive laying curve.

Necropsy remains the most accurate method of evaluating keel bone integrity, but it's invasive and terminal. Ultrasonography, already used in poultry science to assess egg freshness and shell thickness, now offers a reliable, on-farm alternative for R&D investigation. Lallemand Animal Nutrition has pioneered a real-time, portable ultrasound application for evaluating both breast muscle thickness and keel bone condition.

“Ultrasonographic analysis provides objective quantification of muscular development with precision to the millimeter,” explains **Eric Chevaux**, R&D manager at Lallemand Animal Nutrition.

“Transforming qualitative observations into numerical data that can predict laying curve persistence with significantly improved accuracy.”

Using a standardized scanning protocol, the device captures pectoralis muscle thickness (Figure 1) and identifies keel bone deviations or fractures offering consistent tracking across production stages.<sup>1</sup>

## The Muscle-Bone-Egg Connection

Recent research<sup>2</sup> has established clear connections between breast muscle development, skeletal health, and egg production quality. The pectoralis muscle serves as a critical protein reserve for egg synthesis, while the skeleton provides essential minerals like calcium and phosphorus for eggshell formation.

In a 2024 field study conducted by Lallemand Animal Nutrition in Italy, hens with well-developed muscles showed 28-40% thicker pectoralis measurements compared to under-developed counterparts - clear evidence of the technology's diagnostic value.

## Nutritional Strategy Validation

This ultrasound method also opens the door to validating nutritional strategies such as probiotic supplementation. In controlled trials, supplementation with *Pediococcus acidilactici* CNCM I-4622 (BACTOCELL) demonstrated significant physiological improvements over specific timeframes.<sup>3</sup>

