

cowmanagement

Making the most of maize



JULY 2026

In partnership with

**MAIZE MANAGEMENT TO OPTIMISE FORAGE
YIELD, QUALITY & NUTRITIONAL VALUE**

volac 



Tips for making the most of maize

1 Reduce the crop's environmental impact by choosing the right maturity class and undersowing with grass.

2 Avoid clamp losses and retain nutrients by choosing an appropriate, proven silage additive.

3 Prioritise consolidation, sheeting and management of the clamp face to safeguard every tonne of dry matter.

4 Adopt a preventive approach to mycotoxins in high-risk maize diets and protect milk yields by using a mycotoxin remediator and endotoxin binder.

5 Think about energy density in maize diets for optimum cow fertility, yields and milk quality.

6 Consider feeding a rumen-protected fat to deliver energy safely, particularly during periods of heat stress.

7 Balance the diet carefully to meet milk contract requirements and maximise feed efficiencies.



How-to guide for maize-silage success

Forage maize can play a significant role in relieving the on-going financial and environmental pressures faced by dairy businesses, particularly if the crop is well managed.

So, with that in mind, this supplement offers a wealth of in-depth technical information and advice on exactly how producers really can 'make the most of maize'. It takes a close look at each important stage of the maize-silage production process – from sowing and growing, through to harvest, clamping and feeding.

Key to success with this valuable home-grown forage starts with variety selection. Choosing the right maturity class variety that best suits the soil type, topography and unit's climate will ensure that producers see a good return on their investment, with maize silage clamps filled with top-quality forage that balances dairy rations and supports herd health, fertility and productivity.

Planning nutrient applications carefully, rethinking variety selection and considering under-sowing could help producers meet growing pressures to reduce the environmental impact of maize – particularly in terms of soil health and stability both during and post harvest.

To ensure that this feed 'gold' is protected from clamp losses and to retain nutrients, using an appropriate, proven silage additive at harvest will serve as an insurance policy after season-long planning and investment in this valuable crop.

Page five features a dairy business that uses a dual-action, heterofermentative additive, which produces lactic acid to drive efficient fermentation and a rapid drop in pH to stop the proliferation of undesirable bacteria. Acetic acid production also inhibits yeasts and helps aerobic stability. Find out what a difference using the additive has made to herd performance and the business' bottom-line, and how it also offers peace of mind when it comes to protecting what is a substantial investment in maize silage.

This supplement also explains why producers should prioritise cleaning clamps before filling, as well as ensuring good consolidation and careful sheeting and management of the clamp face to safeguard each and every tonne of dry matter ensiled. Paying close attention to detail matters.

And it's also vital when it comes to feed out. Producers should consider adopting another preventive approach, this time to avoid issues with mycotoxins in high-risk maize diets and protect milk yields, producers should also think about using a mycotoxin remediator and endotoxin binder.

Page 12 takes a look at why thinking about the energy density in maize diets for optimum cow fertility, yields and milk quality is also important – and what steps producers can take to best balance the forage in dairy rations. And there's more nutritional information and advice on page 14, which focuses on the benefits of feeding a rumen-protected fat to deliver energy safely, particularly during periods of heat stress. Carefully balancing rations when feeding maize silage is vital to support herd health, fertility, milk production and feed efficiency. And producers also have to meet milk-contract requirements.

It's a tall order – but something that maize silage can help to deliver. There's a wealth of knowledge, information and advice on how to grow, harvest, ensile and feed a top-quality crop. And all the specialists featured in this supplement are also contactable to offer more help and support, if needed.

Tips for reducing maize's environmental impact

Rethinking variety selection and how maize is grown could increase the crop's environmental credentials.

Planning nutrient applications, rethinking variety selection and undersowing could help producers meet growing pressure to reduce the environmental impact of maize.

