

International Dairy Topics

Volume 20 Number 2 (2021)

Practical information for progressive dairy professionals

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Protect herd health and performance with oregano

FORAGE QUALITY

What have we learned about mycotoxins?

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MILK FEVER

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International Dairy Topics (ISSN 1745 7785) is published six times a year (January, March, May, July, September and November) by Positive Action Publications Ltd and distributed in the USA by UKP Worldwide, 3390 Rand Road, South Plainfield, NJ 07080. Periodicals postage paid at Rahway, NJ and at additional mailing offices. Postmaster: Send address changes to International Dairy Topics, Positive Action Publications, c/o 3390 Rand Road, South Plainfield NJ 07080.

chewing^{the}cud

Have you ever stopped to define what a calf means to your business? Is it a valuable asset that should be looked after and cherished, or is it a necessary byproduct of modern milk production?

Some would answer this question by saying it depends on the calf's value. There is some truth to this as the market cost of a calf can oscillate so much. When the price is high our calf is an asset, but when it is low, it is a necessary burden on the system.

However, society, consumers and our customers can view the calf very differently. They simply see a calf as a baby cow and a bundle of new life running around in a sunny paddock among the buttercups and other spring flowers. They do not see it as an important factor in business.

We need to appreciate this because anything that impinges on their idyllic perception, or worse still shatters it, has the potential to trigger a nasty backlash against dairy farming. This is something we as dairy farmers can ill afford.

We must recognise the calf for what it is – a living animal.

This means our calves are going to require good housing that provides them with a favourable environment. This should keep them draught free and at the correct temperature, as well as keeping them and their bedding dry.

They are going to require balanced nutrition and a good supply of quality water. To keep our calves healthy, we must ensure that they all get their colostrum requirement and that there is a responsible member of staff who can recognise when a calf is below par.

So, what are we going to do with our calves? We have two options – we keep them on the farm or we sell them.

Several factors are going to decide which side of the fence we come down on when addressing this question. However, an overriding concern is biosecurity. The golden rule is to never mix calves from different sources.

Therefore, you should never bring back to the farm the calves that failed to sell because they may have picked up a nasty and expensive free gift for you. ■

Cover Picture:

Fast efficient milking
(Photo courtesy of DeLaval)



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worldfocus

An executive summary of key international issues

UK

Carbon net zero roadmap

A new roadmap is being developed by researchers from the Dairy Group that is specifically designed for UK dairy farmers to become carbon net zero within the industry's 2040 time frame. The Dairy Group have been given funding of £15,000 from The Trehane Trust to help to deliver this roadmap. The findings from the 12 month research, plus pre-existing knowledge of the industry, allows for recommendations on measuring and reducing carbon emissions at farm level. Recommendations will have to be both realistic and profitable, providing farmers and producers with a blueprint in order to become sustainable.

Canada

Buttergate

Canadians are arguing that their blocks of butter are harder to spread than normal and do not soften at room temperature. Food experts have concluded that the palm oil found in cow feed is the likely explanation. Due to the Covid-19 pandemic the demand for butter has risen by 12% and many farmers around Canada have had to increase their use of palm oil substances in an attempt to boost supply. Palm oil has a higher melting point and therefore may be the locus for the spreadable complaints. Canada's Dairy Processors Association has insisted that there have been no alterations to butter production itself nor to the national ingredient regulations.

India

Dairy export potential

The potential growth for India's dairy industry was highlighted at the recent 13th edition of the Foodworld India Global Convention for Food Business. Although not competitive in exporting milk as a commodity, many of India's neighbouring countries are milk deficient and therefore there is potential to increase the export of milk to these regions. While it is recognised that India may never be able to compete globally in cow milk exports, there is promise of carving out their own USP in more niche products, such as buffalo milk and cheese. Industry leaders have stated that India needs to focus on allowing milk exports to the world's leading dairy importing countries and negotiating better trade deals.

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Protect herd health and performance with oregano essential oil

Securing health and performance of the herd throughout the lifetime of the animal helps to protect the substantial investment by maintaining the productive lifespan of the animal for longer. The benefits of supplementing feed or milk with natural phytochemicals, such as oregano essential oil (OEO), are well established in pre-weaned calves.

by David Wilde,
Global Innovation Manager,
Anpario plc.
www.anpario.com

With a growing number of published performance trials alongside proven efficacy in the commercial environment, confidence to use such products amongst vets, nutritionists and producers is growing.

With the challenge of climate change and the need to reduce the prophylactic use of antibiotics, more attention is turning to the benefits these phytochemicals may confer in mature animals and those most at risk from higher levels of metabolic stress.

For transition cows, the risk of metabolic disease is high, and this can result in reduced performance, reproductive failure and an increased likelihood of involuntary culling.

The transition period both pre- and post-calving is a stressful time and this increase in oxidative stress can make transition cows more susceptible to impaired immune function, elevating risk of disease. Disruption to feed and social behaviours can further exacerbate the issue.

University trial

A recent trial carried out at the Federal University of Rio Grande do Sul in Brazil, by Dr Fischer and her group, aimed to determine if one of two natural phytochemical dietary supplements, oregano essential oil or green tea extract, may help to support transition cow health and performance.

Twenty-four Jersey cows, approximated 400kg bodyweight, 2.7 lactations, were split into one of three dietary treatment groups from 21 days pre-calving to 21 days post-calving.

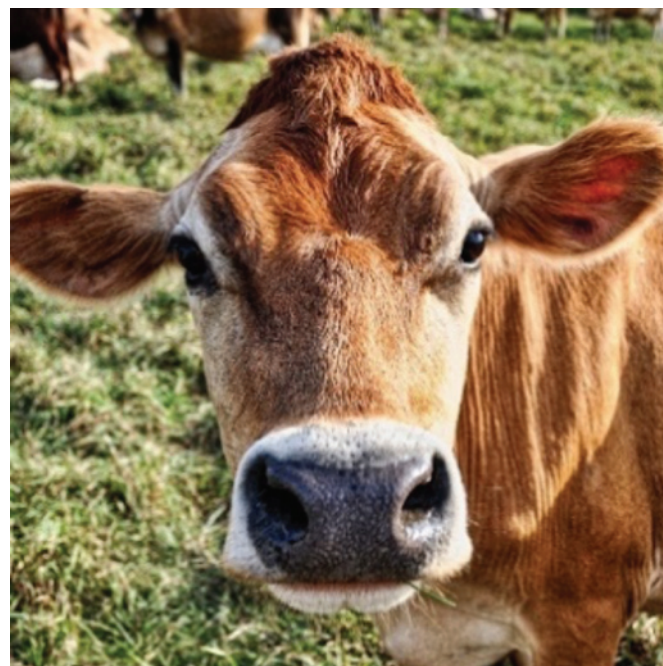
These groups were as follows;

- A control group (standard diet with no additives).
- An OEO supplemented group (standard diet supplemented with Orego-Stim from Anpario at 10g/head/day).
- A green tea supplemented group (standard diet supplemented with 5g of green tea extract per day).

Improved feed behaviour and social interactions pre-calving

Whilst the supplementation of OEO and green tea had no effect on bodyweight or body condition during the course of the trial, it was found that, during the pre-calving period, cows offered OEO visited feed troughs less often. However, these cows had fewer visits where no feed was consumed and tended to spend more time ruminating than other groups.

This may allow for better feed digestion and utilisation, possibly a reason for the higher plasma calcium found in these animals. Incidences of



aggressive episodes in cows pre-calving were significantly reduced in OEO and green tea supplemented cows compared to the control group, indicating that these phytochemicals had a calming influence on the cows' behaviour, thus helping to minimise stress.

Improved milk yield and immune function post-calving

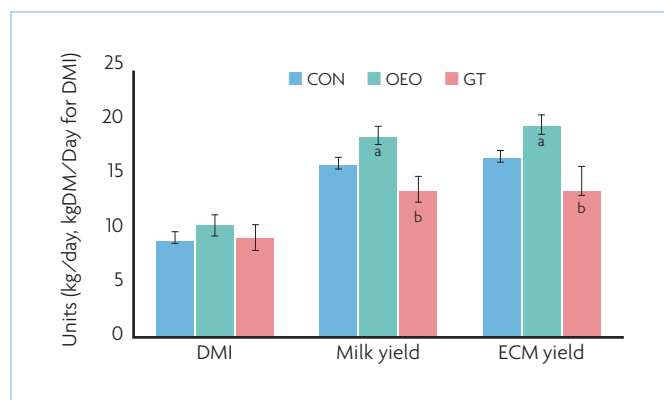
Post-calving, the benefits seen with OEO supplementation were substantial. Cows from the OEO dietary group tended to have higher dry matter intakes and produced significantly greater milk yields and energy corrected milk yields than green tea supplementation and tended to produce more than control cows (Fig. 1).

Cows subjected to oxidative stress are likely to have impaired productivity as well as reduced immune function. Measuring the somatic cell count (SCC) of milk can be a good indicator of cow health, with high levels suggesting infection as well as causing an altered mineral flow in the udder, which can result in a higher pH in the milk and lower production.

The SCC of milk was analysed daily between days 5-21 of lactation. It was found that cows receiving dietary OEO supplementation had significantly lower SCC, by 62% and 50% compared to levels in milk from

Continued on page 8

Fig. 1. Dry matter intake (DMI) (kg DM/day), milk yield (kg/day) and energy corrected milk yield (ECM) (kg/day) post-calving in cows from the control group (CON), OEO supplemented group (Orego-Stim, Anpario plc) or the green tea extract supplemented group (GT). Different letters indicate significant difference (p<0.01) (Stivanin et al., 2019).



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cows in the control or green tea groups respectively.

Supplementing dairy cow diets with OEO in this study helped to improve milk yields, reduce SCC and maintain a lower milk pH. This may be due to properties offered by the specific OEO additive used in the trial, which is a unique source of 100% natural OEO. Natural OEO may contain over 100 active compounds, some of which are known to convey antimicrobial, anti-inflammatory and immunomodulatory properties, as well as proven antioxidant function.

Supporting antioxidant status

Antioxidants can help to reduce incidence of oxidative stress, helping to support performance and immune function.

For transition cows, antioxidant function is particularly important as these animals are highly susceptible to impaired immunity and increased disease prevalence, elevating the risk of poor performance or involuntary culling.

During the trial period, blood samples were taken on days -28, 0, 2 and 28 relative to calving in order to determine the antioxidant status of the cows, using a variety of tests

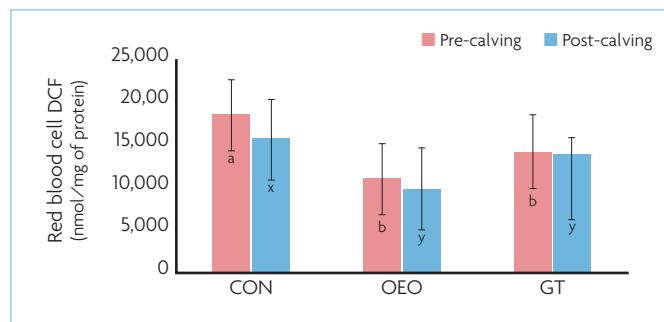


Fig. 2. Dichlorofluorescein (DCF) diacetate oxidation (nmol/mg of protein) in red blood cells from blood samples taken from cows in the control group (CON), OEO supplemented group (Orego-Stim, Anpario plc) or the green tea extract supplemented group (GT) both pre- and post-calving. Letters a-b, x-y, indicate significant difference between treatments (p<0.05) (Vizzotto et al., 2021).

including the ability to reduce dichlorofluorescein (DCF) diacetate oxidation that indicates the level of harmful free radicals.

The results indicated that both OEO and green tea supplemented cows had significantly lower DCF levels both pre- and post-calving, demonstrating an increased antioxidant activity and a reduced level of oxidative stress compared to control cows (Fig. 2).

Post-calving, cows fed OEO also had significantly higher glutathione (GSH) levels, indicating reduced metabolic stress.

Supporting the redox status of the calf

When essential oils are supplemented in the diet of dairy cows, the active compounds within the oil may transfer from the dam into her milk. Therefore, these compounds may be passed onto the newborn calf and support their redox status.

The redox status is the balance between the presence of oxidants and antioxidants and it is very important that this balance is optimal for newborn calves that are born with a naive immune system.

The more antioxidants present, the lower the risk to the calf of oxidative stress. Interestingly, the study found that calves fed milk from cows supplemented with OEO also had significantly lower levels of free radicals, just like their mothers suggesting a better redox status in these calves compared to calves born to cows in the control or green tea groups.

Therefore, supplementing cows with OEO pre-calving may allow for transfer of active compounds to the milk, benefitting the redox status and supporting overall health of the newborn calf.

Protecting herd health and performance - naturally

The benefits to dairy producers when supplementing diets or milk with a natural phytochemical, such as OEO, particularly during periods of challenge or stress, is usually associated with fewer losses. Products which deliver a consistent, high quality source of OEO offer producers a natural solution to support health and performance and boost profitability. ■

References are available from the author on request

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What have we learned about forage quality and mycotoxins?

Forages have long been the standard feedstuff for ruminant livestock production. The use of higher forage content total mixed ration (TMR) has increased in recent years, creating the need for greater monitoring of the quality of high-inclusion feedstuff(s).

by Dr Max Hawkins,
Global technical support,
Mycotoxin Management, Alltech.
www.knowmycotoxins.com



Major forage crops include corn silage, grass silages, haylages and small grain silages.

