

Correct fat balance will improve feed efficiency

New research shows that paying close attention to the fat content of the diet can have

a big impact on overall feed efficiency and production costs as UFAC UK Technical Manager Joe Magadi explains.



There are broadly two ways to reduce feed costs per litre. The first is to reduce the price paid for feed, buying cheaper ingredients, focusing on price not quality and hoping the cows will manage to perform. The second is to increase the efficiency with which the diet is used.

As feed represents over 40% of the cash cost of milk production, the efficiency with which it is converted into milk has a huge bearing on overall costs of production. Feed efficiency is measured as the kilos of milk produced per kilo of dry matter consumed.

A great number of factors will influence feed efficiency, the majority of which are within the farmer's control. For example, fresh calved cows have higher feed efficiency than late lactation animals. The way the diet is presented and the amount of trough space have

a big impact as does the formulation of the diet itself. Now new research shows that the balance of fats in the diet can have a big impact on feed efficiency.

Unsaturated fats are key

The trials show the importance of ensuring sufficient rumen inert unsaturated fats are present in the diet. The reason is that they are required in the small intestine to make full use of the volatile fatty acids (VFAs) produced as a result of rumen fermentation. In simple terms, if you have insufficient unsaturated fat then less of the VFAs produced from most of the diet are utilised, driving down feed efficiency.

In the trial three diets were compared:

- control diet containing no added fats
- control diet with added C16:0 fats
- control diet plus a balanced fat supply with higher levels of rumen inert unsaturated fats.

All the diets were balanced to contain the same levels of energy, protein and other nutrients. The only difference was the make up of fats. The results were significant.

The cows on the control diet produced 1.66 litres/kgDM while the cows on the balanced diet produced 1.76 litres/kgDM, an increase in feed efficiency of 6%. Feeding balanced fats meant the whole diet was used more efficiently.

However, the group fed the diet with added C16:0 produced 1.5 litres/kgDM, a reduction in feed efficiency of 10%. Ensuring the correct fat choice improved feed efficiency by 16%.

Big financial benefit

The economic impact of this can be considerable. Feed efficiency improvements can be used in one of two ways:

1. Produce the same milk yield from less feed
2. Feed the same and produce more milk.

The table demonstrates the potential impact. Based on milk at 17ppl and a TMR costing 15p/kgDM, the benefit of improving feed efficiency by feeding a balanced supply of fats would be 21-34 pence/cow/day - £8400 - 13,600 for a 200 cow herd for a 200 day winter. Clearly the actual economics will depend on individual circumstances.

To increase the efficiency of the whole diet, the key is to improve the efficiency with which VFAs are used. The trial clearly shows that feeding rumen inert unsaturated fats can have a significant role in improving feed efficiency and reducing costs of production. The saving achieved will far exceed savings that can be made by focussing just on ingredient cost.

	Feed efficiency (kgmilk/kgDMI)	Dry matter intake (Kg/day)	Milk yield (l)	Physical benefit	Financial benefit (p/cow/day)
Control	1.66	24.0	40		
Balanced fat diet with same milk from less feed	1.76	22.6	40	1.4kg DM less @15p/kgDM	21p
Balanced fat diet with more milk from same feed	1.76	24.0	42	2 litres @ 17ppl	34p

Immune system glucose demand will hit yields

Mark Townsend from UFAC-UK explains how immune system responses can hit milk yields.

Glucose is the major energy source for a dairy cow and is a vital nutrient for milk production as it is essential for the production of lactose which is the key driver of milk yield. For example, a cow producing 40 litres of milk at 4.6% lactose will require 2.64kg glucose per day just for milk production.

But glucose is also an essential component of the cow's immune system. When a cow faces an immune challenge such as mastitis or metritis, she will immediately divert extra glucose to the immune system. She can't stop this happening and what actually happens is glucose is diverted from milk production so yield will fall.

This can be a particular problem at calving and while cows get established into lactation for two reasons. The first is that intakes are suppressed meaning that cows can be short of glucose anyway.

The second is that at this time cows will face a raised immune challenge and increased glucose demand. It has been shown that all cows will experience some degree of inflammation and heightened immune response for several days after calving.

