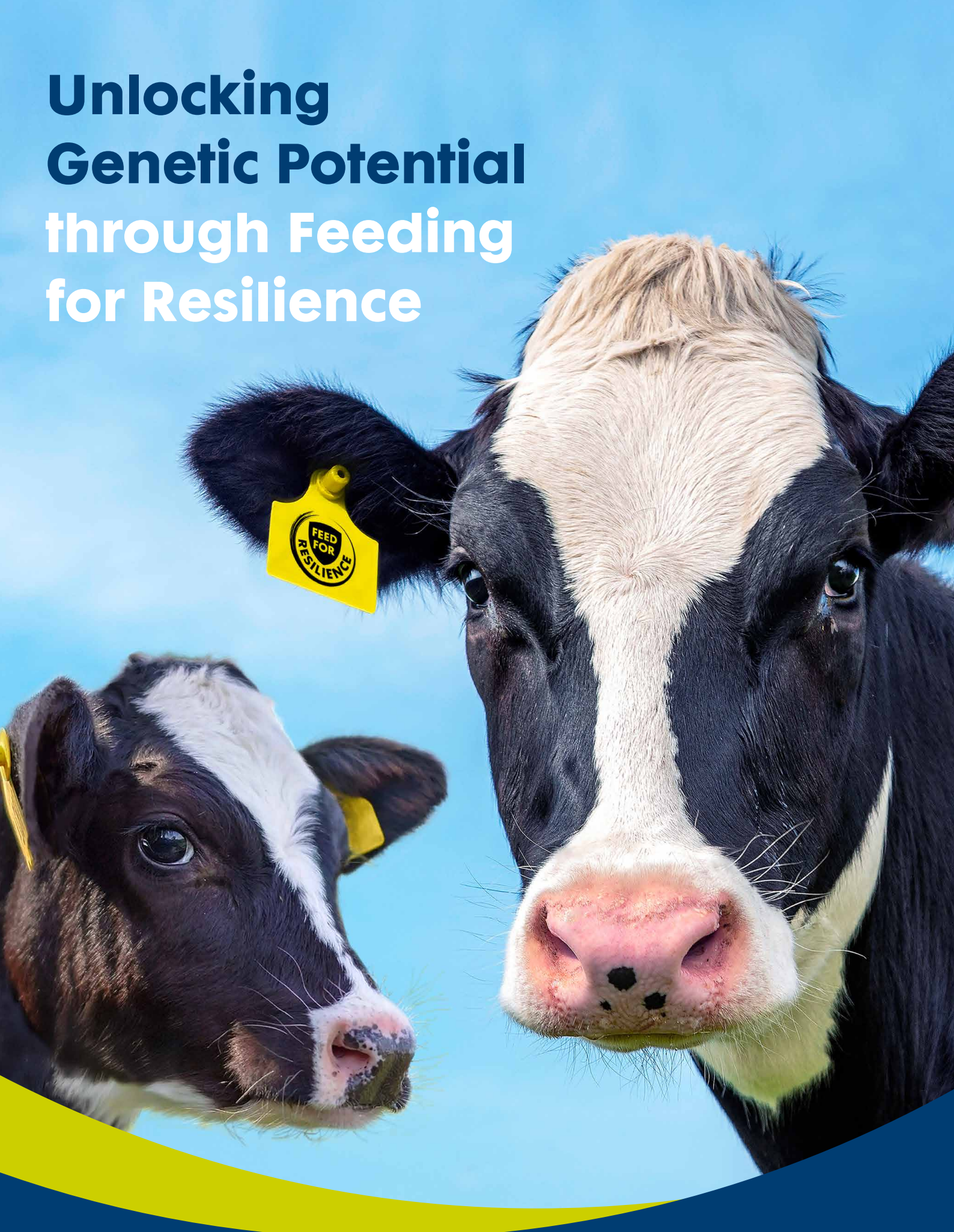
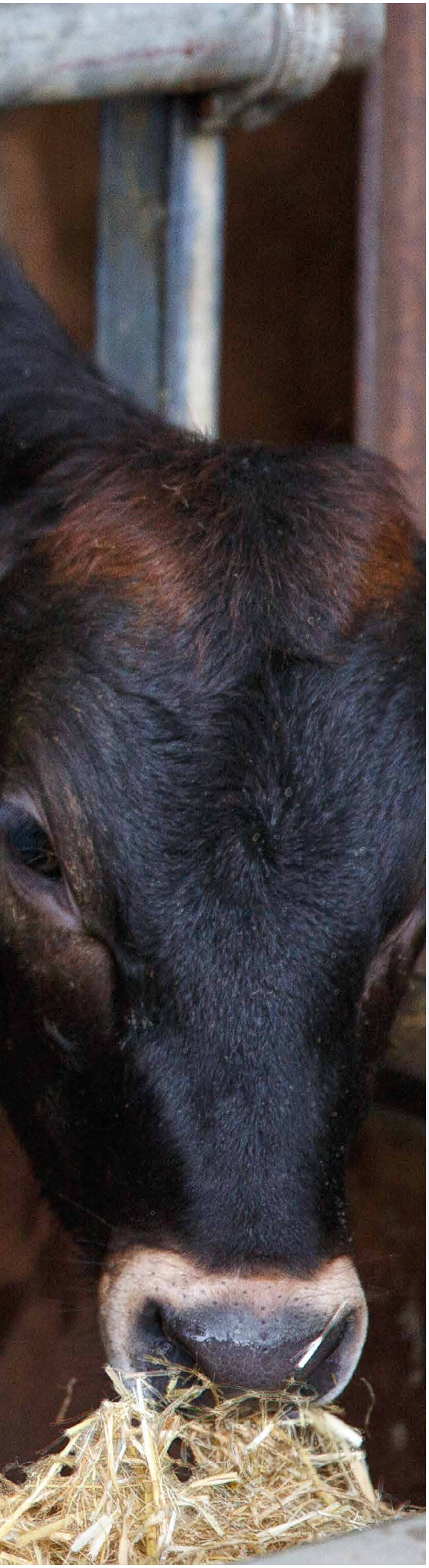
Unlocking Genetic Potential through Feeding for Resilience