These, individually and in combination, will represent most of the TMR, and their quality is a determining factor in efficient production and animal health.

Weather stresses can greatly influence forage crop quality. These stresses can include drought, excess moisture, wind, hail and combinations of these factors. The stress will make the plant more susceptible to mould infestation.

These soil-borne moulds include *Aspergillus*, *Fusarium* and *Penicillium* that can produce secondary metabolites called mycotoxins. In

addition to the challenge posed by these individual mycotoxin types, there is also potential for additive and synergistic toxin effects to be considered.

The associated environmental stresses and some of the mycotoxins produced from these moulds are:

- *Aspergillus* (warm and dry environment): aflatoxin, gliotoxin, sterigmatocystin and verruculogen.
- *Fusarium* (moderate temperature and moist): trichothecenes, fusaric acid, emerging mycotoxins, fumonisin and zearalenone.
- *Penicillium* (drier, less densely packed forage clumps that allow

oxygen penetration): mycophenolic acid, penicillic acid, roquefortine C and patulin.

Factors influencing mycotoxin production

The climatic factors that can affect forage quality and mycotoxins may range from a high impact incident in a day or two to longer-term seasonal effects. The timing of these events in terms of plant maturity is important as to which mycotoxin(s) may be produced. Most of this relates to pre- and post-flowering and pollination.

This critical phase is also when the plant is susceptible to climatic, disease and insect challenges that can further increase plant damage and subsequent mould infestation and mycotoxin challenges. Crucial to the success of a mycotoxin management programme is effective mycotoxin analysis.

Identifying multiple-mycotoxin contamination using tests such as Alltech 37+ is a more accurate risk assessment of feeds. However, producers should not discount the value of a rapid mycotoxin test such as Alltech's RAPIREAD, which can provide results in minutes for individual mycotoxins.

The sample itself must be collected while considering the amount of variation in the total inventory. It has been shown that silage cannot be regarded as a homogeneous mixture due to variation within a field, plant maturity and dry matter, time to

harvest and fill, delays due to weather and breakdowns and filling and packing methods. Therefore, it is important to utilise multiple samples from throughout the silage pile to build a pooled sample that attempts to develop a homogenous selection of the available inventory.

The mycotoxin impact on ruminant animals

The greatest mycotoxin challenge in corn silage typically derives from the *Fusarium* mould, while the most prominent mycotoxins are type B trichothecenes, fumonisin, fusaric acid and emerging mycotoxins.

In Alltech's 2020 North American Summer Harvest Survey (Table 1), almost 95% of the 288 samples analysed contained fusaric acid, over 80% contained type B trichothecenes and over 70% of samples were contaminated with emerging mycotoxins. These mycotoxins in feeds can lead to issues with dry matter intake, milk production, average daily gain (ADG), digestion, gut health, liver function, respiratory health, conception rate, liver function and immune response.

Mycotoxins can be present at high risk levels at harvest, and the trend is that they can increase over time in storage. The exact nature of this increase in risk is dependent on the individual situation. Vandicke et al. (2021) suggested that some field-produced mycotoxins may be reduced during storage.

Still, if silages are poorly made, this effect is lost through the production of storage mycotoxins, increasing the overall risk. This trend has been seen in recent years based on submissions to the Alltech 37+ mycotoxin analysis laboratory. Corn silage data collected in Alltech's US Harvest Analysis over a three-year period, 2018-2020, shows an increase in *Fusarium* mycotoxins over time from harvest until winter and spring feed-out. Deoxynivalenol, one of the most occurring mycotoxins, has a consistent year-on-year increase during this period.

There are some key steps in the management of forage during harvest

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Table 1. Mycotoxin occurrence in samples analysed during the Alltech 2020 North American Summer Harvest Survey.

Mycotoxin	Mycotoxin occurrence (%)
Fusaric acid	94.44
Type B trichothecenes	80.90
Emerging mycotoxins	70.83
Fumonisins	63.54
Other <i>Aspergillus</i>	11.46
Type A trichothecenes	4.51
Zearalenone	3.47
Ergot toxins	3.13
Aflatoxins, total	2.78
Other <i>Penicillium</i>	2.78
Aflatoxin B1	1.04
Ochratoxins/Citrinin	1.04

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and ensiling that producers can take to minimise this risk, including ensiling forages between 32-36% dry matter content, tightly packing and sealing the clamp and proper clamp face management during feed-out to minimise oxygen penetration.

Penicillium can present a major challenge in grass silage and haylages. Penicilliums are normally viewed as storage mycotoxins, and dry, poorly packed silages and haylages can allow greater oxygen penetration, providing the conditions for micro-aerobic mould to flourish.

The levels of Penicilliums can increase greatly from harvest through feed-out. Small grain silages can have an array of mycotoxins present, but typically Fusarium and Penicilliums occur the most. Zearalenone tends to be more present in cooler and wetter growing seasons, with subsequent negative effects on reproduction performance when ingested by animals.

The actual mycotoxin risk can range from low to high. It can be the result of an individual mycotoxin at lower or higher risk or multiple mycotoxins that generate additive and/or synergistic interactions. The multiple-mycotoxin challenge is demonstrated in Fig. 1.

An effective mycotoxin control programme must be able to manage



Fig. 1. Key results from the Alltech 2020 North American Summer Harvest Survey.

all situations. A higher risk situation was studied across three separate dairy farms. In this study, a multiple-mycotoxin challenge resulted in decreased milk production and increased somatic cell count (SCC) across all three farms.

When a glucomannan mycotoxin adsorbent (GMA) was added to the diet, milk production increased by 6.1kg/cow/day, SCC decreased by 62% and Trolox equivalent antioxidant capacity (TEAC) was improved over an eight-week period. Lower-risk challenges are often considered as non-challenging to cow health and performance.

Hulik (2014) demonstrated that multiple mycotoxins at low risk did not significantly impact milk production. However, when a GMA was included in the control programme, the pregnancy rate was improved by 19.3%.

Mitigating the mycotoxin threat

The climate impact on crop quality and subsequent mycotoxin contamination poses a continuous risk to healthy and efficient ruminant production.

This mycotoxin risk can be further increased by less-than-ideal harvest and storage conditions.

Although mycotoxins are an unavoidable problem, some key management practices can help reduce the risk attached to forages and ruminant feeds.

Alltech believes that effective mycotoxin management is about seeing the whole challenge, from the farm to the feed mill and from risk assessment to feed management.

To effectively manage the inevitability of feed mycotoxin contamination, it is crucial to

understand the level of mycotoxin challenges so that the right steps can be taken to mitigate any adverse effects on animal performance, production efficiency and food safety.

Using a combination of modern management tools, the Alltech Mycotoxin Management Program provides a complete holistic solution to help producers take control of mycotoxin contamination and protect their businesses.

The programme is built around next-generation risk identification technology, data analysis and insights and mycotoxin binder solutions designed to reduce the damaging effects of mycotoxins on animal health and production potential. ■

References are available from the author on request

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Simple milking and feeding system for new American goat dairy

Fourth generation cheese maker Jean Rossard stepped down from his Montchevre goat cheese factory in Belmont, Wisconsin, USA in 2018. But he was not quite ready for retirement so when his son Simon became interested in raising dairy goats, Jean took the chance to pass on his knowledge to the next generation.

by the USA Waikato
Milking Systems Team.
www.waikatomilking.com

Jean and his sons, Simon and Julien, set out on a venture which would lead to establishing a new dairy, The Laughing Goat, LLC in 2019.

They started on a farm lease with 400 animals near Darlington WI. Simon trained on the Darlington farm from 2018 and about a year later the family decided to set up their own dairy, near their home by Belmont in Lafayette County, WI.

That is when they started to look around for a new goat milking system. They spent a year reviewing the options with several dairy dealers, visiting milking plants in the US, Canada and France.

"We decided to go with the Waikato Milking Systems goat rotary parlour to replace our 2 x 16 rapid exit stanchions and an archaic feed system," Jean told International Dairy Topics. "Our goal was to find a simple milking and feeding system,

From left: Julien and Simon Rossard with their father, Jean set up the Laughing Goat dairy.



with technology, built using high quality materials to resist a harsh farm environment and, of course, to be animal friendly."

The Waikato Milking System rotary satisfied most of their requirements. Plus, the company's midwest team was in Verona, WI, about one hour from the farm, which was a major selling point. "We knew that if we needed an urgent service repair or to obtain critical replacement parts, we could do that right away."

The family was impressed with the rotary design and its lightweight composite deck. They liked that the inflators, pulsators, vacuum lines, and milk pipeline were accessible outside and inside the rotary. The rotary platform, stalls and components were mostly built of stainless steel, hard plastic and rubber.

Beating the pandemic

The family began to set up Laughing Goat in the Northern Hemisphere fall of 2019 but Covid-19 arrived in March 2020 which held up delivery of barn equipment. "Fortunately the rotary was ordered in August 2019 and it was delivered from New Zealand just before the pandemic."

They moved to the new farm on 16th April, 2020. The local contractors and the Waikato Milking Systems team did a good job of getting the building ready to assemble the parlour during the pandemic. The rotary is easy to operate and safe to use with just two people, one to take care of the milking and the other to move the animals around and for post-dipping.

The platform operates with a simple switch to put it into milking or cleaning mode. Another switch controls the platform speed or rotation per minute.

In March, the plant was milking about 300 goats, with another 90 to freshen. "The rotary is set at 7.5 minutes per rotation which is capable of milking about 480 goats per hour," Jean told us. The rotary would allow the farm to increase to 1,000 milking goats in the near future. With the rotary's quick stop and start feature, the operator can



The Optima External Goat Rotary at the Laughing Goat farm.

pull on a blue line above their head for a quick stop and quick start. The red line can be pulled for an emergency stop which needs to be cleared and reset on the control panel to resume milking.

The goat rotary also features an automatic cluster presentation arm unique to Waikato Milking Systems. It automatically returns the cluster to the platform height, ready for cupping, so the operator does not have to constantly bend over to reach for the clusters. The automatic detach is also a good option which saves a lot of walking around the rotary.

Dairy management software training

The only challenge setting up the rotary was learning how to use the dairy management software. The family worked with their local Waikato Milking Systems representative from Belmont, and with the company's technicians in New Zealand via audio-visual, to calibrate, create groups and manage the feed system. It is a great tool to manage and schedule the amount of feed and feed choice that needs to be dropped per animal, per day in a selected group (lactate, dry or freshen group).

The feed weights can also be automatically increased or decreased per goat in a group through the year on a weekly basis. The feed weight control is definitely

a saving factor, knowing the high feed price per ton, and is a way to be sure each goat is getting the right amount of feed.

The dairy management software has other useful features like milk volume data per animal and per milking, animal alerts and animal health history.

Overall the rotary plant has lived up to the family's expectations. If Jean were to wish for any additions, he says it would be a pre and post dip system to keep the somatic cell and bacteria count under control. "But we definitely think the Waikato Milking Systems' goat rotary parlour and feeding system were the right choice for our farm," Jean added. ■

The automatic cluster presentation arms makes it easy for Julien to milk the goats.



Impact of milk fever on the lifetime performance of your dairy cows

Milk fever is a metabolic disturbance or production disease of dairy cows that generally occurs just before, or soon after, calving due to low calcium levels in the blood. It is associated with the drain of calcium within the foetus and milk during pregnancy and calving, respectively. Milk fever has both direct and indirect economic impacts on the dairy industry.

by **Dr Maurice Verschaeve, Veterinary Surgeon,**
Kathleen Verschaeve, Pharmacist,
Jonas De Roo, Biologist &
Dr Glenn Verstraete, Pharmacist,
Emma Nutrition.
www.emma.be

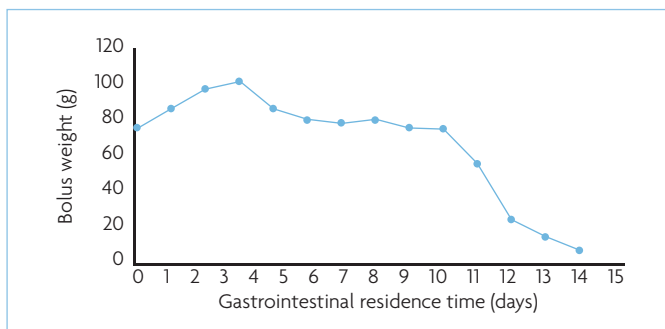
The most important direct economic losses due to milk fever are losses due to reduction in milk production of affected cows, loss of animals through death and culling, and the cost of treatment.

In addition, the excessive drop in calcium levels around calving can



Single dose Green Bolus that can slowly release calcitriol-glycoside.

Fig. 1. Impact of gastrointestinal residence time (days) on bolus weight (g).



lead to a long-term calcium deficiency, further threatening the economic profitability. Hence, the prevention of milk fever and long-term calcium deficiency is key in the dairy industry.

Milk fever

Milk fever (also called parturient paresis or parturient hypocalcaemia) is one of the production diseases which primarily occur among older high-yielding dairy cows during the period around calving. The increased demand for calcium at parturition due to the onset of lactation may result in a calcium deficiency situation potentially provoking the outbreak of milk fever in dairy cows.

Milk fever generally occurs when calcium blood plasma concentration is lower than 8mg/dL (i.e., 2.2 mmol/L). Such a low calcium blood plasma concentration has consequences for many nerve and muscle functions.

Milk fever is an economically important disease due to milk secretion that can reduce the productive life of a dairy cow. Milk fever incidence has remained steady in some countries at about 10%.