Huge immune demand

When immune activity is increased, cows can move an additional 90g glucose per hour to fight infection, which adds up to over 2.00 kg/day. The impact on yield can therefore be considerable.

Research shows that cows with high immune response post-calving are more likely to have significant negative energy balance, so steps should be taken to minimise the impact.

The key is to ensure adequate glucose is provided in transition and fresh cow diets to allow an efficient immune system while not compromising milk yield. To achieve this, diets should contain high levels of glucose precursors, particularly glycerol, that can be used efficiently by the cow.

UFAC UK's Glycerene is a source of glycerol which is utilised efficiently by the liver to give cows a glucose boost. Being rumen inert, it passes quickly to the intestine where it is absorbed. It is a better source of glycerol than propylene glycol because it is utilised more efficiently by the cow and because it is rumen inert. Focussing on glucose supply in the transition and early lactation period will help get cows settled into milk production, reduce negative energy balance and help them cope with the immune challenges around calving.



Welcome from Robert Jones, MD



At long last we are starting to see the first glimmers of a recovery in the global milk markets, but it will be a while before farm gate prices show any real recovery. So in the meantime it is vital to focus on efficiency.

There are two big reasons for driving efficiency of production. The first is to help keep costs down now, while the second is about making sure cows are well placed to produce effectively once prices do rise so you can capitalise on those prices.

Diet has a huge part to play in driving efficiency and we believe it is vital to feed cows correctly, focussing on quality not price. Grass needs to be carefully balanced with the correct energy and protein sources. Over-estimating grass can result in reduced fertility and increased body condition loss, both of which will reduce future performance.

If the weather gets hot, feeding a balanced fat instead of carbohydrates can reduce the impact of heat stress so needs real consideration.

Also focus on transition cows. Get them calving down in optimum condition, with fewer metabolic problems and settled into lactation quickly will mean your herd is better placed when prices start trending up again.

Our team is here to help deliver efficient and effective diets and we will be delighted to offer a second opinion on your dairy rations.

Contact us:

For further details please contact UFAC-UK on:

UK Sales office
01780 460327

North - David Turnbull
07788 963487

Midlands - Mike Chown
07827 249157

South & South Wales - Mark Townsend
07788 294539

International - Dr V Nigdikar
+44 (0)1638 665923
+44 (0)7733 365907

Email: sales@ufacuk.com
Web: www.ufacuk.com

The importance of transition cow management



David Turnbull from UFAC-UK looks at the importance of effective transition cow nutrition.

Transition management is all about:

- Providing the foundations for a productive lactation including the cow getting back in calf again,
- Adapting the rumen to feeds of higher density rations and maximise DMI post calving to minimise negative energy balance (NEB),
- To reduce metabolic disease, and
- To produce a healthy calf.

The transition period is where up to 80% of disease costs occur. The risks are considerable when one considers milk fever, retained cleasings, metritis, early lactation mastitis, ketosis and acidosis.

The transition diet needs to address a wide range of issues. Most importantly we need to ensure transition cows are free from rumen disruption so that the diet can be used effectively and intakes built up so that the cow mobilizes less fat and muscle from body reserves.

Stimulate DMI

Feed Intakes are key. Maximum body tissue loss in response to NEB occurs in the period 2 weeks pre to 5 weeks post calving. Losses are approximately 70% fat & 30% protein. Research shows that feeding dietary non-fibre carbohydrate, highly digestible forages and protein during the transition period stimulates DMI. As DMI is also affected by management and environmental factors, it is essential transition cows are well looked after.

Looking at the diet, the key nutrients are glucose, amino acids, fatty acids and minerals so diets should be carefully evaluated for each of these. Glucose and amino acids are the major fuel supply for the developing foetus, mammary gland and milk protein synthesis.

Don't forget amino acids

With regard to protein, the pre-calving transition diet needs to be a minimum 14% CP, ideally 15%. Firstly, it is essential to maximise microbial protein yield as this is the most economic source of protein. Then we need to ensure DUP is at least 30% of the total diet CP content as amino acids are a major contributor to glucose production.

Specifically, methionine is one of the 10 essential amino acids that must be fed because the cow cannot produce it. It is required for normal liver function and to reduce the incidence of fatty livers. Methionine has beneficial effects on rumen fermentation and microbial protein synthesis, energy balance and immune system and can boost fertility, milk yield, protein and fat.