LIFESTART®
SETS LIFE PERFORMANCE

trouw nutrition
a Nutreco company


Resilient calves
stay healthier, grow
consistently and fulfil
their potential



Feeding for Resilience

Having established the role of milk and energy intake levels, the next chapter in the LifeStart science story of unlocking genetic potential teaches us how a focus on resilience can help calves stay on track through everyday challenges, supporting health, growth and the expression of their genetic potential. The aim is to help farmers raise calves that require fewer medical interventions, maintain more consistent performance and are better prepared to deliver lifetime productivity.

LifeStart sets life performance

LifeStart is a science-based platform that is dedicated to completing and communicating cutting edge research. It provides evidence-based best practice related to the critical period in the first months of life; offering the science required to unlock the full potential of dairy cows.

Dedicated research team

LifeStart is driven by our specialised early life nutrition research team, focused on advancing nutritional science from birth. Purpose designed research facilities support innovative trials, helping to expand our understanding of the fundamentals of calf nutrition and early development.

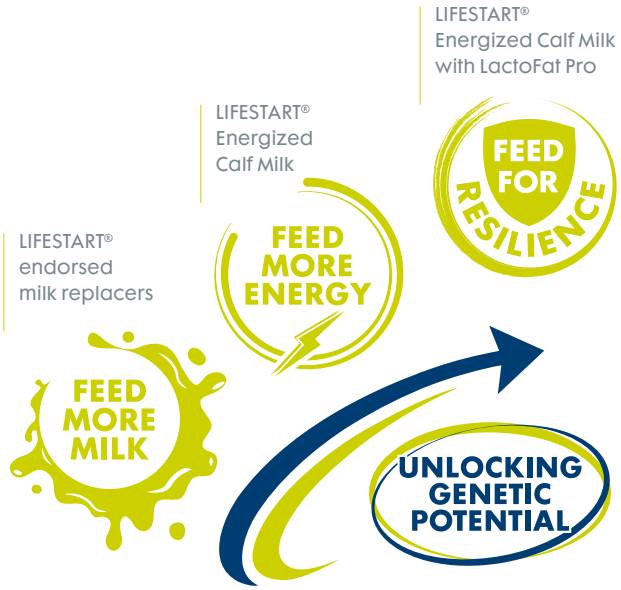
Turning science into on-farm results

A clear, farm-focused application strategy is a core priority at Trouw Nutrition, a translational approach that bridges scientific advancements with practical, on-farm application to improve calf outcomes and rearer success. It ensures that the science translates into meaningful results for farmers.

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Unlocking Genetic Potential

Unlocking genetic potential through feeding more milk and optimising energy intake can be achieved on many farms.



Feed More Milk

LifeStart science shows that feeding more milk is a key factor in optimising early life growth rates while supporting overall development. When elevating feeding levels, it is essential that a specifically formulated calf milk replacer is used to ensure the calf receives a balanced nutrient supply that avoids the risk of exceeding nutrient tolerances, such as lactose.

