YEASTSOLUTIONS
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FEED THE RUMEN MICROBES TO FEED THE COW

As dairies across the UK and Ireland look ahead to winter feeding, there is much to be considered. Input costs are high, raw material markets are volatile and forage quality is variable.

To maintain and maximise margins, optimising the rumen environment will be critical to maximise feed efficiency. Effective strategies should aim to promote optimal conditions by minimising variability in the rumen. Careful management of feed and balancing of forages on farm will also be necessary to ensure that the nutrient requirements of microbes are met. We feed the microbes and the microbes feed the cow.

During the transition from summer grazing to winter housing, it is inevitable that dietary, housing, and environmental changes will put pressure on cows. Diet transition and forage variability have one key thing in common: they cause instability within the rumen, more specifically within the microbial community responsible for feed digestion. When this transition is too sudden or feed is too variable in quality or quantity, the rumen microbes can suffer, leading to digestive upsets, loss of digestion efficiency, sub-acute ruminal acidosis (SARA) and - in severe circumstances - clinical acidosis. This invariably leads to an impact on milk yield, milk solids, fertility and overall health.

Feeding the rumen

The rumen is the engine of the cow - an environment in which a diverse community of anaerobic bacteria, archaea, protozoa, and fungi exist. Through fermentation of feed, these microorganisms are largely responsible for supplying the energy and protein that the cow needs for maintenance, lactation and reproduction.

Feed efficiency is influenced by a range of dietary, genetic, environmental and management factors. Optimising rumen function is critical in achieving high levels of feed efficiency as an optimised rumen environment supplies higher levels of nutrients to the cow.

In modern high performing herds, dry matter intake (DMI) must be high to obtain target yields and to achieve this, diets are often high in concentrates. The rate of passage through the digestive tract for these feeds is much faster as the fibre content is lower, resulting in sub-optimal digestion by the rumen microbes. While the energy content of the diet is higher, a greater amount of feed passes in the dung and so feed efficiency is often poor.

Being more rapidly fermentable than fibre, high levels of starch and sugar within concentrate feeds also reduce rumen pH. Depending upon the severity of the overload or imbalance, this will then promote either SARA or clinical acidosis. This results in digestive upset, predisposes the cow to further metabolic diseases and reduces DMI and milk yield.

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Phileo by Lesaffre

While the microbiome can acclimatise and adapt to change, many keystone species are sensitive, being disadvantaged by instability. Housing in the autumn presents a challenge as environmental, social and dietary changes can place them under significant stress. In particular, the diet transition can be dramatic as herds move rapidly from a grazing-based diet, supplemented with a complementary compound and/or buffer feed, to a full winter ration.

Feed efficiency

AHDB estimate that feed and forage collectively account for 40% of the average dairy's cost of production. As such, optimising feed efficiency will minimise feed costs per litre or kilogram of milk, significantly boosting the profitability of any enterprise.

Feed efficiency is a measure of the energy corrected milk (ECM) produced from the ingestion of one kilogram of dry matter (DM), expressed as a ratio. For example, when 30kg of ECM is produced following consumption of 20kg of DM, a feed efficiency of 1.5 is obtained. The higher the ratio, the better the rate of feed efficiency.

If yield were to rise by 1.5kg for instance, without a change in DMI, feed efficiency would rise to 1.575, indicating a 5% improvement and a dilution of the maintenance cost of each kg of milk. As such, in a herd of 100, your original yield is obtained for the cost of only 95 cows.

Such advances are targeted in a variety of ways, from improvement in forage quality to increasing concentrate feed. Ultimately however, feed efficiency is most positively influenced by a focus on optimising rumen function and digestive efficiency.

Focus on Forage

Considering the volatility in feed pricing, maximising milk from forage is a sure way to mitigate financial risk whilst improving profit margins. Forage is described by many as 'natural capital', being the most cost-effective feed source available to a dairy. Indeed, the most profitable 25% of herds within the UK and Ireland produce more than 50% of their milk from grazed grass and/or silage, highlighting its relevance.