Increasingly unpredictable autumns mean maize growers are often faced with later, wetter harvests that risk run-off, damaging fields and introducing mud into the clamp. According to independent agronomist and Crop Advisors' director Howard Nason, there are four key areas to consider to lower environmental risk:

1. Target muck

To prevent leaching and to meet Farming Rules for Water, target nitrogen, potash and phosphate to match crop requirements and soil indices. This should be based on a Nutrient Management Plan and consider Nitrate Vulnerable Zone (NVZ) requirements.

2. Choose earlier maturing varieties

Can you select an earlier maturing maize variety that can be harvested earlier, thus buying time in the autumn? Very early maturing varieties will be lower yielding, but Mr Nason says it's possible to choose an FAO 170 (early maturing) variety that yields more than some with an FAO of 180–190 (later maturing).

He advises tailoring maturity class to the site, location and season, depending on when the crop is drilled and the target harvest date.

3. Think about field selection

Avoid growing maize on fields that traditionally lay wet, compact easily, are at risk of erosion or slope towards water courses.

4. Consider undersowing

Undersowing maize with grass should be seriously considered. *"I think undersowing has a significant impact on reducing environmental risk,"* Mr Nason says. *"It's keeping a growing root in the soil, mopping up residual nitrogen and stabilising soil structure. And it's reliable and pretty easy to get established."*

He advises drilling Italian Ryegrass at between 10kg/ha and 12kg/ha between the rows after weed control and when maize is at the 4 to 6 leaf stage. The under-sown grass eases travel at harvest and reduces mud contamination risk. Keeping the soil covered during the winter also lowers run-off risk, with a cover crop typically capturing between 30kg and 40kg of nitrogen per hectare. The grass could also provide an early silage cut.

Under-sown grass eases travel at maize harvest and reduces the risk of mud contamination

Agronomist, **Howard Nason** believes undersowing could significantly reduce the environmental impact of maize



Focus on crop cleanliness

Crop cleanliness and good fermentation are fundamental in the production of quality maize silage, says Volac's research and development technical manager for forage, Adrienne Kerley.

"Maize naturally has a lot of undesirable bacteria, yeasts and moulds that can affect preservation," Adrienne Kerley says. *"There's also the risk of enterobacteria from slurry and clostridia from soil, which all have a negative impact on fermentation and silage quality. For example, clostridia bacteria can potentially lead to around 18% energy wastage."*

"Although clostridial fermentation is less likely in maize, it doesn't mean it can't happen, so it's worth doing everything possible to tip the balance in your favour."

To produce the cleanest crop possible, Dr Kerley advises:

- Leaving at least 15cm of stubble to lower the risk of soil and slurry contamination.
- Cleaning the clamp before filling and consolidating effectively.
- Using the dual-action, heterofermentative additive Ecocool, which produces lactic acid to drive efficient fermentation and a rapid drop in pH to stop the proliferation of undesirable bacteria. Acetic acid production also inhibits yeasts and helps aerobic stability.



Improved maize quality helps boost yields on college farm

Improved maize silage quality has supported an uplift in total yields and milk from forage at Bridgwater and Taunton College's dairy unit.

Forage quality is a key focus for farm manager **George Stickley** and assistant principle for land-based studies, **Claire Winson**



Using a silage additive to prevent aerobic spoilage on the clamp face has translated into better maize quality, improved palatability and better performance at Rodway Farm, Somerset.

During the past five years, farm manager George Stickley and assistant principle for land-based studies, Claire Winson, have been working hard to elevate forage quality.

"Our aim has been to improve the forage and reduce our concentrate costs," Ms Winson explains. *"Five years ago, cows were producing between 25 litres and 26 litres per cow per day, and now they are at 33 litres. We put all of that down to better forage, we just use a blend, cake and minerals now."*

Milk from forage is up 491 litres per cow per year since February 2025, to an average of 3,000 litres.

With the farm unsuitable for grazing, producing the best possible grass, maize and wholecrop silage from the hectare available is a must. Grass-silage quality has been improved by moving to a multi-cut system, paying close attention to consolidation and using Ecocool silage additive on every cut. The maize area grown has also increased to 32 hectares to improve ration forage balance.

