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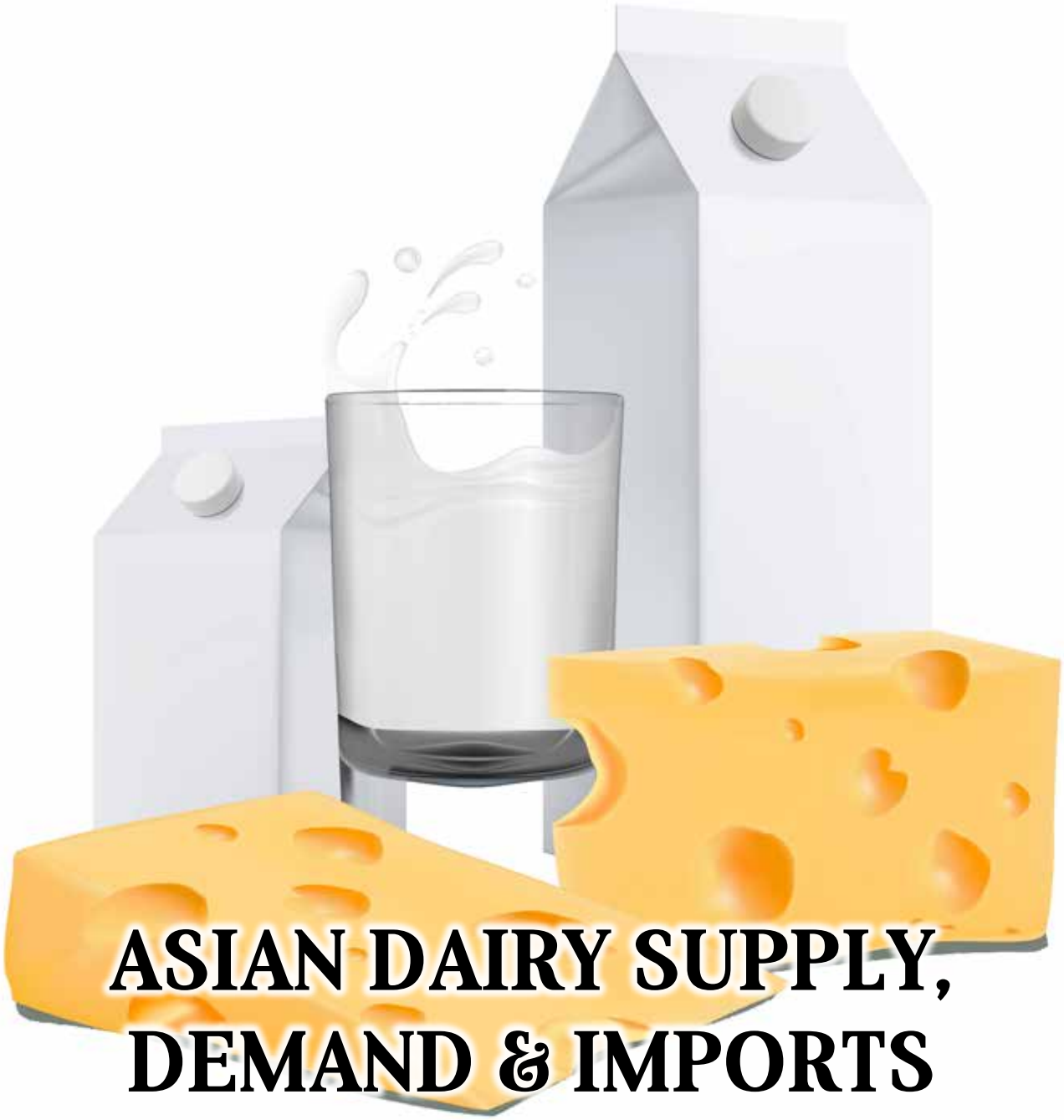
OCTOBER-DECEMBER 2018



ASIAN DAIRY SUPPLY, DEMAND & IMPORTS

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From The Web

LATEST

Revised US-Canada trade deal a bad news for Canadian dairy

The US and Canada finally agreed to an updated trade agreement, which would give US dairy farmers a 3.6% access to the Canadian dairy market - a development not welcomed by Canadian farmers.

Chr. Hansen acquires dairy ingredient supplier Hundsbichler

Chr. Hansen has bought over assets of an Austrian-based ingredient supplier, a move that will further expand its enzyme production into the traditional segments of specialty cheeses.

eFeedLink.com

EU-funded project aims to create non-antibiotic solution for lactating cows

The project aims to develop a non-antibiotic antimicrobial technology, which has been found to be effective against all tested microorganisms.

New Zealand company develops device that detects dairy processing losses

Lincoln Agritech Ltd had developed a new device - known as Milk-Guard - that could potentially save the dairy industry millions of dollars a year and help prevent pollutants from entering waterways.

Metabolic disorders in transition period indicate dairy cows' ability to adapt is overstressed

Research author A. Sundrum suggested that "Both farm management and agricultural sciences should support animals in their ability to cope with nutritional and metabolic challenges by employing a functional and result-driven approach."

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ASIAN DAIRY SUPPLY, DEMAND AND IMPORTS

Asian dairy is sharply divided by product and region. China and Southeast Asia drive world dairy imports of value-added goods. South Asia is a large stand-alone market that will import capital goods in place of dairy products.

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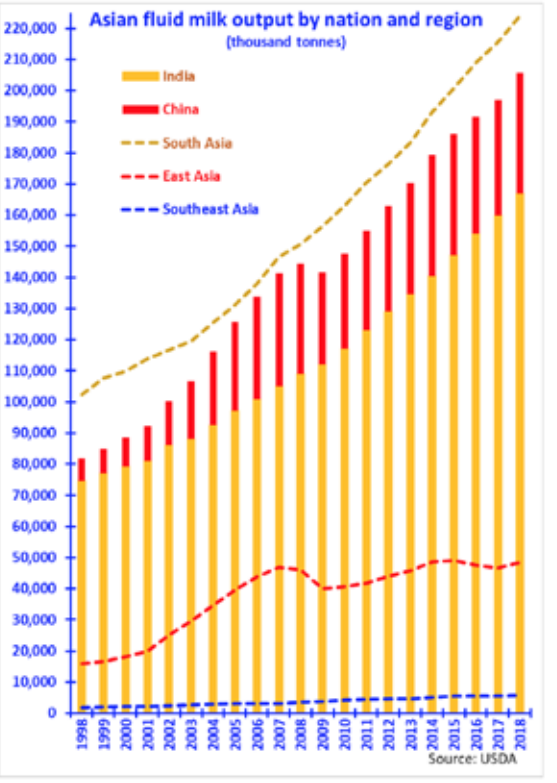
Consuming an FAO estimated 300 million tonnes of dairy products today, Asia is the world's fastest growing dairy market and is expected to grow to 320 million tonnes by 2021, with much of this consumption imported. At the same time, whether measured in aggregate volume or value-added terms, Asian dairy production and consumption are highly diverse.



