Help dairy yields rise by supplementing rations with 'active' yeasts

Give your girls a lift

Not all yeasts that can be added to dairy rations are the same. We spoke to two dairy nutritionists to find out how they differ and the important role that metabolic activity plays in enhancing rumen function and milk production.

text **Rachael Porter and Roly Marks**

Feed conversion efficiency is key to boosting margin over feed on dairy units. And with forage stocks set to be tight again this winter, producers will be particularly focused on this parameter during the coming months. They will want to see their cows make the best use of each ingredient in the diet.

Fine tuning rations and nutrient supply

Feed efficiency: live yeasts help to optimise rumen function and improve milk production

to the rumen can achieve only so much. And this situation is putting the role of yeasts, buffers and rumen conditioners firmly under the spotlight.

The benefit of yeasts to the rumen environment, and the factors that determine its efficacy are often not well understood, according to AB Vista's Derek McIlmoyle. "A lack of understanding can turn the use of yeasts into a lottery," he says.

Rumen function

"Yeasts have a key role to play in high performance dairy rations," he says. "But it needs to be the right type of yeast and used in situations where the benefits will outweigh the cost."

Derek McIlmoyle: "Live yeasts should be used where the benefits outweigh the cost"

Nick Berni: "Live yeasts are the best option for adding to TMR rations"

ForFarmers' Nick Berni agrees. He thinks that live, rather than 'stabilised' or dead yeasts, are the best option.

"These are classed a feed additive and, as such, they have to have considerable trial data behind them if feed companies and manufactures wish to make claims about their performance enhancing potential."

All work by enhancing or optimising rumen function. They are, in effect, rumen friendly – they help rumen microbes to do their job.

"The rumen functions best when conditions are both relatively stable and optimised for fermentation.

"That means a pH that's as close to 6.0 as possible – fibre digestion is compromised any time pH drops below 5.8 or rises above 6.2 – while minimising the build-up of oxygen that's so detrimental to the anaerobic fibre-digesting rumen microbes," explains Dr McIlmoyle.

Anaerobic conditions

"The main focus for buffers and rumen conditioners is to optimise rumen pH. And although yeasts can have some effect on this, that's not their primary function," he adds.

"Research has shown that yeasts deliver their main feed efficiency gains by mopping up excess oxygen in the rumen. They also compete for sugars, which reduces populations of detrimental microbes and encourages proliferation of those responsible for fibre digestion."

The greatest effect is seen when that yeast is intact, live and metabolically active (see Figure 1), and introduced to a rumen where the pH is already close to optimum.

"It's the reason why greatest performance gains are often seen when a yeast and rumen conditioner are used together."

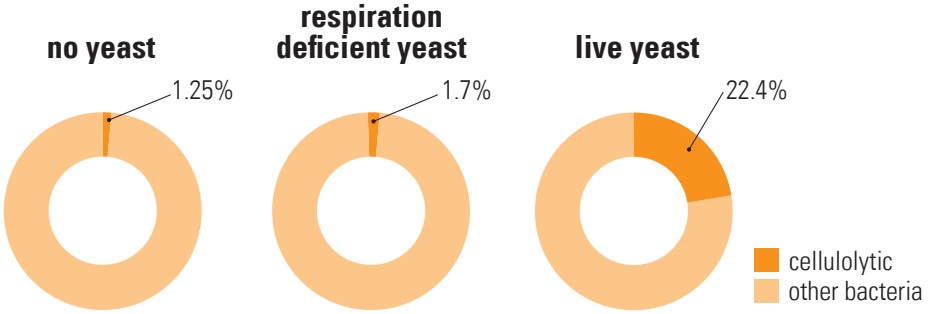
Proven results

In a study carried out in the Netherlands using a small group of Holstein Friesians, which were fed a 65:35 forage-to-concentrate ratio diet, the combination of an active live yeast and a rumen conditioner improved performance.

The time rumen pH was below 5.8 was cut to 50 minutes, compared to 87 minutes when using the yeast alone (see Figure 2). This led to significant improvements in volatile fatty acid (VFA) production in the rumen.