Feed More Energy

LifeStart science demonstrates that increasing the inclusion levels of fat closer to the levels naturally found in cow's milk is crucial to calf development. Research trials have shown that by applying the principles of Feed More Milk and Feed More Energy, we can optimise calf, heifer and cow performance leading to multiple benefits including:

- Higher survivability rates from birth to 4th lactation
- Enhanced fertility and reproductive success
- Increased Lifetime Daily Yield

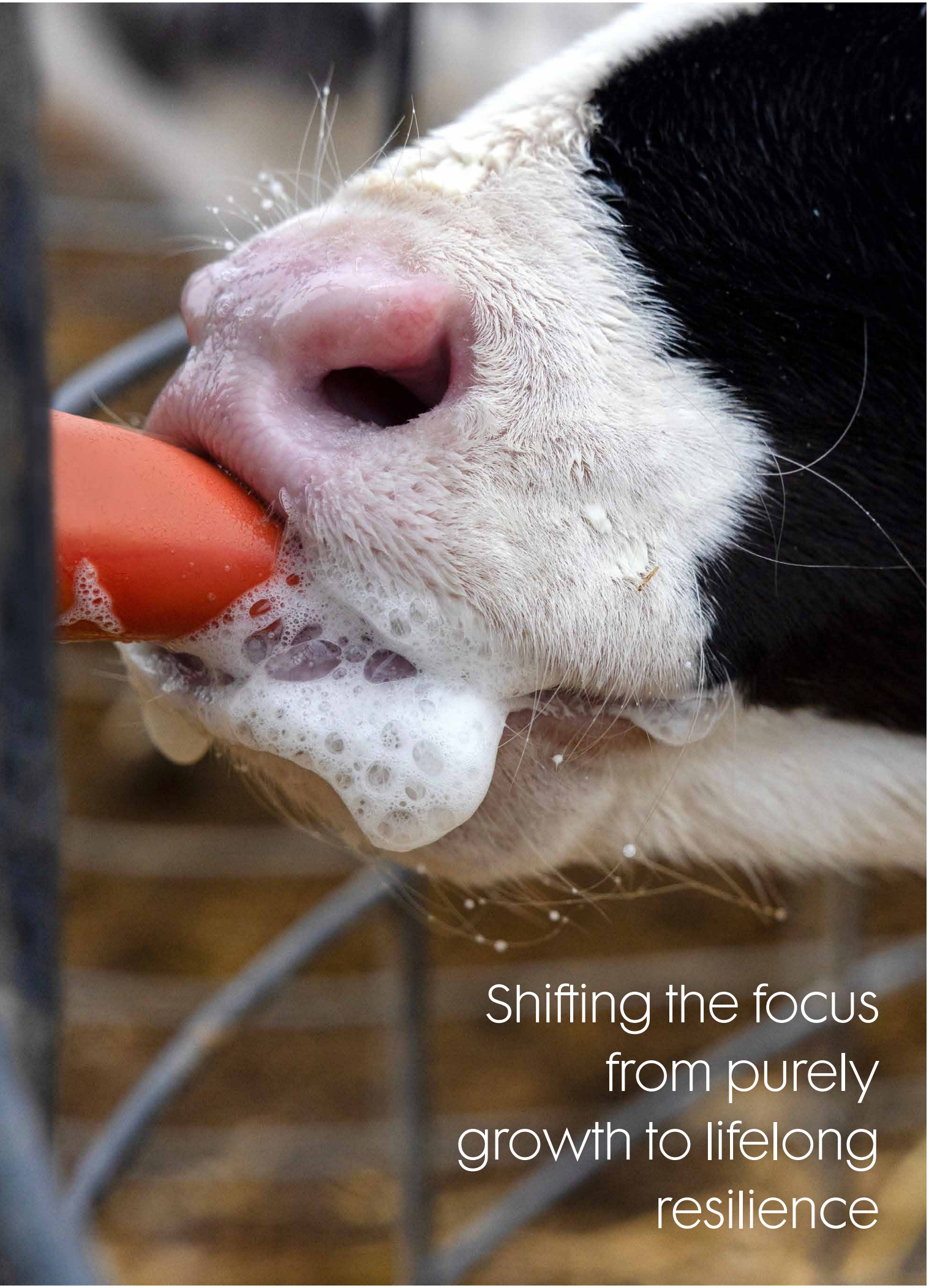
The next leap forward in calf nutrition comes from a focus on fat composition

The importance of feeding more milk and more energy to support early growth is now well established in research and in practice.

Feed for Resilience

The next step is Feed for Resilience which uses insights into fat composition to help calves better cope with early-life challenges and perform more consistently on farm.