Typically, maize is harvested at around 30% dry matter. The team chooses an early-maturing variety so the crop can be harvested by the end of September to meet Stewardship requirements. It also allows Westerwolds to be planted afterwards to provide an early spring-silage cut.

A dual-acting silage additive is used on maize and wholecrop silage to reduce aerobic spoilage. Ecocool provides a tailored dose of *Lactobacillus plantarum* MTD/1 bacteria to support rapid fermentation, and *Lactobacillus buchneri* PJB/1, which has been selected to inhibit yeasts and moulds, and help prevent aerobic spoilage.



Ecocool proved particularly valuable on last year's dry maize crop, preventing aerobic spoilage on the face

Reduced aerobic spoilage on the maize clamp thanks to use of an additive has reduced losses and boosted intakes, helping to support increased yields

Farm Facts

- 182 hectares farmed, including grass, wholecrop and maize.
- 230-cow Holstein herd, housed all year round and milked twice a day.
- Averaging 10,640 litres of milk, at 4.45% fat and 3.5% protein.
- 3,000 litres per cow per year milk from forage.
- Supplying Müller Tesco.
- Aim to take between four and five cuts of grass silage per year.
- Westerwolds planted after maize for a spring silage cut.

Prior to using the additive, Mr Stickley believes spoilage had been negatively impacting palatability and lowering silage quality, resulting in suboptimal yields and poor cow health. Now, spoilage is a thing of the past, and higher silage quality and intakes have directly translated into better yields.

"We get very little wastage now, particularly with maize and wholecrop. Maize came off a lot drier in 2025, at 35.4% dry matter, so consolidation was harder and it's created challenges with managing the face, which has tended to crumble. I'm sure that if we hadn't used Ecocool we'd have had lots of problems with heating," he explains.

"We always use an additive, I wouldn't not, for the simple reason I want to preserve the quality I've got. There's no point getting it in there and then chucking away half of the front of the clamp because it's heating."

How to produce better maize silage



Only one chance to harvest and conserve maize correctly, means it's worth putting the time in to get it right.

Good clamp consolidation should be a priority to drive out as much air as possible

Milk-price pressures and rising input costs underline the value of producing quality home-grown maize, and the need to adopt a joined-up approach from field to feed out.

That's according to Volac's research and development technical manager for forage, Adrienne Kerley, who believes planning how maize is harvested and clamped will pay dividends.

"Actions taken during harvest and ensiling can have long-term consequences for how well the resulting maize silage keeps through the winter, how well it feeds and how much is lost," she says. "With pressure on milk price and input costs, it makes sense to optimise the value of home-grown maize and squeeze every possible litre out of it."

Maize represents a highly nutritious, high dry matter (DM) and energy crop that can help increase intakes, milk yields and proteins.

However, it is naturally prone to dry matter and energy losses – both during storage and at feed-out – due to the action of undesirable bacteria, yeasts and moulds that feed on it. Microbes can also reduce palatability and thus valuable dry matter intakes.

Aerobic spoilage

One major source of losses occurs when maize heats in the presence of air in a process known as aerobic spoilage. This is predominantly caused by yeasts feeding on the silage and producing heat and dry matter losses in the process. After the initial yeast activity, moulds join in too. In addition, invisible losses from poor quality fermentation can account for as much as half the overall dry matter losses, Dr Kerley says.

"A key challenge is that maize plants host a lot of undesirable microorganisms like bacteria, yeasts and moulds, for example on dying leaves and rotting tassels that collect in the leaf joints. It's these that can interfere with preservation if left unchecked," she explains.

"To reduce losses, the focus should be on minimising the number of undesirable microorganisms that get in the clamp in the first place, and inhibiting the growth of any that do."