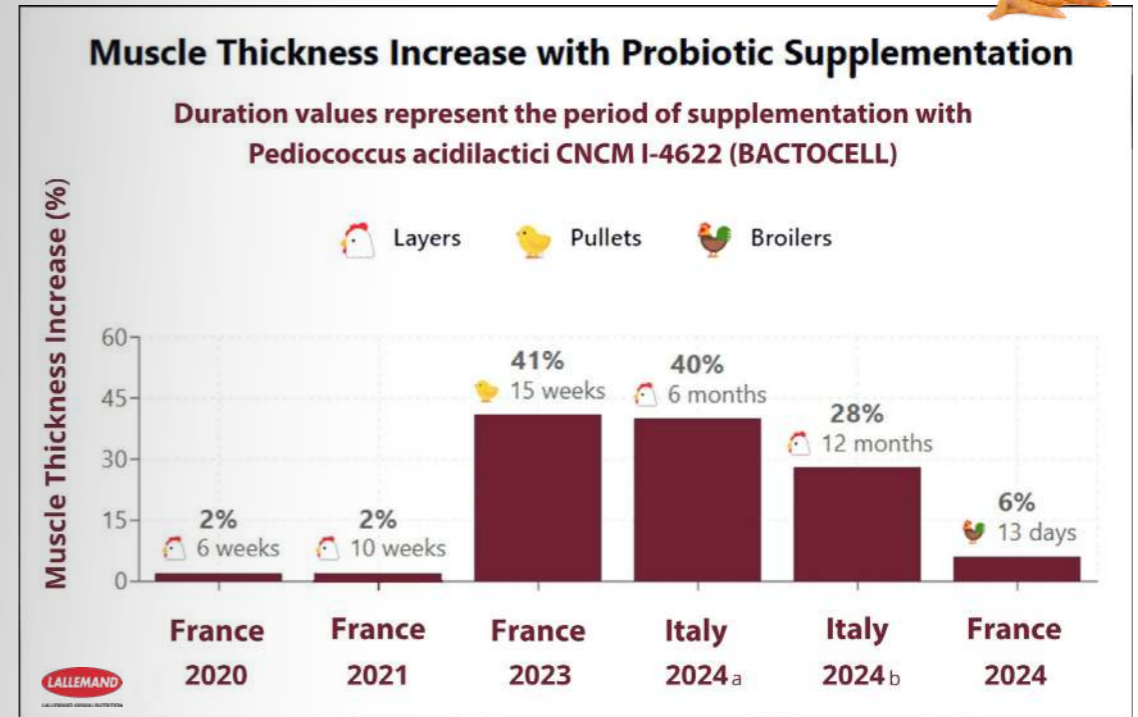


Figure 2 : Muscle Thickness Increase with Probiotic Supplementation

In the same field trial in Italy, these improvements corresponded with dramatic differences in keel bone integrity - 50% of probiotic-supplemented hens maintained undamaged keel bones versus just 15% in control groups (Figure 2). Furthermore, when fractures occurred, their severity was substantially reduced (0% severe fractures in supplemented birds compared to 25% in control groups).

“This methodology represents an intersection of diagnostic imaging science and production physiology,” notes Chevaux. “The high-frequency sound waves generate detailed tissue mapping that correlates strongly with metabolic efficiency indicators. Ultrasonography gives us that insight without sacrificing birds for examination.”

The adoption of this technology represents a forward-thinking approach to poultry management where science meets practicality to optimize production while supporting bird welfare.

<sup>1</sup> Vignale et al., 2018

<sup>2</sup> Alfonso-Carillo et al., 2021; Eusemann et al., 2020

<sup>3</sup> Allain et al., 2024; Soler et al. 2023



# BALANCING ACT: TACKLING OXIDATIVE STRESS WITH SUPEROXIDE DISMUTASE-RICH DRIED MELON JUICE AND SELENIUM-ENRICHED YEAST

**Monika Leukert**, product manager for Antioxidative Solutions and Yeast Derivatives at Lallemand Animal Nutrition, answers question on oxidative stress and its consequences for animals.

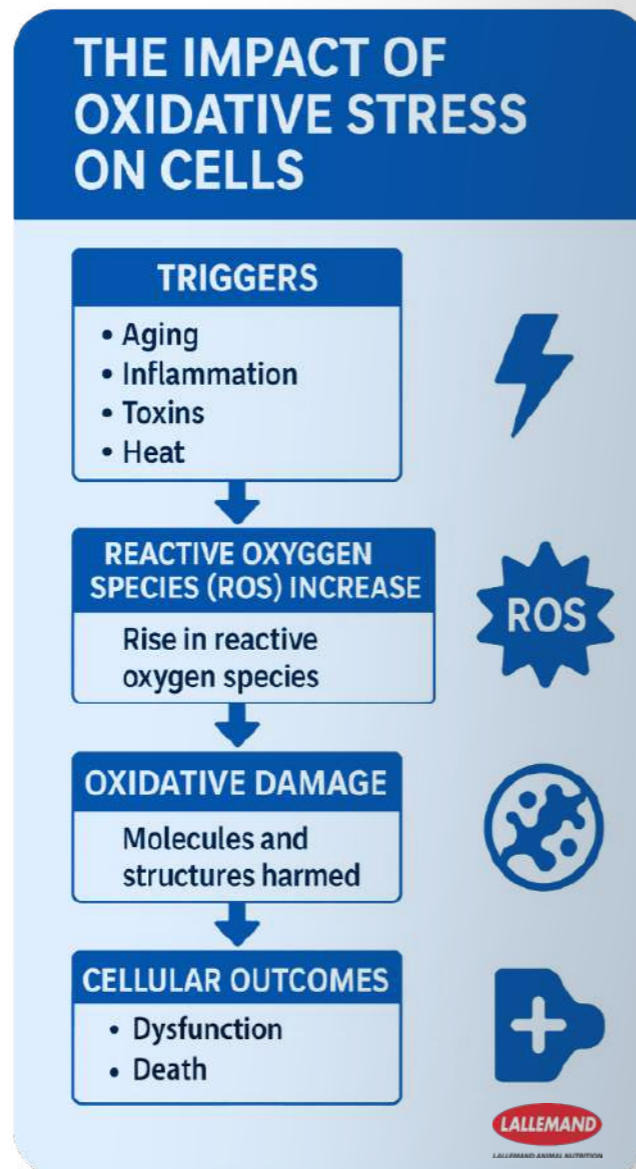
Imagine a constant battle inside every cell between harmful molecules and the body's built-in defense squad. This is oxidative stress in action. Scientifically speaking, oxidative stress occurs when there's an imbalance between reactive oxygen species (ROS) - highly reactive molecules produced during normal cellular metabolism - and the body's capacity to neutralize their effects using antioxidants.