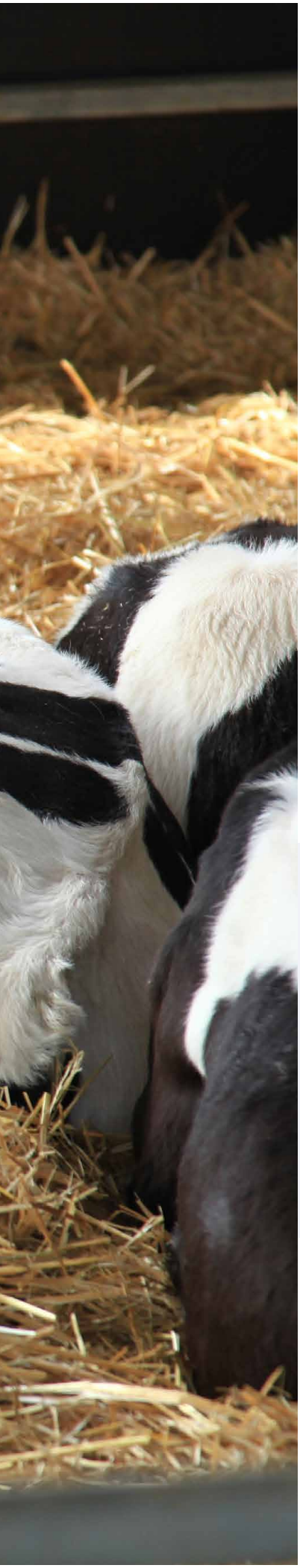




Shifting the focus from purely growth to lifelong resilience



The next leap forward in calf nutrition comes from rebalancing fat composition



Resilience is programmed in the milk phase

LifeStart science shows that the milk phase is not only a period of rapid growth, but a critical window for biological programming. Nutrition in the first weeks of life supports gastrointestinal development, metabolic programming and immune function. This can directly influence how calves respond to disease challenges both during rearing and later in life.

Feed for Resilience reflects a shift in calf nutrition: from feeding solely for growth, to feeding to support health robustness, recovery capacity and long-term resilience. By optimising milk feeding strategies from the very start, and avoiding nutritional gaps common in conventional milk replacers, calves are better supported to cope with infectious and environmental stressors.

Feed for Resilience is therefore a core principle of the latest generation of milk replacers, translating LifeStart science into tangible on farm health benefits.

Fat composition matters for resilience – not just energy supply

Compared with bovine whole milk, many milk replacers provide substantially less fat and lack key fatty acids. LifeStart research demonstrates that this difference is biologically meaningful: both fat level and fat composition directly influence calf health outcomes.

Newborn calves are born with very limited energy reserves and rely heavily on dietary fat from liquid feed for:

- Thermoregulation and energy availability
- Gastrointestinal maturation
- Immune and metabolic development

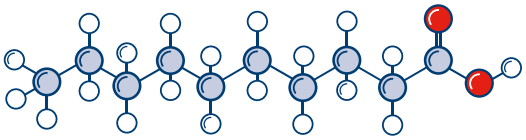
Beyond energy, specific short- and medium-chain fatty acids which are naturally present in bovine milk fat play a functional role in gut development and immune signalling. These fatty acids are largely absent from standard vegetable-based fat blends (and also absent in milk replacers with animal fats).

The biggest challenge has been how to restore these functional fatty acids in calf milk replacers...

Patent pending fatty acid technology: restoring functional milk fat biology

Trouw Nutrition's **Next Generation LifeStart Energized Calf Milk** incorporates LactoFat Pro, a patent pending fatty acid technology developed through LifeStart science, to restore key functional properties of milk fat that are largely absent from conventional milk replacers. Rather than focusing solely on fat inclusion level, this technology addresses fat quality and biological functionality during the most critical phase of calf development.

By integrating targeted shorter fatty acids into the milk replacer fat matrix, this patent pending technology supports intestinal maturation, metabolic stability and systemic resilience in early life.



The results with Next Generation Energized Calf Milk

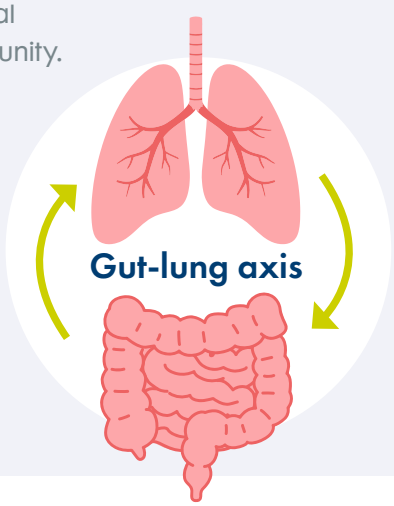
LifeStart research demonstrates that calves fed milk replacers containing LactoFat Pro technology show:

- **A lower likelihood of requiring medical treatment,** indicating improved ability to cope with health challenges
- **Fewer days requiring therapeutic intervention,** reflecting reduced disease severity and faster recovery
- **A substantially lower need for respiratory health treatments,** closely linked to improved gastrointestinal development and function
- **Reduced antibiotic use,** supporting responsible antimicrobial stewardship

Importantly, these outcomes were consistently observed across multiple controlled studies, under both ad libitum and restricted milk feeding conditions. The benefits were achieved without increasing osmolality or compromising intake, confirming that improvements in health and resilience were driven by the biological action of LactoFat Pro technology, rather than changes in feeding behaviour.