Milk fever affects about 6% of dairy cows in the United States each year, according to the 1996 National Animal Health Monitoring Survey. If left untreated, about 60-70% of the affected cows may die.

There are some factors which influence incidence and severity of milk fever. These are: age (older cows are more sensitive than younger),



milk yield (cows with higher yield are more predisposed than cows with lower yield), breed, body condition, length of dry period and diet composition.

Long-term hypocalcaemia

As mentioned earlier, high yielding dairy cows suddenly experience a high demand of calcium during parturition.

Calcium is necessary for contraction of the uterine wall muscle and milk production. The natural regulation systems in the dairy cow can not always cope with this sudden increase in calcium demand. As a result, calcium blood plasma levels can drop significantly.

Depending on the severity of this drop in calcium levels this can lead to a long-term calcium deficiency and thus a persistent lack of appetite, hypersensitivity, weakness and, if left untreated, even paralysis and mortality.

Long-term hypocalcaemia also has some widespread effects that predispose to other periparturient diseases such as mastitis, ketosis, displaced abomasum and retained placenta. Even if no visible symptoms are observed, long-term hypocalcaemia can lead to a decrease in production and fertility.

Even successful treatment of hypocalcaemia does not eliminate further complications associated with milk fever, which results in further economic losses. This stresses the demand for an effective prevention: administration of calcitriol.

The role of calcitriol

Calcitriol or 1,25-dihydroxyvitamin D3 is a metabolite of vitamin D3. Unlike vitamin D3 that needs to be transformed in the liver and kidney, calcitriol works directly on the vitamin D3 receptors in the intestinal wall, bones and kidney having the following effects:

- **Intestinal wall:** Calcitriol is able to activate the calcium-binding proteins increasing the calcium absorption rate from the gut to the blood vessels.

- **Bones:** Calcitriol activates the vitamin D receptors in the bone cells increasing calcium deposition or release from the bones, depending on the concentration of calcium in the blood plasma.

- **Kidney:** Calcitriol stimulates the resorption of calcium from the urinary tracts to the blood vessels

Taking all the above-mentioned into account, it can be stated that calcitriol can increase the absorption and regulation rate of calcium thus maintaining an optimal calcium level in the blood plasma. In addition, calcitriol is known to have a similar effect on phosphorus absorption and regulation, positively affecting the immune system and improving the suppression of pathogens.

Advantages of calcitriol-glycoside

The binding of calcitriol to a glycoside is known to improve

Continued on page 14

Continued from page 13
 stability and increase bioavailability (due to better absorption through the intestinal wall). Calcitriol-glycoside can be found in dried leaves of the plant *Solanum glaucophyllum* (containing a standardised concentration).

Studies with herbal calcitriol-glycoside added to the feed of ruminants show a significant increase of calcitriol in the blood levels. Furthermore, it was observed that a single high dose of herbal calcitriol-glycoside around calving could result in a major increase in both calcium and phosphorus blood levels.

Slow-release calcitriol-glycoside

Considering calcitriol-glycoside as an effective substance to prevent hypocalcaemia, it was of the highest importance for Emma Nutrition to search for the most convenient and easiest way of administration.

As displayed in Fig. 1, Emma Nutrition developed a slowly

disintegrating bolus that should only be administered once (approximately 1-2 days before calving).

As listed in Table 1 and displayed in Fig. 2, this unique patented formula allows farmers to easily increase calcitriol blood concentration 8-10 hours after oral administration.

Furthermore, it was found that calcium concentration in blood could be kept above 2.2 mmol/L (i.e., 8.8mg/dL which is the recommended minimum calcium blood plasma concentration to prevent milk fever and long-term hypocalcaemia).

Therefore, one might assume that hypocalcaemia could still be countered even in case the Green Bolus is administered just before or after calving. Finally, it was observed that the administration of Green Bolus could positively affect phosphorus levels. As a result of the excellent in vivo performance, Emma Nutrition's Green Bolus was officially recognised in 2020 as a highly effective diet food for the prevention of long-term hypocalcaemia and milk fever.

Calcium concentration in blood (mmol/L)			
	Cow	T0 (when applying bolus)	T1 (24 hours after calving)
Control	1	2.33	2.13
	2	1.93	1.83
	3	1.87	2.47
	4	1.98	2.16
Green Bolus	5	1.96	2.16
	6	2.51	2.16
	7	2.10	2.21
	8	2.20	2.25
	9	2.24	2.33

Table 1. Impact of Green Bolus administration on calcium concentration in the blood of Holstein-Friesian cattle.

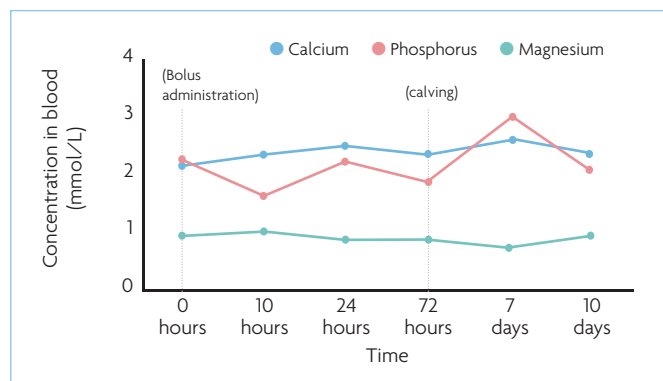
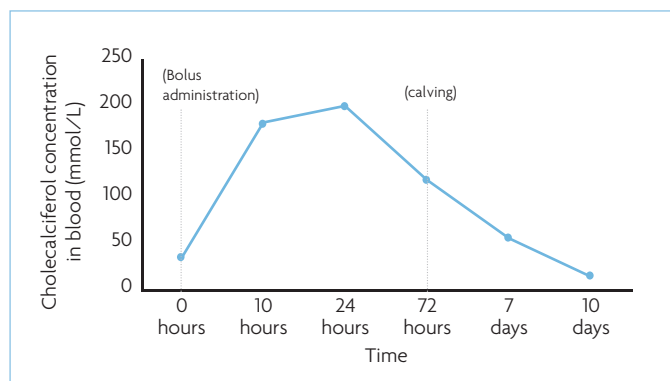
Conclusion

Emma Nutrition successfully developed a single dose calcitriol glycoside bolus (Green Bolus) that is officially recognised as a diet food to prevent dairy cows from

hypocalcaemia and milk fever, resulting in a higher economic yield.

References are available from the authors on request

Fig. 2. The impact of Green Bolus administration on cholecalciferol (left) and calcium, phosphorus and magnesium levels (right).



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Trial shows major reduction in greenhouse gas emissions from cows

A trial at the Dairy Campus from Wageningen Livestock Research in Leeuwarden, the Netherlands, has successfully demonstrated that a novel feed additive, developed by Royal DSM, can be included in dairy cow diets to significantly reduce methane emissions.

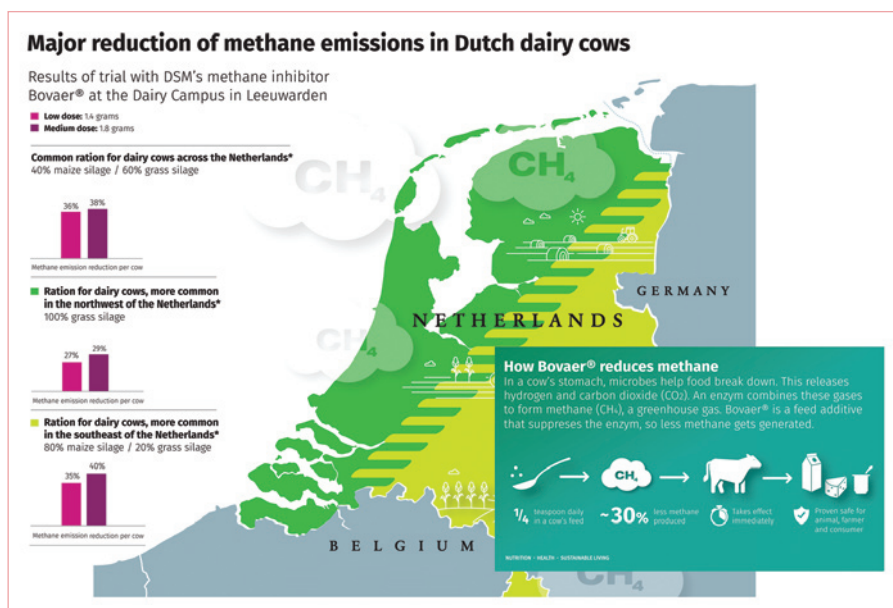
The emission reductions vary from 27-40% of methane per cow, depending on the diets and the amount of methane inhibitor in the feed. Methane emission from ruminants represents a significant portion of anthropogenic greenhouse gases and contributes to climate change.

The trial with the methane inhibitor Bovaer was designed and executed by a consortium from across the Dutch Dairy Chain, comprising of DSM, Wageningen University & Research, FrieslandCampina, Royal Agrifirm Group, De Heus Animal Nutrition and ForFarmers. It ran for three months at the Livestock Wageningen Research at the Dairy Campus in Leeuwarden. The Dairy Campus is an experimental dairy farm, part of Wageningen Livestock Research. The trial was supervised by a team of cattle nutrition experts for the Wageningen University & Research and supported by the Dairy Campus Innovation Fund.

Trial design

The trial was designed to deliver methane reduction results for three different ratios of grass silage and maize silage in dietary roughage, typical for Dutch circumstance in different regions, with two different dosages of Bovaer.

Sixty-four Holstein-Friesian cows in mid-lactation were enrolled in the study to investigate the effect of supplementation of the methane inhibitor with the different diets.



The information from the trial is necessary to substantiate accreditation of Bovaer by the Carbon Footprint Monitor/Climate Module of the Dutch Kringloopwijzer (the Annual Nutrient Cycling Assessment) but is applicable across Europe.

Methane reductions from 27-40%

Methane was reduced by 27% when a low dose of Bovaer (60mg/kg dry matter) was supplemented to a diet without maize silage in the roughage and up to 35% when a low dose of Bovaer was supplemented to a diet containing 80% maize silage in roughage dry matter (DM). Dry matter is the dry portion of animal feed with the water extracted.

With a medium dose of Bovaer (80mg/kg DM), this percentage ranged from 29-40%.

The results provide farmers with insights on the effects of applying Bovaer.

Furthermore, they enable governments and inventory organisations to adequately account for enteric methane reductions and they can be used to help reward and recognise every individual farmer for their sustainability contributions.

Bovaer is a feed additive for cows and other cattle and ruminants, such as sheep and goats, researched and developed over 10 years by DSM. Just a quarter teaspoon of Bovaer per cow per day reduces enteric methane emission by approximately 30%.

The feed additive Bovaer therefore contributes to a significant and immediate reduction of the environmental footprint of meat, milk and dairy products.

DSM has filed the novel feed ingredient for commercial registration under the trade name Bovaer in various geographies.

DSM is working with partners from the dairy and beef value chain across the globe to prepare for market introduction.

The activities include joint trials to confirm effectiveness in local business systems, co-development of low-carbon dairy products, and establishment of business models. ■

For more information
www.dsm.com

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to prevent intestinal inflammation]

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milking parlours

SUPPLEMENT

International
**Dairy
Topics**

First Covid-19 remote parlour installation worldwide

Milkline NG S.p.A., Italy

Milkline NG is very proud to have carried out their first remote installation on the other side of the world, in the middle of the Covid-19 pandemic. It was a great job with wonderful worldwide co-operation and support involving Italy, Bulgaria, Thailand, and Israel. It was a great adventure.

Milkline NG S.p.A. is a world-leading manufacturer of milking systems. With the precious collaboration of its dealer in Thailand, 108 Agriculture Machine And Equipment Co Ltd, they prepared a Parallel 20+20 Milking parlour with ED200 Milpro 350 and Dataflow II herd management system.

In September 2020 Thailand's travel ban for commercial flights was still in force, but both companies entered into contact with the related Embassy and General Consulates to prepare the list of documents for their technicians, to organise the installation.

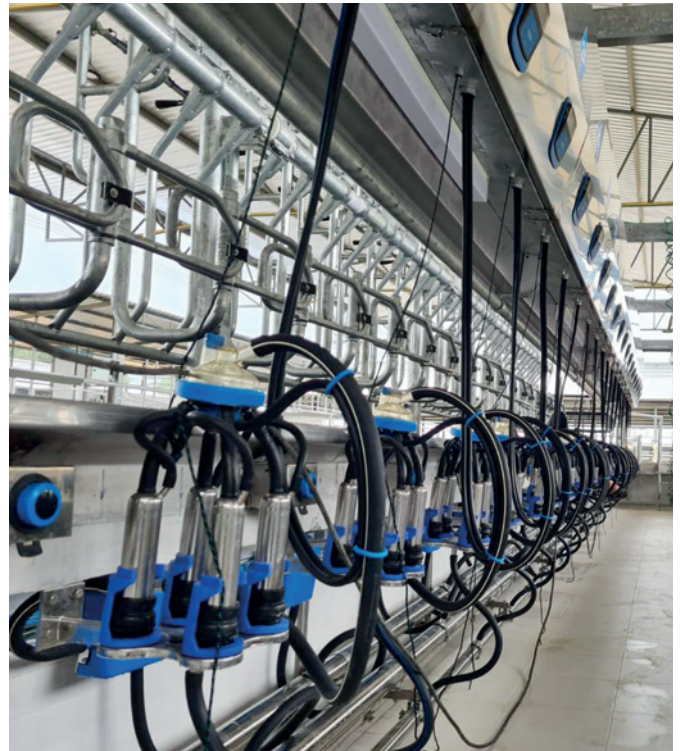
Milkline NG established an online video and voice connection 24/7 between the Thailand and Milkline installation teams.