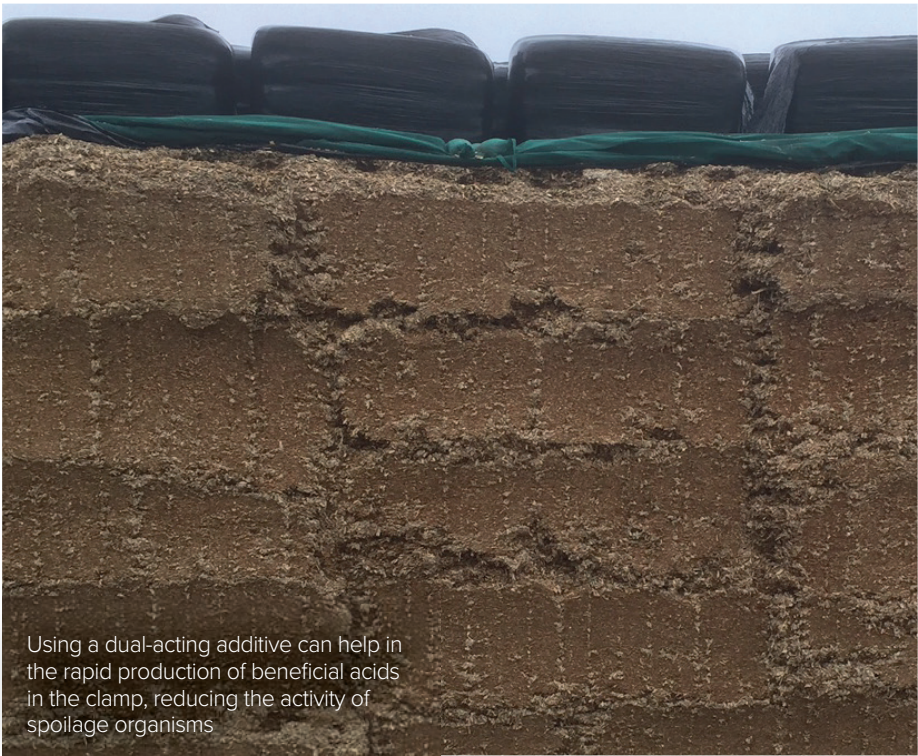
To do this, Dr Kerley advises thinking about the following:

1. Harvest promptly

Harvest maize as soon as it reaches the optimum dry matter of between 30% and 33%. This will maximise quality and aid consolidation, which is essential for eliminating air from the crop. Be aware that modern varieties tend to reach optimum dry matter (DM) while still green, so monitor DM closely in the run-up to harvest. Leave at least 15cm of stubble to reduce the risk of introducing yeasts and moulds into the clamp.

2. Prioritise consolidation

Good clamp consolidation should be a priority to drive out as much air as possible, which will reduce the ability of harmful microbes to propagate. Shorter chop lengths will aid consolidation, so consider chopping to between 1.5cm and 2cm. Fill the clamp in horizontal layers, each between 10cm and 15cm deep.



Using a dual-acting additive can help in the rapid production of beneficial acids in the clamp, reducing the activity of spoilage organisms

Table 1: Inhibition of yeasts on maize silage treated with Ecocool

	No additive	With Ecocool
Number of yeasts (colony forming units per gramme of forage)		
After ensiling	1,500,000	<1,000
After air exposure	440,000,000	<1,000

3. Focus on clamp sealing

Once air has been squeezed out, focus on creating as much of an airtight 'bag' in the clamp as possible. Use polythene side sheets to line the walls and an oxygen barrier film with the side sheet folded over it. This should be followed by a polythene top sheet and a woven sheet weighed down with mats, touching tyres or bales. Gravel bags should be placed round the edges of the clamp and netting used to stop birds and rodents.

4. Treat with a dual-acting additive

Using a dual-acting, proven silage additive can help in the rapid production of beneficial acids in the clamp, creating a stable pH and reducing the activity of spoilage organisms. The dual-acting additive Ecocool provides a tailored dose of *Lactobacillus plantarum* MTD/1 to support rapid fermentation, and a second beneficial bacterial strain, *Lactobacillus buchneri* PJB/1, which has been specially selected to inhibit yeasts and moulds, and help prevent aerobic spoilage.

