

Balance fats for optimum performance



Mark Townsend

A better understanding of the role of fats in dairy diets means we can more precisely balance the supply of fatty acids to ensure higher performance. UFAC-UK's Mark Townsend urges dairy farmers to think long and hard before choosing straight C16:0 as the only fat added to their diets.

While we used to think straight C16:0 did the job in dairy diets, we now know this is not the case. We understand much more about fat nutrition and how to supplement cows most effectively.

R&D has shown we need a balance of fatty acids. In particular there is an optimum ratio between C16:0 and C18:1 for maximum milk fat yield and NDF digestibility which drives fat output, and herd health. In addition, there is an ideal ratio between C18:2 (Omega 6) and total omega 3's (C18:3, EPA and DHA) for optimum health, milk yield and fertility.

In simple terms, dairy diets need sufficient total fat but also need the right balance of fatty acids. Getting the balance right will ensure better performance while getting it wrong can lead to problems and lower productivity.

The target most nutritionists work to is 5% total fat in the diet. Typically 3.5% of this will be in the base diet from ingredients like forages, cereals, rape, soya and distillers. The fatty acid predominant in feed grains Linoleic acid (C18:2) and is in a form that is not rumen inert and can cause milk fat depression.

So we need to supplement the base diets with 1.5% fats and supply the fatty acids that cows need to meet their requirements and balance the base diet in a rumen inert form.

Important to understand what different fats do.

All fatty acids carry out different roles in the cow, which is why they must be balanced.

C16:0 (Palmitic) Partitions energy to increase butterfat content and milk yield, but in early lactation can prolong the negative energy balance. Therefore potentially having a negative impact on body condition and fertility.

C18:0 (Stearic) is a good energy source from the rumen and is in plentiful supply in the cow. So we need to limit added C18:0 as it lowers digestibility of total fatty acids, reducing the overall energy value of the rest of the diet.

C18:1 (Oleic) increases insulin to improve body condition, enhances fertility and also increases the digestibility of all fatty acids in the diet so improving energy availability. So we need to feed it, especially in early lactation.

C18:2 (Linoleic) is an essential omega 6 fatty acid so must be included. It enhances growth, parturition and the reproductive system. Basal diets are typically high in it. However, if too much extra is added it can inhibit milk fat.

C18:3 (Linolenic) is an essential omega 3 fatty acid which is converted inefficiently, mainly in the intestines and liver, to C20:5 and C22:6 (EPA & DHA) which are involved in the immune and reproductive systems.

C20:5 and C22:6 (EPA and DHA) boost the immune system which is vital around calving and early lactation when the immune system is suppressed. EPA and DHA from marine sources have significant reproductive benefits including larger egg size and quality, and better embryo survival. They also increases milk yield.

Understanding what different fatty acids do and the roles they play in the cow, it is possible to match them to the different requirements during the lactation. (see table).

We have formulated carefully balanced combinations of rumen inert fatty acids to meet the specific requirements at different stages of lactation. In early lactation when C16:0 should be avoided we would recommend Dynalac, moving onto Supa-Cream in mid-lactation and finally Omega Cream in late lactation when C16:0 content can be optimised.

By including the correct balance of fatty acids you can optimise herd health and productivity.

Stage of lactation	Cow requirements	Fats required	Recommended proportion of C16:0 in supplements
Transition and early lactation (-21-90DIM)	Support immune system Minimise BCS loss Return to cycling	C18:1, C18:2, C18:3, EPA & DHA	0%
Mid-lactation (91-200DIM)	Hold to service Optimise milk yield Increase milk constituents	C16:0, C18:1, C18:2, C18:3, EPA & DHA	Max 45%
Late lactation (201DIM+)	Maximise fat production Control BCS gain	C16:0, C18:1, C18:2, C18:3, EPA & DHA	Max 70%



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What can your cows tell you about the diet?

Spending a few minutes looking critically at your cows and using Cow Signals can tell you a lot about the diet, its presentation and availability and how cows are using it, as UFAC's Mike Chown a Cow Signal Trainer and Advisor explains.

If we want to know how well the diet is working and how well cows are using it we need to focus on the rumen.

The rumen is nearly one third of the size of a cow and provides roughly two thirds of her daily energy and protein requirements. It is a 24 hour mixing machine designed to optimise fermentation and absorption so we need to keep it working effectively. Quite simply, if the rumen is OK, the cow will be OK and vice versa.