From Thailand, Milkline requested the following preparations:

- An English-speaking person in charge of installation.
- Four fixed cameras installed in the four corners of the parlour.
- One movable camera that can be moved to a specific requested position.
- The possibility to connect online to these five cameras.

The Milkline installation team monitored in real-time the installation process and the technicians were available 24/7 to give real-time instructions and advice to support and guide their partner in Thailand step by step.

During the whole installation, 108AME Celikel Thailand had a person in charge of the translation, from the start until the end of the installation. 108AME Celikel Thailand got all of the cameras up and ready and a daily



briefing call for daily tasks to be faced was planned. All these efforts were supported by their partner in Israel with whom they shared the camera access and sent daily reports via email with daily steps completed for this Covid-19 style installation.

The milking parlour installed was a full hot deep galvanised frame 20+20 with a 90-degree suspended frame for optimal visibility and access to the animal's udders providing further space for easier milking operation. It is the preferred option for farmers who have a high number of animals.

The vacuum system is equipped with three vacuum units HPU160L Triphasic Motor kW 4, capacity of 1600L/min at 50kPa with hot galvanised 100L vacuum tank and vacuum servo-regulator.

The washing process is secured by the Clean-O-Tronic controller where you can choose complete or partial cleaning cycles and pre-milking sanitisation if necessary. The temperature is always displayed, and the detergent dosage is automatic to guarantee precision and no waste of chemicals.

The milking system consists of the ED200 control system of individual milking points which ensures advanced milking thanks to special features such as automatic stimulation and dynamic pulsation based on milk flow. It provides real time information about the milking process (for example, milk yield, milk flow and milking time, as well as alarms and notifications).

All the milking operations are managed by a single multifunction pushbutton, ensuring a simple, efficient, and error-free milking routine. All the parameters of the milking cycle can be configured (ratio and pulsation frequency, group removal, advanced functions) with a mobile phone.

The integration with the DataFlow II herd management software allows real-time management of the herd and of the single animal directly from a PC. Moreover, all the data are stored in the cloud and you can access this at any time and from anywhere on the farm thanks to the HealthyCow24 (HC24) app, using a mobile device or the web application.

Included in the system there is the Data Terminal, a touchscreen terminal that is installed in the milking parlour. This important tool allows operators to interact with the system and enter data and events in real time, and also to check the alarms on specific cows directly from the milking parlour.

The Milkline Dataflow II Herd Management System is a complete, integrated, real-time, cow monitoring and milking management solution. Producers can configure their Milkline milking parlour in 3D on the website. ■



milkline.com/en/3d-configurator

Automated milking puts Dutch dairy farm ahead

GEA Farm Technologies, Germany

Alida Meering and Jan Hendrik Deiman can look back on a very successful year of milk production, which the couple attribute above all to the switch to an automated milking system. For over a year now, their 220 dairy cows have been milked by four GEA DairyRobot R9500 milking boxes in their newly built and fully automated freestall barn. With the generational change at Deiman's family farm, the wish arose to increase efficiency, and at the same time improve animal well-being and make milk production more sustainable.

"In 2017, we started with the preparations for building the new freestall barn," Alida Meering, told International Dairy Topics. "We had to move the barn and several feed silos, however the extensive construction measures have definitely been worth it for us." The conversion of the dairy farm located on the outskirts of the town of Stadskanaal in the Groningen province of the Netherlands also proved advantageous in terms of economising work effort. For 20 years, use of a rotary milking parlour had tethered staff to morning and evening milking times. Thanks to GEA's automated milking system, a self-driving feeding system and cleaning robots, the new freestall barn can be run by a single worker.

Alongside the four GEA milking robots, the impressive size of the modern building catches the eye. Open-design side walls allow light and air to flow in as needed with the help of curtains. Neither too warm and nor too cold, an ideal atmosphere of well-being is created for the dairy cows. The wide walkways offer extra space to move freely. "Since February 2020, we have been milking with the four milking robots. We especially like how compact they are," Alida added. The four milking boxes are connected to one central supply unit, so they can be run particularly cost-effectively and energy-efficiently.

What fascinates Alida about GEA's milking robot is the gentle milking procedure at low vacuum levels and the unique In-Liner Everything technology: "Udder health has improved significantly since we started milking our cows with the DairyRobot R9500. The somatic cell count is at 100,000, which is an excellent result." Every step, from udder stimulation, cleaning teats and pre-milking all the way to gentle and complete milking as well as dipping takes place on the quarter level, swiftly and hygienically in the protected teat cup. The dipping procedure moistens the teat's skin with a protective shield and protects the teat canal from bacteria and germs in the barn.



Aside from excellent milk quality, the DairyRobot R9500 delivers a precise picture of every udder quarter of every cow. Deviating values in milk quantity, conductivity or temperature can point to an emerging udder infection and are included on the list of milk alarms. Alida uses the precise notifications for efficient cow health management. Early examination and treatment can bring a diseased cow back to a healthy performance level and prevent milk losses: "We have a large straw area for sick and weak cows. Thanks to the milking pit and the possibility to attach manually, cows with special needs can be conveniently treated directly in the milking box," she explains. In addition to herd management with GEA DairyPlan, the milk farmers also get support in animal observation from GEA CowScout. The monitoring system analyses eating, lying or walking behaviour around the clock. Cows needing attention can be examined immediately or can be made available on time for insemination.

The couple also turned to GEA to equip the barn. For the natural rhythm of eating, lying and milking, the GEA One Way Finger Gates keep dairy cows on the right track. GEA DairyBarn B3130 flexible cubicles offer considerable additional animal comfort. Without confining, they provide cows with security and freedom to move when entering and leaving the box. A comfortable Akwatopsoft mattress system invites the cows to lie down and offers a high degree of hygiene in cubicle beds. The longer time spent there also supports blood circulation and rumination activity, which in turn promotes milk yield.

The dairy farm's first year balance sheet is more than encouraging: "With the extra space in the new barn and the effect of more frequent milking with GEA's milking robots, milk production has risen significantly in the last year. The average performance of our cows is at around 10,450 litres per cow per year. We are very satisfied," Jan told us proudly.

The helpful support from GEA's specialised dealers also has a positive effect on the cheesemaking side of the business. As Alida explains, "I use a small amount of the milk to produce unpasteurised cheese for selling it directly from our farm. In addition, I produce yoghurt, kefir, pudding and chocolate milk for which I take the milk directly from the milk line behind the filter. This was done for me by the dealer's service technician, actively supporting me in developing my cheese business. It's great that there is such a wide range of knowledge available at the GEA dealership. The dealer makes the brand. And the technicians make the dealer. I think that's an important part of GEA's strength."

[gea.com](https://www.gea.com)



Fast, efficient milking with one man operation

DeLaval, UK

The expertise DeLaval has gained designing, manufacturing and monitoring the performance of the highest throughput dairy systems around the world have been applied to the latest generation of rotary systems.

The new DeLaval Rotaries E100 and E300 are developed to help the farmers to do more, with less. They are not just rotary platforms but full systems with more information, more automation, more functions and more technology than DeLaval have ever offered before – and they deliver it so that one person can operate everything safely, comfortably and easily, from a central point.

The focus on efficiency and throughput means that whichever DeLaval rotary is the best for the particular farm, it will help to manage each farm's challenges: animal welfare, work efficiency, milk quality and, ultimately, the profitability.

The Godel family produce milk for Gruyère AOP in Ecublens in Switzerland. They wanted to milk their high producing 90 red Holstein cows quickly and efficiently. The Godel brothers studied different possibilities and on their visit to a new DeLaval Rotary E100 in Ireland they were convinced that due to the unique FastLane entry/exit area design and the low profile ComfortBail on the platform, the cows get into milking position immediately after entry and the milker can start the milking routines quickly. They decided on a 28 bails E100 rotary. Their one milker works in a comfortably designed cockpit area, where the rotary controller and the interactive herd management touchscreen is within reach. They are able to milk the 90 cows in 45 minutes since the ODTS On-Deck Teat Spray system disinfects the teats automatically before the cows leave the platform.

Peter Farrel in Tipperary, Ireland has a grassland spring calving dairy farm. He is milking his 250 cows on a new 50 bails E100 rotary system and he is very satisfied with the performance. "The reason we decided to change our milking parlour from our old herringbone parlour to the new DeLaval Rotary was that it was just taking forever to milk the cows in the old parlour. I was always milking cows. Since we got the new parlour we just don't know ourselves. Milking time is down over 50%. The parlour runs smoothly. We can comfortably do 250 cows an hour," Peter said.



One milker operation would not be possible without the automatic teat spray robot DeLaval TSR. "Over on the far side end we have the TSR that sprays the cows. It is the man that never fails to turn up. He is so reliable now we don't even look over. He's just there, he's always there. He's never late, he's standing there ready to go. All you do is turn him on," added Peter.

The high performance, efficiency and short milking times of their new E100 rotary milking system has truly transformed the life of the Farrell family. "One of the other benefits from installing the new rotary is the amount of time it has freed up. It really, really benefits family life."

In Wangerland, Germany, young farmer Jan Philip Doden is running the family farm. In 2018 the Doden family built new facilities and increased the herd within the last two years to 650 cows, milking more than 13,000kg/cow per year. The heart of the new dairy system is the new DeLaval Rotary E300.

"The cows love the rotary," explains Jan. "They like to enter it and especially the heifers enter the platform directly in the first few days. They are very relaxed during milking. Because of the FastBail and the 1.5 entrance of the rotary the cows are able to enter the platform really well."

The FastExit with the 15 degree FastBail design ensures that the cows can leave the platform quickly. The exit bow guides the cows out from the platform, which increases the throughput of the rotary. The cows are very relaxed and behave much better in the herd.

Jan is very satisfied that the new rotary system contributes to the improved udder health. "At the end of milking the udders are sprayed by the Teat Spray Robot. In addition, the cluster is flushed with air, water and acetic acid by the Air Wash system. Because of the automatic disinfection and spraying by the TSR robot, we have seen an improvement in udder health." This combination allows the SCC to be kept at a stable herd-level of around 150,000 cells/ml.

Due to the complete package of milking system, DeLaval DelPro Farm Management and the advisory services provided by DeLaval, Jan can invest more time on health monitoring and managing the herd. As he summarises: "We finally chose DeLaval because, beside all the new and well proven features delivered with the rotary system, they could offer a complete package with service and herd management. Those are the reasons why I can recommend this milking rotary." ■

delaval.com



Milk more cows in less time with less labour

Dairymaster, Ireland

The aim of any milking facility is to have all cows milked and the parlour cleaned in 90 minutes, anything after this the operator's concentration levels will decrease. Farmers with 180 cows or more are now looking to Dairymaster for a more cost-effective solution. The Dairymaster rotary allows them to milk more cows, in less time with less labour. Attaining a good work-life balance has become more of a priority for the modern, progressive dairy farmer and the desire to install a Dairymaster rotary has grown significantly.

Some of the biggest advantages of a Dairymaster rotary include:

- Throughput is exceptionally good.
- Operator and cow comfort.
- More time for other farm jobs.
- Less labour unit required.
- Great work-life balance.
- Excellent parlour design and plans.
- Heavy duty, built to last.
- Excellent milking characteristics.
- Excellent cluster alignment.
- Divert milk at the touch of a button.
- Information at your fingertips.
- Low maintenance.
- Easy cleaning.
- First class service.

The rotary solution allows the dairy farm to steadily increase in herd size into the future without the need for further investment. The Dairymaster rotary can be designed to suit all budgets where more advanced features can be added later:

- **Swiftflo Performance:** Suitable for entry level farms with little automation.
- **Swiftflo Optimum:** Suitable for typical family farms with some automation.
- **Swiftflo Endurance:** Suitable for large scale farms with full automation.

Trusted by farmers worldwide

Dairymaster have rotary installations all over the world, including Ireland, Germany, The Netherlands, USA, France, Ukraine, Russia, Middle East, and China. These farms are experiencing all the benefits of milking 'the Dairymaster way'. With the overwhelming benefits of a Dairymaster rotary parlour, it is easy to see why it is such an attractive way of milking, not only for this generation but also for the next generation of young farmers, securing future investment to producing milk efficiently.

Plan what is right for your farm

Take the time to walk your farm with a 'fresh outlook'. There is a whole lot more to designing a parlour than one would initially think. Are you planning to build in an existing building, or is it a greenfield site? It is also important to future proof your plans for your new parlour and consider the following questions:

- What will your herd look like in 10 years' time?
- Do you plan on purchasing more cows?
- Will the next generation be taking over?
- Any land restrictions to limit the number of cows you have in the future?



Dairymaster's professional and experienced design team go through each of the following in detail in order to design the milking facility that best suits your specific needs. The team look at:

- Designing for the cow.
- Designing for the operator.
- Layout of the buildings and site.
- Parlour requirements.
- Air flow.
- Accessibility.
- Biosecurity.
- Existing buildings.
- Energy efficiency.
- Automation requirements.

One of the most important tasks you can do when purchasing a new rotary milking parlour is to take the time to visit farms with all makes of parlours in each of them. This will allow you to see for yourself the throughput, cow flow, cluster alignment, operator comfort, and intelligent technology in action, such as diversion line, Swiftflo Commander, ClusterCleanse, automatic teat sprayer and much more. It can be a time-consuming task, but it will be worthwhile and will make your decision much easier.