In trials, maize silage made with Ecocool contained fewer than 1,000 colony forming yeast units per gramme of forage after exposure to air. This compared to 440 million in the untreated crop (see Table 1). Ecocool has also been shown to keep silage removed from the clamp cool and stable for more than 10 days.

5. Think about clamp design & management

Narrow clamps are best to minimise the size of the face exposed to air. Avoid south-facing clamps where the sun could heat the open face. Use a block cutter or shear grab to keep the face smooth, and don't allow the top sheet to hang over the face as this creates a warm, humid environment where yeasts thrive.

Did you know?

Typical maize clamp losses equate to about one in every 10 trailer loads of dry matter being lost.



With pressure on milk price and input costs, it makes sense to optimise the value of home-grown maize, says Volac's **Adrienne Kerley**

Dual-action additive helps curb maize mycotoxins

Ensiling forage maize with the dual-action additive Ecocool can prevent significant mycotoxin accumulation in silages exposed to air.

Mycotoxins (see page nine) are produced by certain moulds which can grow on feeds and silages. These invisible toxins have wide-ranging effects including reduced feed efficiency and poor fertility. A Volac study at maize harvest found that:

- When Ecocool was applied to the maize crop at ensiling, accumulation of the mycotoxins, mycophenolic acid and roquefortine C – produced by *Penicillium* moulds – was controlled to levels 98% lower than in untreated silage.
- A little over a month after ensiling, yeast levels in the Ecocool-treated silage were 96% lower than in the untreated.
- The untreated silage took just 1.5 days to start heating when exposed to air, compared with 3.5 days for the Ecocool-treated.
- Where a high level of mycotoxin is present in the harvested crop – such as DON (deoxynivalenol), neither the ensiling process nor the additive can remove this. In this case, a separate mycotoxin treatment is required.

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Adopt preventive approach to mycotoxins in maize diets

Taking a preventive approach to mycotoxins management, particularly when feeding high-risk maize diets, is essential to safeguard profit margins in light of low milk price.

All dairy producers could benefit from protecting their herds against mycotoxins according to the latest Mycocheck results, which identified the toxins in more than 90% of samples.

Nearly 800 animal feed and forage samples were tested in the UK & Ireland in 2025, with 93% of those positive for one or more mycotoxins, which is comparable to data from the previous year. Maize was also higher risk, with 99% of maize silages testing positive, versus 80% of grass silages.

Mycotoxins are produced by certain moulds which can grow on bought-in feeds and home-grown silages. These invisible toxins have wide-ranging effects including reduced feed efficiency, suboptimal yields, poor fertility and problems such as lameness and mastitis.

Profit drain

Volac's scientific services manager Rob Furmage believes the test results show that mycotoxins could be 'silently eroding profit margins' on many farms.

"Usually, producers don't realise there are background issues caused by mycotoxins putting the brakes on performance," he says. "If they're present at low levels, they may be causing slightly reduced yields. Producers may not even know you could be achieving more."

Ruminant technical manager GB & Ireland for Trident MicroNutri, Anna Dinsdale says pressure on milk price means producers can ill-afford any drain on performance.

"There isn't room this season for inefficiencies and that's essentially what mycotoxins do to a herd."



Mycotoxins are so common in feed and forage samples, it's important to adopt an on-going preventive strategy to protect cows, says ruminant technical manager GB & Ireland for Trident MicroNutri, **Anna Dinsdale**

They can immuno-suppress or immuno-stimulate. If a cow's immune system is switched on unnecessarily, that is very energy inefficient and diverts energy away from production," she explains.

Not all moulds will produce mycotoxins, but a mould is more likely to produce a mycotoxin if it is stressed. Likewise, moulds don't have to be visible for mycotoxins to be present.

93% of UK & Ireland feed and forage samples tested positive for one or more mycotoxins in 2025 (Volac's Mycocheck service, 776 samples).

99% of maize silages tested positive for mycotoxins versus 80% of grass silages (Volac's Mycocheck, 2025).



