Milkivit

NEW INNOVATION

The power of mother nature

LIFESTART®
SETS LIFE PERFORMANCE

trouw nutrition
a Nutreco company

LifeStart Science demonstrates that fat inclusion and composition are crucial for calf development

Restoring the volume of milk fed in early life is a proven strategy to support optimal development and resilience in the calf. Research trials have shown that this strategy also provides long-term benefits, including improved production, fertility and survivability to 4th lactation.

It is essential that the macronutrient profile of calf milk is optimised to deliver a balanced and digestible liquid feed, just as mother nature intended.

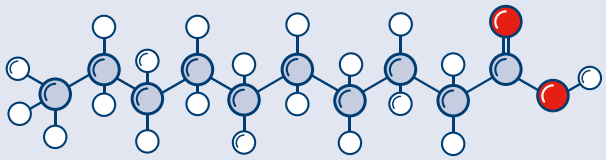
Research that underpinned the introduction of Energized Calf Milk in 2018 shows that higher fat inclusion in milk replacers to more closely align with cow's milk brings multiple benefits.

LactoFat Pro — unique fatty acid technology

Our ground-breaking next generation Energized Calf Milk harnesses our latest findings in the creation of a new fatty acid technology. The inclusion of this unique technology allows calf milk to more closely emulate the fatty acid composition of cow's milk, bringing multiple benefits to calf development, health and performance.

Essential fatty acids

Fatty acids are the building blocks of fat. There are 400 different fatty acids in bovine milk which makes it the most complex of all the natural fats. Whilst fat inclusion is crucial to provide dietary energy, the balance of individual fatty acids impacts important structural and metabolic functions in newborn animals.



Taking your calf rearing to the next level

Milkivit ONE is designed to level up calf rearing by improving calf health and resilience. It is based on cutting-edge LifeStart Science research and contains our patent-pending LactoFat Pro technology.

Trials have shown enhanced rumen and intestinal development leading to fewer incidence of diarrhoea and respiratory disorders. Feeding Milkivit ONE also resulted in higher starter feed intake both pre and post-weaning.

"Milkivit ONE is a true game changer. This is the closest we have ever been to mother nature."

Javier Martin Tereso, Head of Ruminant R&D, Trouw Nutrition

Milkivit ONE offers a new option to the whole milk calf-feeding sector as the most nutritionally comparable product available.

Science Based

LifeStart Science: cutting edge research by Trouw Nutrition

Unique Fatty Acid Technology

The first milk replacer with a fatty acid profile that closely resembles fat in bovine milk

27% Fat

Improved energy density

23% Protein

50% skimmed milk, 100% dairy protein base, supporting gentle digestion and low osmolality

Balanced Vitamins and Minerals

Responsible vitamin and mineral profile ensuring requirements are met and environment considered

Fat composition: crucial to calf development

LifeStart Science demonstrates that fat inclusion and composition is crucial to calf development. Fat provides dietary energy and essential fatty acids, which have important structural and metabolic functions in newborn animals. Fat is also associated with gut health and the stimulation of suckling activity.

Research has shown that a higher fat inclusion in milk replacers that more closely align with bovine milk brings multiple benefits:

- Reduced pre-weaning mortality[1]
- Improved health in terms of faecal consistency[2]
- Reduced therapeutic interventions[3]
- Greater gastrointestinal development[4]
- Reduction in hunger related behaviours, thereby enhancing calf welfare[5]

Bovine milk and traditional calf milk: spot the differences

The right composition of fat can elevate calf health and performance beyond anything experienced in the industry. Research shows that the fatty acid profile of traditional calf milks does not yet sufficiently match the fatty acid profile of bovine milk (Figure 1), but not for long. Cutting edge research from Trouw Nutrition introduces the new standard in calf milk performance with unique LactoFat Pro technology.