Meeting your needs in every aspect of the investment

The unique Dairymaster design results in extremely low power consumption to rotate the platform. The patented Rotaglide suspension system facilitates the smooth rotating movement of plant during milking. The system improves load transfer from the rotary platform to the support structure, meaning reduced wear on the track, resulting in less maintenance and better reliability. It is vigorously endurance tested for longer life and is proven on farms with 24x7 operation. One of the key factors of Dairymaster's growth is that a good aftercare service is available. The Dairymaster Technical and Service Team have been trained to the highest possible standards. Support is available with their Global Technical Team 24x7x365 and when you ring for assistance you get to speak to a real person who can understand your situation and give you the best possible solution.

Built to last

When researching rotary parlours, be sure to compare like with like. Build quality is very important when making a choice for the next 20+ years. The entire range of Dairymaster rotary parlours are of a very sound structure with strength where it matters, meaning it is built to last. This is evident when you look at rotary parlours installed by Dairymaster worldwide. You too can 'experience the difference'. ■

dairymaster.com



Rotary system designed for maximum performance

BouMatic, USA

Ebert Enterprises LLC operates with 3,500 adult cows and 3,500 heifers. They had been milking in two parlours; a Double 26 parallel and a Double 8 for the cows that needed closer attention after freshening. In 2016, they started milking with an 80-stall BouMatic Xcalibur 360EX external rotary parlour.

They are working 6,500 acres of cropland with 20% double-cropped each season. A few interesting aspects about Ebert Enterprises LLC include their ability to feed high-forage rations due to the land base, and the double cropping gives them opportunity to plant alternative forages like sorghum and peas and oats.

With the updated milking facility they have been able to minimise the cow's milking time and provide an efficient atmosphere for their employees. It has also given them the ability to adjust for growth for future generations.

Ebert Enterprises LLC – owned by Randy and Renee Ebert – was chosen to host the 2017 Wisconsin Farm Technology Days Inc show. Randy and Renee are the sixth generation of the family to live on the farm. The Ebert's farm showcases all aspects of agriculture in Kewaunee County.

Designed for continuous, around-the-clock milking, the BouMatic Xcalibur 360EX is rugged and precision engineered to deliver unrivalled throughput and maximum efficiency for a dairy operation.

Reducing the risk of downtime and finding ways to help an operator save cost with energy efficiency are all factors of the design. Super strong radial



arms link the platform to the centre. The platform rotates on a massive circular double I-beam rail system with nylon rollers for the ultimate in smooth operation that is safe and easy on the cows. The extremely durable nylon rollers require no lubrication and reduces maintenance costs. The rotary electric drive system saves operating costs with an energy efficient design.

The system also provides comfort to both the cow and operator. The sloped concrete platform deck enhances cleaning and promotes sure footing for the cows and a quiet environment for milking. Low profile cabinets eliminate an intimidating maze of pipes and a well-designed entrance and exit add to the cow's comfort.

Each stall has an integrated system console to house automation components and pulsators and provides easy access to CIP jetter cups. Automation is within easy reach of the operators to prevent fatigue. Fold-down jetter doors are positioned for easy access and quick set-up.

Smooth operation, clean, contemporary lines and easy cow loading and unloading are hallmarks of BouMatic's rotary milking system. Through increased cow comfort, operator efficiencies, improved equipment performance, and long lasting construction, the Xcalibur 360EX provides dairy operators with the ability to harvest the highest quality milk gently, quickly and completely.

boumatic.com



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Higher milk production through fresh, cold and tasty feed

Within livestock farming ration quality is evident to achieve good production results, making poor silage quality a serious threat to animals and profits. While dairy farmers are critical about the quality of the compound feed and the roughage, the mixed ration often does not receive the attention it deserves.

by Rob Pullens,
Kanters, The Netherlands.
www.kanters.nl

Besides the silage quality, the quality of the mixed ration is mainly influenced by the particle length and the dry matter percentage. But factors like loading sequence, speed on the mortars, quality of the knives in the mixing wagon and the mixing time are also evident. All these factors are individually important but combined they are of great importance as well, because they affect homogeneity of the mixture and the potential scalding sensitivity.

Scalding sensitivity

Scalding is the process whereby unwanted micro-organisms develop under the influence of oxygen. As a result, the silage pH rises and therefore growth of unwanted micro-organisms is no longer inhibited, causing spoilage. The heat produced by these micro-organisms in this decay process can be found as 'scalding' in the pit (an increase in the silage temperature).

In general, we speak of scalding when the difference in temperature

between the lower and the upper layer of the pit is greater than eight degrees or if hotspots can be designated. Controlling the scalding sensitivity is essential to get the most out of the silage. Scalding affects the palatability and the feed value of the ration, often resulting in a decreased feed intake. In addition, the produced mycotoxins may cause health risks such as digestive problems, fertility problems and a diminished immune system. Besides the effects on the technical results it also has a financial impact due to unnecessary feed losses due to dry matter loss (Table 1).

Prevention by management

Many factors (pH, temperature, dry matter percentage, oxygen, composition of crop) play a major role in the process of scalding. The most important three are the pH of the silage after conservation, the temperature of the silage before and after conservation and the density (penetration of oxygen) of the silage.

pH after conservation

The pH indicates the degree to which silage is acidified. During the preservation process, acids are formed that stabilise the silage and inhibit bacteria in their development. A pit is well preserved at a pH of 5.2 or less.

The silage pH is related to the dry matter content. A high dry matter percentage often means a high pH. Therefore, the pH of the pit can be influenced by lowering the dry matter percentage of the silage (to

Temperature rise (°C) above the ambient temperature	5	10	15
Daily dry matter loss (%)	1.2	2.3	3.5
Dry matter loss after seven days (%)	8.4	16.1	24.5

Table 1. Effect of scalding on dry matter loss of grass silage.

approximately 30-45%) around harvesting and by creating good conditions for preservation so that sufficient acetic and lactic acid can be formed.

Temperature

Temperature is an important determinant for scalding. If the silage temperature after preservation is too high this will promote the activity of micro-organisms after opening the silage pit. Also, an ambient temperature equal to or higher than 20° Celsius is an important catalyst for scalding because the bacterial development will increase rapidly. We can state that the lower the temperature, the less the losses due to scalding.

Density of the silage

When the silage comes into contact with air (oxygen), the unwanted micro-organisms become active again at the expense of the feed value and the palatability of the silage.

The exact depth of oxygen penetration is highly dependent on the density of the silage and the method of feeding. A low density

means that the oxygen will penetrate the silage easily resulting in exposure of the feed to the environment for a relatively long time.

Depending on the exact oxygen penetration, a decline in nutritional value can be predicted. An additional risk is that yeasts and moulds develop quickly under the influence of oxygen. The sooner they can start their development, the sooner these fungi will be able to produce mycotoxins.

Prevention by acidification

When management measures during the ensiling process seem ineffective an alternative is to use a mixture of organic acids in the total mixed ration to prevent scalding.

The organic acids (for example formic acid and propionic acid) will cause a pH drop in the mixed ration (Fig. 1), thus creating an unfavourable environment for bacteria, fungi and yeasts. As a result, the growth of these unfavourable micro-organisms is inhibited, the reproduction of bacteria is stopped and further preservation losses remain limited leading to less decay in feeding value.

Continued on page 24

Fig. 1. Schematic representation of indirect and direct effect of the acids in Nutripreserve in the cow.



Continued from page 23

Effect on the digestion

An important aspect of silage acidification is the effect on the digestion. The intake of formic and propionic acid in the rumen does not have a negative effect on rumen health, provided these acids are added to the ration in appropriate quantities. Furthermore, these are two (derivatives of) acids that ruminants also produce naturally during the carbohydrate metabolism in the rumen (Fig. 2).

Rumen conversion

In the rumen, formic acid is converted to methane gas. This provides an additional advantage because during the formation of methane hydrogen ions are removed, having a positive effect on the acidity of the rumen.

Propionic acid is converted to propionate in the rumen after which it will be absorbed in the bloodstream. When propionate reaches the liver, it will be used in the synthesis of glucose after which it will play a role in energy metabolism.



An important side note is that the use of propionic acid can also work as an inhibitor because propionic acid plays an important role in the regulation of feed intake in ruminants. If the concentration of this volatile fatty acid becomes too high (measured by receptors on the rumen wall), feed intake will decline, which will be at the expense of milk production.

Nutripreserve Basic

To support preservation and for maintaining feed quality, Kanter's developed their Nutripreserve products. These liquid acidifiers are suitable to preserve all kinds of animal feed. Whether it concerns roughage, raw materials, liquid feeds or by-products, the Nutripreserve products guarantee the feed quality for a longer period.

Nutripreserve Basic is a liquid blend based on organic acids (formic and propionic acid) and molasses that is developed to reduce overheating in ruminant rations. Due to the combination of buffered and non-buffered acids the mixture is very effective in mixed rations containing high amounts

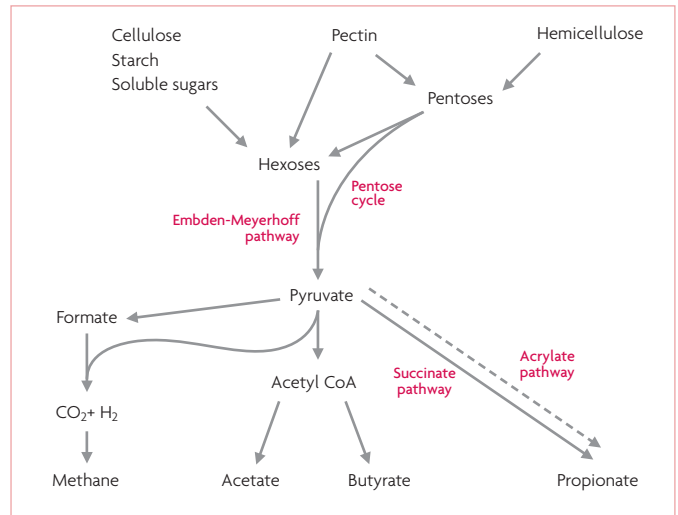


Fig. 2. Schematic representation of carbohydrate metabolism in the rumen (Veen et al., 2003).

of silage (corn, alfalfa and grass). Because the blend contains a high amount of buffered acids, Nutripreserve Basic is very suitable for use in the mixing wagon because it is less corrosive than non-buffered blends. Besides retaining the nutritional value and the palatability of the mixed ration with organic acids, the addition of molasses also improves the palatability to stimulate feed intake.

Nutripreserve Basic is the perfect addition to mixed rations in order to maintain a fresh, tasty and nourishing ration.

As a result, the feed intake of the animals will go up and they will have more resistance against bacteria and diseases.

In conclusion, proper use of Nutripreserve Basic results in fewer feed losses, better technical results and healthier animals. ■

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	ManGrin® HIGHLY PURIFIED MANGANESE OXIDE		CoRouge® MONOVALENT COPPER OXIDE
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Clean and disinfect in one go for improved herd health

Lameness triggers a domino-effect as it causes many costly health problems in the herd. Sick cows lose weight because of loss of appetite and due to reduced movement ability, their fertility falls and milk production is markedly less.

gea.com

All these factors contribute to increased spending on veterinary costs, higher work load and treatment costs, increased replacement costs and loss of income.

GEA knows the consequences of hoof problems and therefore offer

an efficient combination of cleaning and disinfection for hooves: pre-cleaning, with PedicoPré and a biocidal main bath with PedicoSan.

Clean hooves and effective germ control lower the risk of infection caused by pathogenic bacteria.

PedicoPré is used to clean the hooves directly before the hoof disinfection bath.

The preliminary cleaning with PedicoPré substantially reduces the level of soiling in the primary bath, thus enabling the disinfectant solution to be used for a longer period.

PedicoSan is an efficient concentrated biocide for hoof hygiene. It provides optimum hoof disinfection without formaldehyde, copper sulphate or any other heavy metals.

The disinfectant is more efficacious on pre-cleaned hooves and germ control is more effective.



Effective footbath solution for cattle and sheep

Lameness is a challenge but by implementing an effective hoof care program digital dermatitis can be controlled and prevented. It is important to aim for an appropriate contact time with a well-constructed and well-positioned footbath containing a proven footbath solution.

provita.co.uk

Provita have developed a hoof care range of proprietary blends of organic acids and essential oils:

- Proprietary blend of organic acids formulation.
- Safer to use and biodegradable.
- Highly concentrated allowing up to 500 cow passes per 200 litre footbath and up to 400 sheep passes per 100 litre footbath.
- 40+ trials across three continents, 440+ million cow passes worldwide.

● Notable research shows it is up to 44% more effective than formalin and copper sulphate with proven antibacterial activity.

● An independent clinical study on the effectiveness of footbath solutions in sheep found that 65% of sheep improved after one pass through a footbath containing Hoofsure Endurance at 2% dilution rate.

● Range also includes Konquest hoof gel and Combat hoof spray.



The bovine hoofcare specialists offer training and expertise

GDS Hoofcare helps you to care for and trim the hooves of your cows. Not only can you purchase top-grade products, but they also share their expertise and train hoof trimmers.

gds-hoofcare.com

GDS has a wide range of manual, electric and hydraulic hoof trimming crushes made in-house. In their range they have hoof trimming crushes for both the dairy farmer

and the professional hoof trimmer or veterinarian.