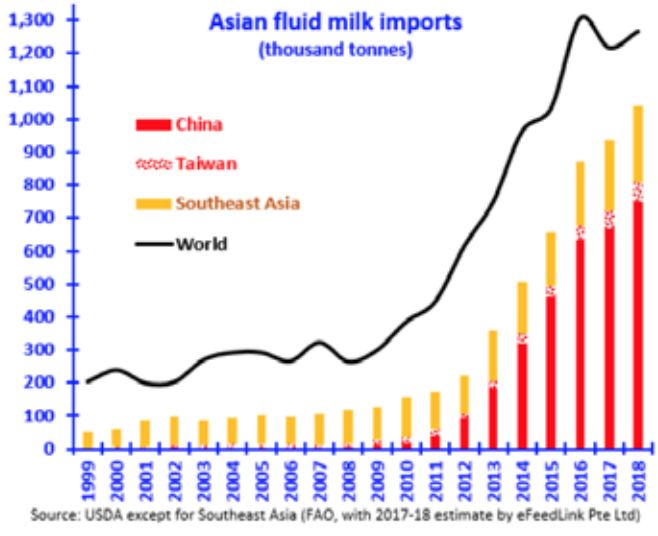
Producing a world-leading 165 million tonnes of fluid milk this year and self-sufficient in dairy goods, India singlehandedly accounts for half of Asian dairy demand, with China making up another 13%. While the Indian subcontinent appears to dominate dairy supply and consumption volumes, an entirely different picture emerges when value-added revenue, product differentiation and world market integration are taken into account.

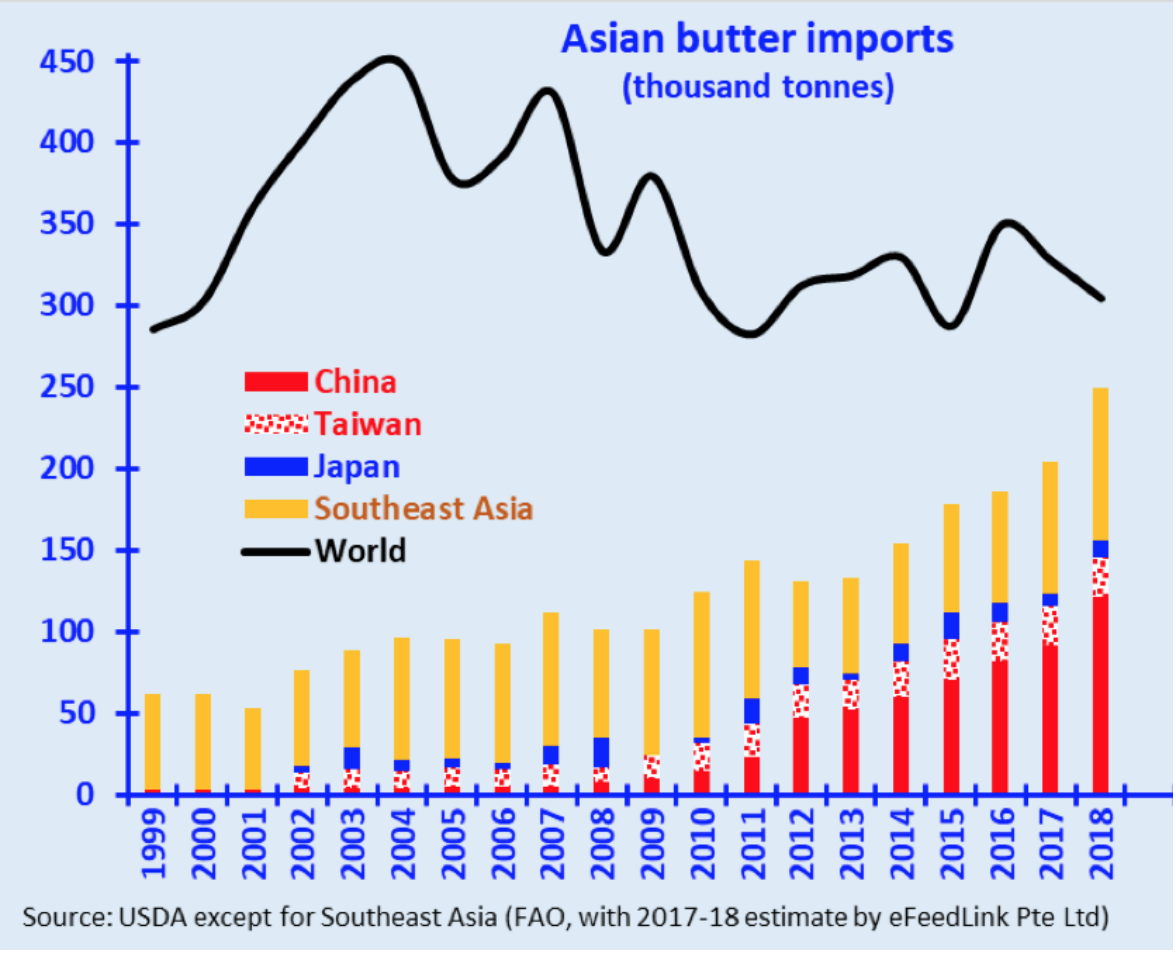
Across Asia, dairy consumption varies as widely as culture and income levels. Low income and with unreliable official statistics, Cambodian and Laotian per capita dairy consumption is estimated somewhere between 2kg and 5kg in milk equivalent (ME) terms. Further along the economic development curve, Indonesians consume 10.3kg ME in dairy products.

Due to their higher incomes, government-sponsored milk drinking campaigns and historical contact with western milk drinking traditions Vietnam (15kg ME) and the Philippines (17.9kg ME) have higher per capita consumption. While China (23.2kg ME) was able to leverage rapid income growth into a higher per capita income and milk consumption levels than what is found in Southeast Asia, it still trails that of developed Asian nations such as Japan (66.1kg ME) and South Korea (63.2kg ME).

Superficially, India (53.3kg) gives the impression of being an exception to the rule: A developing country with a fraction of China's per capita income but a per capita dairy consumption level closest to that of wealthy Japan or South Korea.

In truth, 49.3kg or 91.4% of Indian dairy consumption is accounted for by fluid milk alone. That means that Indians only consume 4.6kg of processed dairy goods annually, of which 4.03kg or 88% is accounted for by butter. By comparison, 55% or 12.7kg per capita of China's annual dairy consumption consists of processed dairy goods. Hence, while dairy





Source: USDA except for Southeast Asia (FAO, with 2017-18 estimate by eFeedLink Pte Ltd)

consumption is not part of traditional Chinese culture and they consume less in aggregate terms, on a product or value-added basis, China is a more important market than India.

It also means that the 3.2 billion people in India, China and Southeast Asia must multiply their overall consumption of dairy goods by several times over the next few decades to achieve consumption levels taken for granted in Japan and South Korea, whose own per capita consumption continues to grow. Even then, they would be consuming only a fraction of the 250kg to 300kg ME of per capita dairy product consumption taken for granted in Europe and North America.

Alongside the inevitability of population growth and multiplying per capita consumption, high population densities and a lack of arable land constrain Asia Pacific dairy supplies. Unsurprisingly, Asian fluid milk production cannot keep up with demand, thereby causing this region to account for a large and ever-growing share of world dairy imports.

On one hand, depending on the developing Asian country in question, demand for everything from commodity milk powders to high-value whey, butter, yogurt, and cheeses rises by anywhere from 4% to 10% annually. On the other hand, the USDA reports that in 2017, Asian fluid milk production only increased by 1.9%. A 3.8% increase in Indian fluid milk production (which barely kept up with dairy processing demand) was offset by flat or falling East Asian production. China, which accounts for approximately 80% of East Asian fluid milk output, produced only 1.7% more milk in 2017 than it did in 2007.

>>>

While imports are growing aggressively across Asia Pacific, the type of dairy goods experiencing rapid growth and their quantity of import varies greatly across this diverse continent. Japan and South Korea, which dominated Asian dairy imports twenty years ago, have been reduced to a minority of the region's imports for most product lines. China and Southeast Asia have eclipsed them in market importance while importing products which wealthier East Asian nations never did.