The gut-lung axis: how nutrition supports respiratory resilience

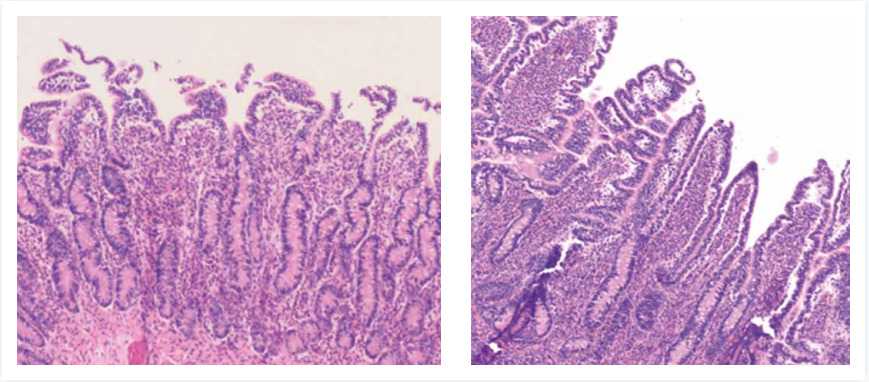
LifeStart research confirms that many respiratory challenges in calves cannot be viewed in isolation from gut health. The **gut-lung axis** describes how intestinal integrity, microbial balance and immune signalling influence respiratory immunity. This helps to explain why nutritional changes in the gut can affect respiratory health outcomes.



A well developed and functional gut can help to:

- **Reduce systemic inflammatory pressure**
- **Support balanced immune responses**
- **Limit disease progression and severity**

Enhanced intestinal development of calves fed Next Generation Energized Calf Milk



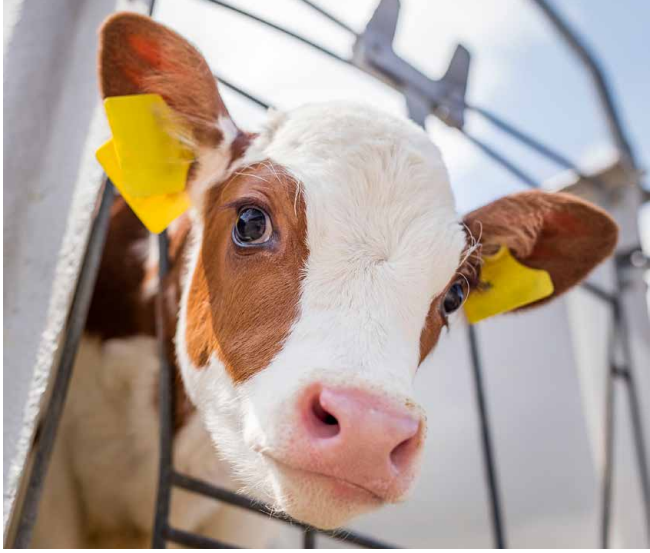
Control group | LactoFat Pro

Calves fed milk replacers containing patent pending LactoFat Pro technology showed improved faecal consistency and intestinal development, alongside a substantially lower need for respiratory treatments and retreatments. This pattern strongly supports the role of gut mediated immune resilience rather than simple symptom suppression.

A holistic approach to building resilience – nutrition as the foundation

Calf health is always the result of multiple interacting factors, including colostrum management, hygiene, housing and veterinary care. These remain essential foundations of successful calf rearing.

By supporting the calf's own defence and recovery mechanisms, Feed for Resilience goes beyond growth as the only goal, applying advances in nutritional science to raise calves that are biologically prepared to thrive.



Translating Feed for Resilience into daily practice

Feed for Resilience starts with consistent feeding and management, especially during the critical first weeks of life. Use the checklist below to help calves get the most from Energized Calf Milk and reach their full biological potential.

1. Get colostrum right – resilience starts here

Effective colostrum management remains the single most important starting point.

- Give high-quality colostrum: minimum 25% Brix
- Provide 4 L within 2 hours of birth + 2 L within 12 hours
- Verify: monitor passive transfer (target serum total protein > 6.5 g/dL)

Goal: Help calves enter the milk phase with a functional immune baseline.

2. Feed More Milk early – appetite drives development

Early milk intake drives gut development, immunity and lifetime performance.

- Increase milk volumes early to meet natural appetite (min. 8 L/day)
- Adjust volume to appetite rather than limiting intake
- Reach the peak of the feeding curve quickly and efficiently
- Avoid unnecessary restriction in the first weeks of life

Goal: Improve gastrointestinal development and support immune competence.

3. Support hydration proactively, not reactively

A proactive rehydration strategy helps protect resilience before performance is compromised.