Their many years of personal experience as a hoof trimmer and that of various fellow hoof trimmers and dairy farmers is reflected in their hoofcare crushes.

Their electric crush has become the most popular crush in Europe.

By visiting their webshop online you will find a wide range of hoofcare products at attractive prices. Your order will also be delivered quickly.

Early-intervention hoof treatment can be crucial

When there is lameness in a dairy herd the wider impact it has on animal welfare, productivity and economic return can be crippling.

Early intervention is critical in reducing the duration and severity of lameness, and while it will not be possible to eliminate lameness, alleviation of pain and reduction of long-term damage can be achieved with the use of Walkease hoof blocks by Shoof International Ltd.

walkease.co.nz

Designed for situations of early lameness detection, the Walkease hoof block is a new generation claw prosthetic made from Ethylene-Vinyl Acetate (EVA).

EVA is a common material used in support of running shoe soles. Used in combination with the Walkease fast-drying cyanoacrylate adhesive, it is a fast and effective way to address

early stages of lameness in cattle. Walkease elevates the compromised claw by enabling the animal to transfer weight onto its healthy claw. This technique enables a faster recovery process due to increased mobility and function (a reduction in locomotion score).

The blocks compress down naturally over 10-14 days of wear and pose no risk of compromising the healthy claw. The benefits for the farmer is quicker recovery, low cost and the speed and ease of fitting of Walkease.





Unique formula ensures hoof hygiene and reduced lameness

Lameness is the third most important problem on many modern dairy farms after mastitis and reproductive failure.

The considerable economic losses are attributable to the cost of treatment, decreased milk production, decreased reproductive performance, and increased culling.

cidlines.com

The incidence of lameness has steadily increased over the past 20 years and, on some farms, over half of the animals become lame at least once each year.

Possible causes are:

- Confinement of cows to harder, wet and abrasive floors.
- Housing conditions which are not ideal for resting time.
- Slippery floors.

- Prolonged exposure of feet to wet manure.
- Nutritional mismanagement which encourage rumen acidosis.
- Failure to recognise and institute prompt treatment of lameness.
- Trimming techniques and schedules.
- Genetics.
- High infection pressure.

Pediline Pro is a unique formula for the treatment of hooves. Thanks to its synergistic composition Pediline Pro retains its action in the presence of organic material (manure) even during cold temperatures. Pediline Pro has a high and proven stability.

Associated with an adequate prevention protocol, and combined with the treatment when needed, Pediline Pro is the solution to control infectious lameness on your farm.

Minerals selected for SmartCow research project for second time

HiZox, a potentiated zinc oxide manufactured in Europe, is a highly bioavailable source of zinc, that can be supplied to animals to support hoof health. This innovative additive was selected in the first wave of the SmartCow project: a European programme for cattle research funded by EU Horizon 2020 to develop innovative solutions for efficient use of cattle production. In this context, HiZox was evaluated for its impact on dairy cows in partnership with IRTA in Spain.

animine.eu

More recently, Animine minerals were accepted for the second time by the consortium. This second phase intends to evaluate the

interactions between copper sources (focusing on CoRouge) in the presence of antagonists in dairy cattle.

Animine is a French company supplying added-value trace minerals to the global animal nutrition business. The company is driven by strong values, among which are scientific credibility and a commitment to address environmental challenges.

HiZox is a potentiated source of ZnO and CoRouge is the only monovalent source of Cu available in the market. Both sources display a common feature: high stability in the rumen to optimise animal performance, minimise interactions in the rumen and reduce toxicity on rumen microflora.

New approach in the control of digital dermatitis

Using the hoof care product HooFoss on a regular basis, the level of digital dermatitis (DD) decreased from 30% to 2.3% at a Danish dairy farm with 340 high-yielding Holstein cows.

vilofoss.com

When the farm started using HooFoss, the cow herd was in a situation well known for many dairy farmers. Approximately 30% of the cows had DD, even though many different products and solutions had been tried. At the same time the dairy farm had problems finding a hoof care product that did not cause harm to the workers.

Therefore, it was decided to start treating each cow with HooFoss twice per week during milking in the rotary. The treatments were done by a knapsack sprayer. The effect of HooFoss did not fail. The farm went from approximately 30% affected cows to less than 5% after the first nine months.

More than two and a half years after starting with regular HooFoss treatments, the level of DD was 2.3%. Now the heifers are also treated with HooFoss in a knapsack sprayer 1-2 times per week, and the level of DD has dropped from 10% down to less than 1%.



Innovative cow comfort and well-being solutions

Innovative cow comfort and well-being solutions are the foundation of Bioret-Agri. In 2015, the first-ever self-draining and grooved rubber alley flooring system was released with a focus on keeping cow hooves drier and healthier.

bioret-agri.com

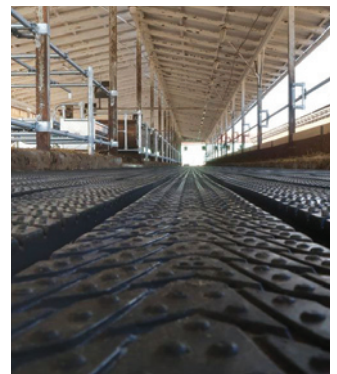
The Magellan achieves this by immediately diverting liquids into drainage grooves. The cows stand on a comforting rubber surface 17mm above the drainage grooves, keeping hooves drier and helping reduce pathogens associated with wet hooves.

Bioret-Agri's Magellan has won innovation awards and has been recognised to reduce humidity levels in the barn and reduce gas emissions by immediately draining liquids and improving hoof health.

Continuing the effort to create a better environment for cows and to lessen greenhouse gas emissions, the Delta X is a revolutionary product that separates and transfers urine

and faeces in the alley. It was recently awarded the silver medal for innovation at the EuroTier show.

The alley flooring has a 3% slope which guides excrement to drainage channels. In the channel is a two-level conveyor belt system which transfers faeces on the top belt and transfers urine in the opposite direction along the bottom. Faeces and urine are stored separately, thus reducing ammonia synthesis and emissions by up to 70%.



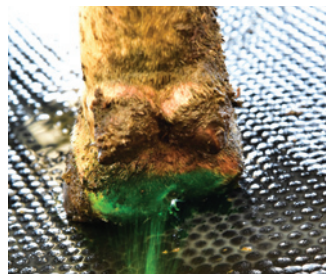


The first choice for every farmer and hoof trimmer

Intracare is established in The Netherlands where dairy production is in the nation's DNA. Claw problems form one of the largest loss items on the modern dairy cattle farm. Globally, 25% of the dairy herd has the Mortellaro infection (Digital Dermatitis).

intracare.nl

Intracare advocate an integral approach with their Hoof-fit programme. It is antibiotic free, green and sustainable, but most of all it is proven to be very effective.



The practical protocol and convenience of use sets a fresh green standard for hoof trimmers and dairy farmers.

Intracare is the only company with non-antibiotic veterinary medicines to cure digital dermatitis with a gel or aerosol spray. Complementary footbath and spraying products, dedicated for use in automated spraying systems in the milking parlour or milking robot have been developed for full herd maintenance.

Intra Hoof-fit technology includes chelated organic minerals and a firm adhesion. Production under GMP pharma conditions guarantees a consistent high product quality.

Using the Intra Hoof-fit technology significantly improves animal welfare, reduces antibiotic use, is safe to use for the farmer, the animal and the environment and ensures lameness is kept below 5%.

Intra Hoof-fit and Intra Repiderma globally are the first choice for every farmer and hoof trimmer.

Holistic approach to successful solutions for hoof care

In order to get good control of hoof problems, a holistic approach is needed to ensure successful treatment.

livisto.global

Besides proper and periodical claw trimming, which is essential for lameness control and cow comfort, it is also important to have a good hygienic control of the environment and the claws, keeping them dry and clean with a footbath routine. However, if routine husbandry is not enough, you must start a treatment as soon as you detect a problem.

Livisto offers three treatments for different stages:

● **Protego:**
A powder spray containing natural compounds with antibacterial, antiseptic and anti-fungal properties, designed for early control of minor wounds and skin irritations. It helps to reduce the risk of infections and greater injuries, providing topical care and protection for swollen or injured skin areas.

● **Animedazon Spray:**
A precise spray, composed of chlortetracycline hydrochloride, can be used in a first therapeutic approach as a topical treatment of contaminated superficial traumatic, surgical wounds or infections such as

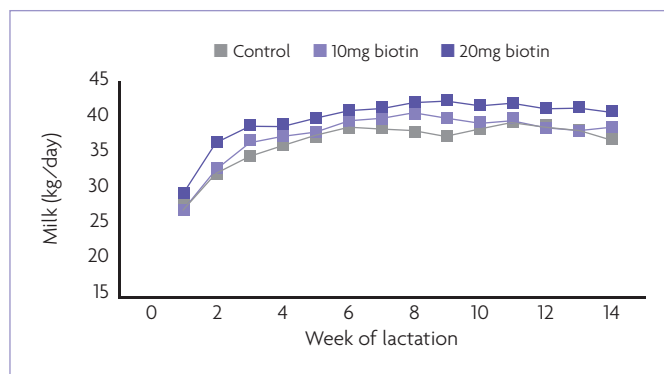


Fig. 1. The effect of daily biotin supplementation on milk production (C. A. Zimmerly and W. P. Weiss, 2001).

Biotin: the cheapest feed additive for dairy cows

Lameness is one of the most costly production diseases in dairy farming today. Digital lameness costs from €200-600 per dairy cow if we consider the milk losses over the full lactation.

dsm.com

Good nutritional management, together with improving the environment and management of cows, can help reduce the incidence of many common types of lameness.

Biotin is a sulphur-containing B group vitamin. It is essential for keratin synthesis, which is the major structural component of horn.

Biotin promotes optimal composition and distribution of intercellular cement, which is required for good horn quality and strength.

Many studies have demonstrated that supplementing dairy cows with 20mg per day DSM Rovimix Biotin results in reduced incidence of

several of the most common hoof disorders including sole ulcer, white line disease, sandcracks and digital dermatitis.

Rovimix Biotin is essential for milk production as it increases the synthesis of glucose, protein and fat by the cow.

More glucose means higher milk yields. Supplementing high-yielding cows with Rovimix Biotin has resulted in milk yield increases of almost 2kg per cow per day.

Overall, Rovimix Biotin builds stronger hooves, higher milk yields and greater profits. By investing only €15 per cow per year at farm level with DSM Biotin, you generate more than €200 extra margin per cow per year. Rovimix Biotin spray dried formulation provides an excellent flowability in feed mills, stability and multiple particles that increase the bioavailability.

If there is one ingredient to never forget when formulating a dairy premix, it is Rovimix Biotin.

interdigital dermatitis (foot rot and foul in the foot), and digital dermatitis.

● **Hymatil:**
An injectable solution of tilmicosin (subcutaneous route) intended as a single long-acting treatment for advanced problems requiring more specific solutions, like interdigital necrobacillosis.



Bacterial diversity and metabolite profiles

Preparation of curd varies worldwide, which means its taste, texture and impact on human health also differs. The microbial diversity of raw milk (RM), boiled milk (BM), RM curd and BM curd collected from three farms in India were investigated by culture dependent and independent techniques (*World J. Micro & Bio.*, 35, 102).

Additionally, metabolite profiles of RM curd and BM curd were studied by gas chromatography and mass spectroscopy. Oligotyping analysis revealed that *Lactobacillus brevis* and *L. fermentum* were abundant in RM curd and BM curd respectively.

In a metabolomic study, ascorbic acid, dodecanoic acid and hexadecenoic acid were found to be significantly higher in RM curd. The presence of different types of probiotics in these curd samples opens a new avenue to understand their effects on human health.

Calf well-being during lactation and weaning

The state in which the animal is found directly interferes with the degree of its well-being, compromising the production and quality of products of animal origin. (*PUBVET*, 14, 8).

In this sense, the search by the market for quality products that consider the welfare of animals has left producers to seek alternative ways of handling the way animals are housed, for example.

Animals when improperly housed are prevented from performing normal behaviours of the species.

Therefore, the objective of this work is to realise a literature review, addressing the importance of welfare for calves during

lactation and weaning submitted to different rearing systems.

Estimating breeding values for smallholder dairy cattle

Australian researchers report the results of the first large scale milk recording and genetic evaluation for crossbred cows in a smallholder dairy production system in India (*AAABG*, 2019, 440-443).

The moderate heritability of the milk yield found in their results, together with the wide range of Genomic Estimates breeding values, indicate that a good response to genomic selection for milk yield can be expected for smallholder dairy farms in India.

Cattle breeding and Covid-19

Cattle breeding in the territory of the Republic of Croatia has a long tradition, but in recent years it has been affected by various problems (*Meso*, 22, 288-294).

Due to the deteriorating situation in the dairy sector, the number of cows, and thus calves for further breeding, is decreasing, which affects the constant increase in imports.

Most calves are imported from Romania, while most of the young bulls are exported to Lebanon and Italy.

Due to the crisis of the authorities in Lebanon and the closure of the Italian market due to the Covid-19 epidemic, the cattle breeding sector found itself in trouble.

The measure of support to the sector adopted by the Ministry of Agriculture in May 2020, did not achieve the desired results because the subsidies intended for beef breeders reduced the purchase price of cattle.

Paper mulberry silage for Holstein dairy cows

Paper mulberry (PM) is an excellent and extensive type of roughage in Asia.

