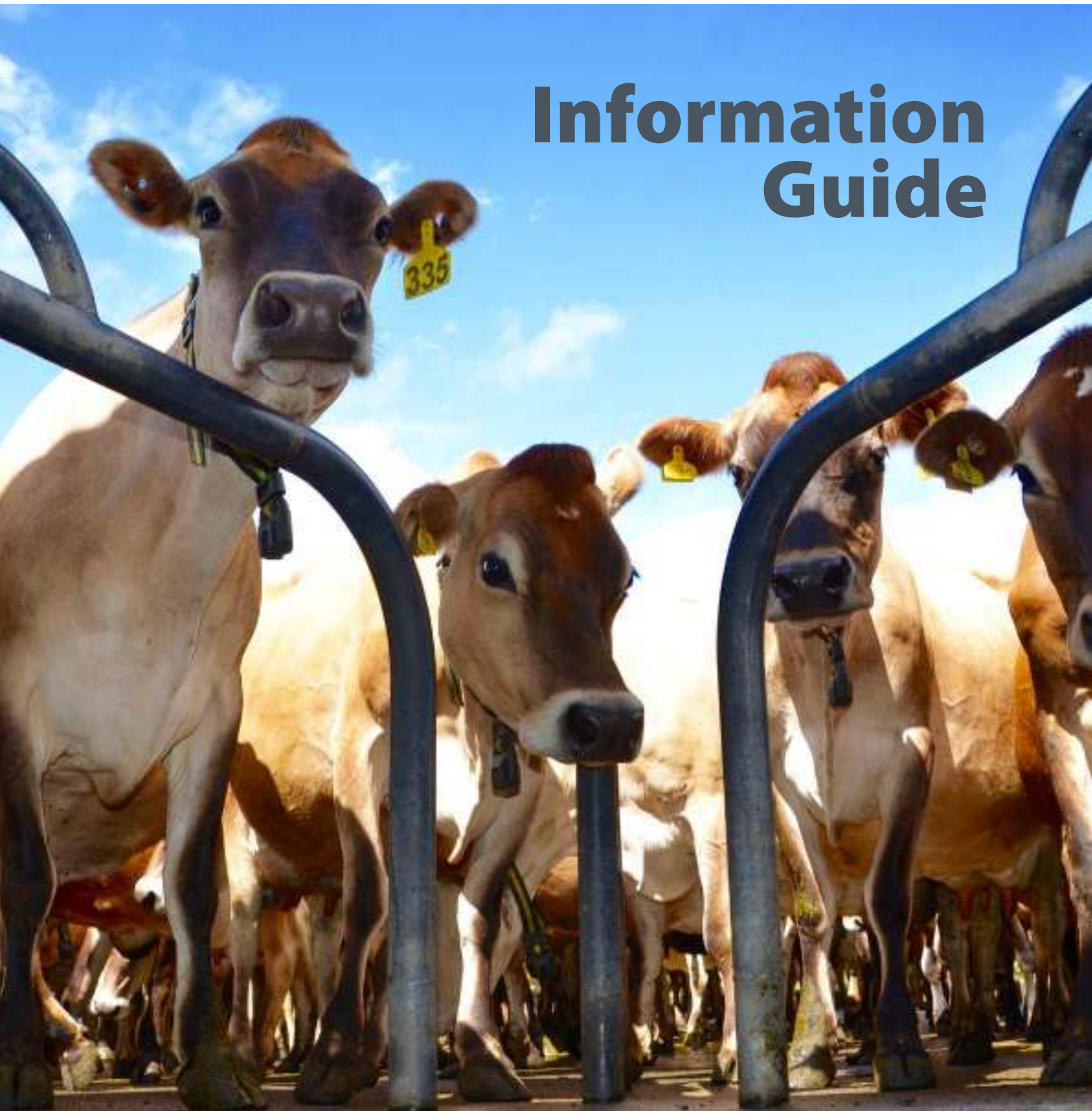


**Sollus**  
building healthy cows



# Information Guide





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# Who we are & what we do



**Sollus helps farmers build stronger, healthier more productive cows with practical nutritional knowledge, unique products and dedicated service.**

Sollus is a collaboration between DSM – the world’s largest feed ingredients manufacturer – and Image Holdings – New Zealand’s leading premix manufacturer.

We formed Sollus together because we could see that New Zealand dairy farmers were being short changed on nutrition. There were ingredients and expertise that Kiwis were missing out on, critical to cow health and sustainable, profitable farming.

The productivity of New Zealand’s dairy herd has improved dramatically over the last few years. The down-side of that productivity gain has been worsening health; animals that get sick and struggle to get better. Lameness, mastitis, reproductive issues and metabolic disorders are all getting worse and this seems to be simply accepted as the price we must pay. Great news for the vet, not so good for the farmer.

We take a different view. We understand that to farm profitably we have to maximise lifetime value. It takes several years for a dairy cow to break even so the last thing farmers need is for cows to be dropping out of the herd early with these largely preventable conditions.

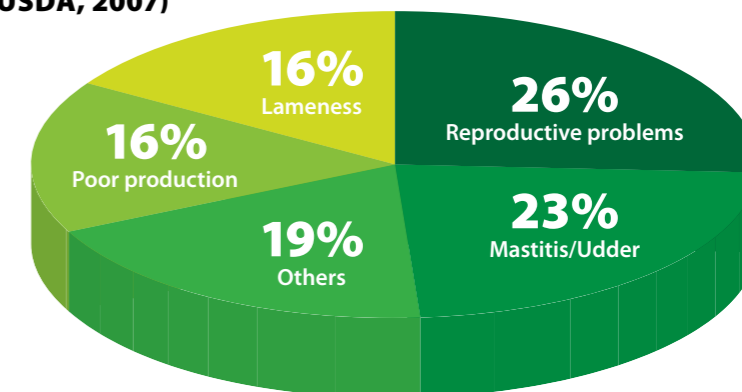
The good news is that it really doesn’t have to be that way. The knowledge and the ingredients exist that enable farmers to prevent these issues; to build a fence at the top of the animal health cliff, instead of continually sending the ambulance to pick up animals at the bottom of it.

And the pay-back is immense. Dairy NZ estimate for every down cow treated in New Zealand there are a further fifteen that are subclinical and whose health, productivity and life expectancy is impacted. They estimate the cost of milk fever alone to the dairy industry annually at one billion dollars.

We set about developing a range of products that are simple to use and flexible enough for all farming systems, delivering the desired outcome whatever your feed type. They’re safe, dust free and highly cost-effective.

We really believe we’ve made a difference already and Sollus users up and down the country are finding out for themselves that they can make a difference too; in the health and wellbeing of their cows and to their own peace of mind.

## REASONS FOR DAIRY COWS CULLED TOO EARLY IN LIFE (USDA, 2007)



# Your team



## **DR JOE MCGRATH** Nutritionist

Dr. McGrath's experience and credentials underscore the Sollus commitment to delivering farmers trace element and supplement products based on good science and evidence.

His experience stretches from researching and lecturing on animal health and nutrition at Australia's University of New England, to farm-side experience as nutrition manager at Rangers Valley cattle station.

While at the University of New England Joe researched the mineral-vitamin interactions in grass based dairy and beef systems. Much of the science he studied there has been applied to the Sollus nutrition and mineral products now available in New Zealand.

Eight years spent at Rangers Valley meant Joe was heavily involved in developing nutritional programmes for 50,000 head of cattle. Today Joe covers much of the Pacific region advising a wide range of ruminant farmers on how best to optimise their feed inputs and maximise animal health, welfare and productivity.

His experience both in nutritional research and hands on feed operations mean he is well placed to offer farmers practical, affordable and realistic advice on addressing their production issues.

## **JOHN BALDIE** Account Manager

John has a lifetime of experience in nutrition. Born and raised in the UK where feed and farming were his passion, John picked up a higher national diploma in farm business management and was the recipient of the Craftsmen's Dairy Award.

After arriving in NZ, he progressed through the sharemilking system to farm ownership. He then went on to represent a feed business in the Taranaki, respected for his experience and advice.

Having a deep understanding and empathy for farmers and the industry on how to achieve individual goals whilst overcoming challenges. John looks forward to working with farmers and being a part of the team to strive for a positive outcome.

[john@sollus.co.nz](mailto:john@sollus.co.nz) 021 245 0252



## **ERIN STABLES** Business Development Manager

With over 20 years of involvement in the agricultural sector, Erin is well known to many farmers, particularly in the upper North Island.

He has experience on both sides of the fence when it comes to being a farmer, and advising them. This includes several years running a large agribusiness machinery company, and also being involved in a family owned and operated farming business in the Waikato.

Erin brings a deep understanding of the challenges that seasonal pastoral farming systems present to farmers wanting to optimise animal production, and the ability to offer the best solutions to those challenges.

Erin welcomes the opportunity to discuss herd nutrition and mineral needs, and how Sollus can help improve your herd's productivity.

[erin@sollus.co.nz](mailto:erin@sollus.co.nz) 027 714 4148



## **DAVE KEANE** Account Manager

Originally from Ireland, Dave now lives in Geraldine and is well known in the area.

With previous roles ranging from sales advisory with a rural retailer, managing a high-producing dairy farm back in Ireland, and spending time as agricultural contractor in Southland, Dave has gained a wealth of experience and knowledge in the NZ dairy industry.

Dave also has a keen interest in sports and is involved with the local rugby club leading the charge with the Golden Oldies.

Dave is friendly, down-to-earth, and passionate about the dairy industry and helping farmers succeed.