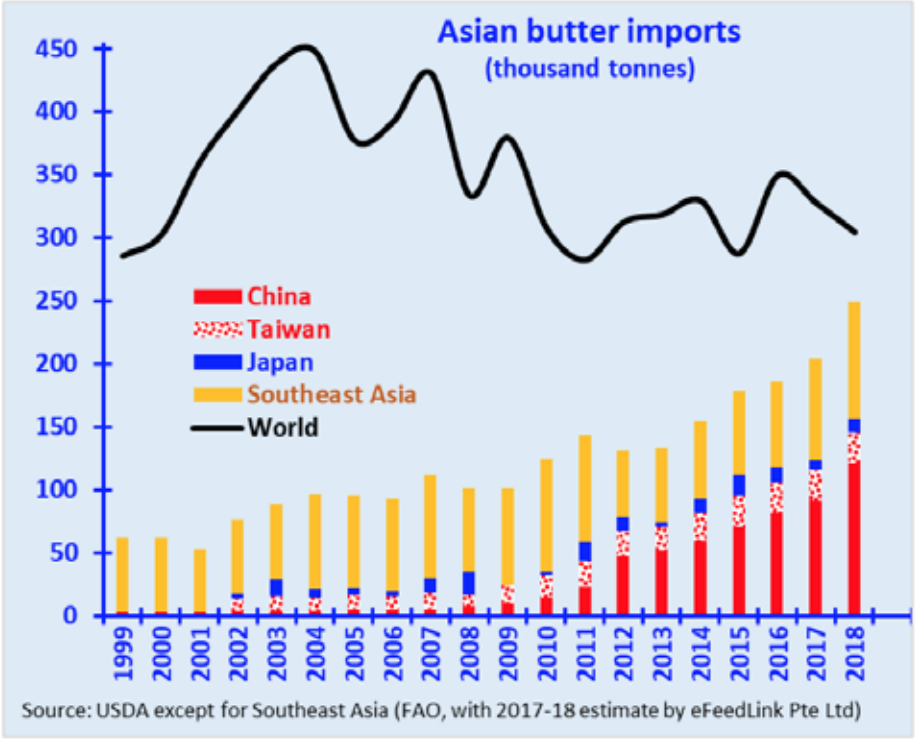
For example, whereas Japan and South Korea are self-sufficient in milk, China's fluid milk imports rose from a few thousand tonnes twenty years ago to 13,000 tonnes in 2009, the year after the melamine contamination scandal broke. This grew to 320,000 tonnes by 2014 and a USDA projected 750,000 tonnes this year.

Even more short of dairy feed inputs than China, Southeast Asia's fluid milk imports experienced similar, though slightly more subdued growth. From an FAO estimated 57,000 tonnes in 2000 to 157,000 tonnes in 2014, when the world dairy market peaked. They then continued to grow to an FAO estimated 194,000 tonnes in 2016 and over 230,000 tonnes this year. Hence, from around 25% of world dairy imports in 2000, China and Southeast Asia will buy around three-quarters of the world's 2018 fluid milk imports.

The past two decades have seen China and Southeast Asia achieve a similar, though segmented dominance over milk powder imports. China's WMP imports skyrocketed from 51,000 tonnes in 2000 to 671,000 tonnes in 2014, before slumping back to 347,000 tonnes a year later. China's 500,000 tonnes 2018 import volume is below its pre-crash record. Even so, its share of world WMP imports has jumped from 8% in 2000 to nearly 47% this year and is expected to exceed 50% before 2020.

Similarly, Southeast Asia has gone from importing an FAO estimated 375,000 tonnes of SMP in 1999 to 683,000 tonnes in 2016 and an estimated 733,000 tonnes this year. It now accounts for over half of world SMP purchases.

Whereas WMP and SMP drove Asia's dairy trade prior to 2014, the past five years have seen Asia's imports of these lower end dairy commodities level off. This is particularly true of WMP, where faltering Chinese demand has seen world imports fall from 1.21 million tonnes in 2014 to 1.05 million tonnes this year. SMP fared better, growing by 20.6% from 1.178 million tonnes in 20154 to 1.421 million tonnes in 2018, as Chinese demand rebounded to previous levels and Southeast Asian imports kept growing. Even so, it was slower than the 35% growth in world SMP imports during the previous four years.



Source: USDA except for Southeast Asia (FAO, with 2017-18 estimate by eFeedLink Pte Ltd)

On the other hand, world fluid milk imports went from rising barely 1.2% annually from 2000 (238,000 tonnes) to 2008 (263,000 tonnes) to rising 381% over the past ten years, to a USDA estimated 1.267 million tonnes in 2018. Here

too, the story is driven by China and Southeast Asia.

ASEAN fluid milk imports roughly double every ten years, from 57,000 tonnes in 2000 to 102,000 in 2008 to 231,000 tonnes this year. China's thirst for imported milk grew even more rapidly, from under 10,000 tonnes in the early 2000s to 16,000 tonnes by 2010 and a USDA estimated 750,000 tonnes in 2018.

Chinese and Southeast Asian thirst for foreign milk was only rivaled by its demand for fattier, processed dairy goods. From 33% of world cheese imports in 1999, China, Taiwan, Japan, South Korea and Southeast Asia will account for 57.5% this year. But unlike fluid milk or milk powder, China and Southeast Asia do not dominate world cheese markets in the same way or to the same extent.

East Asia is becoming world dairy's most important export destination, particularly for fluid milk and fatty, high end dairy goods.

Since the late 2000s, China and Southeast Asia did not "catch up" to the rapid cheese import growth already underway in Japan and South Korea. Despite having only a tenth of China's population, Japan still imports twice as much cheese and will continue importing more until at least around 2030.

Similarly, Southeast Asia's 600 million people import as much cheese as South Korea's 50 million people but did not overtake it. Both imported a little over 30,000 tonnes of cheese in 2000. By 2010, South Korea was importing 61,000 tonnes of cheese annually; Southeast Asia 41,000 tonnes.

In this decade, lower income Asian countries' import demand for fattier high-end dairy goods took off. Whereas South Korean cheese import volumes will have doubled in eight years to 125,000 tonnes, Southeast Asia's foreign cheese purchases will have tripled, to 120,000 tonnes.

But the greatest cheese import growth is in fast food crazy China. It went from importing under 5,000 tonnes of cheese in 2000 and a little over 30,000 tonnes in 2011 to 108,000 tonnes in 2017 and a projected 140,000 tonnes this year.

Perhaps the most interesting symptom of rising Asian influence however, is in the world market for butter. On one hand, at 305,000 tonnes, the USDA's estimate for world butter imports is barely higher than the 303,000 tonnes shipped in 2000. On the other hand, Southeast Asian butter imports rose 59%, from 59,000 tonnes in 2000 to 94,000 tonnes this year.

China's butter import volume rose even more impressively from under 10,000 tonnes in 2008 to an FAO estimated 82,000 tonnes in 2016 and a projected 140,000 tonnes this year. Along the way, the share of world butter imports accounted for by China, Taiwan, Japan, South Korea and Southeast Asia increased from 24% in 2006 to 53% in 2016.

From all this, we can see some very definite patterns. South Asia currently functions as a stand-alone dairy market whose higher consumption and supply self-sufficiency is offset by significantly lower value-added content. Going forward, it is possible for India to maintain dairy self-sufficiency even for high-end goods. Even so, it will have to substitute the importation of dairy farming capital goods and cattle genetics if long-term supply is to keep up with demand.

With China acting as a locomotive, East Asia is becoming the world dairy trade's most important export destination, particularly for fluid milk and fatty, high end dairy goods. With fewer productivity gains to be reaped, we can expect Chinese and Southeast dairy production to rise at respectable, world-leading rates –but not nearly as quickly as their taste for high-end dairy goods from Europe, Australia, New Zealand and America.

- ERIC J. BROOKS

Rory Macleod, managing director of Freedom Foods Group.