The objective is to get cows to maximise dry matter intakes. This requires stress free access to quality, palatable, accurately mixed feed and water, without cows eating too fast or selectively feeding. Work on a minimum of 70cm feed space/cow.

Ideally a cow should eat 10-14 equal meals per day, with each visit roughly half an hour long, consuming 2-2.2kgDM/visit and you should expect to see around a third of animals at the feed space chewing.

There are five things to look at to assess rumen performance:

Rumen fill score - an indication of how well she ate in the last six hours. Ideally we are looking for an average rumen score of 3.5 - 4.0.

Belly fill - a guide to how she has been eating over the last week. Standing two metres directly behind the cow, can you see the belly bulging out on both sides? If you can, then intakes have been good. If you can't, then intakes may have been suppressed.

Body Condition Score - a good indicator to DMI in the last month. This is very important in early lactation as we need to minimise weight loss so cows remain healthy and conceive. We should look for a BCS of 2.5-3.0.

Rumination rate - you are looking for 7 out of 10 lying cows cudging with moisture on their lower jaw and chewing 55-70 chews/cud ball. Less than this is an indication of low effective fibre levels, which can have a negative impact on butter fat production. To be effective, the ration should ideally contain a minimum 8% of fibre 15-20cm in length and it must be less than the width of the muzzle. Effective fibre length also helps reduce sorting.

Manure scoring - look at the 3C's - Colour, Consistency and Content.

Hear it, see it, feel it, smell it, squeeze it! Do the boot test. Is it standing 3-4 cm high and does it hold the tread of your boots when you lightly stand on it. If it doesn't, it is possible we have SARA or excessive hind gut fermentation in the herd, especially if manure contains mucus.

Then sieve it. Are there more than 33% undigested particles? If there, are it means we have a poorly balanced ration and the rumen is not at optimum performance.

Armed with this information you will have a good picture of the health of the rumen and cows, which in turn will suggest how effective your diet is, allowing you to assess the diet to obtain a Feed Conversion Efficiency over 1.5 kg milk/kg DMI.



Mike Chown

Welcome from Managing Director Robert Jones



Getting the most from dairy cows this winter will mean paying close attention to all components of the diet to ensure they deliver a meaningful return on investment.

With forages generally in short supply even if quality is reportedly good, and with many popular supplementary feeds hard to come by, formulating diets will be a challenge. The devil will be in the detail and fine-tuning diets.

Irrespective of what forage you are feeding this winter, maintaining rumen health will be key. Reduced forage intakes and higher concentrate: forage ratios could leave more cows at risk of low rumen pH and SARA so there could be a big role for rumen inert glycerine and buffers such as Glyco-Buf.

Balancing energy sources will be important, and never more so when considering which fats to include. It will be essential to feed the correct fatty acid balance to match the cows' requirements from transition through to late lactation. In addition, including EPA and DHA from marine sources such as our Omega 3 Supplement will ensure the most effective source of these Omega 3 fatty acids which are essential for better fertility.

Finally, don't forget protein. It is really important to ensure cows receive adequate supplies of essential amino acids. In dairy diets, particularly those where soya is replacing rape on price, Methionine will be the first limiting amino acid followed by Lysine. Adding Promega Plus will ensure your cows have the amino acids they need.

With proper planning and attention to detail, it will be possible to formulate cost effective diets to support high levels of production. Our team will be happy to assess your diets for you.

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Use milk records to boost fresh calvers

NMR and CIS milk records contains a wealth of information to help you improve fresh cow performance. UFAC-UK's David Bonsall considers how they can unlock the key to a more productive lactation.

In the past, dairy farmers have often relied on measures like milk yield results and whether cows are losing weight or not as the best guide of how fresh calvers are performing. But now, taking a look at milk records data at the first two recordings can shine a spotlight on how well they are really doing and allow action to be taken to correct any problems.

There are four main areas to look at.

Mono-unsaturated fats in milk

High levels of mono-unsaturated fats can suggest cows are losing too much body fat. Anything above 30% of milk fat as mono-unsaturates is an indicator that body weight loss is an issue. Because cows carry large amounts of fat in the body cavity which can be mobilised, they can be losing weight without actually losing visible condition.

Also look at levels of C18:1 oleic acid. Levels above 22-25% suggest a real problem. This is one of the first fats mobilised and it is found in large quantities in the foot pad. If cows are mobilising C18:1 they will be predisposed to lameness, particularly solar ulcers.