- Use a precisely balanced oral rehydration solution alongside milk feeding
- Choose a product with correct osmolality, sodium to glucose ratio, and strong ion difference (SID) such as OsmoFit®
- Encourage early use at all times for gut health and recovery

Goal: Support calves through transient stress without disrupting milk intake.

4. Plan weaning to protect resilience

When higher milk volumes are fed, how milk is removed matters as much as how it is fed.

- Wean calves at 10-12 weeks of age
- Reduce milk gradually over a minimum period of 3-4 weeks
- Ensure calves reach approximately 2.25-2.5 × their birthweight before weaning
- Check that calves are consuming 2.5 kg of concentrates per day for several consecutive days before milk removal

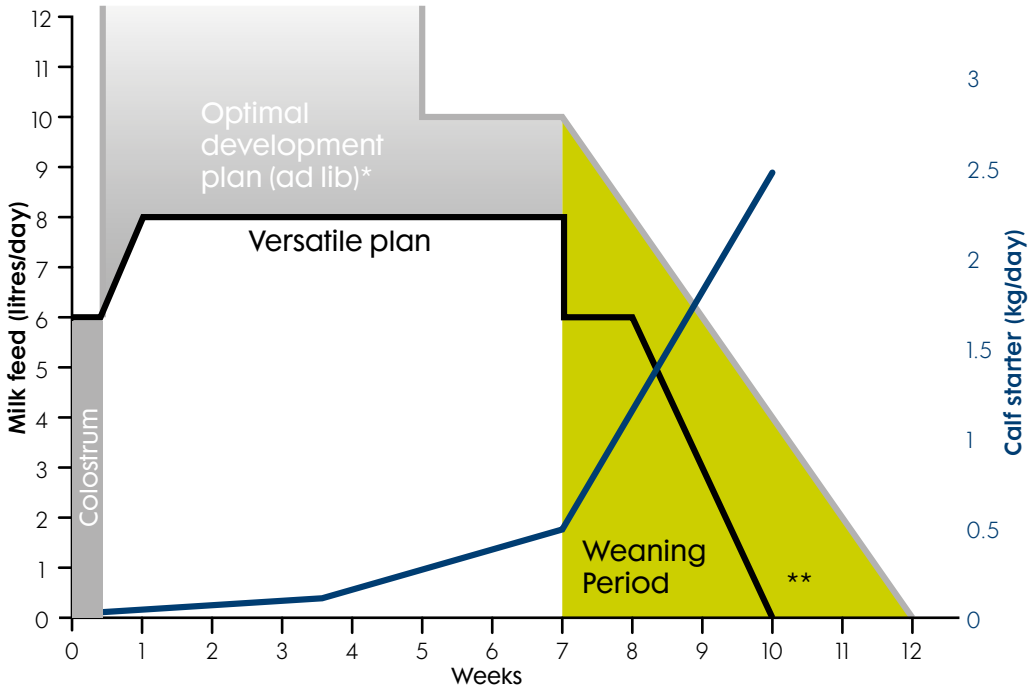
Goal: Minimise nutritional stress, protect gut stability and support smooth post weaning performance.

5. Build the full nutritional environment

Milk feeding does not act in isolation. To fully express Feed for Resilience:

- Give calves early access to fresh water at all times
- Provide daily access to a suitable starter concentrate (with refusals removed)
- Offer good quality chopped straw introduced early to support rumen development

Goal: Support gastrointestinal maturity and a resilient transition to solid feed.



Optimal development feeding plan

*Allow calves to feed to their individual appetite.

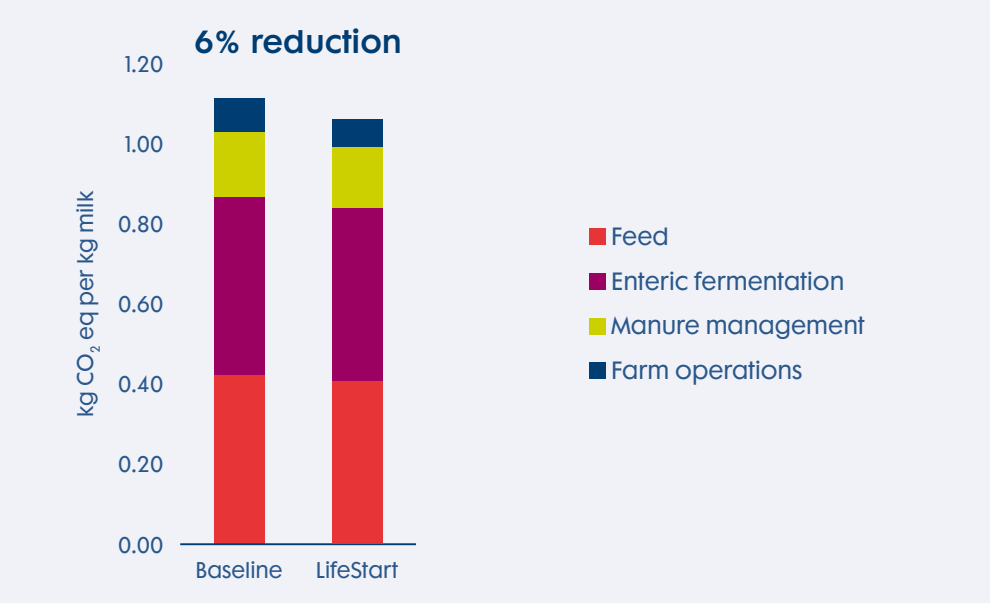
**Depending on individual farm circumstances, weaning from an ad lib feeding programme may need to be extended to 12 weeks.