Regarding the balance of fatty acids, PUFA are also required, in particular omega 3's from marine oils. These boost the immune system along with vitamin E, Selenium, copper and zinc. Also marine oils boost egg quality and size post calving thus help to improve conception rates.

UFAC UK's Promega Plus including methionine and marine oil, the modern fish meal replacer for ruminants and Glycerene are specifically designed for this period and early lactation as a good DUP and energy source without any disruption to the rumen function.



Take a new look at milk records



Many farmers are considering quitting milk recording, questioning the value when all costs are coming under closer scrutiny. UFAC-UK Sales Manager Mike Chown, believes there are some very good reasons to keep recording, suggesting some new analyses can throw extra light on how the diet is performing.

While many farmers may be unsure whether they need some of the traditional reasons quoted for milk recording, a more in depth look at the data can really take the lid off how cows, and the diet, are performing. This will allow management to be fine-tuned to improve performance and efficiency. This is particularly true for cows in the crucial first 100 days of lactation.

Milk records need to be seen as a dynamic management tool and the following are just four examples of how the data can provide a real view of performance.

Look at milk lactose

Lactose is the driver of milk yield and should be at least 4.5%. Lactose levels below this are a clear indication

that cows are short of glucogenic energy in the diet and that yield may be suffering as a result.

If lactose levels are low the diet should be reviewed with particular attention paid to energy sources. It will probably pay to add Glycerene to the diet of fresh calvers.

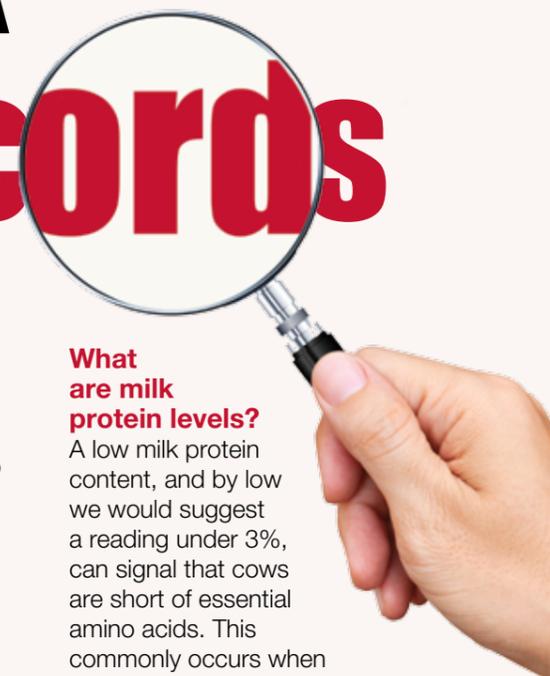
Check the fat: protein ratio

This is a good indicator of whether cows are mobilising excess body fat. If the ratio is greater than 1.5:1 then it is probable too much body fat is being mobilised. This can be confirmed by looking at two other elements on the records. A C18:1 level of over 22 points to excessive bodyweight loss, especially if MUFA levels are over 30.

As these indicate an energy shortfall in the diet, review energy levels and also dry matter intakes. The problem may be more with how much cows are eating than the diet itself.

Look at short chain fatty acid levels

This is a great indicator of rumen function with low levels pointing to an under-performing rumen. If levels are less than 9 then you should assume rumen conditions are sub-optimal and should assess the diet for effective fibre levels. Also check the balance of fats in the diet to ensure sufficient unsaturated fats are being fed.



What are milk protein levels?

A low milk protein content, and by low we would suggest a reading under 3%, can signal that cows are short of essential amino acids. This commonly occurs when cows have lost so much condition in early lactation that they have mobilised muscle as well as fat, and are now using protein in the diet to rebuild this muscle. In these cases look at energy levels in the diet to try and reduce condition loss and negative energy balance.

It is also important to look at when problems are occurring, or more importantly stop occurring. If problems are in the first 40 days of lactation, the source of the problem is more likely to be in the transition diet. Later in lactation would suggest it is the fresh calved diet which needs reviewing.

With the focus on improving efficiency to reduce costs, delving into milk records could help highlight where diets can be fine-tuned to get fresh calved cows performing to their potential.