This Chinese study (*Animals*, 10, 1152) aimed to evaluate the effects of PM silage on the milk production, apparent digestibility, antioxidant capacity, and faecal bacteria composition of Holstein dairy cows. The PM silage significantly decreased the relative abundance of the genera

NUTRIPRESERVE[®] Basic

Higher milk production through fresh, cold and tasty food

- ◆ Maintaining quality of the roughage
- ◆ Higher feed intake due to less overheating
- ◆ Less selection at the feeding fence
- ◆ Stimulates milk yield

Balance

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Healthy Animals, Healthy Farm

Ruminococcaceae UCG-013 and Tyzzerella-4. PM silage enhanced the antioxidant capacity and immunity of dairy cows, but did not influence the milk yield, dry matter digestibility, and faecal bacteria composition.

Automatic body condition scoring system

Body condition scoring (BCS) is an important management tool in the modern dairy industry, and one of the basic techniques for determining animal welfare and precision dairy farming.

The objective of this Chinese study (*Int. J. Agri & Bio. Eng.*, 13, 45-54) was to use a vision system to evaluate the fat cover on the back of cows and to automatically determine BCS. On average, the BP network model scored each cow within 0.25 BCS points compared to their manual scores during this study period.

The measured values of visibility and curvature used in this study have strong correlations with BCS and can be used to automatically assess BCS with high accuracy. This study demonstrates that the automatic body condition scoring system has the possibility of being more accurate than human scoring.

Ultrasonographic measurements of teat canal and mastitis

The aim of this Turkish study (*EUVFD*, 17, 131-137) was to investigate the relationship between ultrasonographic (USG) measurements of the teat canal and mastitis in cows.

For this purpose, the length and diameter of the teat canal were USG measured on 50 teats belonging to 15 cows, aged 3-5, between 2-6 months of lactation.

It was concluded that there was no significant correlation between the length or diameter of teat canal and mastitis in cows, but it could be related to the parameters of milk composition and some chemical properties.

Livestock manure and antibiotics alter enzyme activity

Soil enzyme activities are commonly used for inferring microbial processes and nutrient limitations.

In this American study, researchers report the effect of dairy manure inputs and veterinary antibiotics (cephapirin and pirlimycin) on soil enzyme activities, using both a nationwide survey and also a controlled field experiment (*App. Soil Eco.*,

155, 103667). Their results suggest that administering antibiotics to livestock affects gross ecosystem processes – i.e., decomposition rate – through effects on microbial biomass.

Furthermore, manure directly impacts microbial resource allocation, while antibiotics administered to livestock appears to have a less pronounced impact on microbial resource allocation.

Taken together, administration of antibiotics to livestock can affect the overall ecosystem process rates, but it is unlikely to affect microbial resource allocation.

Fluorinated magnetic covalent organic frameworks

Perfluorinated compounds (PFCs) are new types of persistent organic pollutants known to bioaccumulate in organisms. They have come under increased scrutiny due to the close relation with various health problems. Fluorinated magnetic covalent organic frameworks were first synthesised via a monomer-mediated in situ growth strategy and served as fluorinated magnetic adsorbent (*J. Chromatography A.*, 1615, 460773).

Under optimised parameters, the developed method displayed good linearity for six PFCs in the range of 0.1-250 ng/L with high correlation coefficients and the corresponding limits of detection were 0.005-0.05 ng/L. Furthermore, high enrichment factors and acceptable relative standard deviations of inter-day and batch-to-batch for six PFCs were achieved.

Moreover, this method was further employed to milk samples with different brands and packages, in which ultratrace PFCs were found with diverse concentrations from 10.36-729.34 ng/L, confirming the promising applicability of the fluorinated magnetic covalent organic frameworks as an alternative adsorbent for sample pre-treatment.

Artificial grooming could boost the activity of female calves

Early cow-calf separation management induced various welfare problems for dairy cows. Chinese researchers (*Animals*, 10, 302) mimicked the maternal licking by manually brushing right after the Holstein female calves were born and during the first week of life.

It was concluded that this artificial grooming during early life could boost the activity and the human affinity of female calves and it might advance their starter diet ingestion.



Fresh Milk Management System

Fully automated process from cow to calf

The Fresh Milk Management System from GEA transports the milk directly from the robot to the milk collector, which in turn continuously collects and transports the milk to the cooling tank. The tank cools and stores the milk to maintain its valuable quality and deliver it fresh to the calf feeder. To know more contact your local GEA Dealer. gea.com

Milk

Collect

Store

Feed

GEA engineering for a better world

Rapid Dairy Antibiotic Testing Solutions from Your Trusted Partner

Disease prevention and control is part of the daily life on dairy farms and despite best practices, bacterial and viral infections can still persist. Conditions that affect the health of animals such as cattle are treated with antibiotics. In dairy cows, antibiotic residues can then pass through into their milk following treatment of the animal with antibiotics.

They can be dangerous for humans as well as impacting the yield and the quality of fermented milk-based products like cheese and yogurt. For these reasons, it is important to test milk throughout the supply chain to ensure it complies with the different Maximum Residue Levels (MRL) set by regulators for each class of antibiotic.

Testing throughout the supply chain

BetaStar is a range of rapid, easy-to-use and internationally-approved tests that can be run anywhere, from the farm or milk tanker to dairy processors, in just 5-10 minutes. BetaStar offers rapid detection of different classes of antibiotics in raw commingled, UHT, sterilised, frozen-thawed, reconstituted bovine milk, goat's milk, ewe's milk, and mare's milk at or below established Maximum Residue Levels

All BetaStar test kits are read using Neogen's automated analysis Raptor platforms, while BetaStar S and BetaStar S Combo tests can also be visually interpreted. Their BetaStar range can detect the main classes of antibiotics, such as beta-lactams and tetracyclines.

A unique rapid testing solution

Neogen has combined the simplicity of their BetaStar test kits with the automation of their Raptor analysis platforms to offer a unique rapid solution for dairy antibiotic testing. Their Raptor integrated analysis platforms are lateral flow test strip readers with built-in incubation for automated testing that delivers qualitative results. Unlike traditional testing methods that require multiple hands-on steps, the Raptor platforms improve the efficiency of your testing protocol by minimising user error and increasing productivity.

Lot IDs are automatically scanned, the sample volume has forgiving tolerance, and the system provides control over test parameters including time and temperature, allowing users to simply add the prepared sample and walk away. With incubation times between 5-10 minutes depending on the test used, you can work quickly and efficiently.



For more information on our solutions for dairy antibiotic testing, visit NEOGEN.com

internationalnews

Triple mode of action



Livestock bears the brunt of endotoxin contamination and all too often this results in diminished performance due to an overactive immune system. To help feed producers, farmers and animals combat endotoxins, the multidisciplinary team of experts at Dr Eckel Animal Nutrition in Rhineland-Palatinate, Germany, has spent two years of intensive development to produce the best available solution to endotoxins – AntaCatch.

Dr Eckel states that farmers and producers can get the threat posed by endotoxins under control with this highly effective product.

The secret of AntaCatch's success lies in the careful selection of raw materials and the production process due to which it is double-activated and has a triple mode of action.

First, the product is activated through the rectification of the cations on its surface, enabling AntaCatch to immobilise endotoxins

over a wide pH range, effectively catching up to 99% of the endotoxins; then, the micronised ingredients – i.e. substances that have a particularly small particle size – ensure optimal bioavailability.

AntaCatch's special triple mode of action kicks in simultaneously: it supports the formation of an intact intestinal barrier, contributes to the effective protection of the liver against endotoxins and thus promotes liver function.

Consequently, AntaCatch comes with the promise of strong and healthy animals, top performance, and animal-friendly and profitable production.

dr-eckel.de



First-of-its-kind genetic tool



Mastitis is the most common clinical disease reported in dairy cows and cited as the number three reason for culling in commercial dairy herds. A case of clinical mastitis in the first 30 days of lactation can result in an economic loss of \$444. This cost includes treatment expenses and the subsequent effects on milk loss, premature culling, replacement loss and future reproductive challenges. To combat mastitis, Select Sires has introduced Mastitis ResistantPRO, a new genetic tool to boost mastitis resistance in the next generation.

Mastitis ResistantPRO is the latest designation to be added to Select Sires' toolbox and will appear on qualifying sires following the April 2021 sire summaries.

A new icon will identify sires that excel in multiple indicators of mastitis resistance, including CDCB Mastitis Resistance, CDCB Somatic Cell Score (SCS) and Zoetis Mastitis Resistance genomic evaluations. Both Holstein and Jersey sires will be eligible for this designation.

Select Sires professionals across the nation have analysed the

economic impact of mastitis resistance traits in dairy herds. Genetic audits of CDCB Mastitis Resistance and CDCB SCS revealed significant savings for higher genetic merit animals, translating to more profit for farmers.

The farmer-owned cooperative and farmer-led sire committees recognise the immense value of mastitis resistance traits to secure greater profit margins.

Industry reports show the incidence rate for mastitis is 24.8% and most cows with a mastitis event are treated with antibiotics.

Improving genetic merit for mastitis resistance will reduce the use of antimicrobials, which translates to both on-farm savings and consumer approval.

Holstein sires that carry the Mastitis ResistantPRO designation will reduce mastitis cases by 2.3%. In a 1,000-cow herd, the savings are greater than \$10,000 per year.

In addition to the cost savings gained from less treatments, taking genetic strides to reduce mastitis events improves udder health, increases milk quality and strengthens consumer trust.

selectsires.com

Rapid identification test

 Dairy farmers and herd managers can now quickly segregate their cows according to the type of milk they produce

Swiss foodtech company SwissDeCode is launching the DNAFoil A2 Cow Test, a rapid kit that allows dairy farms and companies to test their cows independently and on the spot, in order to detect the presence of the A1 beta-casein allele and identify A2 milk-producing cows.

The new test comes to answer the market's demands for A2 milk testing and joins the DNAFoil A2 Cow Milk Test, launched last year.

The DNAFoil A2 Cow is a highly accurate test that uses tail hair samples from cows to detect the presence of the A1 beta-casein allele. Providing all necessary material, the all-in-one test can be performed on-site, even by non-experts.

The reliable and easily-interpretable results are available in 45 minutes, including approximately 15 minutes hands-on time.

This significantly shortens the time to result, compared to current analytical methods.

Following the successful launch of the DNAFoil A2 Cow Milk last year, a test that allows dairy processing companies to assess the purity of batches of A2 milk, SwissDeCode now adds a new product to the A2 family of tests, as customers expressed their interest in testing

not only batches of milk, but also individual cows.

By offering products that are useful to breeders, farms, processing companies and others, the A2 family of tests has the potential to secure the authenticity and transparency of a large part of the A2 milk supply chain.

"We redesigned DNA testing to scan over three billion DNA letters present in the hair of a cow and return a simple test band when that important A1 or A2 letter is present. By putting this powerful tool in the hands of farmers, we are helping them bring better milk products to market and enabling pure A2 supply chains and efficient herd management," Gianpaolo Rando, CTO and Co-Founder of SwissDeCode, told International Dairy Topics.

swissdecode.com



Aveve and Palital under one brand



Arvesta, the parent company of Aveve Biochem, remains committed to international growth and therefore extended its participation in Palital to full ownership in January 2021.

This ownership is fully in line with the strategy of both companies for further international expansion.

To reinforce that strategy, the two brands have now chosen to continue their growth ambitions under only one brand name: Palital.

"Palital is a well-known brand name that together with its baseline 'Clean growth' will help us realise our growth plans in the coming years. This choice also emphasises our ambition to integrate the two brands as soon as possible," Guy Janssens, Director Feed Additives & Specialties

at Arvesta, told International Dairy Topics.

"This means that the Aveve Biochem brand will be integrated into the Palital brand, but we will keep our strong product names, like AveMix, well known for 15 years in the market and with a proven track record with our clients and distributors.

"This integration will allow us to offer a more dedicated service to our customers, with expertise from both the Aveve Biochem and Palital team of experts.

"Furthermore, we will extend our portfolio with the specialties of Palital, such as butyrates and slow release urea. This integration will also benefit our geographic reach, which will allow us to grow faster," he added.

avevebiochem.com



GEA finds the right balance for unique organic dairy farm

For small organic dairy farms, finding the right level of automation is key. For Camphill Village in South Africa, updating to a smart GEA in-line milking parlour was the best solution for improving efficiency without losing the hands-on approach the unique farmers require in their daily work. Camphill Village is a residential facility, where nearly 100 adults with diverse disabilities and special needs are given an opportunity to lead a healthy and productive life by creating useful, value-added products.

Set on a 220-hectare farm near Philadelphia just north of Cape Town, the organisation added a Jersey dairy herd and milk processing facility to its operations in the late 1980s. Alongside other flourishing activities, Camphill Village provides organic dairy products for the residents and surrounding communities. The income from the dairy provides critical funds for the residents and for paying the support staff. But increasing raw material handling and dairy production had remained a long-standing challenge for Camphill. The original milking equipment needed an urgent upgrade, along with the dairy processing facility. Soon after Camphill Farm Manager Antonius Verhoeven got a glimpse of GEA milking equipment at a trade fair in 2018, a GEA team began working closely with Camphill's management team to find the right milking solution for their needs. The equipment and installation would need to deliver on process optimisation, ease of maintenance and repairs, improved hygiene and safety.