[dave@sollus.co.nz](mailto:dave@sollus.co.nz) 027 477 1687

## **BRUCE HEMINGWAY** Account Manager

Bruce has a lifetime of experience in the rural sector and a wealth of knowledge that can only come from operating and owning a farming operation himself.

From farm ownership Bruce moved into the rural retail sector starting on the shop floor and moving up to management level. Bruce was recruited by a supplier into a career in dairy hygiene for 10 years where he was highly regarded for his ability in dealing with milk quality issues and related animal health such as mastitis, etc.

From there he moved back into the rural retail sector but this time as an account manager, helping farmers from Taupo to Northland, ultimately leading a team of on farm technical field officers in the Bay of Plenty and Waikato.

Bruce became the senior advisor on agronomy, crop, seed and nutrition within the business. He has a large network of professionals he can draw on for specific expertise and a passion for the industry.

[bruce@sollus.co.nz](mailto:bruce@sollus.co.nz) 021 241 0104



## **TONY CASSIDY** Account Manager

Tony joins the team with 16+ years in the Dairy industry including six years day to day operations on dairy farms followed by 11 years in the rural retail sector. A family man, born and raised in Tokoroa, he developed a passion for the industry at a young age, holidaying on family dairy farms.

Tony is Rural Servicing Certified via Primary ITO and industry trained in agronomy, including cropping inputs, chemical use, dairy nutrition, water reticulation and animal management. He has close links to a list of sector experts across the Central North Island to aid in forming whole-of-farm solutions.

Tony is easy-going and enjoys building relationships. Communication is always open and visits are recorded to build a history that can be referred to over time. He looks forward to sitting down to discuss your unique farming situation.

[tony@sollus.co.nz](mailto:tony@sollus.co.nz) 021 224 5175

# Transition with



The most impactful nutritional intervention in dairy cows is a transition program. During transition a cow changes from an animal that expels little or no fat, carbohydrates, proteins, minerals and vitamins through milk, to an animal that produces huge amounts of these products to feed a calf. To enable this we must provide the cow a healthy diet. Pasture is not always healthy for transitioning cows; mainly because it is too high in cations (potassium, ammonia, sodium) that can cause calcium deficiencies and oedema.

To allow for an effective transition we must do three things:

1. Adjust the rumen to the milking diet. This reduces the chance of ketosis, acidosis and displaced abomasums.
2. Provide adequate antioxidants to support immunity. This reduces the incidence of mastitis and retained placentas.
3. Allow enough available calcium to prevent milk fever. This is the most important point as a cow with milk fever will not eat (which impacts point 1) and will have a lower level of immunity (point 2)

## TRANZSOL

To help manage the critical transition period, so cows have a healthier and more productive lactation, Sollus has developed Tranzsol, enabling cows to activate safe, metabolisable dietary calcium rather than compromising their skeletal calcium store.

Calcium carbonate combined with a patented form of activated vitamin D (Hy-D®) ensures she can receive an effective, regular dose of calcium over transition. Hy-D enables her to absorb that calcium.

New Zealand studies\* have shown, under a Tranzsol transition diet, calcium blood concentrations have been lifted by 30% compared to DCAD diets.



## THE NEW ZEALAND TRANSITION PROGRAM

Tranzsol is simply the best and easiest transition supplement for a New Zealand dairy cow. Tranzsol incorporates antioxidants, magnesium, calcium and most importantly Rovimix Hy-D. It also contains Rovimix® Biotin for energy and keratin production. This combination allows cows to safely transition even when consuming pasture.

In order to get the most out of transitioning your cows with Tranzsol it's important that:

- ✓ No more than 6kg of grass and grass silage per day is fed in the diet before calving.
- ✓ Cows must consume the required dose of Tranzsol (plus magnesium and calcium if using Tranzsol Nucleus) for a minimum of 14 days prior to calving.
- ✓ Cows must consume Tranzsol immediately post calving.

### Example transition diet recipe (per cow per day):

#### Tranzsol (only one of the following)

- > 480g of Tranzsol complete
- > 100g of Tranzsol Nucleus plus the below macro mineral recommendations

#### Grass & Grass Silage (maximum 6kg total)

- > No effluent paddocks. New break in the afternoon.
- Keep Potassium fertiliser to a minimum.

#### Silage (3kg)

- > Corn/Maize silage preferred. No Lucerne.

#### Concentrate (3kg)

- > Use any of the typical meals

#### Macro Minerals (when using Tranzsol NUCLEUS)

- > Mag Chloride 100g
- > Lime flour 280g (not negotiable!!!)

There are many ways Tranzsol can be fed including:

Feeds pads, mixer wagon, meal silo, feed trough, silage in paddock and a mineral dispenser.

A tool to help identify the ideal way to transition for different farming systems is available on the Sollus website.

\*DSM proprietary study

# The transition period

## WHY TRANSITION?

A transition period is generally 3 weeks pre-calving until three weeks post-calving, and is one of the most important periods of a dairy cow's life. During the transition period, a cow moves from late pregnancy into lactation.

The transition period determines future cow health, milk production, and reproductive success.

The impact of hypocalcemia (low levels of calcium) alone is massive industry wide. In New Zealand approximately 40% of the herd will experience either clinical (typically downer or sad cow) or sub clinical milk fever\*. This results in further problems with calving, milk production, fertility and mastitis through the season.

According to Dairy NZ in 2012\* milk fever will cost farmers about \$400 million in treatments resulting from calcium deficiency. Furthermore, it has been conservatively estimated that poor health of dairy cows during the calving period is costing the industry as a whole over \$1 billion dollars per year.

Understanding the importance of transition and managing this period is crucial. We need to take into account vitamin levels, mineral ratios & antagonisms, to devise the most beneficial strategy on farm.

## WHAT ARE THE COMMON TRANSITION METHODS?

Dusting with magnesium oxide is the most common and basic type of transition practiced. The point of magnesium dusting is to ensure the herd receives sufficient magnesium to prevent hypomagnesemia or "grass staggers". Magnesium also plays a vital role in calcium absorption and mobilization which aids in the prevention of milk fever.

Often Kiwi farmers will adopt a transition programme aimed at lowering the dietary cation-anion difference in the cow's bloodstream. Commonly called the DCAD diet, this aims to push the cow's diet into acidic or "negative" levels, by feeding anionic salts, usually in the form of magnesium chloride. The aim of this is to improve the cow's ability to mobilise calcium from her skeleton, helping increase the levels in her blood stream and reduce hypocalcaemia or milk fever.

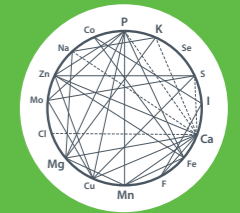


## IS DCAD TRANSITION SUITABLE IN NEW ZEALAND?

DCAD transition diets were not developed with New Zealand's pasture based dairy system in mind. These diets require a high proportions of "low cation" feed like maize silage or soy in them to work effectively. But grass is the highest proportion of a typical Kiwi cow's diet, and it means the cation (positive ion) level is too high for a DCAD diet to pull down into negative or acidic territory. For a DCAD diet to work, a NZ dairy farmer would have to drop their cows' grass intake to a minimal level (3kgDM per head per day). That is simply not practical. It means the valuable nutrients in grass would have to be sourced elsewhere, and would be far from cost effective. Furthermore, a DCAD diet with the usual high proportion of grass in it does not provide an external source of calcium to the cow. It only enables her to mobilise the reserve of calcium more efficiently that she holds in her skeleton.

Over several lactations the continual draw down on her skeleton's calcium, and the risk of traumatic events, make life hard for cows over this stressful period. Even when she is optimally fed, a cow will be calcium deficient for the first six to nine weeks post calving, typically losing skeletal mass post calving, and only regaining some of it back over the late lactation/dry period.

During early lactation a cow can lose between 0.3kg-1.5kg of calcium from her bone structure. That can reduce her fertility, impact on her health, and ultimately reduce her longevity within the herd.



A cow's ability to get sufficient calcium is usually compromised by a complex interaction between available calcium, magnesium levels, phosphorous levels and vitamin D.



With high potassium, nitrate and ammonia intake from eating young green grass, magnesium absorption is reduced, and the cow's ability to mobilise calcium will be reduced.



Vitamin D levels will be lowest over late winter-spring, the same time her calcium demand is greatest. A cow producing 10 litres of colostrum may lose 23g of calcium in one milking alone!



Tranzsol contains a patented form of active vitamin D called Hy-D. Hy-D used with calcium minimises bone degradation over the transition period.

### INCIDENCE IN NEW ZEALAND\*

DOWNER **2%**

MILK FEVER **5%**

SUB-CLINICAL **33%**

Averaging the cost to **\$80/cow**

Equating to **\$24,000 for 300 cow herd**



## CALCIUM FROM THE DIET AND BONES

Mobilising calcium from bone is a normal process for the dairy cow. However, continuously mining the skeleton for calcium, without fully rebuilding it over the lactation and dry periods, leads to a cow either being in a worse position for the next season, or being culled due to poor animal health and performance. Because of this, we need to ensure she can also access the calcium in her diet.

Absorption of calcium sourced from a cow's diet, rather than just her skeleton, requires adequate levels of activated vitamin D, to make it available. However her vitamin D levels from sunlight will be lowest over late winter-spring; the same time her calcium demand is greatest. Phosphorous rich spring grass will also further inhibit a cow's ability to activate sufficient levels of vitamin D post calving.

As a result of the cow's failure to metabolise dietary calcium properly she can suffer from milk fever.