BETTER AUSTRALIA-CHINA TIES WILL SUPPORT MILK EXPORTS, SAYS DAIRY GROUP DIRECTOR

China looks ready to cut down restrictions that hinder imports, but Australia should also seek to improve relations with the Chinese government, the managing director of food and dairy group Freedom Foods Group told The Australian Financial Review.

Such an engagement, according to Rory Macleod, would support increased sales of the country's dairy, cereals and other products to China due to friendlier Chinese policies for imports.

"Fundamentally, we may have lost a bit of that personal relationship into government. The thing Australia has to recognise is government-to-government is fundamental in China. Here, government pervades all life and it is important the two are in lockstep," Macleod commented. He also said that government officials appear willing to enhance trade between both countries.

While Macleod is optimistic about getting products into China following recent conversations, he believes its strained relationship with Australia may have delayed approval for Freedom Foods to bring milk into the Chinese market. He claimed that the company had been waiting for a year to obtain a license that permits the delivery of milk from its plant in Ingleburn, New South Wales.

However, Macleod thinks there would not be further, long-term delays in the export registration accreditation, given China's interest to promote quality products from overseas.

There is also a significant demand among Chinese middle classes for reputable Australian dairy products. This is especially true as Chinese consumers are more inclined to buy milk from outside China, while the government cracks down on fake products.

Yet, even with a breakthrough in China-Australia trade, regulatory risks would be a key challenge in the Chinese market, Macleod admitted.

For now, he foresees growth in China's "tier 3" and "tier 4" cities where consumers are less confident about local food safety and making online purchases, compared to urbanites in major cities like Beijing and Shanghai.

Meanwhile, Freedom Foods, Macleod said, is expanding into new Chinese cities, and intends to place its products in more than a thousand stores by the end of 2018.

The Australian Financial Review pointed out that the company has the biggest imported children's milk brand in China.

Furthermore, Freedom Foods had established a joint venture with Shenzhen-based JiaLiLe Food, which is linked to the sales of the former's Australia's Own products in the country.

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EVALUATION OF DRY DISINFECTANT STALOSAN F ON COMMERCIAL DAIRY COWS IN TRAKYA, TURKEY

Dairy cattle at commercial farms in the Trakya region of Turkey often face high somatic cell counts related to subclinical mastitis. In addition, hypocalcaemia is identified as the most common metabolic disorder.

To mitigate these problems, it is important to research alternate solutions which can be feasibly applied under local conditions. In relation to that aspect, maintaining dry bedding area and reducing pathogen load may be accepted as effective methods.

In this study, the effects of Stalosan F (a dry broad spectrum disinfectant effective against bacteria, fungi, viruses, fly larvae and coccidia) on somatic cell count, calf diarrhoea and cow locomotion score were investigated.

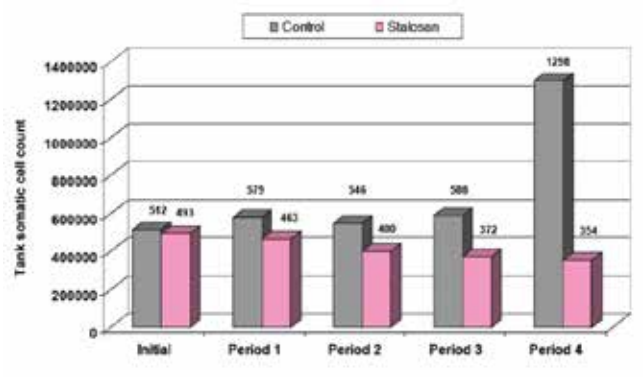


Figure 1: Tank SCC over a trial period of 28 days (x1000)

Trial design and procedure

Experiments were conducted at two commercial dairy farms, namely, Doğamar Farm which has a 1,000-head capacity, and Ertan Farm with a 3,500-head capacity.

For Doğamar farm, Stalosan was applied on beds with the use of a spreader.

To determine somatic cell count (SCC), milk samples were taken from the tank five times at seven-day intervals and analysed using a De Laval SCC device.

Mammary heat patterns or temperature changes were measured on 40 cows for each group using Fluke thermal imagers (model Ti20). Images were then loaded to a computer and analysed with a SmartView 3.1.89 Insight packet programme.

Stalosan application on a calf pen.

After Stalosan application, teats surface did not come into contact with wet materials.

Trial Results

After Stalosan application, teats surface did not come into contact with wet materials. For Ertan farm, Stalosan F was applied to stalls, a manure alley and the area for drinking water supply on day 1, 2, 3, 10, 17, 24 and 31 at 50 g/m2.

To determine somatic cell count (SCC), milk samples were taken from the tank five times at seven-day intervals and analysed using a De Laval SCC device.

Mammary heat patterns or temperature changes were measured on 40 cows for each group using Fluke thermal imagers (model Ti20). Images were then loaded to a computer and analysed with a SmartView 3.1.89 Insight packet programme.

Doğamar Farm

The application of Stalosan helped reduce the SCC by 47.22% for the 28-day trial. An application of Stalosan over 30 days had also helped slash the locomotion score by 0.60 in the Stalosan group.

In comparison, the locomotion score had a tendency to increase in the control group. In addition, Stalosan was observed to have reduced the severity of diarrhoea in some cases. Average faecal fluidity scores for Stalosan F-treated calves decreased until the end of the trial by 21.15%.

Ertan Farm

The SCC decreased significantly in the treatment groups. The most significant decrease was seen in the S+V group.

At the end of the four weeks, a milk pH value (a parameter that indicates the incidence of mastitis), which is close to ideal limits, was seen in the Stalosan and S+V groups.

It was observed that cows in the three treatment groups produced more milk than the control group. Among the treatment groups, the average daily milk per cow was the highest in the final trial period of the S+V group.

To determine the effects of treatments on mammary health, thermal images were taken during the trial's initial and final periods, which focused on the mammary gland. The rate of decrease in mammary gland temperatures was higher in the Stalosan and S+V groups.

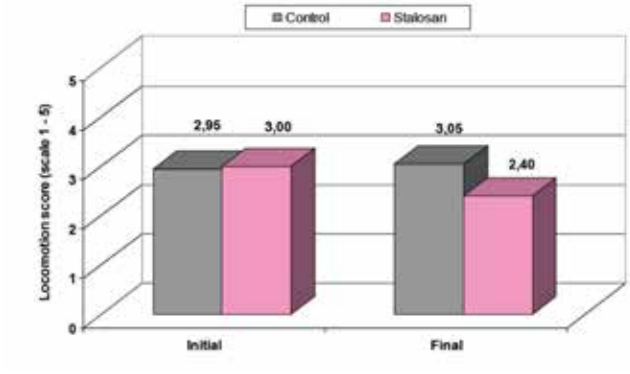


Figure 2: Locomotion scores over trial period of 30 days

The hooves of cows (Stalosan group) were covered with powder and did not come into much contact with manure and wet surface.

Conclusion

The results showed that Stalosan F helps to mitigate hoof and mastitis problems. Cows were also observed to have spent more time in front of the feed alley.

Furthermore, Stalosan F is proven to have a positive effect on calf health, as well as reducing the frequency and severity of diarrhoea.