The differences in fatty acid composition of traditional calf milk based on coconut and palm oil versus bovine whole milk (milk fat) and Milkivit ONE

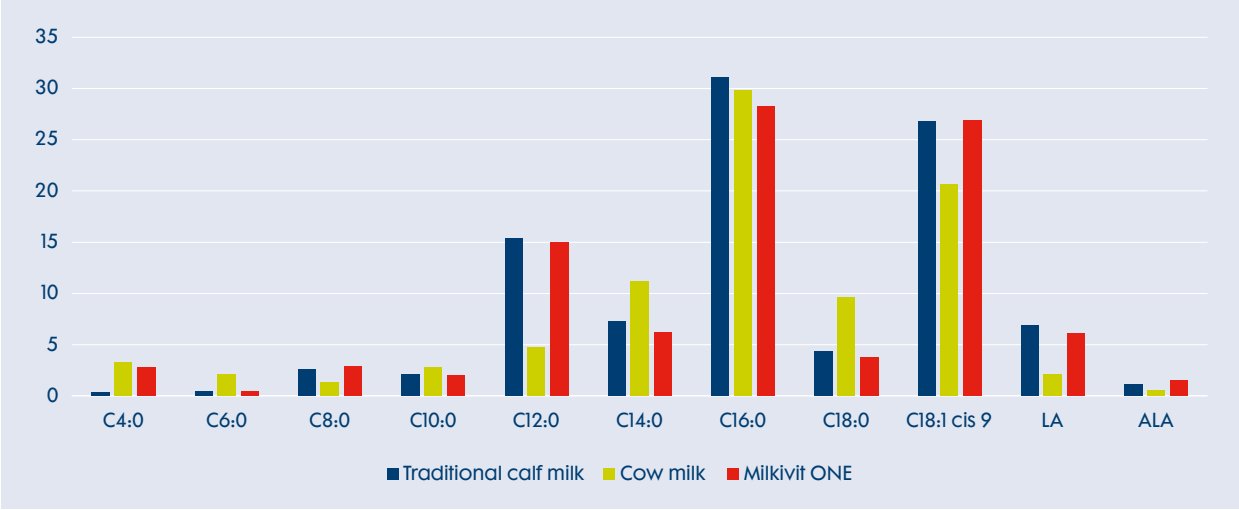


Figure 1

References:

1. Urie et al., 2018 N.J. Urie, J.E. Lombard, C.B. Shivley, C.A. Kopral, A.E. Adams, T.J. Earleywine, J.D. Olson, F.B. Garry, Preweaned heifer management on US dairy operations: Part V. Factors associated with morbidity and mortality in preweaned dairy heifer calves, Journal of Dairy Science, Volume 101, Issue 10, 2018, Pages 9229-9244.
2. Amando et al., 2019 L. Amado, H. Berends, L.N. Leal, J. Wilms, H. Van Laar, W.J.J. Gerrits, J. Martín-Tereso, Effect of energy source in calf milk replacer on performance, digestibility, and gut permeability in rearing calves, Journal of Dairy Science, Volume 102, Issue 5, 2019. Pages 3994-4001.
3. H. Berends, H. van Laar, L.N. Leal, W.J.J. Gerrits, J. Martín-Tereso, Effects of exchanging lactose for fat in milk replacer on ad libitum feed intake and growth performance in dairy calves, Journal of Dairy Science, Volume 103, Issue 5,2020, Pages 4275-4287.
4. Welboren, B. Hatew, J.B. Renaud, L.N. Leal, J. Martín-Tereso, M.A. Steele, Intestinal adaptations to energy source of milk replacer in neonatal dairy calves. Journal of Dairy Science, Volume 104, Issue 11, 2021, Pages 12079-12093.
5. Echeverry-Munera et al., 2021 J. Echeverry-Munera, L.N. Leal, J.N. Wilms, H. Berends, J.H.C. Costa, M. Steele, J. Martín-Tereso, Effect of partial exchange of lactose with fat in milk replacer on ad libitum feed intake and performance in dairy calves, Journal of Dairy Science, Volume 104, 2021.

LactoFat Pro: a unique fatty acid technology

Milkivit ONE Energized Calf Milk contains our unique, patent-pending fatty acid technology. This fatty acid profile closely resembles that of fat in bovine milk and has been fine-tuned to amplify the growth signaling to the intestine and rumen. The result is to elevate calf health and performance to the next level using the power of mother nature.

Enhanced rumen and intestinal development

Trials at our research and development centre have shown that the fatty acid profile of Milkivit ONE leads to improved rumen development during the milk feeding phase (Figure 2).

