

In the MIX

FEATURING:
RUMEN EFFICIENCY &
MICROBIAL RESEARCH

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SILAGE FEEDING INCREASES BEEF MANAGEMENT OPTIONS

HOMEMADE silage has the potential to provide management flexibility and shorten the growing phase of the beef production pathway, according to Jordan Minniecon, Technical Services Manager, Lallemand Animal Nutrition.

"Silage made from grain crops can be the backbone of on-farm feeding systems," says Jordan. "This strategy involves being set up for opportunity cropping, with the aim of conserving enough feed to provide for supplementary feeding requirements during three to four years of below average rainfall."

Typically a combination of silage, molasses, cotton seed, grain, hay and protein meal are fed in on-farm silage systems and the ingredients are usually mixed in a tractor-drawn or truck-mounted feed wagon and delivered to the cattle.

"The level of inclusion depends on the desired rate of gain, the quality of the silage and the relative cost of other feeds to balance the ration," said Jordan.

Most of the silages produced in northern Australia come from irrigated corn and rain grown sorghums. Corn has highly digestible grain and fibre, requiring a large amount of water and management to reach its potential. Varieties are best chosen on

their ability to produce grain in the local environment.

"It's preferable to choose "starch" type corns with soft endosperm rather than processing types with a hard glassy grain.

"Conventional grain sorghums make great silage, with higher energy than other silage types, however some yield is sacrificed in the process. Winter cereals also make great silage, even if the yields under dryland conditions are less than the summer crops. Irrigation of these crops during winter can be cost effective when evaporation rates are much lower."

Introducing silage feeding requires some planning and decision making about which classes of animals will be fed and for how long as there are benefits to be gained from supplementary feeding animals during breeding, weaning and backgrounding.

"The body condition of cattle, particularly females, is strongly correlated with fertility and performance levels of the herd, he said.

"Optimum body condition will improve both pregnancy rates and weaning weights."

In the case of replacement heifers, correct nutrition is vital as nutritional stress could delay puberty and decrease breeding performance in young breeding females.

"Supplementing replacement heifers to set them up for their first calf will have an impact on profitability for 10 years or more. This suggests heifers warrant better treatment," says Jordan.

Silage feeding is also valuable during weaning, helping cows cycle quicker.

"With the assurance of an on-farm feed supply, weaning time can be managed effectively to assist the breeding females in regaining body condition to get back in calf when pasture quantity and quality is sub par."

Jordan said the feeding practice also had a role to play during the growing phase, the period between weaning and finishing.

"This is an area of the business which can have huge influence on profitability. Trying to estimate what the cost is to the business to have cattle lose weight is quite difficult. Producers have been known to say, even if the value of the gain is equal to the cost of creating it, the impact on cash flow and profitability will justify the investment."

Lallemand Animal Nutrition offers a full range of products and services relating to silage production, including advice on planning and budgeting, variety selection, harvest management, nutrition and training.

W E L C O M E

WELL 2018 rocketed past at a great rate of knots didn't it! And what a contrasting year. Some parts of the country continue in crippling drought whilst other parts snuck under the radar with relatively good seasonal rainfall. Looking forward, our focus on rumen health and rumen function continues with new data on Levucell SC in transition feeding, along with our growing knowledge of the smaXtec rumen bolus technology. Lallemand Animal Nutrition Australia now distributes the smaXtec rumen boluses and will provide you with a personal insight into the technology with Carl Moon making some spot on comments

about what drives their business. Remember if you can't measure it, you can't manage it. You'll also see data on our positive biofilm agent, Lalfilm Pro. A real chance to explore the positive side of washing and disinfection. It's been really interesting talking to people about this new approach to biosecurity and hygiene which undoubtedly plays a huge role in our intensive livestock system.

Thank you for your continued support and have a fun and safe Christmas and New Year holiday.

Alex Turney - Country Manager



REPORTING ON THE XVIII INTERNATIONAL SILAGE CONFERENCE

THE latest in forage preservation techniques and innovation was discussed in Germany at the 2018 International Silage Conference (ISC). The conference was well attended, with more than 350 participants from 34 countries. Lallemand Animal Nutrition led the way with almost 20 papers or posters presented featuring Lallemand products and technologies as well as the largest team of researchers and technical support staff present. Here are some highlights of the conference.