ROS are not inherently bad – they are natural by-products of energy production in mitochondria. Under normal conditions, cells have defense mechanisms to keep ROS in check. However, when ROS levels spike – due to factors like dietary toxins, metabolic disorders, inflammations, medications, aging and thermal stress - these defenses can be overwhelmed leading to oxidative stress.

## Why Does it Matter? The Cellular Consequences

Oxidative stress is more than just a buzz word. It has a profound implication for cellular health. Elevated ROS can damage mitochondria, disrupt energy production, destabilize cell membranes, impair protein function, mutate DNA, and activate the immune system. Over time, this cellular chaos can trigger chronic inflammation, even lead to cell death, increasing susceptibilities to various diseases and pathological conditions.

To combat this, the body relies on a sophisticated network of antioxidants. Primary antioxidants like superoxide dismutase, catalase, glutathione peroxidase are enzymatic powerhouses that metabolize ROS into water and oxygen. Secondary antioxidants including vitamins C and E act as scavengers, neutralizing free radicals before they cause damage. Together, they form an antioxidant defense system.



## Nature's Defence System : Nutritional Strategies

Modern animal nutrition has embraced antioxidant supplementation as a frontline defense. Secondary antioxidants are now common additions to almost all animal diets offering to buffer oxidative stress. Trace minerals are also supplemented as they are important co-factors for primary antioxidants.

At Lallemand, innovation meets science in products like ALKOSEL, the selenium-enriched yeast that provides highly bioavailable organic selenium. This trace element is crucial for glutathione peroxidase production, an important antioxidant enzyme.

Similarly, MELOFEED, containing dried melon juice rich in superoxide dismutase, stimulates the production of antioxidant enzymes in the cells supporting the antioxidant defense system directly in the mitochondria.

## Defending from Within

A well-rounded antioxidant strategy isn't just a nutritional luxury - it's a biological necessity. Implementing a comprehensive antioxidant strategy can help maintain cellular balance and mitigate the negative effects of oxidative stress. In a world full of stressors, giving animals the tools to fight back from within is a game-changer.



**NUTRITIONAL STRATEGY TO COMBAT OXIDATIVE STRESS**



Include antioxidants in feed



Ensure trace mineral supplementation



Use products like ALKOSEL & MELOFEED



Monitor environmental and dietary stressors



WATCH THE FULL INTERVIEW



# BEATING THE RISING TEMPS: HOW PROBIOTICS SUPPORT SOWS UNDER WARM CONDITIONS

**David Saornil**, Global Swine Applications Manager at *Lallemand Animal Nutrition*, with a focus on practical, research-driven solutions for modern pig production systems.



**A**s rising temperatures become the norm in many parts of the world, heat stress has gone from a seasonal concern to a regular management hurdle in swine production. Among the most affected are lactating sows, whose performance and welfare can decline sharply during prolonged periods of heat. Understanding how to manage these impacts is becoming a crucial part of reproductive performance, milk production, and ultimately, farm profitability.