Improved rumen development in 5 week old calves

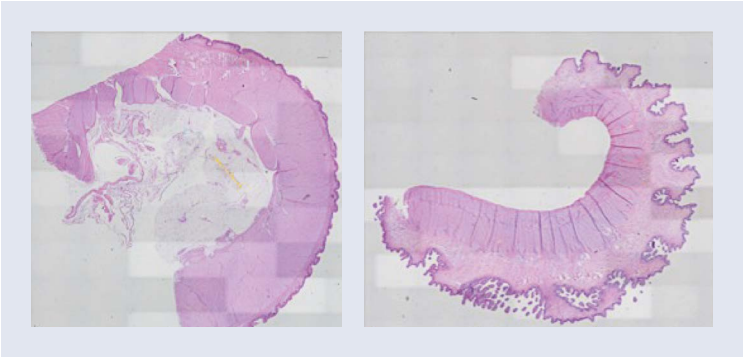


Figure 2

Control group | Milkivit ONE

Histological research shows that the intestinal structures in calves that were fed Milkivit ONE were more developed, with significantly longer villi length (Figure 3). Additionally, the stronger intestinal development supports a trend for higher fat digestibility in calves.

Enhanced intestinal development of calves fed Milkivit ONE

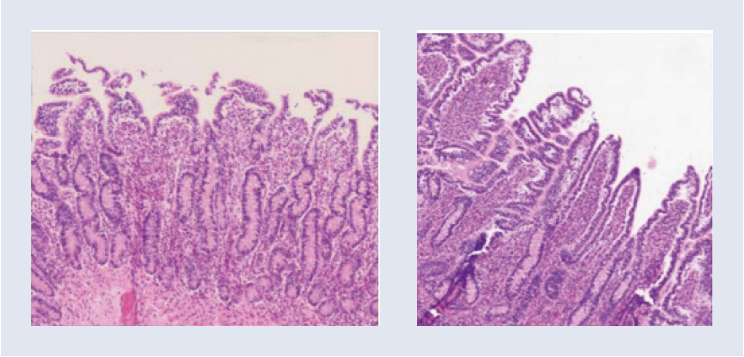


Figure 3

Control group | Milkivit ONE

Key benefits of Milkivit ONE for on farm performance

Improved health

The correct balance of fatty acids in Milkivit ONE supports gastrointestinal tract integrity, which plays an important role in protecting the calves against diarrhoea. Feeding Milkivit ONE has shown to reduce the incidence and severity of diarrhoea in calves (Figure 4). Additionally, calves fed Milkivit ONE were found to have less treatment days and therefore a lower risk of mortality compared to a control group, which was fed Energized Calf Milk.

Incidence and severity of diarrhoea

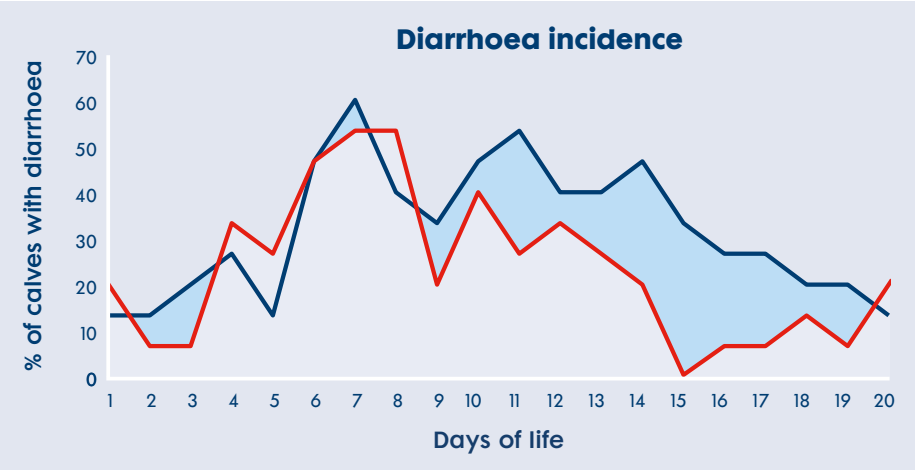


Figure 4

Higher starter feed and energy intake

The significant improvement in rumen activity and intestinal development leads to optimal digestion and improved energy intakes from milk and starter feed (Figure 5), which in turn supports a smoother weaning transition and promotes optimal growth rates that develop a robust and resilient calf at weaning and beyond.