\*DairyNZ, Technical Series June 2012

# Lactation with



Our milk companies love to promote our great dairy products as the best source of calcium. However, do you ever stop to wonder where this calcium comes from?

Every gram of calcium in milk comes from the cow, in one way or another, and there can be up to 20g of calcium a day produced by our top cows.

Lactisol™ is all about calcium. In combination with Tranzsol in the transition period, Lactisol provides the right building blocks at the right time.

Optimum absorption of calcium and phosphorus is required for strong healthy cows, putting back what we take out. Lactisol makes sure this happens by:

- Providing the “next generation” source of Vitamin D, Rovimix Hy-D – which ensures optimum uptake and utilisation of Vitamin D within the animal.
- Balancing the diet to make sure cows are receiving the right amount of vitamins and minerals for their stage of production and time of year.
- Providing Biotin which is essential for the synthesis of keratin in hooves and for energy uptake in the liver. Lactisol contains Rovimix Biotin.
- Providing zinc which is a component of a wide variety of enzymes and proteins supporting metabolism, growth, production, and reproduction. Zinc is required for production of protective keratins in the hoof and teat. Lactisol contains multi stage release zinc compounds for optimal uptake and utilisation.
- Providing antioxidants to improve health and support the cow’s own immune system to fight infection.
- Providing rumen available magnesium for a better, safer response.

The Lactisol range is designed to meet the needs of different New Zealand farming systems, production levels and seasons. Lactisol 400, Lactisol 500, Lactisol 600 and Lactisol Z each meet different needs and are available in 3 different forms; Proton, Nucleus or Complete.

Refer to the table to see which product best fits your system.



## COMPLETE

Proton + Nucleus + Salt + Lime

## NUCLEUS

Proton + Magnesium

## PROTON

Vitamins + Trace Minerals +  
Rumen Modifiers

### LACTISOL PRODUCT SELECTION TABLE

MINERAL OPTIONS	PRODUCTION LEVEL		
	350 - 450 MS/cow	450 - 550 MS/cow	550+ MS/cow
Supply own Mag, Lime & Salt	Lactisol 400 Proton	Lactisol 500 Proton	Lactisol 600 Proton
Supply own Lime, Salt*	Lactisol 400 Nucleus	Lactisol 500 Nucleus	Lactisol 600 Nucleus
Mag, Lime & Salt Included*	Lactisol 400 Complete	Lactisol 500 Complete	Lactisol 600 Complete
Elevated zinc for facial eczema	Lactisol Z, Complete and Nucleus forms available only		

\* Magnesium requirements can vary from farm to farm and at different times of the year. Consult with your Sollus rep for more information




# Product range

The Lactisol range is created with the understanding that one size does not fit all in New Zealand dairy farming. There are different farming and feeding systems, different levels of milk production and changing conditions through the year and season. The Lactisol range was developed and formulated in New Zealand, for New Zealand farms.

The range is made up of 4 products, with each product coming in 3 different forms, Proton, Nucleus or Complete. Read about the different products below and use the table on the previous page to see which product best suits your farm.




## LACTISOL 400

A full range of minerals plus Biotin to maintain production and health in dairy cows milking 350 - 450 milk solids a season. Lactisol 400 contains DSM's Rovimix Biotin for keratin production, a key component of healthy hooves. Also, because Rovimix Biotin is soluble in water and non-electrostatic, the Proton form of this product can be used through water dosing systems.

-  Cows producing less than 450 milk solids a season
-  Proton form can be used via water treatment
-  Dust free formulation





## LACTISOL 500

The vitamins, minerals and antioxidants required to maintain production and health in dairy cows producing 450 – 550 milk solids a season. Plus, it contains Hy-D, DSM's unique form of vitamin D, and DSM's Rovimix Biotin for keratin production.

-  Cows producing their bodyweight in milk solids
-  Hy-D for optimum mineral absorption
-  Dust free formulation




## LACTISOL 600

Formulated to meet the elevated nutritional requirements of high producing cows and cows in barn systems. It contains elevated levels of vitamins and antioxidants. Plus, it contains Hy-D, DSM's unique form of vitamin D, and DSM's Rovimix Biotin for keratin production.

-  Cows producing more than their bodyweight in milk solids
-  Ideal for barn based cows
-  Hy-D for optimum mineral absorption
-  Dust free formulation

## LACTISOL ZINC

Formulated to aid in the prevention of facial eczema with elevated levels of zinc and the required vitamins, minerals and antioxidants. Copper has been removed as it's a zinc antagonist. Lactisol Zinc also contains DSM's Rovimix® Biotin which supports healthy hooves and milk production.

-  Aids in prevention of facial eczema
-  Antioxidants for immune support
-  Dust free formulation

### SOLLUS PRODUCT TABLE

INGREDIENT	LACTISOL 400			LACTISOL 500			LACTISOL 600			LACTISOL Z		TRANZSOL	
	Proton 5g dose	Nucleus 25g dose	Complete 200g dose	Proton 5g dose	Nucleus 25g dose	Complete 200g dose	Proton 10g dose	Nucleus 25g dose	Complete 200g dose	Nucleus 50g dose	Complete 200g dose	Nucleus 100g dose	Complete 480g dose
Vitamin A				●	●	●	●	●	●	●	●	●	●
Vitamin D3				●	●	●	●	●	●			●	●
Vitamin E				●	●	●	●	●	●	●	●	●	●
Rovimix Biotin	●	●	●	●	●	●	●	●	●	●	●	●	●
Rovimix Hy-D				●	●	●	●	●	●			●	●
Cobalt	●	●	●	●	●	●	●	●	●	●	●	●	●
Copper	●	●	●	●	●	●	●	●	●			●	●
Iodine	●	●	●	●	●	●	●	●	●	●	●	●	●
Zinc	●	●	●	●	●	●	●	●	●	●	●	●	●
Selenium	●	●	●	●	●	●	●	●	●	●	●	●	●
Magnesium		●	●		●	●		●	●	●	●	●	●
Sodium Chloride			●			●			●	●	●		●
Calcium			●			●			●		●		●
Monensin				●	●	●	●	●	●				
Lasalocid												●	●
MOS												●	●

● Sollus Standard Level   ● Sollus Elevated Level

# The 3 Down Cows

KNOW YOUR DOWN COWS TO PREVENT DISEASE

## Calcium Downer

- Also known as milk fever, sad cow, S-bend in the neck, dopey cow.
- Non-responsive on approach.
- Responds to calcium metabolic bag.



## Phosphorus Downer

- Also known as crawler cow.
- Often sitting normally, gets agitated as you approach.
- Responds best to direct injection of phosphorus. Does not respond to calcium bag. Will also respond to 4-n-1 metabolic bag.



## Magnesium Downer

- Also known as grass tetany, snow angel, crazy cow.
- Often found dead or not far off. Usually shows signs of muscle tremors.
- Still a lot of sub-clinically affected cows: SPOCS (Slightly Pissed Off CowS)
- Usually best to use 4-n-1 bag, although straight magnesium works well.



# The 3 R's of Lameness

KNOW YOUR CAUSES OF LAMENESS

## Races

- **Dry** – people often think smoothness, but a healthy and dry hoof can deal with rough surfaces; moisture is the enemy.
- **Wide** – needs to be sufficient for fluid cow flow.
- **Direct** – to minimize time on race.
- **Clear** – no obstacles that cause frights or bottlenecks.
- **Pressure** – do not push, scare or force cows along races.



## Rest

- The definition of rest is the time left after travelling and eating and should be 14h per day.
- Allows blood flow to the hoof.
- Allows time for cow to build energy and prepare for the activities ahead.
- Allows for efficient rumination.



## Ration

- The diet should avoid anti-nutritional factors that interfere with the integrity of the hoof.
- Diets that are conducive to excessive generation of acid, ammonia, toxins, nitrates and amino acids can all have a negative effect on the integrity of the hoof.
- Dietary mineral availability (and associated vitamin interactions) can be positive or negative for hoof integrity.
- Just because pasture is grazed does not mean it is automatically safe. A poor quality pasture can cause all of the above problems. Just like any other form of nutrition.



# Ingredients guide

This section expands on some of the key ingredients in Sollus products; Hy-D, Rovimix Biotin, vitamins, macro minerals and trace minerals – what they do.

## Hy-D

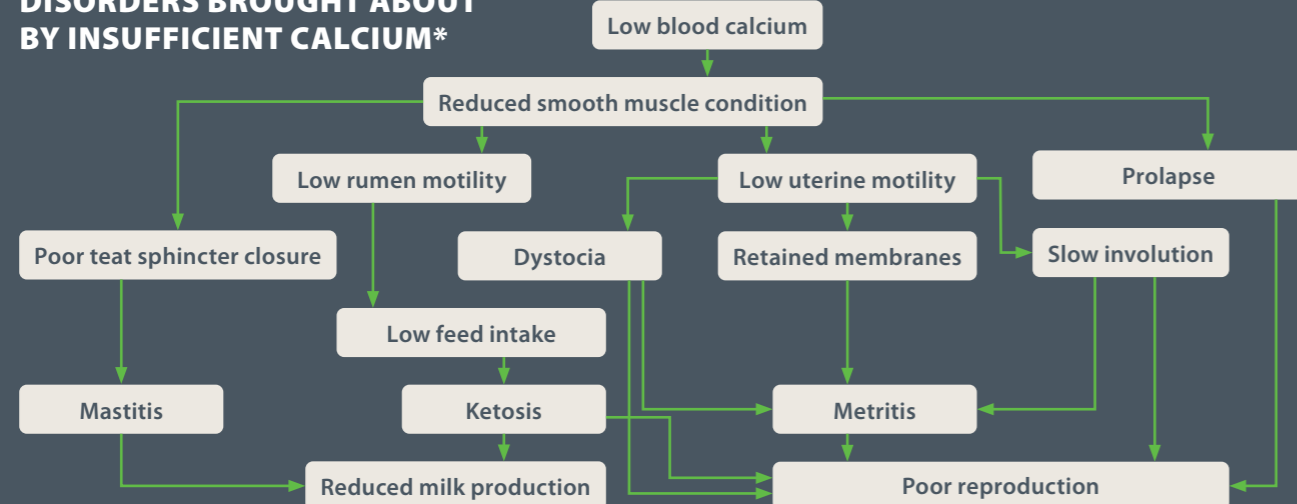
### THE NEXT GENERATION FORM OF VITAMIN D

All animals need a strong skeleton. It's not just the framework holding up the muscle and skin! Bones are also a reservoir for calcium – the calcium that goes into the milk we get from every lactating cow.