Even low background levels of mycotoxins could be silently suppressing milk yields

Mycocheck results highlight the variability in mycotoxin risk both within the same year and between farms. For example, more samples had mycotoxins present in 2025, but the levels and type of toxin present made it lower risk on average than the previous year. However, data analysis showed that high-risk geographical ‘hot spots’ emerged through the year, which could have been linked to buying-in high-risk imported maize-based feeds or environmental stress in a particular region, for example.

Mr Furmage says this underlines the unpredictability of mycotoxins and the fact that they are always present in the background.

“Mycotoxins may be identified as low risk at any given time, but they can very quickly become an issue. For example, very wet or very cold or very hot weather may trigger them, but it’s hard to predict,” he explains.

Any stressor that increases the risk of mycotoxins can quickly tip the balance and lead to greater herd level issues such as poor fertility, diarrhoea or reduced feed intakes (see Table 1), which can mistakenly be linked to any number of things such as genetics, management or poor silage.

Maize is particularly high risk for mycotoxins as moulds favour the crop due to the open ear structure and long growth period. That combined with warm, humid weather creates the perfect environment for moulds to flourish.

Moulds don’t need to be visible for mycotoxins to be a problem

Ms Dinsdale believes the commonness of mycotoxins in feed and forage samples means it’s important to adopt an on-going preventive strategy to protect cows from background low-level mycotoxins. This is even more vital when feeding maize silage or maize-based by-products such as maize distillers’.

Preventive approach

She advises including the triple-action mycotoxin remediator and endotoxin binder, UltraSorb R in all diets at feed-out. Unlike a straight clay binder which simply binds a small number of mycotoxins, UltraSorb R binds, transforms and degrades a wider range using a combination of specifically selected clay binders, yeast fractions and biological active agents. This makes it effective against mycotoxins that are difficult to bind such as deoxynivalenol (DON) and Zearalenone (ZON). It is available through Trident MicroNutri in the UK and can be incorporated into the diet in multiple ways including in blends, minerals or as part of a farm pack.

Ms Dinsdale says it can be used at a preventive, standard rate of 10g per cow per day or 20g per cow per day should a high-risk mycotoxin/endotoxin problem be identified.

“Using UltraSorb R costs pennies per cow per day. If preventive measures are not taken and milk production falls due to mycotoxin intake from the ration, it takes time to get that milk back, during which time you’re losing income,” she explains. *“Feeding it preventively takes the worry away and it also opens up a whole feed library as you don’t have the same level of concern over higher mycotoxin risk materials.”*

Having the product already on-farm also means it’s possible to react quickly should a mycotoxin challenge arise due to issues with a feed or forage. *“Why risk not protecting cows by using a binder when you know the mycotoxins are there and can cause damage to health and performance?”* Ms Dinsdale asks. *“It’s about taking a proactive approach rather than waiting for a problem to arise.”*

That said, if health and production issues are being seen, she urges producers to consider mycotoxins as the potential cause sooner and test the diet for mycotoxins – without testing, it’s impossible to know if they are present.

Table 1: Common mycotoxins and their impact

These common mycotoxins are produced by Fusarium moulds and are the most common mycotoxins identified through Volac’s Mycocheck feed and forage testing service. Mycocheck tests for 31 different mycotoxins and assigns a risk score to each based on how likely they are to impact the cow so that mitigation strategies can be put in place accordingly.

Mycotoxin	Impact on the cow
Deoxynivalenol (DON)	Gut irritation / diarrhoea
	Reduced feed intake
	Immunosuppression or immunostimulation
Zearalenone (ZON)	Irregular oestrus cycling
	Poor milk yield
	Reduced fertility
T-2 and HT-2	Severe gastrointestinal tract damage
	Immunosuppression or immunostimulation
Fumonisin	Reduced feed intake
	Reduced rumen function
	Liver damage
Aflatoxins	Immunosuppression
	Liver damage
	Contaminate milk with the carcinogen AFM1



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Getting rumen-protected fat supplementation right in maize silage rations starts with the basics

Dr Richard Kirkland of Volac Wilmar Feed Ingredients explains how rumen-protected fats support milk production, fertility and cow condition, while helping producers make the most of their home-grown forage.