Improved starter feed intake feeding Milkivit ONE ad lib and control treatment in weeks after birth

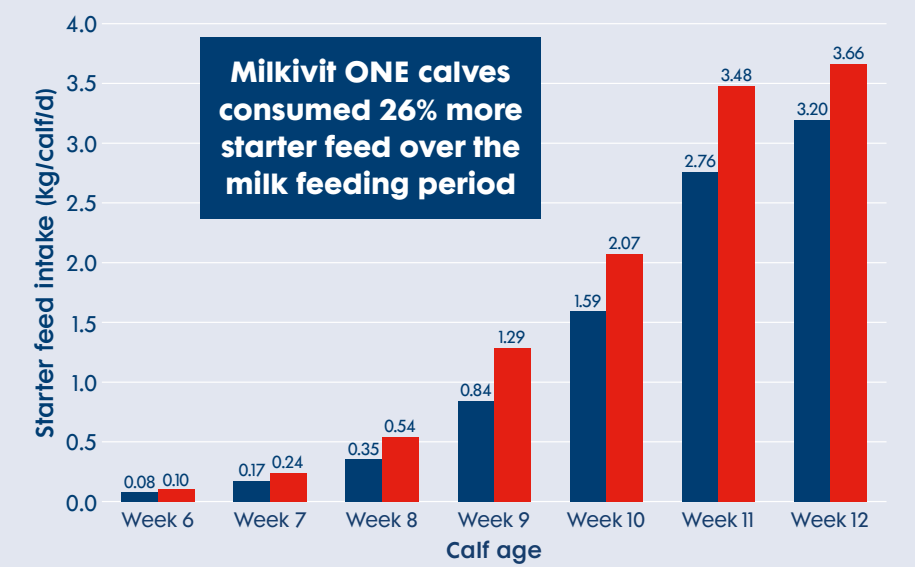


Figure 5

Elevated calf and farmer wellbeing

Calves fed Milkivit ONE experienced fewer treatment days compared to those given first-generation Energized Calf Milk. This reduces the need for costly health interventions and additional monitoring, saving time and effort while minimising animal and human stress. More resilient calves are better positioned to succeed against the challenges they may face in the calf rearing period. In addition, healthy calves not only go on to lead more productive lives but also enhance job satisfaction for the whole farm team.

Responsible vitamin and mineral nutrition

The correct trace mineral supplementation of calves supports performance in terms of health status, growth rate and structural development. Some trace minerals can be accumulated in the calf in utero. After reviewing the latest research some key changes have been made to balance the trace element levels in Milkivit ONE. These changes ensure calf requirements are satisfied whilst minimising the risk of adverse interactions, oversupply, or potential environmental impacts from surplus excretions.

RESPONSIBLE MINERALS
ENVIRONMENT • SCIENCE • PERFORMANCE

↓ Fe Iron ↓ Mn Manganese ↓ Zn Zinc ↓ Cu Copper

LifeStart: Unlocking Genetic Potential to reduce carbon footprint of milk

LifeStart principles have been shown through Life Cycle Assessment (LCA) to have the potential to decrease the carbon footprint (CO2e) per kg fat protein corrected milk (FPCM) by 6%.* An LCA is a methodology used to assess the carbon footprint of milk production by considering the entire life cycle of the cow.

What is LifeStart?

LifeStart is a science-based platform for dairy calves that provides evidence-based best practice related to the critical period in the first months of life. It offers the science required to unlock the full potential of dairy cows. LifeStart-accredited guidelines for calf milk replacers ensure the nutritional and physical parameters are carefully considered to satisfy calf requirements.