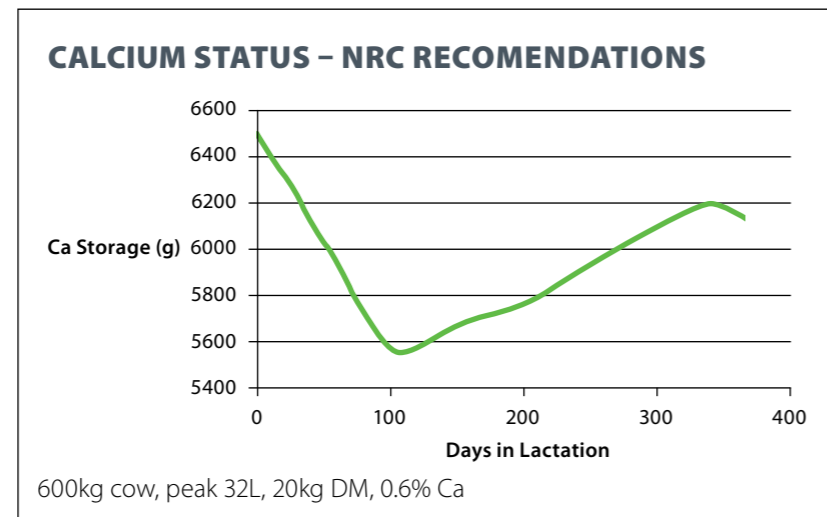
That same calcium is also used in muscle contraction, like the uterine muscles that push out a calf, the muscles that control teat closure or the muscles that control rumen function. So a lactating cow goes through a lot of calcium!

If she doesn't get enough in her diet to replace it then these muscles don't work efficiently, leading to all sorts of health problems.

### DISORDERS BROUGHT ABOUT BY INSUFFICIENT CALCIUM\*



In fact, we can think of bone condition, much like we think of a body condition score. It depletes over a lactation unless we replenish it. If not, even after a dry period, it very rarely comes back to the level it started at. Eventually, over several lactations, it declines to a level risking osteoporosis and bone breakage.



\*DairyNZ, Technical Series June 2012

So the answer is simple, right? Feed calcium! It's cheap; we can just dig it out of the ground. In fact, even cheaper, cows get it through grass! Unfortunately it's a little bit more complicated than that. A cow's ability to regulate calcium adsorption is controlled in part by how much vitamin D she can get from sunlight. While that's enough over summer, when she's at peak lactation in spring – it's not.

So, right at the time she's got the biggest drain on her calcium levels, she can't adsorb enough calcium to replace it.

So isn't the answer to supplement her diet with vitamin D so she can adsorb more calcium? Well, again, not quite so simple. The vitamin D we all get from sunlight is a long way from the vitamin D you can take in oral form. You could eat vitamin D tablets like they were lollies all day and you'll never get to the level you need.

And that's where we come in...

### WHY ALL VITAMIN D IS NOT THE SAME

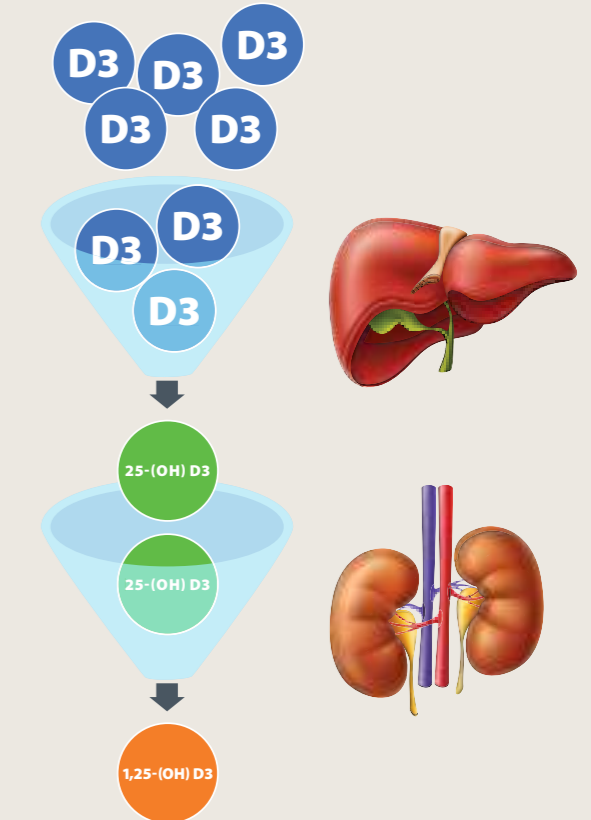
OK, so bear with us while we run through a necessary bit of biochemistry.

Vitamin D taken in an oral form, also known as cholecalciferol-D3, has to go through several transitions in the body before it can be used to regulate calcium uptake. Firstly the liver converts it to 25-dihydroxy cholecalciferol – this is the form we get from sunlight. Then, in the kidneys, this gets further converted to 1,25-dihydroxy cholecalciferol – ACTIVE Vitamin D – the form that controls calcium adsorption.

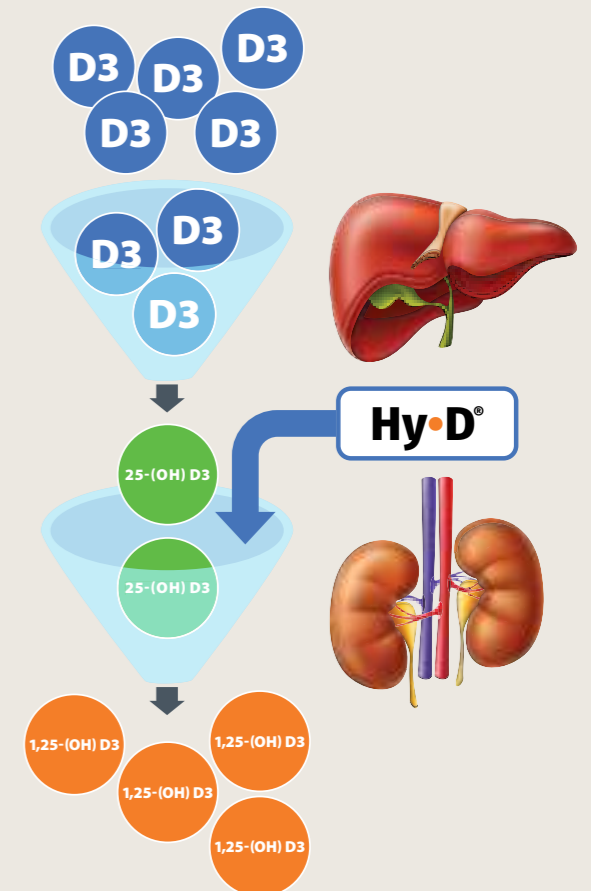
But, those transitions are **SLOW**. That's why you can feed a massive amount of Vitamin D3 and only get a trickle of active vitamin D out from the kidneys. Nowhere near enough to replace calcium in bones to the level that's being depleted.

However, Sollus uses DSM's unique product – **Hy-D** – or 25-dihydroxy cholecalciferol. That's the form the liver produces, which allows us to skip a rate limiting step and get cows producing enough active vitamin D, to allow them to adsorb enough calcium from their diets.

### SUPPLEMENTING WITH STANDARD VITAMIN D



### SUPPLEMENTING WITH HY-D



# Biotin

There are multiple contributors to lameness of which one of the most significant is diet. In particular, lameness is one of the downstream effects of acidosis.

When the pH in the rumen drops, often because too much starch has been fed at the expense of roughage or fibre, it drastically changes the environment that rumen bacteria live in.

Lower pH encourages the growth of amylolytic bacteria which produce propionic acid and lactic acid.

As humans we're well acquainted with lactic acid build-up. It causes muscle pain and fatigue during physical exercise.

In cows, dramatic increases in lactic acid can cause rumen paralysis or displacement and can be fatal.

In cases where the build up of lactic acid is less catastrophic it still kills certain gram-negative rumen bacteria which release endotoxins when they die. These toxins are absorbed into the blood stream and find their way to the hooves. Once in the hooves the toxins attract histamines, which is simply a natural immune

response. The first effect of histamines is inflammation and pain, evident as laminitis.

They also cause the blood vessels carrying nutrients to the hooves to constrict, the effect of which is to reduce the food available to keratinocytes – the cells responsible for producing keratin. This is the glue that holds cells together in hooves. When the keratinocytes die, the lack of cellular adhesion is evident as a white layer on the outer hoof surface.

Another sign of laminitis to look out for is the posture of a cow. A straight back is normal. A slightly arched back is evidence of early onset laminitis. A severely arched back indicates a lame cow.