- VILOFOSS

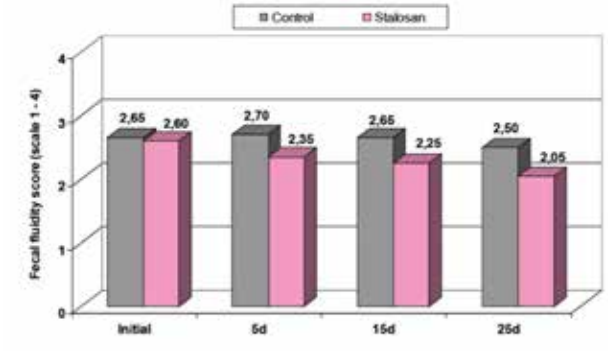


Figure 3: Faecal fluidity scores of the calves over the trial period

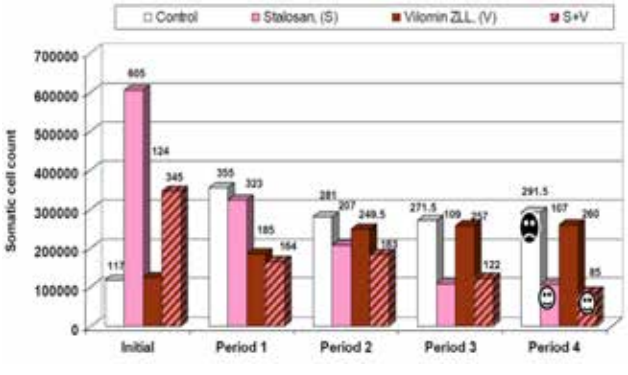


Figure 4: SCC during trial period. Note: Vilomin ZLL is an immunity stimulating product.

The rate of decrease in mammary gland temperatures was higher in the Stalosan cattle group.

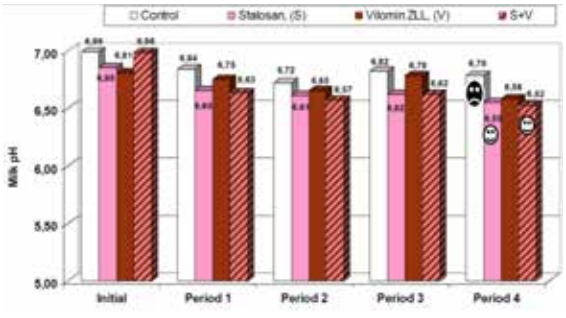


Figure 5: Milk pH during trial period

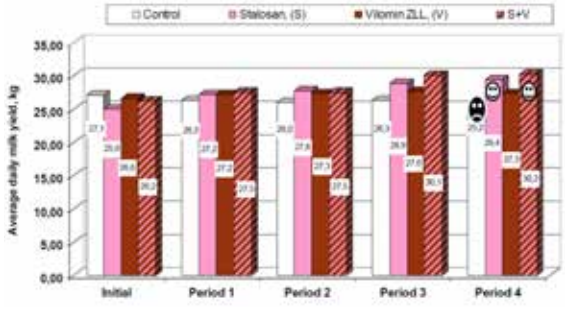


Figure 6: Average daily milk yield during trial period

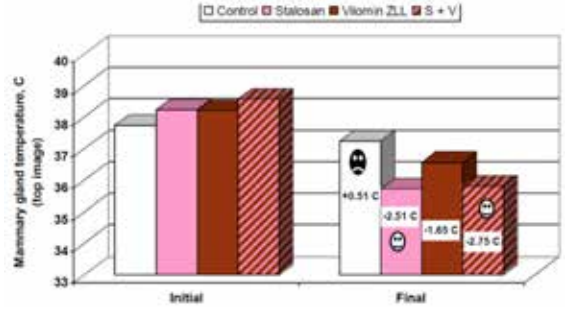


Figure 7: Mammary gland temperature during trial period.

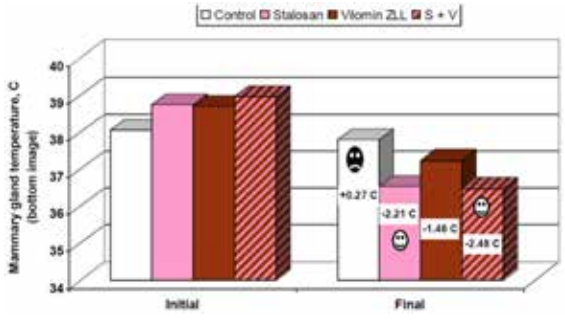
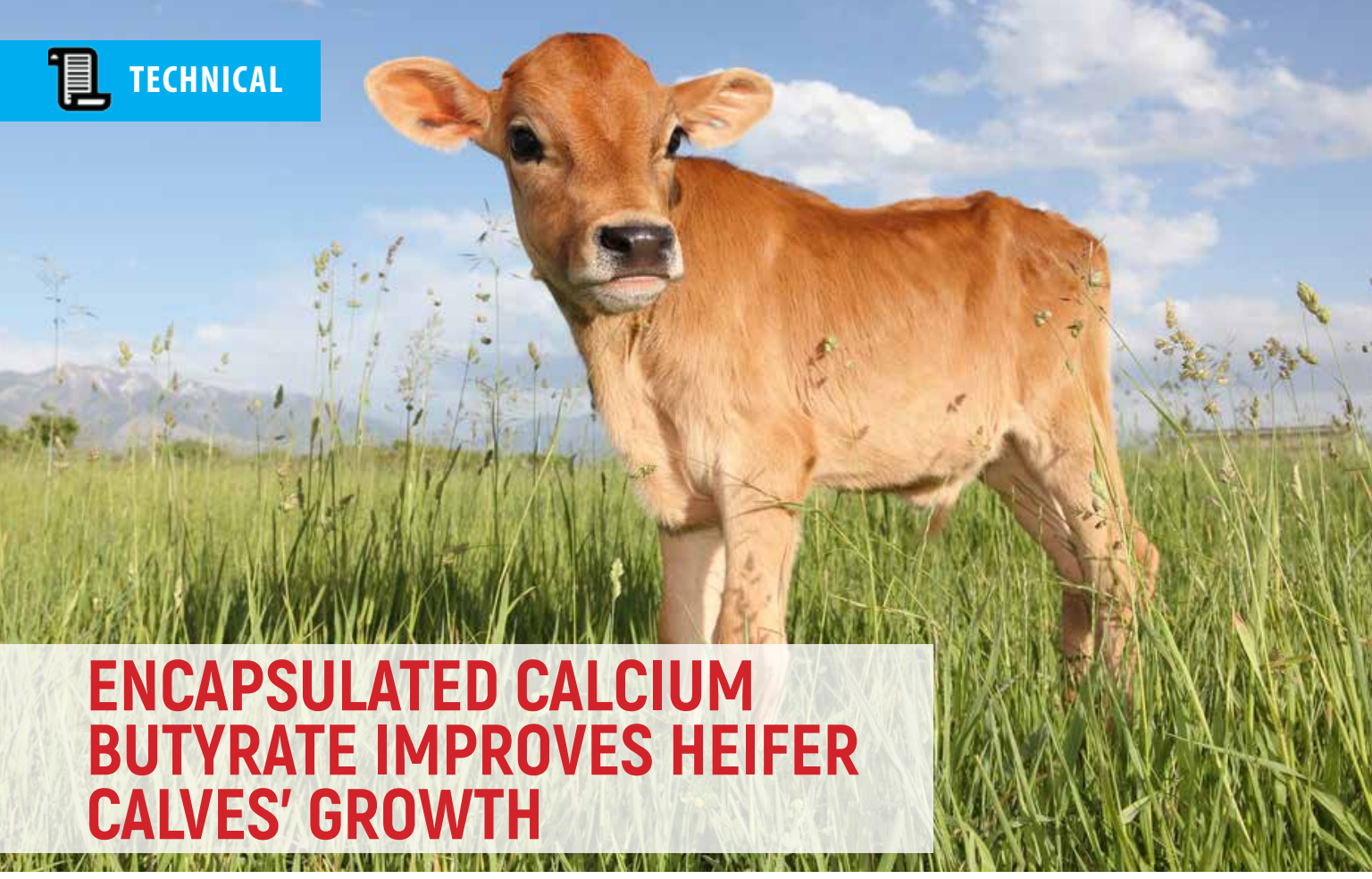


Figure 8: Mammary gland temperature during trial period.