What's the latest on the inoculant front?

There were a number of presentations about the positive effects of inoculants on silage quality or on specific parts of the ensiling process. Three meta-analyses showed microbial inoculation led to increases in milk production of dairy cows, even though some of studies had fermentation/nutrient parameters that did not differ between untreated and treated silages. Inoculation should result in improvements in feed quality — better dry matter recovery, lower protein breakdown and high digestibility — but it may also affect rumen microbiota by increasing microbial biomass and reducing methane loss. The next evolution of inoculants was highlighted with presentations on new bacterial species for aerobic stability and a



bacterium + enzyme combination for high moisture hay, which resulted in higher leaf retention, greater feed value and yield.

Molecular techniques and 'OMICS' – more tools in the box

The development of culture-independent techniques based on the analysis of nucleic acids in silage research has increased dramatically. Discussions from the essential questions in silage microbiology and biochemistry like 'what microbial species and strains?', 'when and how?' and 'what sort of interactions and dynamics are present or have an effect?' can now be better explained and further researched. For example, several abstracts presented showed that after inoculating with *L. buchneri* 40788 — a proven lactic acid bacterium that extends aerobic stability — the populations of spoilage yeasts and enterobacteria were lowered, the total population of lactic acid bacteria was higher and a more consistent microbial community was present especially when compared to the control treatment, in addition to a positive response in fermentation pattern.

For additional cutting-edge technologies and new data in the silage-making industry, join us at the next ISC in China in 2021!

F O O T Y T I P P I N G R E S U L T S

THANK you to everyone who participated in the Lallemand Tipping Competition this year. Gift cards have been sent to our winners:

■ NRL

1. Gerald Fong
2. Ben Morgensen
3. Brett Priebsenow

■ AFL

1. Craig Wood
2. David Henman
3. Jeff Dight

■ Super Rugby

1. Alex Turney
2. David Henman
3. Jeff Dight

Next year is going to be a bigger and better. If you are interested in participating, please contact Ben Morgensen on bmorgensen@lallemand.com or (07) 5491 0125. Register and get your game face on.

NEW BIOFILM KEEPS SURFACES CLEAN



AN innovative 'biofilm' could revolutionise hygiene practices in intensive livestock production by reducing the ability of undesirable bacteria to colonise on farm building surfaces.

Called LALFILM PRO, it contains a blend of strain-specific bacilli and lactic acid bacteria that form a positive microbial film on farm building surfaces.

As these beneficial species establish a biofilm, they create a low pH environment that prevents the development of pathogenic bacteria, such as *Enterobacteria* spp., *Escherichia coli*, *Pediococcus* spp., *Streptococcus* spp. and *Staphylococcus* spp..

Alex Turney, says biofilms have a significant role to play in maximising animal health and performance in intensive livestock systems.

"Traditionally, good nutrition, genetics and immunity have been regarded as the three 'levers' of health and performance," he says.

"The provision of high quality feed and the ability to withstand disease allows animals to perform to their full genetic potential.

"Biofilms could become the fourth lever by reducing the level of pathogens in the environment at the beginning of the production cycle, when the immune system of young animals is not fully developed."

Alex says farm building surfaces quickly become colonised by potentially-pathogenic – and often resistant – bacteria during the production cycle.

"While regular cleaning and disinfection of building surfaces helps to control these undesirable microorganisms, it is impossible for them to maintain a sterile environment," he says.

"Microorganisms in the air, dust and litter quickly colonise the surfaces, providing a ready source of infective material for livestock to inhale or ingest.

"Creating a positive biofilm offers a natural and sustainable way to reduce the concentration of these pathogens in livestock housing, thereby reducing the incidence and persistence of disease challenge.

"Down the track, we believe that positive biofilms will have an important role to play in integrated programs to reduce antibiotic usage and manage resistance."

LALFILM PRO is a water-dispersible powder that is diluted and then applied as a low pressure spray onto farm building surfaces.

It should be applied 24 to 48 hours after disinfection and 12 hours before the entry of livestock to allow sufficient time for a positive biofilm to develop.