Forage variability can however be problematic, as inevitable differences between swards arise due to differences in species mix, plant maturity and growing conditions. Further variation develops when multiple cuts are stored within a single clamp as the proportion of each cut differs within samples. This inconsistency significantly impacts the nutritional composition of the ration presented to the herd each day, forcing the rumen's microbial population to change constantly to make the most of forage being fed.

This season in particular, protein levels have been low as cold and dry conditions delayed grass growth. Farmers who cut early largely avoided this drop in quality, at the expense of quantity, however those who delayed also saw high NDF levels and low D-values.

Early analysis by Trouw Nutrition GB suggests that fermentation quality is good overall, with pH and lactic acid levels moderate and sugars low. The average ME was 11.7MJ/Kg DM and crude protein (CP) 14.6%, however ranges are significant and many crops have analysed as low as 10 and 7.5 respectively. Significant variation was also seen in NDF levels, which ranged from 29-63%DM. While fibre is key for butterfat synthesis and stimulating rumination, excessive NDF levels at the middle to top end of this range will ultimately reduce feed efficiency.

"The nature of a Jersey's high energy diet means we are always pushing the rumen hard anyway, and the addition of Actisaf® to the diet helped the rumen function better - We saw higher intakes and better feed conversion soon after we added it to the diet!"

Geoff Pye, Bayview Jerseys, Lancashire

Some simple, practical solutions can be utilised within an effective plan to optimise performance this winter despite the challenges:

1) You cannot manage what you do not measure. Analyse silage from the clamp face at least once a month. Once you understand the quality and nutrient value of your forage, you can tweak rations to prevent instability within the rumen.

2) Change diets gradually over a period of 2-3 weeks. Grazing by day and housing by night throughout this period is often successful as it provides the microbial population time to adjust in profile, size and activity. Adapting to weather conditions and managing grass availability are also key considerations.

3) Present mixed rations in a consistent way by calibrating and maintaining wagons, loading ingredients in size order (smallest first) and mixing for the same consistency every time. Structural fibre such as straw should be chopped to the width of the cow's muzzle to reduce sorting.

4) Provide at least 65cm of head feed space per cow, ensure neck rails are high enough to allow cows to reach for feed and distribute the diet consistently to ensure all have access.

5) Feed Actisaf® Sc 47 live yeast within the ration to improve rumen stability, facilitating a greater level of fibre digestion to drive milk from forage.

"Putting Actisaf® into the diet has meant we're confident that the cows' rumens are stable enough to utilise the grass in their diets efficiently, which our system is reliant on."

Richard Kennerley, Plum Tree Farm

Recent trial work from the University of Nottingham has proven **Actisaf®** to:

- ↑ Feed efficiency by 5.5%
- ↑ Energy corrected milk yield by 5.9%
- ↑ Butterfat %

Adding **Actisaf® live yeast** to your dairy ration can return up to **8x your investment** through improved milk yields.

ActiSaf Sc 47

"We added Actisaf® to our milking cow diet to help deal with diet changes and rumen function. We saw a big difference in behaviour, manure and, more importantly, yields. Our butterfat levels have risen from 3.9% to 4.1%!"

Simon Davies, Castellhyfryd Holsteins, Camarthenshire

Optimise the rumen with Actisaf®

While correct feed management is critical to maintaining rumen function, it is often not enough. Feeding Actisaf® Sc 47 live yeast can deliver real benefits when you are facing highly variable forage in the winter, particularly in a year where NDF levels are high, and forages are likely to be 'stemmier' than usual.

Actisaf® lowers redox potential (Eh) and increases pH, stabilising the rumen microbiota. This increases the speed of acclimatisation to a new diet composition or diet ingredient, minimising any losses in production that would otherwise occur.

A study conducted by Pinloche et al (2013) established that Actisaf® reduces microbial diversity within the rumen, promoting the growth of highly efficient fibrolytic species such as Fibrobacter, Eubacter and Ruminococcus in addition to lactate-utilising species like Megasphaera and Selenomonas. This increased the efficiency of fibre digestion, harvesting more energy from the diet for milk production, whilst also reducing the accumulation of lactic acid, which is inextricably linked to the development of acidosis.