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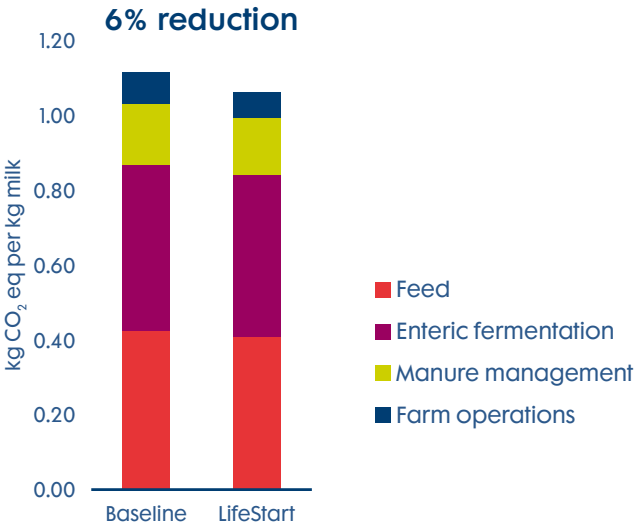
How does LifeStart impact carbon footprint?

Investing in early life nutrition gives a clear and sustainable return, through robust, resilient and high performing dairy cows. This in turn allows Lifetime Daily Yield to be optimised, which is key to improving efficiency in dairy farming and reducing carbon footprint. From a baseline scenario when applying LifeStart principles we can achieve:

UNLOCKING GENETIC POTENTIAL

Example farm	Baseline	LifeStart
Age at 1st calving (months)	25.5	22
Calving interval (days)	408	395
Replacement rate (%)	30	25
Milk production 1st lactation (kg)	7,592	7,900
Milk production 2nd+ lactations (kg)	9,926	10,600
CO2e reduction (%)		-6% v baseline

Graph showing an example of how LifeStart interventions can improve carbon footprint by 6% by emissions category



FEED MORE MILK

FEED MORE ENERGY

LifeStart principles can achieve a 6% reduction in carbon footprint

Improved efficiency, productivity and reduction in carbon footprint are achieved by:

- Healthy animals that grow well
- Fewer animals
- Less feed
- Reduced enteric emissions
- Improved longevity

*An LCA model for milk production was carried out in conformance with the ISO14040:2006 and ISO14044:2006 standards using LifeStart scenarios based on data from trials carried out at Nutreco's R&D facility, Kempenshof research farm.

Feeding protocols

Milkivit ONE is designed to be fed to calves as soon as possible after the colostrum phase and as close to appetite as possible.

Milkivit ONE should be mixed at a concentration of 135 g/litre and a temperature of 42°C, with the objective to feed between 38 - 40°C. Feeding frequency should be at least twice per day.

Age	Colostrum per day	Colostrum phase
Day 1	6 L	4 litres of clean, high antibody colostrum within 4 hours after birth; followed up by a further 2 litres within 12 hours of birth
Day 2	6 - 8 L	Colostrum OR Transition milk/Milkivit ONE (Refer to the feeding recommendations below and attention points opposite)
Day 3	6 - 8 L	

Age	Ad lib system		Bucket system		All systems
	Milkivit ONE per day	Feed phase	Milkivit ONE per day	Feed phase	Other feeds
Day 4 - 7	Ad lib	Ad lib period	6 - 8 L	Increase volume to appetite	**Concentrates:** a suitable concentrate should be offered daily, after colostrum feeding phase, with rejected feed removed **Forage:** good quality chopped straw should be offered after colostrum feeding phase **Water:** clean, fresh water must be available at all times
Week 2	Ad lib		8 - 10 L		
Week 3	Ad lib		8 - 10 L	Peak of feed curve – feed as close to appetite as possible	
Week 4	Ad lib		8 - 10 L		
Week 5	Ad lib		8 - 10 L		
Week 6	10 L	Stable period	8 - 10 L		
Week 7	10 L		8 - 10 L		
Week 8	8 L	Weaning period	8 - 10 L		
Week 9	6 L		8 L	Weaning period	
Week 10	4 L		6 L		
Week 11	2 L		4 L		
Week 12	2 L		2 L		