## Staying Cool Under Pressure

When sows experience heat stress, sows start making physiological adjustments to reduce internal heat production. They limit physical activity and reduce feed intake - natural survival mechanisms. But that comes at a cost. Lower feed intake means reduced milk production, loss of body condition, and compromised litter growth. As the sow struggles to maintain thermal homeostasis, both her health and her piglets' growth are adversely affected.

Maintaining sow body condition during these high-stress periods isn't just a matter of comfort - it's a cornerstone of productive, profitable farming. Managing body condition during heat stress is essential. When energy intake is insufficient during lactation, the sow begins to draw heavily on her own body reserves. Excessive tissue mobilization affects milk production and can increase the risk of issues like poor post-weaning fertility or Second Litter Syndrome, where sows underperform in their second cycle due to the toll taken during their first.

Sows maintaining good body condition at mating demonstrate superior reproductive metrics, including higher conception rates and increased numbers of piglets born alive.

Well-conditioned animals tend to have better reproductive outcomes, including higher conception rates and more piglets born alive.

## Feeding Smarter During the Hottest Months

While cooling systems and shade structures are important tools in the fight against heat stress, nutrition plays a quieter but equally powerful role. A recent field study on 199 sows in the Netherlands examined how a specific probiotic yeast (LEVUCCELL SB) included in a specific nutritional solution might affect maternal performance during heat stress conditions and potential benefits for piglet development. The study group received a specific live yeast supplement *Saccharomyces cerevisiae var. boulardii* CNCM I-1079 (LEVUCCELL SB TITAN) at a 200g/ton of feed from five days pre-farrowing through weaning.

Environmental conditions included significant periods where temperatures exceeded 25°C, as documented by temperature-humidity index (THI) monitoring equipment. The results were striking across multiple parameters. For colostrum quality, Brix measurements showed 85% of supplemented sows produced good or very good samples, compared to just 44% in the control group - a substantial improvement in this critical immune transfer medium.

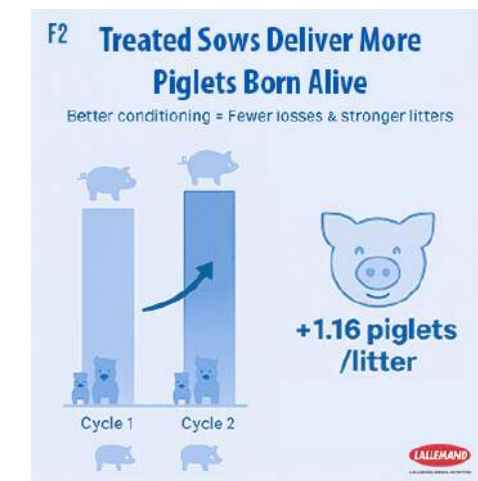
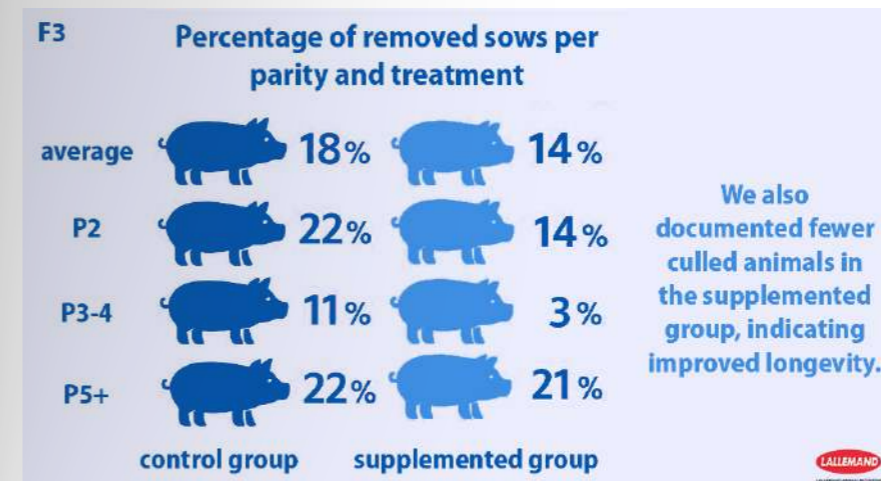
Regarding body condition, supplemented sows experienced 33% less weight loss, 17% less fat depletion, and 23% less loin tissue reduction (Figure 1). Despite similar restricted feeding between groups, the treated animals maintained markedly better condition, suggesting more efficient utilization of nutritional resources.