ENCAPSULATED CALCIUM BUTYRATE IMPROVES HEIFER CALVES' GROWTH

A healthy heifer could potentially become a strong-performing cow for life. It is also important to note that the heifer calves' development can influence puberty and age at first calving. Therefore, nutrition and management that promote heifers' growth during rearing can have a positive effect on their lifetime performance.

This article will highlight how supplementing neonatal heifer calves with calcium butyrate can support their growth and development and the implication for long term performance.

Butyric acid and gut development

Butyric acid, a key energy source for epithelial cells of the gastrointestinal tract (GIT), is known to stimulate the proliferation of such cells in ruminants. It also helps maintain the integrity of the epithelium's tight junctions, prevent gut leakage and regulate immune response.

Given that gastrointestinal tracts of neonatal calves are not well developed at birth, supplementing butyric acid to promote GIT development makes sense. A calf's rumen develops slowly during growth; in this period, neonatal calves have limited dry feed intake and are prone to intestinal disorders.

The use of butyric acid would be applicable in supporting GIT development, as well as in inhibiting intestinal pathogens.

Butyric acid versus butyrate

Butyric acid can be rapidly absorbed in the GIT's upper section, making it unsuitable for dietary supplementation. A more practical alternative would be its salt, butyrate.

Razaq Balogun

Moreover, data have shown butyrate's positive effects on the development of the epithelium, rumen papillae, small intestinal villi and the immune function of the intestine.

Also, different forms of butyrate will determine the method of delivery, either in milk, milk replacer, calf meals or pellets.

Calcium butyrate enhances calves' growth by accelerating intestinal development, consequentially improving feed intake and nutrient absorption.

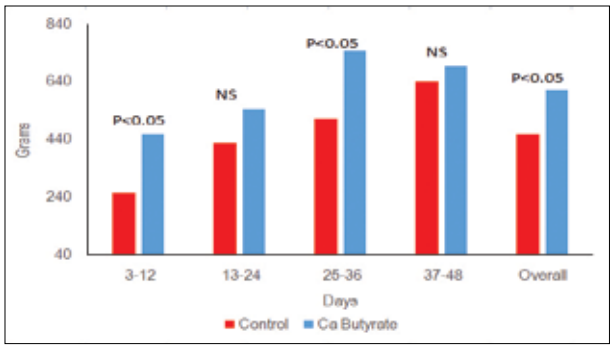


Figure 1. Effect of coated calcium butyrate supplementation on calf average daily gain (adapted from Nazari et al., 2012). Significant at P<0.05; NS not significant at P>0.05.

Supplementation with calcium butyrate

Among all sources of butyrate, calcium butyrate is the least studied in ruminants.

Nazari et al. (2012) supplemented calf replacer with coated calcium butyrate to deliver 3g/head daily in a 48-day trial. These authors observed a significant improvement in average daily gain (Figure 1). Improved growth was seen as early as 3-12 days of feeding, suggesting that butyrate's effect may be rapid and involved cell signaling. The authors also reported that calves fed calcium butyrate had better structural development, compared to control calves.

In another study, Davarmanesh et al. (2015) found

	Control	CAB	OLE	CAO	p-values (butyrate)
Pre-weaning					
1-23 days	0.26	0.26	0.22	0.27	0.393
24-46 days	0.77	0.78	0.76	0.82	0.172
1-46 days	0.52	0.52	0.49	0.54	0.102
Post-weaning	0.76	1.02	0.77	0.79	0.030
Whole trial	0.60	0.68	0.57	0.62	0.013

Table 1. Effect of coated calcium butyrate (CAB), Oleobiotec (OLE) or their combination (CAO) on pre- and post-weaning average daily gain in Holstein dairy calves (adapted from Davarmanesh et al., 2015).

that Holstein dairy calves supplemented with coated calcium butyrate (CAB, 5g/head daily) for 46 days experienced superior growth when compared to control calves (Table 1), both during pre- and post-weaning periods. Other groups of calves were supplemented with a flavor (Oleobiotec, containing mainly spices and essential oils) or a combination of calcium butyrate and the flavor. The flavor or its combination with CAB did not improve calf growth when compared to CAB on its own (Table 1).

The growth response observed when calves were supplemented with calcium butyrate may be associated with the accelerated development of the rumen and small intestine, leading to better feed digestibility and absorption of nutrients.

Calf growth and lifetime performance

The objectives of rearing dairy calves include the quick uptake of solid feed by calves, early weaning, improving feed efficiency and improving growth rate.

	AFC, days		
	≤ 699	700 - 750	≥ 751
Milk production, litres:			
First lactation	8,800 ± 136.95	8,816 ± 129.85	8,946 ± 133.25
Second lactation	10,449 ± 173.75	10,220 ± 153.83	10,221 ± 196.81
Third lactation	10,922 ± 266.26[a]	10,570 ± 237.23[a]	9,903 ± 281.97[b]
Lifetime average production	9,859 ± 201	9,861 ± 179	9,602 ± 213
Reproduction in first lactation:			
Services per conception	2.21 ± 0.14	2.24 ± 0.11	2.25 ± 0.15
Days open	132.38 ± 6.96[b]	139.35 ± 6.29[a]	145.78 ± 7.24[a]

Table 2. Age at first calving (AFC) and lifetime production (adapted from Krpálková et al., 2014). Figures with different superscript within rows are significantly different (P<0.05).

All these will reduce the age at puberty and first calving. Table 4 shows the impact of reducing the age at first calving, on the reproductive and lactation performance of heifer calves.

Regardless of the objectives, a rearing programme should produce healthy calves with good reproductive capabilities.

One way of achieving a better lifetime performance is by reducing the age at first calving. There is a positive relationship between the rearing weight or growth rate of heifers during the early rearing stage and their subsequent milk production potential. Supplementing calcium butyrate can help to accelerate growth, thus reducing the age at first calving.

In conclusion, calcium butyrate enhances young calves' growth by accelerating rumen and intestinal development, consequentially improving feed intake, feed digestion and nutrient absorption.

Although reducing age at calving may not apply to all dairy herds, supplementation with calcium butyrate can aid in boosting calves' growth during early rearing and is a viable option for improving young heifers' reproductive performance.

In response to those challenges, Kemin has developed ButiPEARL™, a coated calcium butyrate that uses the proprietary MicroPEARL™ encapsulation technology. Encapsulation ensures maximum benefits are delivered to calves with the release of the active butyrate at the target rumen and small intestine.

- RAZAQ BALOGUN, PhD, Kemin Animal Nutrition and Health, Asia Pacific

Certain statements may not be applicable in all geographic regions. Product labeling and associated claims may differ based upon regulatory requirements.

References are available on request.

LIVE YEAST IMPROVES RUMEN WALL INTEGRITY AND LIMITS RUMEN EPITHELIUM INFLAMMATION IN TRANSITION DAIRY COWS

The transition around calving is a critical time for the dairy cow due to major dietary, metabolic and physiological changes.

In particular, the transition from a high-fiber to a high-carbohydrate diet represents important challenges for rumen microbiota, given the possibility of the rumen health being negatively impacted (in regards to the cow's inflammatory status).