Alex says the strain-specific bacteria in LALFILM PRO have been carefully selected for their ability to rapidly form a biofilm and produce lactic acid.

"This means that the film will adhere to farm building surfaces," he says.

"The second benefit is that a low pH environment is incompatible with the development of most of the undesirable microorganisms associated with livestock production."

Trials conducted in Europe have shown an integrated hygiene management system, comprising cleaning, disinfection and the creation of a positive biofilm, can significantly reduce the incidence of disease in intensive livestock production facilities.

A trial conducted on a commercial pig farm in France in 2017 examined the effect of LALFILM PRO on microbial ecosystems on farm building surfaces and piglet health and performance.

In this trial, which involved 2,318 piglets over three consecutive batches, the application of LALFILM PRO to the walls and floors of farm buildings after cleaning and disinfecting but before the animals entered the building, resulted in:

- The formation of a positive microbial environment on building surfaces;
- The significant reduction of development of undesirable bacteria (e.g. *Streptococci*, *coliforms*) in the environment; and
- A significant reduction in piglet losses (0.43% treatment vs 1.46% control, $P=0.016$).

Animal production performance and quality depends to a large extent on the quality of the feed and the animals' genetic potential. However, the quality of their environment also affects their performance, especially when the young animals' immune system is not fully developed at the beginning of the production period.

These results show the application of LALFILM PRO is an effective tool to complement the cleaning and disinfection processes. It helps create a safer microbial environment before animals enter the building and thus contributes to the maintenance of the environmental conditions.



H O L I D A Y O R D E R S

Ensure orders are placed before Thursday 13th December for delivery by Christmas. The office will be closed from **Friday 21 December**, and will remain closed until **Wednesday, 2 January**.

RUMINATION COULD BE SUBOPTIMAL IN 2 OUT OF 3 DAIRY FARMS, IMPACTING DAIRY PERFORMANCE



(Source: Lallemand REI survey, internal data 2017)

An international survey conducted by Lallemand Animal Nutrition using internal Rumen Efficiency Investigation (REI) software showed poor rumination is a threat to dairy performance.

"Rumination activity is linked to rumen function and health. It has been shown that a lack of ruminating activity may be due to reduced rumen motility during acidosis. Research tells us that optimal rumination is between 400 to 500 min/day, which is a positive sign of rumen function. Under 400 min/day could be a sign of poor rumen health and probably Subacute Ruminant Acidosis (SARA)," explains Aurélien Piron, Ruminant Technical Manager at Lallemand Animal Nutrition.

"A rapid way to assess rumination activity on the farm is to look at the cows that are laying in the stalls: 50 to 60% of them should be ruminating at any given time."

Rumination is one of the indicators defined as part of the REI audit program designed to help assessing feed efficiency in farms through the appraisal of rumen efficiency. In total, eight indicators have been defined, and the complete audit enables producers to understand the rumen efficiency of their herd at a given point in time.

Aurélien commented: "These audits can

really help producers understand the link between animal signs and dairy performance. At the farm level, it is a great tool to assist the technician or nutritionist in decision making. Ration formulation, especially fibre content, should take into account the link between fibre size and ruminating activity as well as performance."

Thanks to the REI program, a global rumen efficiency survey was conducted, showing that, in as many as 69% of farms audited, rumination is suboptimal.

Consequently, dairy production is affected, and the survey showed that, in 51% of farms, milk fat levels were also suboptimal, with direct consequences on milk prices.

On-farm audits and published trials with the live yeast *Saccharomyces cerevisiae* CNCM I-1077 (LEVUCCELL SC) show the supplement's benefits on rumination and overall rumen efficiency. For example, in an audit conducted on a Japanese dairy farm, the percentage of ruminating cows increased from 49 to 58% during the 3-month trial (Lallemand internal data). This has been confirmed by university trials using rumination monitoring collars.

In one study, the amount of time each day spent chewing increased by 5% with the probiotic yeast compared to the control

group¹.

S. cerevisiae CNCM I-1077 works by improving the overall rumen environment and function through the control of rumen pH.

Animal performance also is improved through enhanced fibre degradation. In standard conditions (non-stressful), a meta-analysis of LEVUCCELL SC data (14 trials, 1,600 dairy cows) has shown a consistent and significant improvement of feed efficiency (+3% in FCM/DMI)². FCM/DMI can increase 6 to 9% under stressful conditions.