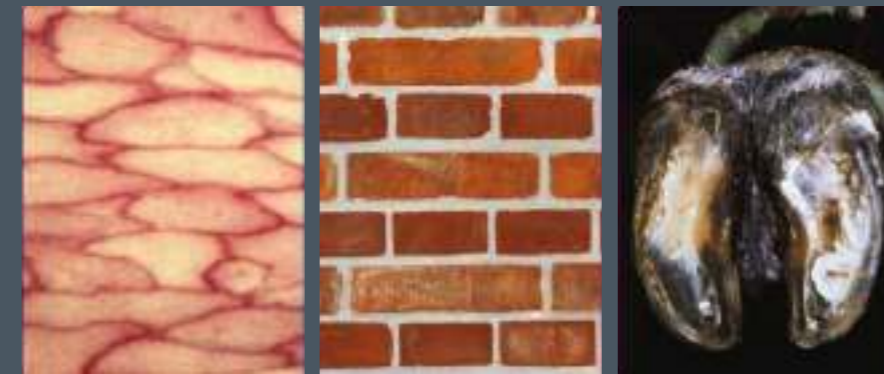
The end-to-end process from incidence of acidosis to evidence of lameness can take several months, which often makes the cause difficult to identify.

pH may have returned to normal by the time symptoms develop but if laminitis is observed the diet should be looked at straight away and the proportion of roughage increased to restore the pH balance. The second response should be to add Biotin to the diet.

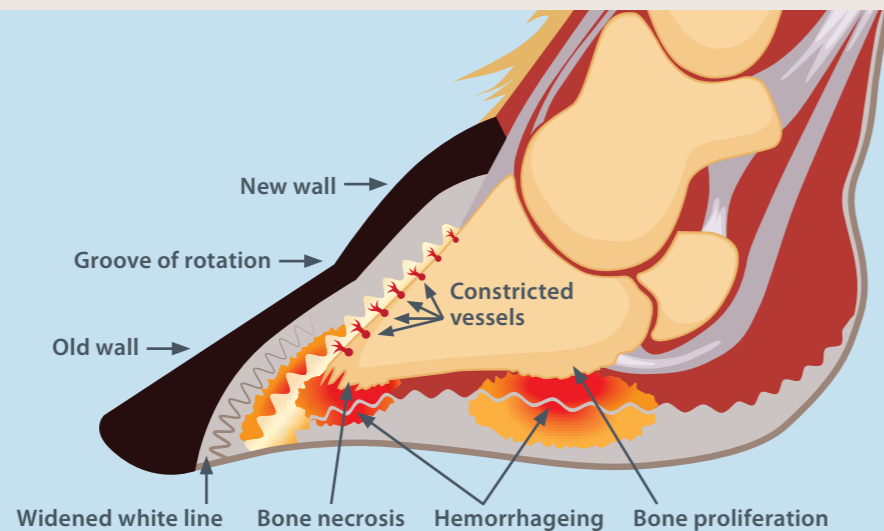
## HOOF HORN STRUCTURE WITHOUT ROVIMIX® BIOTIN



## HOOF HORN STRUCTURE WITH ROVIMIX® BIOTIN



### RESTRICTED FLOW OF NUTRIENTS TO HORN PRODUCING CELLS – KERATINOCYTES



Biotin, also referred to as vitamin H or vitamin B7, has three main roles in the animal, but we're really focused on two: Biotin assists the liver to produce glucose and it assists in the production of certain proteins including keratin.

If a cow is starved of glucose, then the animal will preferentially use Biotin in the liver to generate more glucose. If she is receiving sufficient glucose then more Biotin will be used in keratin production. The boost in Biotin induced keratin production helps hold the hooves together, like mortar between bricks, reducing the impact of the toxin response.

Restoring roughage will also aid the cow to increase its own Biotin production – although not to the point where it removes the need to supplement. Biotin is produced naturally by rumen bacteria. These are reduced when roughage is insufficient and rumen pH drops.

In Sollus products we use DSM's Rovimix® Biotin. This is the most concentrated and only soluble form currently available. It is also the only non-electrostatic form which means it doesn't cling or stick to surfaces throughout the mixing, transport and auguring of your feed. (If you've paid for it you want it to get to your animals.) To target lameness in Sollus products, in addition to Biotin, we add zinc, which is required for the synthesis and maturation of keratin, selenium to support the immune system and manganese for collagen production.

Getting the correct vitamin and mineral balance in a cow is effective at repairing and reducing the incidence of lameness but it is a strategy which has to be applied consistently throughout lactation. Sollus Lactisol, added to a properly balanced diet every day, contains everything needed to ensure she stays happy on her feet.



# Vitamins

Vitamins are compounds needed by all animals in tiny amounts. They are essential for life and must be absorbed directly from food or synthesised by organisms in the digestive system from other substrates. Most supplementary feeds sourced from by-products (e.g. PKE or soy hulls) do not contain sufficient vitamins for cow's daily needs.

Cows in New Zealand generally get their vitamin requirements from pasture but there are certain times, for example when pasture contains much more dry matter over summer, when vitamin supplementation is necessary. This is particularly the case with vitamins A, D & E. Cows generally get sufficient vitamin C synthesised in the liver and kidney and ruminal bacteria synthesise vitamin K and most of the B vitamins.

## Vitamin A

Vitamin A is an important ingredient in improving immune function and as an antioxidant.

Signs of Vitamin A deficiency vary widely but can include impaired vision, uncontrolled bone growth, diarrhea, stillborn or weak calves and low conception rates. Generally the higher the level of milk production, the greater the challenge to immunity and the more vitamin A required.

Grass and other green leaves contain high levels of beta-carotene, which cows convert to vitamin A and, as a fat soluble vitamin, store it conveniently in body fat. At most times this is sufficient for their needs. (Jerseys absorb a greater proportion of carotene intact from the intestine leading to the orange-yellow colour of their milk and body fat.)

Cereals and by-products have poor levels of carotene – though corn / maize is better than others. When grass dries off – over the summer – it contains much lower levels of vitamin A and, at that point, cows are required to draw on their fat stores. Also, it's important to note that the beta-carotene contained in grass, as well as some other micro-nutrients, will be destroyed by the acid environment in silage when ensiled

Lactisol, fed throughout lactation, contains the vitamin A needed to supplement and extend a cow's storage banks in the period when levels in feed sources are low.

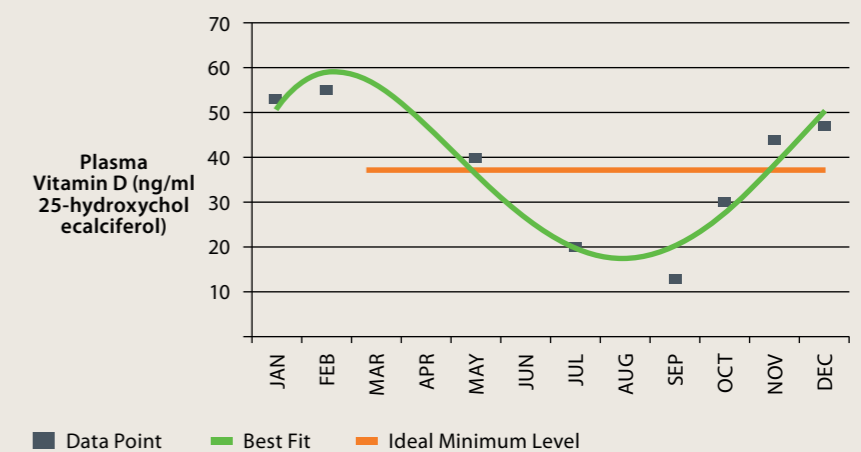


## Vitamin D

Vitamin D is critical for bone formation and maintaining sufficient calcium and phosphorus levels. Without sufficient vitamin D there is no calcium absorbed. Insufficient calcium leads to the impairment of smooth muscle function like those controlling digestion, pushing out calves or in teat closure. In the long term a calcium deficit means bone breakages are more likely. Vitamin D is also needed to stimulate the innate immune defenses against microbial pathogens.

Lactisol contains DSM's patented Hy-D which is the activated form of vitamin D. Lactisol also contains vitamin D3 which provides fuel for the liver and kidneys to process into the activated form, ensuring that we are using the cow's internal conversion process to its optimum efficiency.

### NEW ZEALAND DAIRY COW PLASMA VITAMIN D STATUS THROUGHOUT THE YEAR



## Vitamin E

Like vitamin A, vitamin E is a fat soluble vitamin and a powerful antioxidant. Unlike vitamin A, relatively little gets stored in body fat. Vitamin E is important in reproductive, muscular, circulatory and immune systems. Furthermore, given the facial eczema causal agent, sporidesmin, generates free radicals, scientific studies\* have suggested that high levels of antioxidant can help reduce damage.

Vitamin E continues its role after animals are sent to the works. E is important in maintaining the red colour of meat after processing, preventing discolouration and off-flavours. Vitamin E is depleted in the body by disease, inflammation and oxidative stress; sacrificing its oxygen molecules to disarm free radicals, a bit like a zinc block on a boat. Fresh forages contain high levels of vitamin E but levels in stored feed decrease over time. The fermentation process of silage making destroys most vitamins including E.

Lactisol, fed throughout lactation, boosts the levels cows receive from green feeds, especially important when grass is supplemented by grains or by-products.