As producers work hard to squeeze every litre and every penny out of home-grown maize, rumen-protected fat supplements will provide the consistency required to optimise output.

According to Dr Richard Kirkland, global technical manager for Volac Wilmar Feed Ingredients, understanding the basics of fat nutrition is essential for getting the best from maize-based systems. Below, he outlines three key details that will help yield the best return on rumen-protected fat supplements.

1. Fat is energy-dense

When juggling the challenge of dry matter and energy variables of maize silage, adding 500g of the rumen-protected fat supplement, Megalac, will increase total diet energy density by around 0.5 MJ/kg dry matter (DM). Megalac delivers more than 2.5 times the energy density of cereals while safely passing through the rumen for digestion and absorption in the small intestine. For more detail on this see page 13.

"Maize silage quality and starch content can vary considerably depending on growing conditions, maturity at harvest and fermentation," explains Dr Kirkland. "Including rumen-protected fat supplements in rations helps maximise energy supply from the diet while maintaining ration consistency and making the most of home-grown forage maize."

2. Fat is an essential energy source

According to Dr Kirkland, fat is an essential macronutrient, playing a critical role in meeting the high energy demands of milk production while supporting fertility, body condition and overall cow performance.

"Research suggests dairy cows require approximately between 15% and 20% of their total metabolisable energy from fat. For high-yielding cows, this typically equates to around 6% fat in the total ration DM," explains Dr Kirkland. "While forages and concentrates contribute some dietary fat, supplementation with rumen-protected fats is required to achieve optimal levels safely and consistently."



Dr Richard Kirkland, Global Technical Manager for Volac Wilmar Feed Ingredients

3. Fatty acids matter

Alongside fulfilling nutrient and energy requirements, the fatty acid profile of rumen-protected fat supplements allows producers to better target milk contract and herd performance goals.

"Different fatty acids, the building blocks of fat, influence how nutrients are partitioned within the cow and therefore affect specific areas of performance," explains Dr Kirkland.

The oleic fatty acid (C18:1) supports body condition, improves total fat digestibility to release further energy from the diet and promotes fertility through its role in egg and embryo development, making it particularly valuable in early lactation. The highest C18:1 concentrations are delivered via the rumen-protected fat, Megalac. In contrast, the palmitic fatty acid (C16) directs nutrients towards milk and particularly milk fat production, for example, with the Mega-Fat 88 product.

"The response achieved from a fat supplement depends not only on inclusion rate, but also on the balance of fatty acids being supplied," says Dr Kirkland. "By selecting the right fatty acid balance, producers can target energy supply, fertility, milk composition and cow condition according to stage of lactation and milk contract requirements."



When heat stress cuts intake and raises energy demands, rumen-safe energy sources matter. Rumen-protected fats deliver vital megajoules of energy without fermentation in the rumen, helping cows stay productive during challenging conditions

'Safe' energy supply in practice

From heat stress in summer to balancing winter rations, maintaining energy supply without disrupting rumen function is a constant challenge. Here's how rumen-protected fats can provide a concentrated source of 'safe' energy to support performance throughout the year.

Using 'safe' energy to tackle seasonal challenges

Mitigating heat stress

The effects of heat stress on a dairy herd will start to be felt around 20°C. Heat stress works as a double-edged sword, knocking down appetite while simultaneously increasing energy expenditure.

"Heat stress can reduce DM intake by between 20% and 40%, while maintenance energy requirements may increase by up to 25% as energy is diverted towards cooling mechanisms such as panting and sweating," explains Dr Kirkland.

While milk production will have an immediate hit, the long-term consequences of heat stress can impact fertility, health and future milk production.

Rumen-protected fat supplements are ideal feed ingredients to help counteract heat stress, as they are not fermented in the rumen, helping to reduce heat production during digestion, while providing vital megajoules of energy.