Early life nutrition lays the biological foundation for sustainable dairy

Sustainability in dairy production does not start at the bulk tank – it starts with the calf. LifeStart science demonstrates that how calves are nourished early in life directly influences the environmental footprint of milk produced years later.

Using Life Cycle Assessment (LCA)*, LifeStart principles have been shown to have the potential to reduce carbon footprint (CO_2e) per kg Fat and Protein Corrected Milk (FPCM) by up to 6%.

This reduction is not achieved through compromise, but through biological optimisation.



1. Building resilience delivers sustainable performance

Healthier calves become more efficient cows.

LifeStart science shows that resilience built in early life translates into:

- Lower morbidity and mortality, reducing the need for medical treatment and antibiotic use
- Improved growth, reproductive maturity and fertility, supporting efficient lifetime performance
- Higher milk productivity and longevity, diluting the environmental cost of rearing over more litres of milk

Fewer disease events and longer productive lifetimes mean less waste, fewer replacements and better resource use. Sustainability follows resilience.

2. Closing the loop in calf nutrition

LifeStart principles also support circularity in calf rearing, reducing reliance on virgin raw materials and lowering Scope 3 emissions**.

This is achieved through:

- Valorisation of dairy by-products in milk replacer formulations
- Sourcing from circular supply chains, reducing environmental burden upstream
- Lower embedded emissions when assessing the full feed and rearing footprint

3. Farming for the future means doing more with less

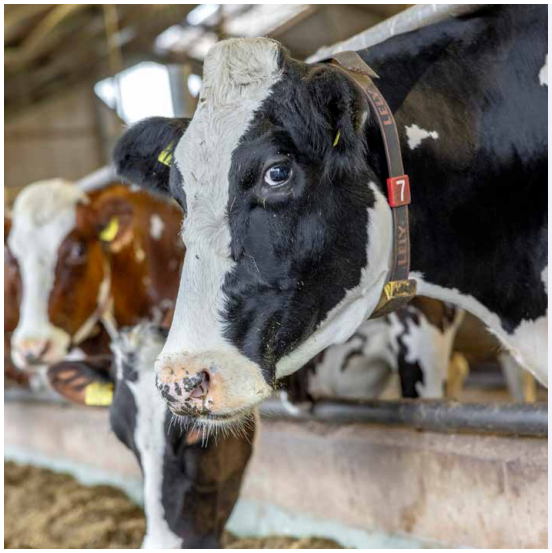
The most powerful sustainability gains come from efficiency at animal level.
LifeStart science supports climate conscious rearing by enabling:

- Fewer calves required to maintain herd size, due to improved survival and longevity
- Lower rearing costs and reduced dry matter intake of unproductive animals
- Higher milk output per cow, reducing CO2e per litre of milk produced

Each of these effects compounds over time, delivering permanent reductions in emissions intensity, not short-term offsets.

Sustainable outcomes, grounded in science

LifeStart sustainability is not driven by trends or targets alone. It is the result of better early life nutrition, improved animal efficiency and longer productive lifetimes, all demonstrated through robust scientific evaluation.



Because the most sustainable litre of milk is the one produced by a resilient cow over a productive lifetime.

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*A Life Cycle Assessment LCA is an independent assessment that uses robust methodology to evaluate emissions across the full life cycle of the cow, linking calf rearing decisions to lifetime productivity and efficiency.

** Scope 3 emissions are the greenhouse gas emissions associated with products and materials purchased by a farm or business, including feed ingredients and their supply chains.


Resilience isn't applied
later, it is built in
from day one



Bringing Feed for Resilience to life on farm

Feed for Resilience is not a single action. It is a deliberate, science-led nutritional strategy, applied from the very first feed. It is the next step in the LifeStart journey that previously brought Feed More Milk, Feed More Energy and the first generation of Energized Calf Milk.