\* Effect of antioxidants on the toxicity of the facial eczema toxin, sporidesmin, in sheep – R. Munday, E. Manns & PH Mortimer – Proceedings of the NZ Society of Animal Production, 1983, Vol 43: 209-212

# Macro Minerals



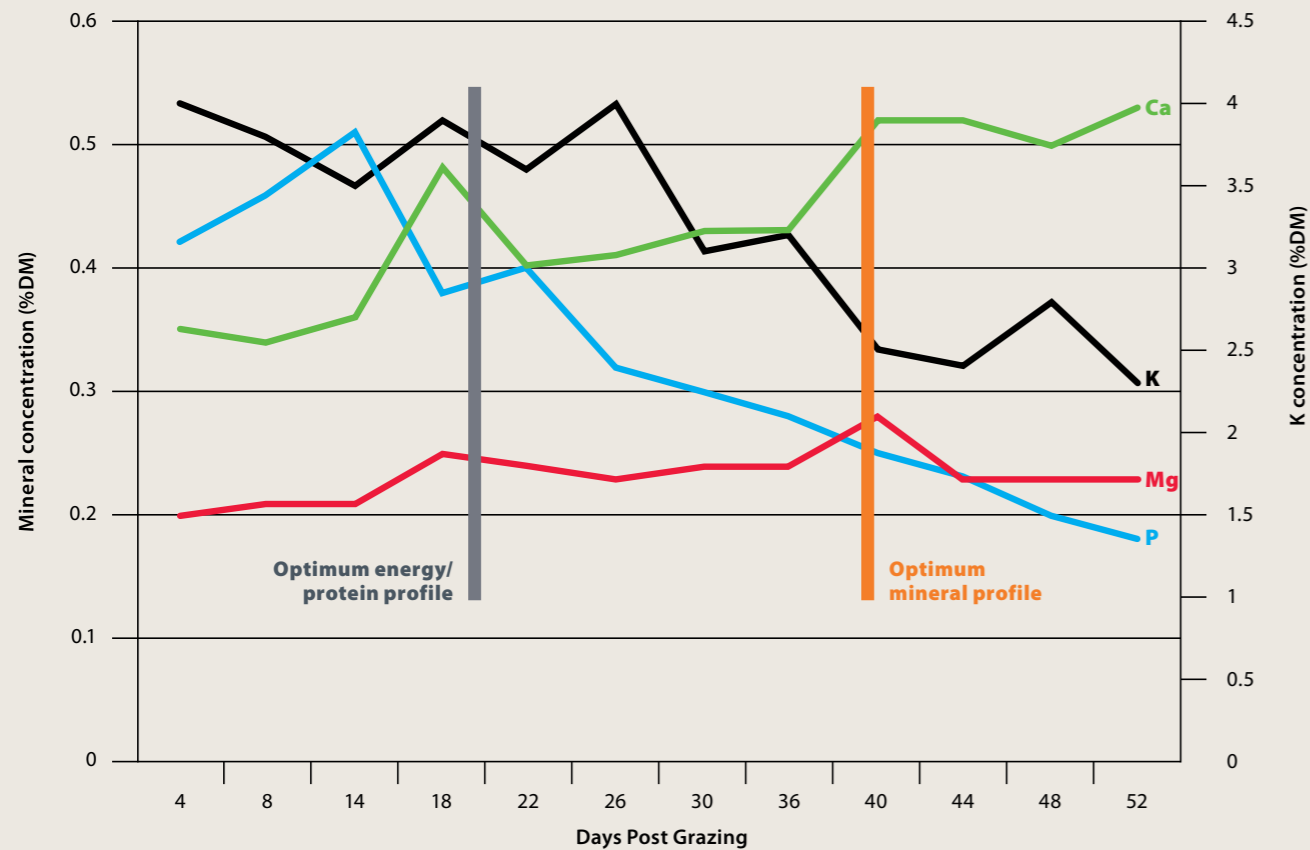
Minerals are inorganic elements that are needed by all animals for growth and maintenance. Macro minerals are those that cows need in large quantities – grams or even hundreds of grams / day – as distinct from trace minerals which are needed at the milligram or microgram level. Macro minerals include calcium, phosphorus, magnesium, potassium, chlorine and sodium.

As well as the total levels, the balance between minerals is critical because they have complex interactions with each other and over-supply of some minerals may reduce the availability of others. Too much potassium, from effluent paddocks for example, can decrease the adsorption of magnesium, and magnesium is required for the adsorption of calcium – round it goes.

Of the macro minerals, we can generally put phosphorus and potassium to one side because levels in New Zealand soils are typically high enough to not require further supplementation. The remainder – calcium, magnesium, chlorine and sodium, should be supplemented in some way in the diet of every milking cow.



**MINERAL CONCENTRATION BY GRAZING DAY – C3**



This graph is an example of a New Zealand pasture where we looked at the levels of certain minerals present post grazing. Although the optimum energy/protein profile is around day 20, the ideal mineral profile isn't until closer to day 40. Of note is the calcium to phosphorus ratio. At day 20 it's closer to 1:1, while at day 40 it's 2:1 which is ideal for optimum absorption.

## Calcium

The role of a dairy cow is to produce calcium, year after year, every day, for around 270 days a year. That has to come from somewhere and the calcium we get in milk comes from her bones. In fact, 98% of a cow's calcium resides in her bones. The calcium dissolved from bones of a lactating cow goes preferentially into milk so, if there's a shortage, we're left with not enough to perform other critical functions. Calcium is needed for muscle contraction, including those active in rumen function, teat closure and uterine contraction. Among other things therefore, insufficient calcium leads to poor digestion, mastitis and birthing problems.

The level of calcium in blood is controlled by the endocrine system which detects when blood calcium is low and reacts by stopping calcium excretion, increasing gut adsorption and mobilizing bone deposits. When this is not enough, hypocalcemia (milk fever) is the result. This can be clinical (observable) or sub-clinical, which generally manifests as a drop in production. Dairy NZ estimate that for every clinical case of milk fever there are 10 sub-clinical.

Vitamin D has a critical role in controlling calcium absorption. The importance of vitamin D in balancing

calcium has been covered in detail in other sections of this publication.

Longer term, calcium depletion without replenishment through the diet can lead to bones weakened to the point they break very easily. Calcium (Ca) and phosphorus (P) are closely linked in animal metabolism. Phosphorus is also found concentrated in the skeleton and together they make up 50% of the mineral content of milk. The desirable Ca:P ratio is 2:1. If phosphorus is too high in proportion then adsorption of calcium is stalled.

The good news is calcium is available in grass and supplemental calcium is cheap and plentiful. Sollus supplements with a larger particle of calcium carbonate in Lactisol and Tranzsol Complete and specially treats it to minimize dust.

Unlike large particles of magnesium, larger particles of calcium don't pose any risk of increased pH in the small intestine, a potential contributor to salmonella.



## Magnesium

Magnesium is needed for bone growth and maintenance. The parathyroid gland requires magnesium to produce parathyroid hormone as a precursor to calcium absorption. Magnesium is also required for fibre digestion in the rumen.

Deficiency is common in early spring. When pasture is growing rapidly under cool conditions the magnesium level in foliage declines. This is exacerbated by a high rumen pH, contributed to by potassium from high potassium soils, ammonia from soluble proteins and low starch levels found in spring grass growth. Increased pH reduces magnesium absorption. Sollus includes monensin in Lactisol to help increase absorption.

Forages and grains supply a large proportion of the magnesium required but in a form that is only 20-30% available. Magnesium is therefore supplemented with magnesium oxide (MgO) which is more like 50% available.

The MPI have recently published an ACVM Guideline highlighting the probable link between MgO and salmonella, particularly highlighting the risk from prills or granules. While this is the case, it must be emphasized that salmonella outbreaks on farm are often caused by multiple factors, including rapid changes to the diet (especially from dry/high fibre to wet fresh grass), poor effluent management and immunity compromised cows... the list goes on.

\*Rumensin is a registered trademark of Elanco

The MPI emphasis on larger particles is important. Larger particles of MgO are often favoured in blending because they are dust free but if a large particle or over-cooked MgO is used (heat is part of the MgO manufacturing process) it can be poorly soluble in the rumen and the abomasum. Most times that's not a problem but if the overall level of MgO added is too high or passage rate through the rumen and abomasum is high for some reason – like a fresh flush of grass – a portion can remain unreacted by the time it reaches the small intestine.

Once into the small intestine trouble begins to brew.

MgO in solution in the rumen will drive pH up, reducing the risk of acidosis and potentially improving milk fat percentage. In the rumen this is a great attribute.

However, if it reaches the small intestine unreacted, a lift in pH is not so great. It causes the environment to favor some bad bacteria that may already be present in the gut at trace levels, especially salmonella.

Despite the risk, for the reasons highlighted above, you can't just stop adding supplemental MgO.

It's a risk that the Sollus team has always been aware of, so we developed a magnesium to be included in all our product forms, fine enough to react fully before it leaves the abomasum and, at the same time, specially treated to be dust free.

## Chlorine

Chlorine is generally required at the ratio in NaCl supplemented for sodium requirement.

Like sodium, it has a role in nutrient transport and maintaining pH balance as well as in digestion as a component of stomach acid (in HCl or hydrochloric acid). Deficiency symptoms include reduced DM intake & weight loss.

In warm weather cows lose sodium, but not chloride, through sweat. They will consume salt if it is freely available to replenish the sodium requirement but this can result in toxic levels of chloride accumulating. Sodium bicarbonate is often used in summer months if additional sodium is required over and above daily intake in feed.