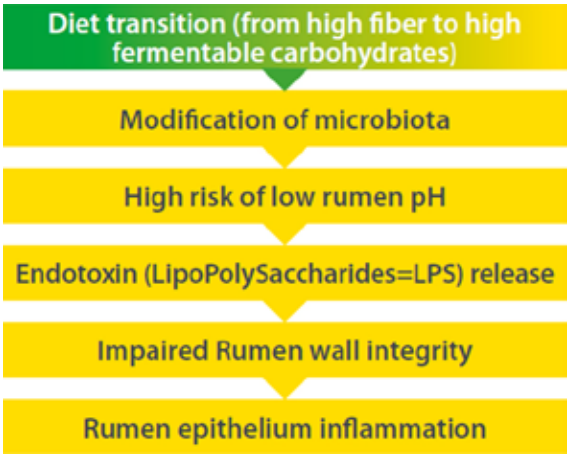
Using endoscopy and quantitative RT-PCR as innovative approaches to assess the dynamics of rumen wall integrity around calving, Alex Bach's team (IRTA, Spain) and Lallemand Animal Nutrition conducted a large-scale study at the Blanca Experimental Farm (Spain) on the impact of transition challenges on rumen health and the effects of live yeast at the rumen wall gene expression level.

Innovative transition study

The trial was conducted on 21 Holstein dairy cows from 21 days before calving until 21 days after calving. The diet changed from 28% concentrate before calving (51.2% NDF, 13.2% crude proteins) to 64% concentrate after calving (34.8% NDF, 15.2% CP).

This study was designed to evaluate the effects of transition challenges and live yeast *Saccharomyces cerevisiae* CNCM I-1077 (LEVUCELL SC) on rumen wall integrity and inflammatory status.

Using a medical endoscope, the researchers biopsied rumen epithelium tissues and studied histological and immune-related gene expression dynamics during diet transition.



Key findings

This study confirmed that the transition represents a challenge for rumen wall integrity, which has been linked to leaky gut issues. The rumen wall responded to inflammation with changes in gene expression levels. For example, the level of anti-inflammatory cytokine IL-10 expression in the rumen epithelium doubles after calving.

The rumen modifier, live yeast *S. cerevisiae* CNCM I-1077, fed prior to calving helps the rumen wall better prepare for the stress encountered around calving.

As a result, the rumen wall barrier integrity is better prepared to face the stress of diet transition. Before calving, the live yeast increases the expression of the gene encoding occludin, a transmembranous protein,

Dairy cows trial at Blanca facilities (Spain) and the medical endoscope used for rumen biopsies.

The improved rumen barrier function results in enhanced rumen health as shown at a genetic and cellular level.

which plays a key role in tight junction stability and barrier function within the rumen epithelium (Fig. 1). By reinforcing the tight junctions, *S. cerevisiae* CNCM I-1077 may improve rumen wall integrity of supplemented cows.

In addition, the rumen wall is better prepared and more resistant to ruminal lipopolysaccharide (LPS) and other inflammatory challenges related to diet changes through a higher TLR4 gene expression for live yeast group before calving. TLR4 (Toll-Like Receptor) is able to recognise lipopolysaccharides.

Furthermore, a reduced IL-10 gene expression post calving suggests lower inflammatory status with the live yeast as compared to control cows around calving.

Finally, the improved rumen barrier function results in enhanced rumen health as shown at a genetic and cellular level, but this is also visible on cow performance.

Dry matter intake in the first three weeks post-calving was higher with the live yeast supplement (on average 18.2 versus 15.7 kg/day, $p<0.05$), leading to a higher milk production. Milk yield was also improved by 6kg/cow/day with the supplement ($p<0.05$).

- LALLEMAND ANIMAL NUTRITION

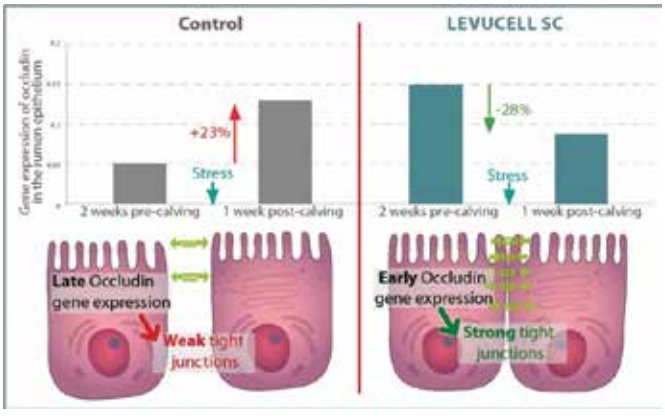


Figure 1: Effect of live yeast treatment pre-calving on occludin gene expression in the rumen wall and consequence on rumen wall integrity (Occludins are transmembrane proteins, which play a key role in tight junction stability and barrier function).

Reference:
Bach A, Guasch I, Elcoso G, Chaucheyras-Durand F, Castex M, Fàbregas F, Garcia-Fruitos E, Aris A., "Changes in gene expression in the rumen and colon epithelia during the dry period through lactation of dairy cows and effects of live yeast supplementation", J Dairy Sci. 2018 Mar; 101(3):2631-2640

For more information on rumen challenges, visit this website dedicated to ruminant digestive system: http://ruminantdigestivesystem.com/

PRECISION DAIRYING IN NEW ZEALAND: CHALLENGES OF FULLY UTILISING TECHNOLOGY

Pasture-based dairy systems have witnessed an increased use of advanced management technologies - a trend prompted by expanding farm operations and a desire for better efficiency, Callum Eastwood et al. wrote.

This evolution is termed as "precision dairying" (PD), which is the capability of applying "fine-scale management" into farming systems by employing "technology aimed at collecting and analysing data for decision making," Eastwood explained.

PD applications consist of "inline milk meters capable of measuring mastitis indicators and milk components, walk-over-weighing scales, pedometers and automated drafting." Another relevant technology is electronic identification (EID), which supports the animal traceability programmes of Australia and New Zealand.

In regards to their acquirement of PD technologies, New Zealand farmers, according to Eastwood, were positive, as they saw benefits of their usage in terms

of lesser time spent during milking, lesser manpower required and higher farm profitability.

However, the full utilisation of these applications does not rest solely in the hands of farmers. As Eastwood pointed out: "Farmers also felt there was unused functionality in their herd management systems and that they could benefit from increased support and training to get more from their technology."

That support would come from technology suppliers who have to "refocus on after-sales service." Support programmes should also accommodate "stages of learning development, as suppliers strive to develop a "value proposition for farmers to pay for such services."

In addition, dairy industry organisations have to play their part in "building awareness of the opportunities such technologies offer while facilitating access to independent information about technology capability and investment," Eastwood said.

He noted (at the time of his research) that dairy organisations did not know enough of the practices and challenges associated with using PD applications.

Hence, one objective of Eastwood's study is to identify "issues and opportunities for dairy industry research, development and extension organisations, technology suppliers and farm service providers."

As part of his research, 44 respondents, who identified themselves as farm owners, were surveyed. These participants revealed that the "labour saving" and easier milking aspects of PD are key reasons to invest in such technologies. Moreover, 91% of them agreed that investing in PD applications was "worthwhile."

Dairy organisations must take the lead in guiding the development of technologies based on farmer needs while reducing uncertainty around precision dairying innovations.

Among its many findings, the survey discovered the main reasons for farmers to get PD applications were:

- 45% of respondents saw a need for "more efficient feeding" as the motivation to adopt PD applications;

- Attracting or retaining staff influenced the decision of 41% and 45%, respectively;

- Less than 40% of farm owners attributed to other factors like "identifying cow health issues, oestrus cows and cows for culling."

When participants were questioned further about their use of PD technologies, the study uncovered instances when applications were not fully utilised, or when the advantages of using these applications were not fully or properly delivered.

In fact, it was found that:

- About one-third of respondents never calibrated their milk meters (33%) or automatic cup removers (34%), while 25% never calibrated their walk-over-weighing systems;

- One farmer reported "missing or inaccurate cow data relating to EID and milk meter performance";

- Farmers also pointed to the limited compatibility between their own management software and MINDA, a herd management system commonly used by New Zealand farmers. This problem led to operators entering data into both systems separately. As a result, some farmers ceased recording data in MINDA, "which might have implications for (New Zealand's) Dairy Industry Good Animal Database," Eastwood stated.