Perhaps most impressively, these benefits carried forward into subsequent reproductive cycles. The better-conditioned treated sows produced an average of 1.16 more piglets born alive per litter in their following parity (Figure 2). We also documented fewer culled animals in the supplemented group, indicating improved longevity (Figure 3). The physiological mechanisms behind these benefits likely involve improved fiber utilization and reduced inflammation. Supplemented sows appear to channel more energy toward milk production while mobilizing fewer body reserves, achieving a more favorable energy balance during challenging heat stress periods.

For producers, the economic implications are substantial. For a typical 500-sow operation experiencing heat stress, our economic modeling indicates substantial returns. Benefits include an average of 1.16 more piglets born alive in the next litter, a reduction of 10 kg in gestation feed per sow to help restore body reserves, and a 4% decrease in sow culling rate. Combined, these improvements represent approximately €15,500 in added value - a significant return on investment.

Heat stress may be unavoidable in many regions, but its impact doesn't have to be devastating. As climate challenges intensify globally, implementing effective nutritional strategies becomes increasingly important for sustainable production. For producers facing rising temperatures, probiotic supplementation offers a practical approach to maintaining sow performance and welfare during the hottest times of year.

The evidence suggests that with the right nutritional support, sows can indeed stay cool under pressure - benefiting their health, their litters, and ultimately, producer profitability.



# FEED EFFICIENCY GAINS IN FRENCH SWINE PRODUCTION USING LEVUCCELL SB

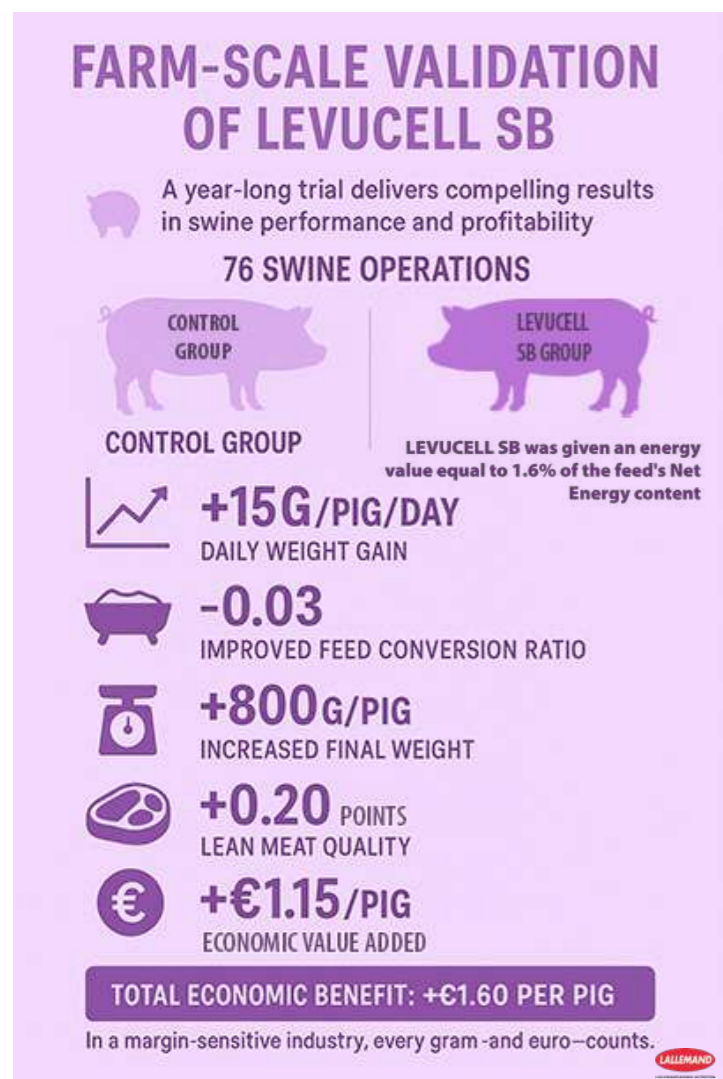
By **Dominique Baudry**, Technical Sales Manager, France