To learn more about the REI tool and the global rumen efficiency survey, download our technical paper: "About half of dairy farms show suboptimal rumen efficiency" on the Lallemand Animal Nutrition website.

1. DeVries T. J. and Chevaux E., 2014. Modification of the feeding behavior of dairy cows through live yeast supplementation. *J. Dairy Sci.* 97:6499–6510

2. de Ondarza M. B., Sniffen C. J., Dussert L., Chevaux E., Sullivan J., and Walker N., 2010. Multiple-Study Analysis of the Effect of Live Yeast on Milk Yield, Milk Component Content and Yield, and Feed Efficiency. *The Professional Animal Scientist* 26:661–666



GROWING or contract growing your own fodder may present a better long-term solution for many livestock producers.

Lallemand's Toowoomba-based Technical Services Manager, Trevor Schoorl, says the current drought is a compelling reason for beef producers to reconsider their dry season feeding strategies.

"Talking about how to prepare for dry times during a drought might seem insensitive – but now is exactly the right time for producers to consider how they might be able to change their management system," he says.

"Attempting to source feed when it's dry is never the best strategy because everyone is facing the same problem.

"Demand quickly outstrips supply, prices go through the roof and the quality of the remaining resource becomes variable and often geographically unfeasible to transport."

According to Trevor, one solution is to consider producing your own silage.

"A lot of extensive livestock producers think that feeding silage is purely in the domain of feedlots or large dairies, or producers who have access to their own cropping programs," he says.

"Nothing could be further from the truth.

"Silage made from irrigated or dryland crops forms the backbone of hundreds of feeding systems in dairy and beef enterprises throughout Australia."

"Some producers are using baled silage, some are using stacked silage and some are using pits.

"It really comes down to whatever is easiest for the customer and what facilities and equipment they have."

"Some of our customers use silage to maximise the performance of their breeding herd or to preserve their precious genetic base during bad years without destocking," he says.

"Some are using silage in their weaning programs to make sure heifers and mature breeders achieve critical mating weights

and body condition scores, respectively, which can have a positive impact on the lifelong profitability of your herd.

"Many beef producers are increasingly using silage in their backgrounding or finishing programs to make sure their steers achieve market specifications and leave the property on time.

"Alternatively, it can be put away and used as a drought management strategy.

"The beauty of silage is that, produced and stored correctly, it can last indefinitely until you need it.

"Although the majority of silage produced nowadays is consumed within 12 months, many people forget that silage can be stored for 10, 20 or even 30 years."

Most silage in northern part of Australia is produced using irrigated corn or dryland sorghum crops.

"Don't forget that silage can also be produced from conventional grain sorghum or winter cereals," Trevor added.

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Lallemand Animal Nutrition has acquired the distribution rights for the smaXtec cow monitoring system.

The technology, which provides highly accurate, real-time monitoring of cow health and fertility, is being used extensively in Europe since being introduced to the market several years ago.

Mike Ryan from Eagle Direct, the manufacturer's former distributor, is continuing to work with Lallemand to support new and existing customers.

Lallemand Animal Nutrition Managing Director, Alex Turney, says smaXtec saves time, money and work by monitoring body temperature, animal activity, water intake and rumen pH around the clock.

This information can then be used to accurately predict a range of parameters, including heat, calving and metabolic challenge.

"Better heat detection can improve conception rates and reduce the number of days open," Alex says.

"Likewise, the early notification of calving enables managers and staff to put all relevant measures into place.

"There is a strong correlation between water and feed uptake, which means any irregularities can be detected right away.

"Tracking body temperature also allows health problems, such as infections or heat stress, to be detected early before they become major problems."

SmaXtec is continuing to develop new algorithms to interpret collected data according to individual farm management strategies, different climates and specific illnesses.

The heart of the smaXtec system is a

100 mm rumen bolus, which is administered to cows orally.

Collected data is transferred to a base station via a series of repeaters throughout the farm, and then to the smaXtec Cloud database.

The dashboard, which can be accessed using a smartphones, tablet or office computer, provides a clear and precise overview of the health and performance of your herd.