## Sodium

Sodium ions are heavily involved in the control of osmotic pressure, pH balance, body fluid regulation, nutrient transport and heart function. Sodium also contributes to the rumen buffering capacity of saliva. Because it isn't stored in the body and is lost through milk, sweat, urine and faeces, daily supplementation is required and a diet deficient in sodium causes symptoms to become quickly evident. These include licking and chewing objects, drinking urine and, ultimately, a steep drop in intake and production.

Soluble sodium will be taken up by forage as well as leached from soil so the amount in the diet is variable and a function of soil type, location and rainfall. Some forages take up less than others – maize, lucerne and kikuyu in particular are poor at taking up sodium. Pasture content varies widely and, at times, will not be sufficient. Typically supplemental feeds are low in sodium so direct addition to diet is required, in Lactisol Complete we use common salt – NaCl (which has the added obvious benefit of contributing to chlorine requirement). It also aids palatability of feed.



# Trace Minerals



Trace minerals are simply those minerals required by animals in trace amounts. That doesn't necessarily mean they're less important than macro minerals. A deficiency of trace minerals can have significant repercussions for health. Sollus Lactisol trace mineral contents are designed to complete the requirements of New Zealand dairy cows, while taking into account the known mineral contents of grass & feed. The trace mineral content does not vary between Lactisol 400, 500 & 600. (The zinc content in Lactisol Z however is increased to 10,000mg to aid in protection against facial

eczema. Copper, which binds zinc and thus increases the risk of facial eczema, is decreased.)

Cow requirements are based on NRC (National Research Council) recommendations for a 500kg cow, consuming 20kg of dry matter and producing 24L/day @4.6% fat. Typical grass requirements have been determined based on meta data over multiple farm pasture tests\*. Where by-product feed supplements substitute for grass, the level of trace minerals they typically contain, particularly copper and zinc, are at least equivalent to grass.



## Cobalt

Cobalt is required by rumen biota to produce B12 which is needed to make red blood cells and for energy.

A poorly functioning rumen will not make B12, whether cobalt is available or not.



Required by 500kg cow, eating 20kg DM, producing 24L/day, 4.6% fat

## Copper

Copper is required to make red blood cells & nerves.

It is important for skin and hair quality.

Copper is stored in the liver.

Sporodesmin is only toxic in presence of copper so we limit copper in formulations where zinc is being used to control facial eczema.



Required by 500kg cow, eating 20kg DM, producing 24L/day, 4.6% fat

## Iodine

Iodine levels in New Zealand can be low and, to complicate matters, bound by certain species, so Lactisol contributes the entire cow requirement.

Iodine is essential for the thyroid to regulate metabolic rate.

It's also essential for reproduction and muscle function.



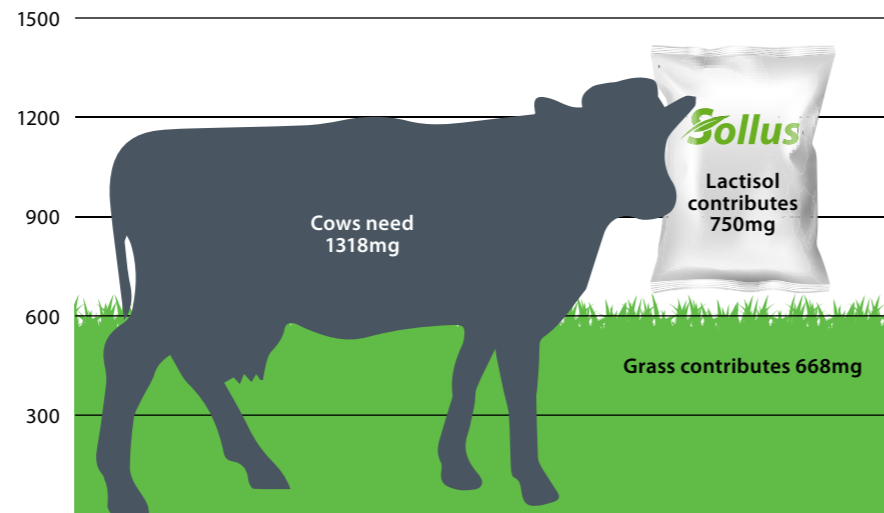
Required by 500kg cow, eating 20kg DM, producing 24L/day, 4.6% fat

\*DSM proprietary research 2019, C Bratz, DSM Technical Manager Ruminants

## Zinc

Zinc is required in enzyme systems affecting the quality of skin, bones, hair, reproduction, immunity and hoof strength.

Elevated levels (10x normal – present in Lactisol Z only) are required for protection against facial eczema.



Required by 500kg cow, eating 20kg DM, producing 24L/day, 4.6% fat

## Selenium

Selenium is a natural antioxidant helping disease resistance (e.g. mastitis), and in placental shedding.

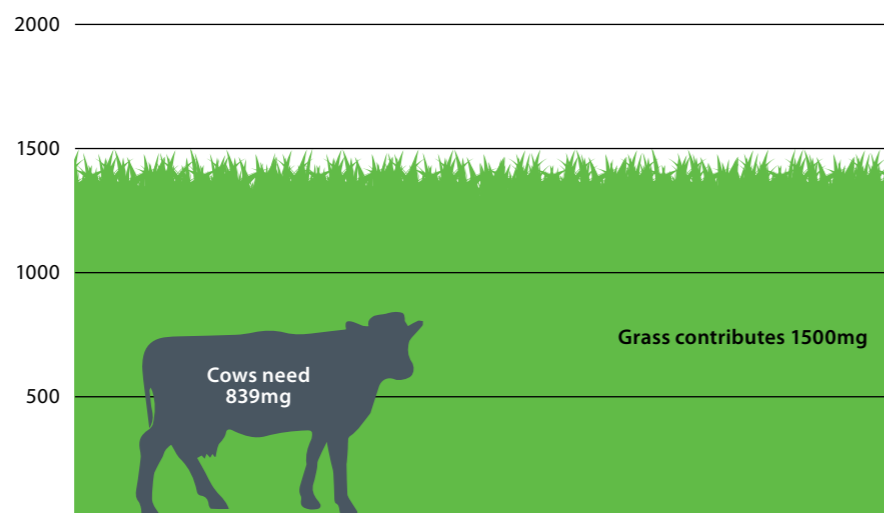
It's important for liver and immune function.



Required by 500kg cow, eating 20kg DM, producing 24L/day, 4.6% fat

## Manganese

Manganese is a key component of metabolic pathways for energy production and is a critical precursor of super oxidase dismutase, a key anti-oxidant. Grass contributes more than enough manganese so we don't add to cost by adding it needlessly.



Required by 500kg cow, eating 20kg DM, producing 24L/day, 4.6% fat



### COWS LIVING OUTSIDE DON'T NEED VITAMIN D

Even in the Land of the Long White Cloud it's still true that animals get the majority of their vitamin D from ultra violet light (specifically UVB). However, this light is only effective when the sun is higher than 50°.

That means in practice, if your shadow is longer than your height then you are not receiving UVB. That also means that you don't receive UVB in winter and, the further south the longer the period during the year that you don't receive UVB. Mammals are adapted to storing Vitamin D that they do receive in the form of Hy-D, however, cows are not adapted to calving in the middle of winter. Ideally calving would take place in spring on old poor quality feed left over from winter! Not in winter on rocket fuel with poor mineral balances.

### NO LIME FLOUR PRE CALVING

This is an opinion that has evolved to become the received wisdom in NZ dairy farming. It is recommended to keep supplemental calcium low pre-calving, to keep blood calcium low, in order to stimulate calcium being dissolved from bones. This is the basis of a DCAD transition diet.

So let's de-bunk this particular myth. For a start, calcium is in almost all feed-stuffs, some much more than others. Clover would be the highest in calcium, and

grains probably the lowest. In between we have grasses, silage, palm kernel meal, DDGs etc. In other words the calcium level of feed stuff alone could theoretically range from 0.2% to 1.2%. what does this mean? If a dry cow is eating 10kg of DM then the variation of calcium by 1% is equivalent to 350g of lime flour. In other words, it's hard to keep calcium out of a diet, so is adding 100g of lime-flour to a diet of maize silage, grain and straw a bad thing? Nutritionally it's the same as feeding a pasture full of calcium. In fact calcium supplementation is critical, and by adding Hy-D to her diet, Sollus enable a cow to absorb the calcium which she does eat, which means she can utilise it from her feed, not from her bones. Because she can absorb it, adding calcium to the diet becomes one of the best things we can do.

### CALCIUM MAKES COWS "LAZY"

This is the general justification to say that cows don't need lime-flour in the diet. To put it into context it would be like saying that by adding phosphate fertilizer to your paddock it is making the grass lazy, and if you don't add it the grass will miraculously find a way to get it out of the bed rock. Cows produce vast amounts of calcium, which milk companies love to promote. As a farmer you have to feed this calcium so it can be put into the milk. There are two ways to do it, and you generally have to do both. Apply lime to the soil so the plant absorbs it and put it into the feed supplements.

## GYPNUM VS LIME-FLOUR (TRANSITION)

Both gypsum and lime-flour are good sources of calcium. Lime-flour contains about 34-36% and gypsum about 23-29%, depending on the amount of water associated with the molecule. So, both are very high in calcium. The argument that gypsum is safe and lime flour is not, is flawed. The logic is that gypsum is an anionic salt so therefore safe. Yes, it is true the gypsum molecule is calcium joined to a  $SO_4$  (sulfate) molecule while, in lime flour, the calcium is joined to a  $CO_3$  (carbonate) molecule. Yes, sulfate is an anion, but that doesn't make it safe.  $SO_4$  is the weakest anion, poorly absorbed and, unless the total diet (i.e. DCAD) is made negative, an almost impossible task on NZ's grass diets, then the whole mechanism of anionic salts is irrelevant. There is no difference.