After nearly a decade of scientific validation and commercial collaborative implementation, Lallemand Animal Nutrition's Swine portfolio has reached a significant milestone with one of France's leading feed manufacturers. This case study highlights how LEVUCCELL SB (*Saccharomyces cerevisiae* var. *boulardii* CNCM I-1079), a live yeast developed by Lallemand Animal Nutrition, has demonstrated remarkable results in enhancing feed efficiency for a leading French animal feed producer.



## Building on a Foundation of Trust

For nearly a decade, a leading French feed producer has included LEVUCCELL SB in their sow and prestarter feeds at the recommended technical dosages, building a foundation of consistent performance and trust. The game-changer came in 2021, when Lallemand Animal Nutrition presented compelling research on extending these benefits to fattening pig feed.



Research conducted at the same metabolic chambers used by Dr. Jean Noblet, formerly research director of the French National Institute for Agriculture, Food and Environment (INRAE), to validate the Net Energy System generated considerable interest. Scientists observed a significant improvement in the Coefficient of Energy Retention, indicating potential for improved nutritional balance and reduced production costs. Based on these findings, the probiotic was given an energy value equal to 1.6% of the feed's Net Energy content.

## Farm-Scale Validation

The feed producer's positive experience with LEVUCCELL SB led to a comprehensive one-year trial spanning 76 swine operations, divided into control and test groups. The results were impressive:

## Consistency is Key

Product stability during feed production proved equally important. Extensive testing included over 130 samples analyzed throughout the year, with 96.5% conformity in colony-forming unit (CFU) recovery despite the rigors of the pelleting process. This reliability, alongside positive zootechnical performance, reinforced the product's value.

The large-scale trial's design deserves recognition for its methodological rigor. By implementing a validated model across numerous farms, researchers effectively eliminated external factors that might skew results, ensuring data reliability rarely seen in field trials of this scale.

**Based on the combined technical and stability results, the manufacturer has now fully incorporated LEVUCCELL SB at 1x10<sup>9</sup> CFUs per kg of feed across their complete and complementary feeds portfolio, including all fattening pig formulations.**

## Long-term Benefits

Beyond performance metrics, the incorporation of LEVUCCELL SB contributes to environmental advantages. According to the customer, improved feed utilization directly translates into reduced carbon emissions in their operation.

As we continue advancing probiotic applications in livestock production, this successful large-scale implementation stands as testament to the power of science-based microbial solutions in addressing the complex challenges facing modern swine producers.



# FROM THE SPANISH FIELD: PROACTIVE MEASURES TO REDUCE SOIL CONTAMINATION IN SILAGE

By **David Teran**, Technical Sales Manager at **Lallemand Animal Nutrition**

As I watch many farmers dealing with variable conditions this season, I've noticed a concerning trend of increased soil contamination in silage. This isn't just about dirty feed - it's seriously impacting your bottom line through reduced quality, compromised animal welfare, and diminished performance.

Excess soil in silage introduces harmful bacteria, including Clostridia, which thrive in oxygen-free environments. These bacteria can wreak havoc on silage quality, increasing pH through lactic acid consumption and producing butyric acid, which makes the silage smell rancid. The feed value of the silage is also reduced as Clostridia break down the protein content, leading to the production of biogenic amines like histamine, putrescine, and cadaverine. These compounds can severely impact animal health and production. Silage that not only smells and looks unappealing but actively discourages cows from eating their full ration, significantly lowering production numbers.