Additionally, while the use of PD technologies helped improve farm profitability and milk solids production, 67% of respondents thought that a higher skill level was needed among the farm workforce. Also, when it comes to the proportion of HMS' "potential capability" utilised, an average of 61% (with a range of 20-95%) was recorded.

By identifying those issues, Eastwood's research acknowledged that farmers were still puzzled about getting the most from their technologies and data. He also argued the importance of both technology suppliers and the industry in helping farmers improve their use of PD applications.

"Creating opportunities for peer-to-peer learning between farmers could be a powerful method of knowledge transfer among (technology suppliers') clients," Eastwood wrote.

"Dairy industry organisations also play a role in guiding skill development among dairy farmers and service providers, through proactive development of learning opportunities at the various levels of dairy training."

Eastwood concluded that "Industry organisations must take a leadership role in guiding the development of appropriate and effective new technologies based on farmer needs while reducing uncertainty around PD innovations."

A full version of this article "Getting the most out of advanced farm management technologies: Roles of technology suppliers and dairy industry organisations in supporting precision dairy farmers" can be found at: www.researchgate.net

ARLA FOODS, FOREMOST FARMS USA IN ADVANCED DISCUSSION FOR WHEY-FOCUSED PARTNERSHIP

Dairy co-operatives Denmark-based Arla Foods and Foremost Farms USA, have entered into advanced discussions for a strategic partnership that focuses on increasing whey's value through innovation.

The future partnership's objective would be achieved by combining Foremost Farm's high-quality whey with Arla Food's ingredient expertise and strong sales channels, Arla said.

"...Arla Foods and Foremost Farms USA share many of the same values and both parties see a high degree of compatibility on visions and ambitions within whey," Henrik Andersen, group vice president of Arla Foods Ingredients (AFI), said.

"We are confident that Foremost Farms can be the right partner for us in our efforts to secure access to high-quality whey in the US market."

Michael Doyle, president and CEO of Foremost Farms, commented that a partnership with Arla will enable the co-op to leverage on Arla's "global food supply connections and innovation expertise with Foremost Farm's diverse plant network and access to high-quality member milk."

"These factors combined, will enable both companies to meet business objectives and provide whey solutions of the highest quality to the world," Doyle added.

FONTERRA APPOINTS SUSTAINABILITY ADVISORY BOARD

Fonterra recently announced the appointment of its independent Sustainability Advisory Board, a move that reflects the New Zealand dairy co-op's goal to become a global leader in the sustainable production of dairy nutrition,

The panel will have a lineup of notable figures including board chair, Sir Rob Fenwick, who co-founded the New Zealand Business Council for Sustainable Development, and Paul Gilding, the former global head of Greenpeace.

According to Fonterra CEO Miles Hurrell, the panel is one component of the co-op's strategy to implement sustainability into every aspect of its business.

"Our independent panel will help ensure our strategy is relevant to current and evolving sustainability trends while being integrated into commercial objectives," Hurrell commented.

Fonterra chairman John Monaghan said that the co-op's future "relies on the balance between a productive dairy industry and positive, sustainable environmental outcomes."

The panel will meet twice a year and provide guidance on Fonterra's sustainability strategy, targets and initiatives to improve performance and outcomes.

The co-op's sustainability agenda was underscored by a series of milestones like the completion of over 1,000 Farm Environment Plans through its on-farm sustainability programme TIAKI, and a continuous effort to shift towards renewable energy.

KEMIN, MICRONUTRIENTS LAUNCH "ESSENTIAL" NUTRITION PACKAGE FOR DAIRY CATTLE

Micronutrients USA and Kemin Industries will jointly introduce IntelliBond® VITAL 5 Cr, a product that delivers zinc, manganese, copper, cobalt and iodine from both Micronutrient's IntelliBond VITAL 5 blend and Kemin's KemTRACE® Chromium solution.

IntelliBond® VITAL 5 Cr is touted as the world's first nutrition package containing six essential trace minerals that support dairy and beef cattle well-being and performance. Its introduction addresses a rising concern about the integrity of feed ingredients that are sourced from outside the US, a press release stated.

"Combining IntelliBond and KemTRACE technologies allows us to bring to market a product that eases the delivery of trace minerals to the diet," Dr. Scott Fry, Micronutrients' director of technical sales support, explained.

"Together, these products bring highly available sources of copper, zinc and manganese from IntelliBond to improve fiber digestibility, while KemTRACE Chromium has proven benefits during the transition period in dairy cattle, faster recovery by heat-stressed cattle, improvements in receiving cattle performance and increased carcass weight of feedlot cattle."

KemTRACE Chromium delivers a highly bioavailable, organic source of chromium which helps improve glucose utilisation for increased cellular energy and function, leading to better animal maintenance, reproduction, growth and immunity. It is also the first FDA-approved source of chromium propionate, a safe, proven trace mineral that is supported by more than 20 years of scientific research, Kemin said.

According to Jeff Murphy, senior vice president (commercial division) of Kemin Animal Nutrition and Health, North America, KemTRACE Chromium has been fed to "millions of animals" worldwide since 2000 and "is registered in more than 30 countries."

"Food safety and quality control will always be top priorities for US dairymen and cattlemen. Producers' dedication to quality determines the ingredients used in their feed rations, and ultimately leads to a safe product for the end consumer," Murphy said

Commenting on the collaboration between Kemin and Micronutrients, Dr. Fry said that both companies are "committed to delivering products supported with strong science and a high level of quality assurance."

"The market is interested in chromium, and we see an opportunity to bring a new product to market by having (Micronutrients') VITAL blend technology serve as a vehicle delivering a very low inclusion product to dairy and beef cattle diets in an economical fashion," he added.

EUROTIER 2018 LOOKS INTO DIGITALISATION FOR ANIMAL FARMING

Eurotier 2018 will return to Hanover, Germany, on November 13-16.

Happening at Hanover Fairground, the event is touted to be the world's biggest trade show for livestock farmers. It will showcase the latest trends in the dairy and beef sectors and provide opportunities for cattle farmers to network and share experiences.

Eurotier acknowledges the proliferation of modern data technologies in farming a nd connects these applications to "big data."

This year, Eurotier includes a special feature called "Digital Animal Farming – Management Support, Animal Health, Transparency", which will highlight technologies that combine productivity and animal welfare, as well as information management and the sustainable use of natural resources.

Eurotier acknowledges the current proliferation of modern data technologies in farming and connects these applications to the employment of "big data", which can be interrogated and analysed in order to extract valuable insights into livestock management.

With its special feature, Eurotier hopes to encourage several discussions for personnel involved in livestock farming, as they examine the possibilities of digitisation and determine how relevant systems could be implemented into farming operations.

The last edition of Eurotier in 2016 attracted 163,000 visitors, including close to 40,000 attendees from more than 100 countries outside Germany.

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13–16 November
EUROTIER 2018
Hanover, Germany
Email: k.schloesser@dlg.org
Website: www.eurotier.com/en
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6- 8 December
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FEBUARY 2019

12-14 Febuary
INTERNATIONAL PRODUCTION & PROCESSING EXPO 2019
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Cows agree: growing takes guts.

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Intestinal integrity is one of the most complex issues in animal nutrition. Yet, it is a key success factor in the development of healthy, high-performance animals. For more than 50 years we have been studying the interaction between feed composition, environmental infection and the animal's digestive tract, on the understanding that future use of antibiotics will be reduced. Nutriad's nutritionists and veterinarians were the early pioneers in the use of coated and non-coated butyrate. We developed our ADIMIX® and APEX® product range to improve digestive efficiency and intestinal health. We would like to share our in-depth knowledge and hands-on experience with you. It's good for you, and great for your cows.

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