Introduction to older calves >48 hours old

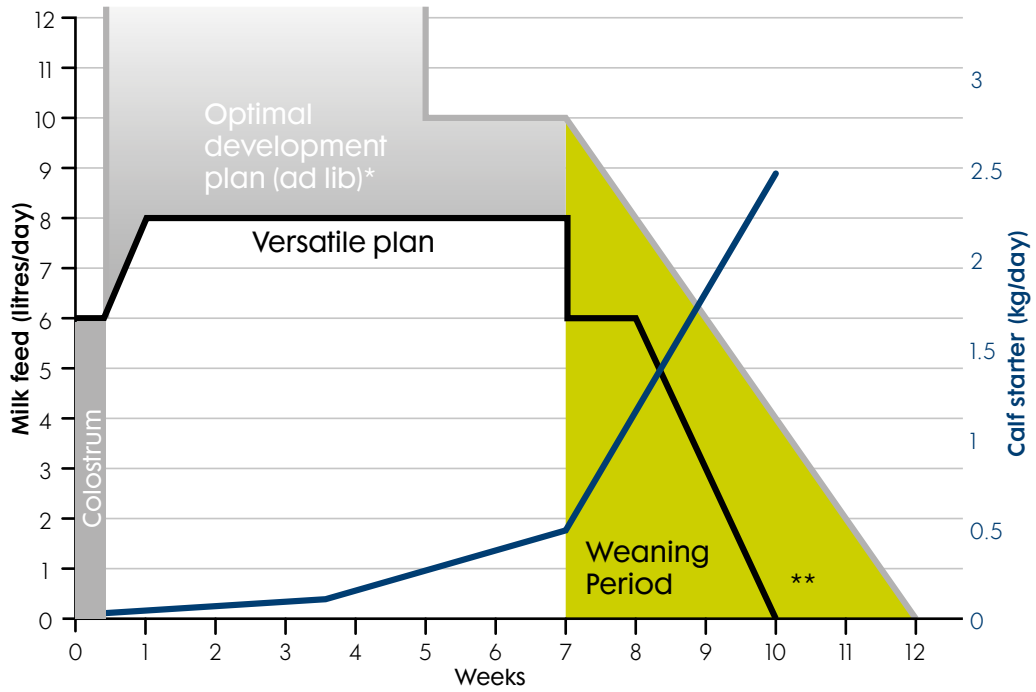
When introducing Milkivit ONE to older calves (>48 hours old) who have received milk other than colostrum, consider implementing this 3-day transition phase:

Transition phase	Feeding recommendations
Day 1	Mix 50% transition milk/whole milk with 50% Milkivit ONE E.g. 2 L of transition milk + 2 L of mixed Milkivit ONE (135 g/L)
Day 2	Mix 25% transition milk/whole milk with 75% Milkivit ONE E.g. 1 L of transition milk + 3 L of mixed Milkivit ONE (135 g/L)
Day 3	Remove transition milk/whole milk. Only feed Milkivit ONE

Day 4 - 7	From here, continue all recommendations of the table above, starting with day 4 - 7

Recommended feed curve

Milkivit ONE is designed to be fed to calves as soon as possible after the colostrum phase and as close to appetite as possible to gain maximum benefits from the LactoFat Pro technology.



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.

Attention points colostrum phase

- **Colostrum** is defined as the first milk produced after calving.
- Use of a refractometer to measure colostrum quality is recommended. Regular testing and benchmarking of passive transfer ensures farm specific colostrum protocols are successful.
- **Transition milk** is defined as the second through fourth milkings after calving.
- If transition milk feeding is not possible (due to availability, disease status or feeding logistics) the recommendation is to move directly to Milkivit ONE after the colostrum feeding phase. Refer to your veterinarian for animal health concerns.

Attention points weaning period

- Weaning should take place over a 4-week period, or 5 weeks with an ad lib system.
- Calf should be consuming a minimum of 2.5 kg of concentrates per day for 3 consecutive days before milk is removed.
- Avoid other changes at point of weaning (e.g. regrouping, feed change) to minimise stress.
- For less developed calves, extend milk feeding period by 1 - 2 weeks.

Milkivit

Milkivit ONE is a next generation Energized Calf Milk containing patent pending LactoFat Pro technology. It provides a superior nutrient supply versus traditional calf milk replacers thus maximising health and calf performance both pre and post-weaning.

Curious about how your farm can benefit from Milkivit ONE? Or want to know more about the advantages of fatty acid technology?

Ask your Milkivit dealer or one of the Trouw Nutrition Young Animal Feed team for more information, or visit our website below.

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Find out more

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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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