What sets Feed for Resilience apart is that these practices are delivered through the latest generation of milk replacers, built on LifeStart nutritional know-how and enabled by patent pending LactoFat Pro technology that restores critical biological functions of milk fat.

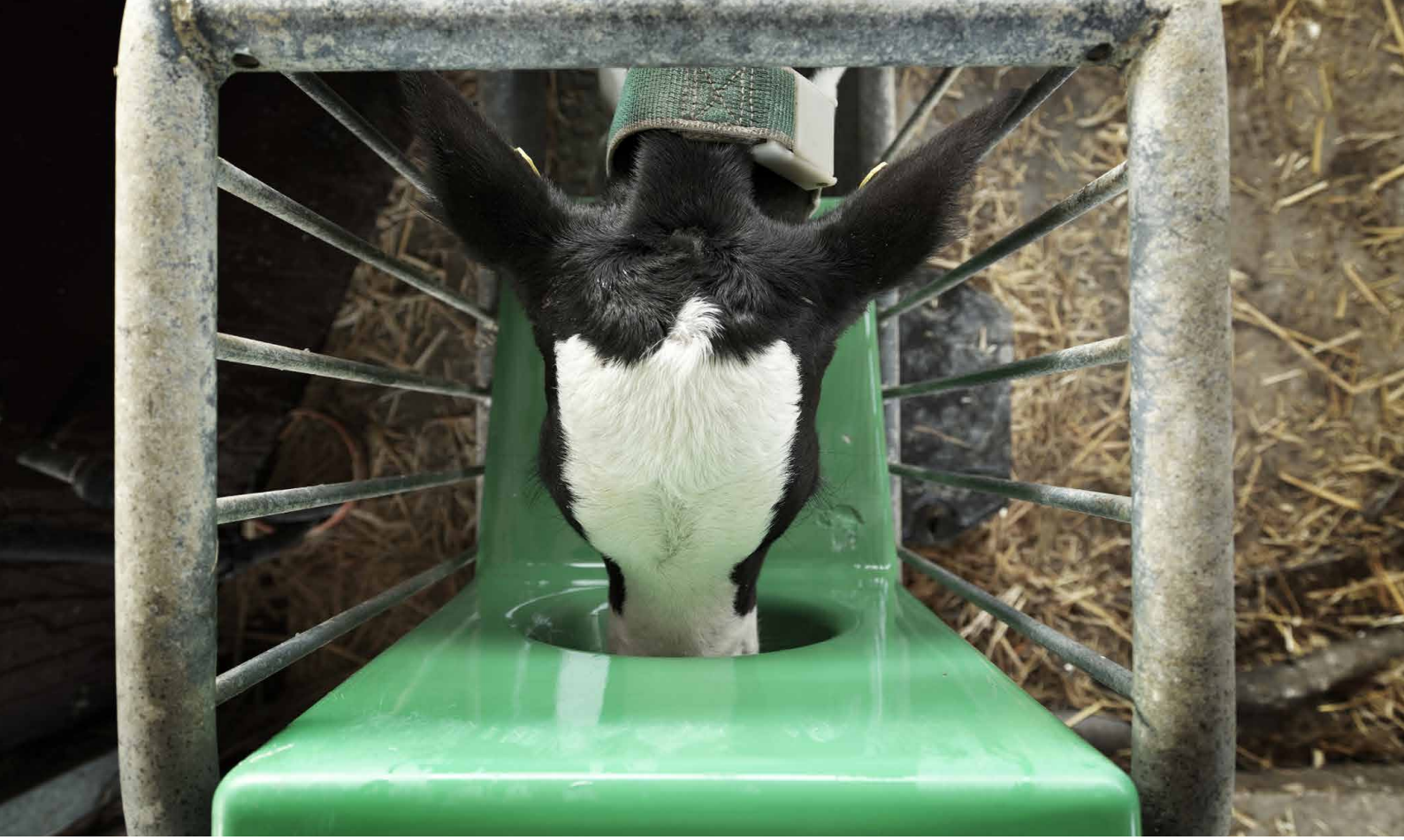
This is where modern science moves beyond traditional feeding. Nutrition no longer just supports growth, it actively supports gut development, immune balance and the calf's ability to cope with challenge.

When advanced milk replacer technology and consistent on farm execution come together, the outcome is clear:

- Healthier calves
- Faster recovery when challenged
- Fewer therapeutic interventions
- Smoother transitions through every rearing phase

Feed for Resilience is not applied later. It is built in from day one through smarter nutrition, better biology and Next Generation milk replacer science.

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LifeStart® is a science programme of Trouw Nutrition, a Nutreco company.

Trouw Nutrition is a global leader in innovative feed specialities, premixes and technical services for animal nutrition. Quality, innovation and sustainability are the guiding principles behind everything we do – from research and raw material procurement, to the delivery of cutting-edge products and services for agriculture.

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