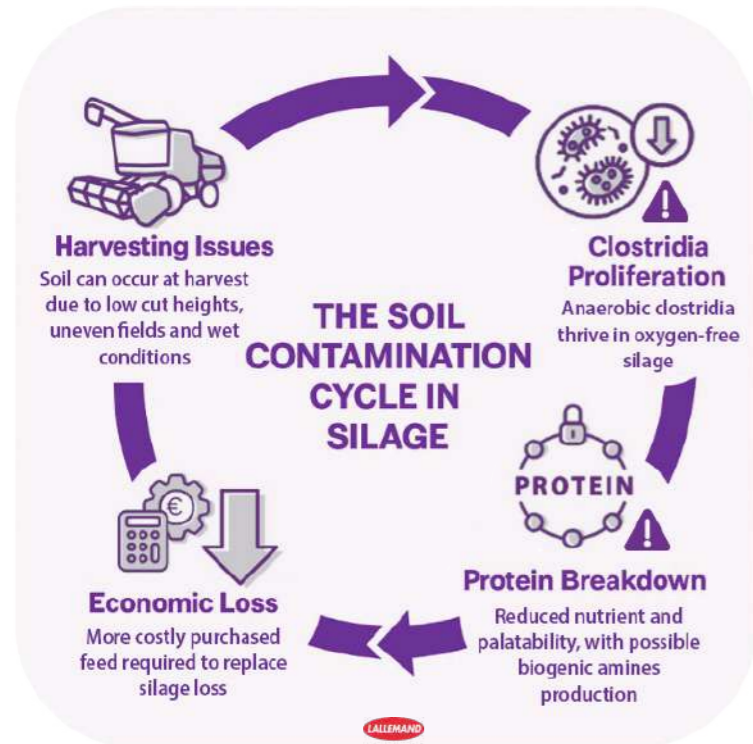
Soil contamination in silage leads to several critical issues:

**Clostridia Proliferation** : These soil-introduced bacteria break down valuable proteins, producing substances that make silage unpalatable to livestock

**Reduced Nutritional Value** : The protein breakdown diminishes essential nutrients, and can lead to the production of biogenic amines, compromising animal performance and health.

**Increased Spoilage** : Contamination accelerates degradation, increasing risks of mold and harmful microorganisms

**Economic Impact** : The resulting poor-quality silage increases per-cow feed costs as you'll need additional supplements to compensate for lost nutrients



Contaminated silage

# FIELD NOTES & SUCCESS STORIES

Farms that have successfully overcome this challenge have used MAGNIVA inoculants to control fermentation and minimize spoilage. The MAGNIVA ranges promotes lactic acid bacteria growth during fermentation, rapidly dropping pH levels to inhibit harmful bacteria such as Clostridia from growing in the silage

## Practical techniques to reduce clostridial silage:



**Adjust Cutting Height**  
Set cutting head higher when soil is soft



**Extend Wilting**  
Increase wilting time for drier silage



**Clean Bunker**  
Thoroughly clean before storing fresh silage

While we can't control the weather, we absolutely can manage the fermentation process. For your subsequent cuts, I strongly recommend using additives to protect silage quality and animal health. Yes, additives represent an additional cost, but they're far more economical than dealing with spoilage and contamination that drive up per-cow feed costs.

Beyond inoculants, consider these practical techniques, to help reduce clostridial silage:

- Adjust your cutting head according to ground conditions - set it higher when soil is soft
- Extend wilting times for drier silage, reducing clostridia's opportunity to flourish
- Ensure your bunker is thoroughly cleaned before storing fresh silage

By implementing these straightforward strategies, you'll maintain silage quality, protect your herd's health, and maximize performance.

Healthy silage





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