Two years later, with financial support from German NGO Rays of Hope and some goodwill investment from GEA, Camphill was able to replace its bucket milking system with an in-line "flat" milking system featuring a 1x8 point high line layout. This meant the new parlour could be installed without altering the existing building or major construction work. In this case, it was necessary that the milking equipment meet modern standards but without a high degree of automation since residents benefit from maintaining close contact with the cows during milking. In fact, this physical interaction is considered to have therapeutic benefits. By integrating a system for recording milk coupled with the DairyPlan Herd Management Software, the team is able to take informed decisions related to production, health and fertility to effectively grow the milking herd over time.

Thanks to these upgrades, Camphill Village has a much higher throughput of milk products and provides a more stable income stream. Today, with just under 30 cows currently being milked out of a herd of 50, Camphill will finally be able to increase its milk production and dairy processing output.

 engineering for a better world

gea.com



AB Vista has launched a free tool to assist nutritionists as they formulate animal diets. The dietary fibre calculator uses average values of global raw materials to calculate the dietary fibre content (plus other more in-depth fibre parameters) of finished animal feed. The calculator offers the option of entering up to 28 different raw materials, along with the daily total intake in kg, to show the fibre composition of the feed and the daily fibre intake in either a data or graphic view. "As feed additive specialists, we know that the role of fibre in monogastric diets can be misunderstood and that achieving the optimum fibre fraction can be challenging, even for experienced nutritionists," Xaviere Rousseau, AB Vista Global Technical Support Manager, told International Dairy Topics. "We have designed this calculator to be a straightforward, easy to access way to assess the total dietary fibre content of finished feed." The parameters within the calculator represent the values that are available within AB Vista's new Dietary Fibre analysis service, part of the company's comprehensive NIR offering. The calculator is accessible at:

abv-calculators.com

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All-in-one feed additive



Biomin has launched its newest mycotoxin risk management solution, Mycofix Plus 5.Z with ZENzyme, in select markets across the Asia Pacific region.

The product is an innovative, all-in-one feed additive providing next-generation mycotoxin risk management for breeding animals and their offspring.

ZENzyme is the first and only purified enzyme that degrades zearalenone (ZEN) fast, specifically and irreversibly into non-toxic and non-oestrogenic metabolites.

ZEN commonly contaminates crops including corn (maize), wheat and soy at potentially harmful levels according to the Biomin Mycotoxin Survey, the longest-running and most comprehensive data set on mycotoxin occurrence in the world.

The chemical structure of ZEN poses two challenges to the agriculture sector.

First, the mycotoxin latches onto an animal's oestrogen receptor which can induce hyperoestrogenism and lead to reproductive problems and impair animal performance.

Second, conventional binders such as clay or yeast-based products have only limited effectiveness in mitigating ZEN's negative impacts.

Zearalenone reduces reproductive efficiency in dairy cattle, which can result in fewer calves being born, false heats, uterine prolapse, ovarian cysts, unsuccessful insemination or abortions.

While it is sometimes stated that ruminants have a natural means to degrade mycotoxins due to their unique digestive systems, this is clearly not beneficial for the animals in the case of zearalenone.

According to Professor Qendrim Zebeli, Head of the Institute of Animal Nutrition and Functional Plant Compounds at the University of Veterinary Medicine Vienna, "By the degradation of zearalenone in the rumen we do not have a detoxification. Rather, we have an upgrade of the toxicity and this is unfortunately due to the metabolites that are being released in the downstream degradation in the rumen which is mainly the alpha type, α -zearalenol, which studies indicate that the oestrogenicity is much higher than the mother molecule."

For dairy cows, calves and herd bulls, Mycofix Plus 5.Z with ZENzyme guards against mycotoxin-related issues and zearalenone-induced reproductive challenges.

biomin.net

IDF Nutrition Symposium 2021



Registration is now open for the IDF International Symposium on nutrition and health, a fully virtual event which takes place from 11-12th May 2021.

Those interested in attending the Symposium can register for what will surely prove to be the dairy sector's leading event on nutrition.

As an opportunity to learn about the latest science on the benefits of dairy, the IDF Nutrition Symposium will be of vital interest to nutritionists, dietitians, health regulators and policy makers, and other health professionals with an interest in nutrition.

fil-idf.org

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Sustainability platform



Royal DSM, a global science-based company active in nutrition, health and sustainable living, has launched its sustainability platform, Reducing Emissions from Livestock, as part of its recent strategic initiative 'We Make It Possible'. The sustainability platform is a commitment from DSM to reducing emissions from livestock in direct support of the UN Sustainable Development Goal 13, Climate Action.

To realise a reduction in carbon emissions, animal farming has to reduce the emissions it produces, cutting the levels of methane and nitrous oxide produced, both directly and indirectly, and reduce ammonia emissions, which lead to eutrophication on land and subsequent biodiversity loss. DSM has developed innovative solutions that make every stage in the value chain more emission friendly.

"For too long, sustainability has been someone else's problem. Amidst global climate change, the need to reduce carbon emissions from animal livestock is increasingly important. It is not a question of whether we need to shift to a more sustainable business model, it is more a question of how fast and with what impact. We need to shift to a model where farmers are getting a fair price for the animal proteins produced, where people across the world have access to affordable proteins, and last but not least, where animal farming reduces its impact on the environment (emissions, water quality through manure measurement, bio-diversity) significantly," Ivo Lansbergen, President, DSM Animal Nutrition & Health, told International Dairy Topics.

"Animal farming alone accounts for 14.5% of all human-derived greenhouse gas (GHG) emissions. At DSM, we have been working for decades on innovative scientific solutions aimed at providing real answers to the challenges facing the agriculture industry including solutions for reduction in carbon emissions," added David Nickell, VP of Sustainability & Business Solutions at DSM Animal Nutrition & Health.

Under the sustainability platform, DSM offers innovative solutions that specifically target these, including

- Bovaer for direct methane reduction in ruminants – consistently reducing methane emissions by a minimum of 30%.
- HiPhos is a highly efficient feed phytase for reducing the reliance of finite reserves of mineral phosphates (P) and unlocking the plant-bound phosphate in the diet itself, resulting in less excretion of excess P to the environment.
- Digestarom from Biomin improves feed efficiency in commercial animal production with demonstrated decreases in environmental emissions i.e. annual ammonia (-26%) and odour (-48%), thus reducing the overall carbon footprint.

"We launched our Reducing Emissions platform as a call to action across the industry to provide real answers to worldwide challenges of sustainable animal protein production. All our sustainability problems essentially come back to one: we need to produce more while using and emitting less. We are looking to lead by example, innovate, and to make every stage of the value chain more emission friendly," added Christie Chavis, VP of Specialties Business Solutions at DSM Animal Nutrition & Health.

dsm.com

EU authorisation for Biomin enzyme



Leading animal nutrition and feed additive firm Biomin has received EU authorisation of FUMzyme, the only commercially available mycotoxin-deactivating enzyme and component of Mycofix for application in fermenting feed including silages.

FUMzyme, a fumonisin esterase, is a purified enzyme that detoxifies fumonisins – a category of

mycotoxins produced by *Fusarium* fungi – into non-toxic metabolites.

Fumonisin is a group of secondary fungal metabolites (mycotoxins) that contaminate crops in the field and have a variety of negative consequences in livestock and humans.

The latest Biomin Mycotoxin Survey reveals that fumonisins occurred in 80% of over 6,000 corn samples analysed worldwide.

biomin.net



As grass growth takes off in the early part of the grazing season, nutrition focus tends to be on completing the transition from the winter TMR to a grass-based diet without succumbing to post-turnout milk fat depression. While this remains important, fertility also needs to be made a priority, says Dr Richard Kirkland, ruminant nutritionist for Volac Wilmar Feed Ingredients. "For spring calvers, there is a short window to support a cow's body condition to help secure her getting back in calf. During early lactation, cows cannot eat enough to meet the high energy demands of milk production and enter a state of 'negative energy balance', using energy from body fat stores to support the genetic drive for milk production, and lose condition. Research indicates a fall-off in conception rate of around 10% for each 0.5-unit loss in condition through this period," Dr Kirkland told International Dairy Topics. "Perfect grazing conditions may support 25+ litres of milk per day, but dry matter and energy intakes can be significantly reduced in wet, overcast conditions. We can see similar effects in the peak of summer where grass availability and heat stress will reduce intakes." Using a combination of digestible fibre sources and rumen-protected fat supplements, such as Mega-Max, in buffer rations will help protect milk production and support fertility in early lactation. Rumen-protected fat supplements have around 2.5-times the energy content of cereals, making them ideal to help maintain energy supply through variable springtime grazing conditions while reducing undesirable rumen effects through the transition from the winter diet to spring grazing. To support both fertility and milk production during this time, Dr Kirkland advises feeding a rumen-protected fat supplement with a research-proven ratio of C16:0 (palmitic acid) and C18:1 (oleic acid) to strategically influence the partitioning of nutrients between milk and body condition.

volac.com

Hot weather performance



CCPA Group's Thermo range is used in prevention or intervention, and digital solutions, to anticipate and better manage the impact of high temperatures.

This year they have updated the Thermotool application by integrating an economic simulator and providing numerous tips that can be found on the first website dedicated to thermal stress.

In order to guarantee maximum efficiency, CCPA has developed a direct purchasing channel with producers and has set up strict quality controls for its raw materials and finished products.

The group has also invested in a specific and patented manufacturing unit to preserve all the efficiency of these sensitive ingredients. The

effectiveness of the products is thus guaranteed. It has been supported by numerous tests carried out each year in different climates.

In order to facilitate decision making and anticipation of hot weather episodes, the CCPA group have integrated an economic simulator of losses linked to heat stress and gains to be made by using Thermo nutritional solutions.

Thermotool thus allows, in addition to measuring the risk linked to the climate, an estimation of the production losses quantitatively and economically.

To achieve this, CCPA engineers and veterinarians have modelled the response laws for each species and used these models in the Thermotool application.

It is available for free download on Google play and Apple store.

groupe-ccpa.com

APPOINTMENTS

PAUL LÖFGREN
DeLaval
President and CEO
www.delaval.com

JOE MCCORMACK
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OLIVIER POLI
CCPA Group
General Manager
www.ccpa.com

JOSÉ RAMON PEREZ H
Animine
Latin American Team
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World Dairy Expo 2021 in Wisconsin



World Dairy Expo has announced that, after thorough consideration, World Dairy Expo 2021 will remain in Madison, Wisconsin. The 54th edition of the event is scheduled for Expo's historic home, the Alliant Energy Center, from 28th September to 2nd October, 2021. This announcement comes after contingency planning and consideration of alternative venues.

"The clarity that Expo's leaders sought from Dane County officials regarding the path forward for responsibly and safely hosting World Dairy Expo 2021 at the Alliant Energy Center has come to fruition," Bill Hageman, WDE Board President, told International Dairy Topics.

"We are grateful for the patience and commitment to World Dairy Expo exhibited by our stakeholders and the dairy community throughout this process. Expo is excited for Madison to once again be the place where the global dairy industry meets."

"We are eager to build upon the strong partnership between Dane County and World Dairy Expo as the organisation moves forward with plans for its 2021 event in Madison," added Dane County Executive Joe Parisi. "The only home World Dairy Expo has known is Dane County, Wisconsin, and we are ready to welcome the dairy industry's premier event back to our community this fall."

worlddairyexpo.com

Achieve a faster silage wilt



Selecting the right wilting technique when making grass silage can make wilting speed as much as five times faster, according to results of new Ecosyl UK research.

Conducted using farm-scale silage machinery on farms in Wales, the research compared the effects of tedding, time of day of cutting, and crop maturity on the rate of crop drying.

Findings from a trial in Pembrokeshire on a light, multi-cut grass crop cut on a warm, dry July day revealed that cutting at 10am and tedding immediately resulted in grass reaching a target dry matter (DM) content of 30% in just 4.5 hours.

That compared with seven hours to reach 30% DM if grass was not tedded until five hours after cutting, or a full 24 hours if grass was left untended in rows.

Where cutting was delayed until 3pm, grass again reached 30% DM in five hours if tedded immediately after cutting, but required a full 23 hours to reach this if not tedded until the following morning. Where the 3pm cut was left untended, it failed to achieve 30% DM at all – reaching only 24% even after 24 hours.

"Results overall showed that the average drying rate of 1.0% DM per hour for the grass cut at 10am and tedded immediately was five times faster than the rate of 0.2% DM per hour for the grass cut at 3pm and left in rows," Ecosyl silage scientist, Dr Mark Leggett, told International Dairy Topics. "This is highly relevant

as farms strive to increase milk production from homegrown forage and silage, because the longer that grass is wilted for, the more nutrients it will lose."

Ecosyl silage advisor, Peter Smith, agrees and says the benefits of wilting are not only that it reduces the risk of clamp effluent, but also that it produces a more nutrient-dense silage, improves silage intakes, and reduces the acid load produced during the fermentation.

Wilting to 28-32% DM gives the best balance between minimising effluent and minimising field and clamp losses, however wilting should be achieved in the shortest possible time, because as soon as grass is cut its nutritional quality starts to decline.

"Sugars and proteins are degraded by the grass, but undesirable micro-organisms present will also multiply up and feed on the sugars and break down the protein," added Peter.

There are various views about whether grass should be cut in the morning or afternoon, but ultimately it is a race against time to wilt and ensile as rapidly as possible. Lost silage energy equates to lost milk.

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www.livestockmalaysia.com

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www.agrilivestock.net

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www.space.fr

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www.wbc-madrid2020.com

World Dairy Expo

28th September - 2nd October
Madison, WI, USA
www.worlddairyexpo.com

Vietstock

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www.vietstock.org

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