## ORGANIC MINERALS ARE ALWAYS BETTER THAN INORGANIC MINERALS

Organics have a place and are arguably more absorbable, but because they are so expensive it is often more effective to simply add a little more inorganic mineral. When it all boils down they are only really required for two reasons. 1) the rate of production of the animal is so high that they cause metabolic stress in mineral absorption pathways and generation of oxidative stress (at a guess higher than 800 MS/lactation). 2) there is a mineral antagonist in the diet that is blocking the absorption of the target trace mineral. That's it; if neither of these conditions apply then the most cost effective option is go for high quality inorganic trace minerals from reputable companies.

## WHAT'S IMPORTANT: THE TOTAL AMOUNT OF THE MINERAL, THE LEVEL OF ELEMENTAL MINERAL OR THE LEVEL OF ELEMENT ABSORBED?

If we look first at elemental vs rate of absorption, possibly the best example is magnesium. Magnesium can come as epsom salts ( $MgSO_4$ ), magnesium chloride ( $MgCl$ ), magnesium oxide ( $MgO$ ) and magnesium carbonate ( $MgCO_3$ ). Respectively they contain approximately 11%, 13%, 55% and 28% Mg. But the first 2 are 100% absorbed, absorbance of the  $MgO$  is dependent on the form, quality and state of the rumen and the  $MgCO_3$  is hardly absorbed at all. What makes things confusing is that  $MgO$  meets multiple needs (buffering, rate absorbed increases when often required) which means it appears to be a better source of magnesium. In reality it is a multi-faceted product when it is of high quality.

If elemental level was the sole critical factor then the smartest thing to do would be to just divide the cost by elemental level and put as much in of the cheapest option as possible, but this doesn't work. Why? It's balance that matters. Minerals work in conjunction with other minerals, vitamins and protein and energy. All nutrients have to be in balance for this to be effective. When a product doesn't get absorbed and then utilised, it's just expensive effluent.



## PASTURE IS THE ONLY SOURCE OF NUTRIENT REQUIRED FOR COWS?

Balance of all 5 essential nutrients is the key. Energy, protein, fibre, minerals and vitamins. We are lucky that in a grass fed environment we get the majority of these from our fresh pasture. But often they are in the wrong proportions. Sollus can help fix the mineral and vitamin ratios, but that is a small part of the story. A farm manager also needs to fix the energy, protein and fibre components. While we don't provide those, we can help with advice. More is not always better; balance is the key. That balance needs to weigh up the cow, the feed source and the desired milk solid target.

## COWS GET ALL THEIR VITAMINS AND MINERALS FROM THE PASTURE

In an ideal world this is the case. But there are three main problems. The first is that pastures are often grown on mineral deficient soils – think about the selenium and copper deficiencies that are common throughout NZ. The second problem is that modern agronomic practices have often induced complex mineral deficiencies. Induced mineral deficiencies occur because the fertilizer and grazing programs are often not conducive to the plant containing the required mineral density, most typically the case for calcium deficiency. An example of a complicated deficiency is when grass growth promoters such as nitrogen and potassium result in poor absorption efficiency of magnesium. The third problem is when cow requirements out-strip what is provided for in the grass. As cows are fed better diets they become more efficient and productive and this is more likely to happen.

## BLOOD TESTS

Blood tests are a useful tool, but they have to be kept in context. They are not always an accurate gauge of what is going on in an animal. For example, in NZ it is common to test **level** of selenium in blood. Most countries, however, use a blood test to show the **activity** of selenium (usually GPx). If this is low, you know that the amount of selenium added is not being utilised – and that's more important than the level at which it's present in blood. Some nutrients just don't spend much time in blood. For example, the liver is a storage site for many nutrients including vitamin A and copper; beta-carotene tends to be stored in fat. When these body tissues are breaking down (e.g. early lactation) then these products will often be found at very high levels in blood – but the animal may be chewing through her resources at an even higher rate and be effectively deficient. So – get a blood test by all means but have it interpreted by a trained nutritionist.

## DO I NEED MINERALS ALL THE TIME? CAN I DROP THEM OUT IN SUMMER?

Vitamins and minerals are 2 of the 5 key nutrients required by cows to function. Like fat and protein they can both be stored in good times and used in bad times. The real question you need to ask is how much is it going to cost me if I raid the bank? In the long run it will cost you much more than the short term cost of supplementation.

## DOWN COWS ARE JUST PART OF CALVING

My grandfather said "if yer gonna have live ones yer gonna have dead ones". While dead cows are indeed part of farming, we should try to minimise unnecessary losses as much as possible. Animal welfare aside for a moment, unplanned losses have a significant impact on a farm's bottom line. The global target for down cows at calving is now less than 1%. If you are at that rate then you can say that is part of calving. This means only about 10% of your herd is suffering from sub-clinical milk fever (hypocalcaemia). But, if your rate is more than this then it is causing your business significant and needless loss of profit.

## ORGANIC COPPER IS SAFE DURING FACIAL ECZEMA

There is no evidence for this assertion. Copper is the key oxidant of the sporedesmin and, once absorbed, copper is copper, whatever form it's taken in. One of the classic roles of therapeutic levels of zinc is causing a mild blood copper deficiency via competitive exclusion at the site of absorption in the small intestine. Organic copper avoids this competition. While we have often been told that no issue has been seen with organic copper it is due probably to the miniscule amount of organic copper used in formulations rather than any magical properties of the copper itself.

## MY LAMENESS IS DUE TO STONES ON THE RACE BECAUSE OF THE SOLE BRUISES

Have you ever noticed that almost all stone bruises in lame cows are in the same spot? How is it possible that the stone always hits the same spot?! Or is it instead likely that the same spot is always soft? And if so why? A healthy cow carries a significant amount of fat in the sole of her foot (immediately above the hoof) in an area called the digital cushion. If your cows get too skinny this cushion is stripped of fat and it makes her susceptible to bruising in this area.

## JANUARY RAIN CAUSES THE WORST LAMENESS

Probably not. What's more likely is that, in January, cows have the worst quality hoof. The rain is the same but the cow has changed. Why? The hoof is much like your fingernail, it tells a story of what you have been up to in the last 3 months. Think about when you hit your thumb nail with a hammer and that bruise on the nail that took several months to grow out. The same happens with hooves. So if your cows go lame in January think about what you did in September – was it 3kg of cracked grain and rocket fuel grass – potentially causing sub-acute acidosis and weakness in the white line?



# Testimonials



## Michelle Burgess

TE POI

*With young kids, Alex and Sophie, Bill and Michelle Burgess now prioritise balance and simplicity. Balancing family time with a highly efficient, profitable dairy operation,*

*In their pursuit of simplicity, Bill emphasised, "Simplicity is the key." Despite complex investments in cow nutrition, the Burgesses faced challenges with ketosis and transitions. In 2020, Erin from Sollus entered the scene, simplifying the minerals in the diet and giving good advice on supplement use.*

*Michelle highlighted the team's commitment to quality advice and effective solutions, emphasising the significant improvements seen with Lactisol and Tranzsol in the herd's calving and reproductive performance.*

*Lactisol and a balanced macro mineral diet contribute to stronger cows, addressing deficiencies and preventing diseases. The Burgesses now believe in their well-balanced dairy system that supports cow performance and family well-being.*

## Gareth Hales

TIMARU

*Pushing for higher performance something was going to give, and we were having to use a vet as the ambulance.*

*Yes, we are spending money on Tranzsol and Lactisol, but adding them means we don't have a full time staff member dusting paddocks, and another full time staff member picking up the down cows all day every day. We can focus on keeping the herd fed, healthy and producing well.*

*Our vet bill would have halved in the past few years.*

*Our lameness problems would have fallen by over two thirds, and with that a lot of time has been saved too.*

*It has made life a lot easier that it was before and if anything we will just be tinkering around the edges from here on in.*



## Tim Drysdale

TOKOROA

*“Sollus’ product line may be more expensive than other products, but the partnership and the results we get from using Sollus is just incomparable” says Tim. On farm they use Sollus’ full suite where they feed Tranzsol, Lactisol Z and Lactisol .*

*Having little to no metabolic issues and increasing milk production by more than 600 milk solids per hectare just by changing the nutrition inputs is exactly why Tim will be working with Sollus for many years to come.*



## Hamish Johnston

TIMARU

*We appreciate not having to use pasture dusting – no one likes it and it is not that effective. And coming down in the morning knowing you are not going to be greeted with lots of down cows, that is a good way to start the day.*

*And I appreciated the interest the Sollus team took in our operation, that is what has made using Sollus different to other companies, they take time to understand our feed use, and work on that first.*

## Mike Tilleman

SOUTH WAIKATO

*In our two Friesian herds we would only have had 5-8 down cows over the entire calving, and in the Jersey herd which had been up at about 20% down cows, we only got four to five cows.*

*We would have had our empty rate decline across the three farms from 12-17% to 7-11%.*

*We have also managed to tighten up our calving pattern thanks to the improved submission rate, moving from 11-12 weeks to 9-10 weeks.*

*It is things like that you don’t fully appreciate changing for the better until you look back over a couple of years and really notice the improvement.*

*Every month we will have a farm meeting with the Sollus rep and the feed company, just reviewing how things are going, and if we need to tweak anything.*





## **Information Guide**

**0800 SOLLUS**  
**[www.sollus.co.nz](http://www.sollus.co.nz)**

**dsm-firmenich** ●●●

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