And the result was a 4% rise in milk fat production, from 1.58kg to 1.65kg per day, as well as a 3% improvement in overall feed conversion efficiency – in terms of kilogrammes of fat-corrected milk yield per kilogramme of dry matter

Figure 1: Impact of different yeast types on fibre digesting rumen microbe populations



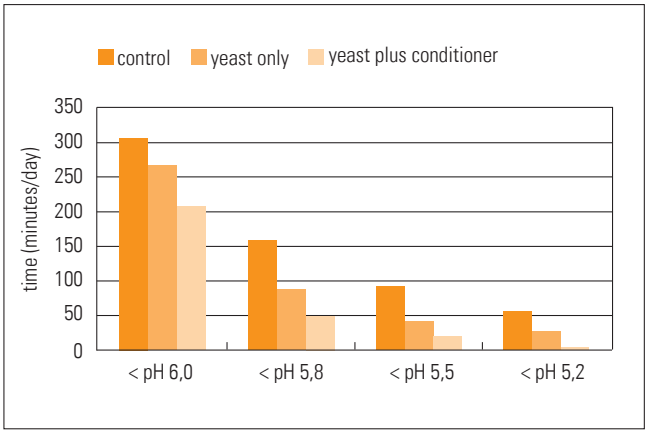


Figure 2: Effect of active live yeast on rumen pH

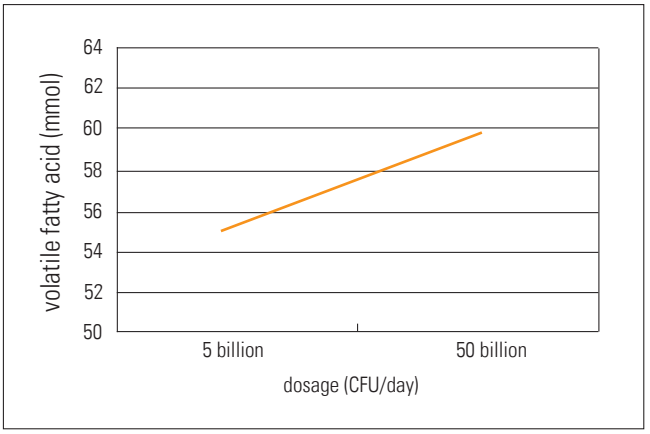


Figure 3: Relationship between active yeast dosage and rumen volatile fatty acid (VFA) production

intake – from 1.60 to 1.65. To consistently achieve good results, it's important to understand the other factors that determine yeast performance.

The most basic 'dead' or stabilised yeast cultures and extracts only deliver prebiotic effects.

Different behaviour

"They don't behave the same way as live yeasts – they don't mop up oxygen in the rumen, for a start," says Mr Berni. "They can bind with pathogens and act as a food source for beneficial microbes within the rumen, but they have no activity themselves. They are, indeed, dead."

"Dead yeast will help to lower the risk of acidosis and reduce the pathogenic load in the rumen and lower gut," adds Dr McIlmoyle. "And even cell wall fragments of a yeast, like Saccharomyces cerevisiae, can bind to pathogens and mycotoxins, stimulate lactic acid bacteria, and boost the cow's immune system."

In contrast, live yeasts that remain metabolically active after ingestion can use up any excess oxygen in the rumen and compete for sugars.

Originally developed for use in the baking industry, the latest versions are specifically selected and screened for beneficial effects and survival within the rumen.

Rumen microbes

"Some versions of these dead yeasts can also act as a source of nutrition and metabolites for beneficial rumen microbes, but they're still much less effective than the probiotic active live yeasts," explains Dr McIlmoyle.

"Live yeast also needs to be in a form that can withstand storage, feed manufacture, delivery and ingestion, and remain viable in the rumen.

"The latest tightly packed 'bead' forms offering greater CFU counts, better oxygen scavenging in the rumen and a longer shelf life," he continues.

Whichever live yeast you feed, it must do three key things in order to increase feed conversion efficiency (FCE).

"Key to its success are reducing detrimental microbial populations, optimising the rumen environment, and directly supporting beneficial microbial activity.

"If this optimal balance is struck then live yeast will maximise FCE gains," adds Dr McIlmoyle. |

Yeast supplement: it needs to be in a form that can withstand storage, feed manufacture, delivery and ingestion – and remain viable in the rumen