"The Task List menu allows you to see which animals need attention and what actions need to be taken," Alex says.

"The Reproduction Status menu provides an overview of the current fertility status of the herd.

"The Health Status provides all the information about animals requiring attention.

"This data can be shared with farm staff, advisors, veterinarians, nutritionists or service providers at any time of the day or week."

"All data is clearly assigned to a specific animal and saved."

Automatic alerts and recommended actions can also be sent via any nominated messenger service.

Alex recommends that about 10 percent of cows are fitted with the smaXtec Premium Bolus, which also measures rumen pH.

"This amazing technology allows you to detect metabolic challenge caused by real-time variations in feed intake or quality so you can take measures to protect the health of your cows," he says.

"We believe this technology has enormous potential in monitoring metabolic change in feedlot cattle."

The cost of the smaXtec system will depend on herd size and the number of transmission devices required to achieve adequate coverage.

"This is a robust, 'plug-and-play' system that is extremely easy to set up and use," Alex says.

"It's important to note that this system is designed to grow as your herd or property size increases."



Carl and Rachelle Moon from Carrell Holsteins, Numurkah, Victoria, adopted the smaXtec system in their 150 cow herd in 2016 as a means of improving conception rates in their AI program.

"Getting more heifers in calf is important because it maximises our investment in genetic improvement and the cost of rearing calves," Carl says.

"This system allows us to see what's happening in our cows, even if we're off-farm.

"It's so simple – the animal tells us when it's on heat or under stress and sends us an alert to our phone or office computer so we can take the appropriate action."

"It picks up the 'softs heats' that we would otherwise miss in the middle of the night.

Carl says the system is extremely 'farmer-friendly'.

"Once it's set up, it's very simple to use and there is zero maintenance," he says.

"The app on our phone gives us access all the basic information we need, quickly and easily.

"Once a task is complete, I just tick the box on my phone and it updates the cow's profile and the whole system."

IMPROVING THE IMMUNE FUNCTION IN FISH



Researchers from Lallemand Animal Nutrition presented five scientific papers at the world's leading aquaculture conference, AQUA 2018, which was held recently at Montpellier in southern France.

Lallemand is developing a range of 'functional feed ingredients' that support the physical, immunological and microbial components of the mucosal surfaces in farmed fish. These innovative products are showing great promise in improving the fish health

and welfare, thereby improving the performance of modern aquaculture production systems.

Mucosal surfaces, which are the fish's first line of defence against disease, are constantly exposed to a range of biological, chemical or physical challenges during the production cycle.

One study, conducted in partnership with the University of Plymouth in the UK, used genomic technology to follow the expression of 62 targeted genes implicated in cell-mediated and humoral immunity.

This innovative approach will allow scientists to better understand the effect of multi-strain yeast fractions and probiotics on bacteria binding, immune modulation and mucous secretion in a number of aquatic species.

Three other studies demonstrated that a single-strain yeast fraction developed by Lallemand Animal Nutrition can protect

the mucosal barrier in salmon, rainbow trout and juvenile gilthead.

The final presentation examined the benefits of melon pulp concentrate, which contains high concentrations of the naturally-occurring antioxidant enzyme, superoxide dismutase (SOD), upon the capacity of mucosal tissues to fight against oxidative stress in Atlantic salmon.

Hydrogen peroxide baths are frequently used to treat sea lice and amoebic gill disease in salmon. However, this powerful oxidizer can also damage the mucosal barrier in fish.

This study found that supplementation with the SOD-rich melon pulp concentrate for several weeks can enhance the antioxidant defences of salmon when subjected to hydrogen peroxide treatment.

TAX AND DROUGHT ASSISTANCE CHECKLIST



Livestock producers can immediately deduct costs associated with the purchase of fodder storage assets, such as silos, hay sheds, grain storage sheds and above-ground silage bunkers, rather than having to depreciate it over three years.

Unlike the \$20,000 immediate asset write-off already available for small businesses, there is no cap on the cost of these assets. These new rules apply to eligible assets purchased or installed after 19 August 2018.