Balancing winter rations

Energy supply remains essential in winter rations to optimise maize silage rations.

"High ME silages targeted to the highest-yielders will improve energy availability, but when it comes to supplementation, we must look for a range of energy sources to give the ration the balance needed," says Dr Kirkland.

With a slower fermentation rate, maize offers a somewhat 'safer' form of starch than traditional cereals and has a slightly higher energy density, making it a good, palatable addition for starch and energy supply to a ration.

Digestible fibre sources such as soya hulls, citrus and sugarbeet pulp will help balance the starchy energy sources and aid rumen function and milk fat, though they offer less of the rumen 'tickle' factor than fibrous forages. Greater bulk will limit the potential to deliver those vital megajoules of energy.

"You can only increase bulky feed ingredients so far before rumen fill begins restricting intake," says Dr Kirkland. "Rumen-protected fats deliver a concentrated source of energy at a small inclusion rate without sacrificing rumen efficiency or ration balance."

Using fat supplements to optimise cow performance

Rumen-protected fat supplements can do more than bridge energy gaps in maize silage-based diets. Here's how to tailor fatty acid supply to improve milk output, fertility, feed efficiency and overall profitability.

As dairy producers push for greater output from maize silage-based systems, attention is increasingly moving beyond simple energy supply considerations. According to Dr Richard Kirkland from Volac Wilmar Feed Ingredients, rumen-protected fat supplements offer a strategic way to support multiple areas of cow performance, including milk production, body condition, feed efficiency and fertility.

Optimising milk contracts

Getting the greatest return from milk contracts starts with matching nutrition strategy to production goals. Tailoring the inclusion rates of specific fatty acids to the cow's energy needs and productivity targets is a key consideration for nutritionists.

In early lactation, the demand for energy for milk production is extremely high, putting body condition and fertility under pressure.

The C18:1 fatty acid (oleic acid), one of the key components of Megalac, directs energy toward body reserves while also supporting egg and embryo development. *"During the first 120 days after calving, maintaining energy supply to support milk production while protecting fertility should take priority,"* says Dr Kirkland. *"Higher-C18:1 products help support milk volume, body condition and reproductive performance during this critical period."*

Once cows pass peak lactation, or are back in calf, introducing a 'high-C16' (palmitic fatty acid) product like Mega-Fat 88 helps drive energy toward milk fat and volume, if milk fat is a key target for a herd's milk contract. For general full-lactation supplementation, the Mega-Fat 70 product offers a balanced fatty acid formulation, providing improved milk and milk fat output through lactation, while supporting body condition and fertility. Research from Michigan State University, USA, reported 'high-C16' supplements increased milk yield by an average of 1.6 kg/cow/day alongside a 0.18 percentage unit increase in milk fat, while also improving feed efficiency.

Boosting fertility

The emphasis on reducing body condition losses in early lactation helps protect herds from negative consequences on fertility.

Research indicates conception rates decline by around 10% for every 0.5-unit reduction in body condition score through early lactation (five-point scale).

Beyond supporting energy status, fatty acids also play direct roles in reproductive function. Fat supplementation has been associated with improved progesterone production, the key hormone of pregnancy, while the oleic fatty acid (C18:1) enhances egg quality and improves embryo development.

Research from the University of Florida, USA, reported that high-yielding cows receiving 450g/day of Megalac through early lactation, achieved first-service conception rates of 45.5% compared with 33.7% in unsupplemented cows, and produced up to 2.5 litres of additional milk per day.

Increasing feed efficiency

For maize silage systems, improving feed efficiency has become increasingly important as producers look to maximise value from home-grown forage.

Rumen-protected fats drive productivity in dairy herds, increasing milk output per unit of DM intake, with significant benefits to feed efficiency.

"Feed efficiency is becoming one of the key measures of profitability on dairy farms," concludes Dr Kirkland. *"If cows can extract more value from home-grown forage and convert more of what they consume into milk solids, the benefit extends beyond production to overall system efficiency."*

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