Similarly, the University of Nottingham's Centre for Dairy Science Innovation (CDSI) recently studied the effect of feeding 10g/day of Actisaf® to their high performing Holstein-Friesian herd, which were averaging 12,500L/cow/year prior to the trial. Professor of Dairy Science Phil Garnsworthy found a 2.8kg increase in ECM with no associated lift in DMI, thereby significantly improving feed conversion efficiency by an average of 5.5%. This improvement in performance had no negative effects on body condition score, health, methane emissions or fertility.

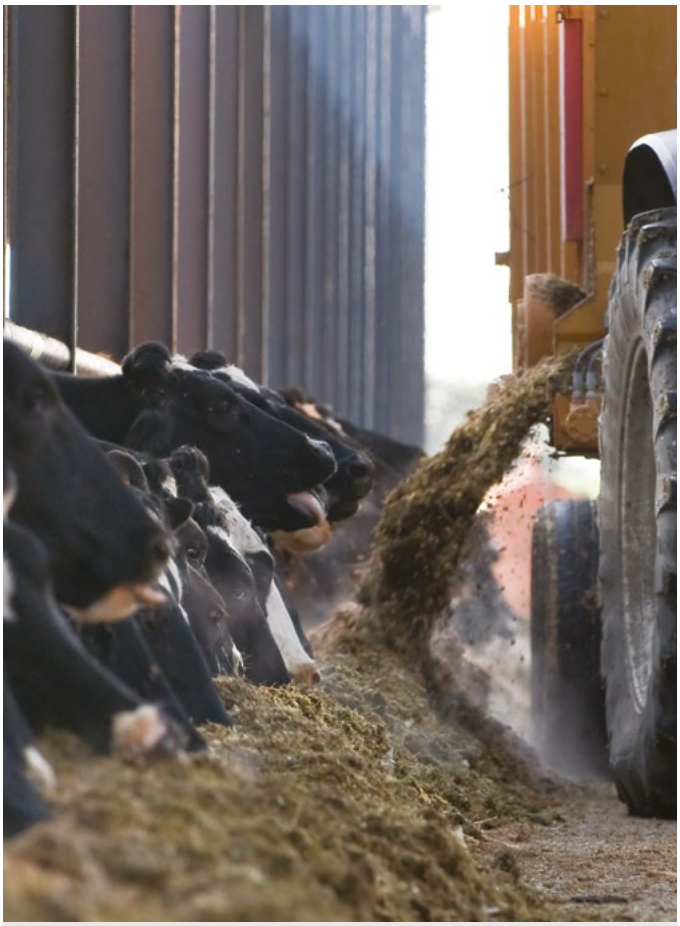
"We have included Actisaf® in the cows' diet for the last 6 years and it is in their feed year-round. By keeping the rumen functioning well, the cows can utilise the grass better and are able to manage diet changes more easily. It's worked brilliantly to drive performance from forage and keeps the cows happy in our system."

Jon Barber, Friends Farm, Shropshire

Not all yeasts are equal

As a result of our unique strain and stability, Actisaf® helps improve animal performance, promoting a better return on investment. As well as delivering effective performance at recommended dose levels, we have been leading the way on higher and targeted dose rates of yeast during particularly challenging periods, such as the transition to winter feeding and housing, to maximise benefits.

By unlocking more energy from your cows' diet and significantly improving feed conversion efficiency, Actisaf® provides a return on investment of up to 8 to 1.



Summary

- To increase profitability, herd management plans must focus on improving feed efficiency by optimising the rumen microbial environment, maximising milk from forage and mitigating the impact of variability.
- High quality forage is needed for intakes of up to 15 kg DM/cow/day, and the rumen microbiome must be optimised through careful feed management and balancing of rations.
- Actisaf® Sc 47 live yeast will deliver real benefits by helping rumen microbiota to digest fibre, harvesting more energy from forage for milk production while reducing the risk of metabolic disorders such as acidosis.
- Actisaf® promotes high health whilst enabling your herd to produce more milk from forage, even when quality is variable or cows are stressed by transitions, making your system of milk production more profitable and sustainable.