Here's a round-up of other assistance programs that might be useful to you:

- The Victorian Government's On-Farm Drought Infrastructure Support Grants program provides up to \$5,000 (+GST) on a dollar-for-a-dollar basis for the implementation of on-farm infrastructure that improves drought preparedness and management. Eligible infrastructure includes stockyards, watering systems, irrigation systems, grain and fodder

storage, farm monitoring technology and feeding system upgrades. Contact Rural Finance on 1800 260 425.

- The NSW Government is offering a subsidy of up to \$30,000 over the 18-month period of 1 January 2018 to 30 June 2019. The subsidy can be applied towards the cost of transporting fodder, or water to a property for stock or domestic use, stock to and from agistment and stock to sale or slaughter. The subsidy covers 50% of the full cost of freight up to a maximum of \$5 per kilometre and 1,500 kilometres per journey. Contact the NSW Rural Assistance Authority on 1800 678 593.
- The Queensland Department of Agriculture and Fisheries Drought Relief Assistance Scheme provides freight subsidies for the transport of fodder, water and livestock and the

Emergency Water Infrastructure Rebate. Contact them on 13 25 23.

- The South Australian Guide for Drought Assistance contains information about funding and assistance available for farmers, families and communities affected by drought. Visit pir.sa.gov.au.

- PIRSA also runs a dedicated 24-hour agriculture, animal health and welfare hotline on 1800 255 556. Animal Health Officers can provide advice and support related to animal health and welfare concerns during dry conditions, as well as livestock transport requirements and biosecurity requirements, such as requesting commodity declarations when buying in feed sources.

- The National Farmers' Federation (NFF) has compiled a list of Federal, State and private initiatives providing support for livestock fodder, everyday living expenses and access to financial and health services. Visit farmers.org.au

Of course, with any change to the taxation landscape it is always important to consult your independent tax professional to see how your business may be impacted.

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Lallemand Animal Nutrition Technical Services Manager, Trevor Schoorl, has been sharing his extensive knowledge about silage production, ruminant nutrition, large dairy herd management and in-feed microbials with his Chinese counterparts.

Trevor has visited China regularly since 2004 and more recently, two or three times a year, to provide technical support and training programs for Lallemand staff, distributors and key customers. "It's hard to earn respect in China – they've seen lots of companies come and go over the years," he says.

"That's why we've kept going back. We have sent over agronomists to show them how to grow their crops, contractors to show them how to set up their foragers and brought in technical experts from the US as needed. Lallemand is now seen as the innovators, the 'go-to' people for silage production in China."

Lallemand Animal Nutrition has had a full-time presence in China since 2012 and now employs eight full-time staff. "My job is to make sure everyone understands the key steps in making quality silage, including inoculant selection and sealing systems," Trevor says.

"The local team is now pretty much running the program. They have some good people on the ground. If you give them a recipe and a plan, they follow it, exactly. The only thing they lack is the same depth of experience, which is where I fit in."

China's estimated dairy population of about 12 million dairy cows produces about 36 million tonnes of milk a year. "Yes, there are thousands of hand-milked, 20-cow herds but the industry is rapidly consolidating

into large-scale operations," Trevor says.

"The smallest herd we're working with has 1000 cows and the largest has 10,000 cows. One of our customers is a processor that milks 300,000 cows across 30 herds. These farms are the future of the Chinese dairy industry and they know what they are doing.

"There have been a dramatic improvement in genetics, nutrition and management over the past 15 years. Some herds are achieving an average production of more than 10,000 litres.

"Traditionally, large herds in China implemented North American production systems exactly. When they started, they were focussed almost entirely on feeding corn silage, imported lucerne hay, imported cottonseed meal and imported soybean meal.

"That's fine if you have strong milk prices. Now they are looking to substitute more home-grown fodder. There has also been a big shift towards the adoption of lucerne, cereal and high moisture corn silage.

"We have focussed on improving the quality of corn silage. Corn remains the biggest component of the final feed, so any change to the quality of this component is going to have the biggest impact on production."

Graduating from Gatton Agricultural College in the early 90's, Trevor spent more than decade working in large dairies in USA and the Dominican Republic. In 2004, he returned to Australia to become Technical Services Manager with Quality Silage Systems, and has been working with Lallemand Animal Nutrition's products ever since.



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