If high mono-unsaturates are a problem, look at the energy density in the diet and monitor intakes as cows probably aren't migrated onto the milking cow diet effectively. Also check they have adequate feed space – at least 70cm/cow.

Short chain fatty acids

These are the fatty acids produced in the rumen and indicate how the rumen is performing. Levels below 9% point to problems with rumen



function and how well cows are making the change from the transition to milking cow diet.

If you see low short chain fatty acid levels take a close look at the diet and particularly whether cows are getting sufficient structural effective fibre to support rumen function. It might be that the diet needs more fibre or that cows are sorting the diet, two things we can confirm by sieving the diet.

Diet sorting can also lead to too much starch in the diet, which can upset the balance of rumen fermentation.

Fat to Protein ratio

Typically you should see a ratio of 1.3:1. A ratio below 1:1, indicates cows could be suffering with SARA while a ratio of over 1.5:1, particularly in early lactation, could indicate cows have ketosis.

Lactose

Lactose can tell us a lot about the energy status of the cow and particularly the levels of glucogenic energy in the diet. Glucose is essential for milk production and lactose levels below 4.5% indicate that cows may be short of glucogenic energy, in which case look closely at the balance of energy sources in the diet. Low lactose can also be caused by cows being away from food too long. A mix of high and low lactose values from cows on the same diet is a good sign of diet sorting.

By looking at milk records in a bit more depth, you will be able to get cows settled into a more profitable lactation.



David Bonsall

Supa-cream helps drive high quality milk

Efficient production from a top quality herd of cows are the goals for Tony Mitchell and his son Will, and UFAC-UK's new product Supa-Cream is already making a big impact.

The Mitchells farm 400 acres at St Kew in North Cornwall. The farm had been primarily a dairy farm for many years, but in 2014 the family were forced to think long and hard about business direction when they lost over 60 cows in a 12 month period to TB.

"With Will coming back into the business we decided we wanted to stay in milk production," Tony explains. *"However we decided that rather than running a larger herd of average cows, we wanted a herd of the best possible cows producing milk as efficiently as possible."*

"Our target is 150 cows from high end cow families, producing high quality milk for our constituent based contract."

Since 2014 they have brought in cows from the Cosmopolitan, Hana from the Dellia's, Ghost, Rapture, Elegance and Rachel families. They purchased 12 cows from the Normead dispersal herd. Embryo transfer is a key part of their strategy, working with Mark Knutsford from Celltech, and they recently purchased four embryos from the Bambi family from Cameron Baty's Tynevalley herd.



Tony and Will Mitchell

They currently have 80 cows in milk but this will increase to around 120 by the end of 2019 as more heifers enter the all year round calving herd. The cows typically graze from late April to early September, but are buffer fed from early July as the farm is prone to drying out.

Focus on quality

They pay close attention to detail. They have fortnightly vet visits, a twice year professional foot trimming session and health and performance are monitored using SenseTime. A comprehensive vaccination programme is followed for Salmonella, IBR, BVD and leptospirosis. All calves are tag and tested for BVD.

Quality forage is the foundation of the system. They look to make 1200 tonnes of first cut and 450 tonnes of maize. First cut averages 11.2ME while maize comes in at 12ME and 31% starch.

Milk is sold to Dairy Crest Davidstow so milk quality has a major impact on milk price and financial performance. The rolling performance is 9867 litres at 4.19% butterfat and 3.28% protein, with a predicted calving interval of 384 days. Diets are formulated with advice from Chris Martindale of Lloyds Animal Feeds. The cows are fed a single TMR which is fed once a day and formulated to maintain high milk quality. The TMR is typically formulated for M+27 litres and is supplemented by Harpers Buttermax Extra in the parlour.

The diet had usually contained a C16:0 fat supplement, but this summer milk quality fell back due to the grazing shortage so they were advised to swap to UFAC Buta-Cup Extra. Before the change, butterfat had been 4.10% with 2.98% protein. Following the change in fat supplement, compositional quality rose to 4.11% fat and 3.13% protein in August and 4.26% fat and 3.27% protein in September after maize was introduced.



In September they took the decision to change to UFAC Supa-Cream on the advice of Chris Martindale. Supa-Cream is an optimum balance of fatty acids to support milk production and compositional quality. It helps improve the digestibility of the whole diet including forages. It also contains high levels of EPA and DHA to support improved fertility and glycerine which is a direct precursor of glucose.

The diet now comprises 24.5kg each of grass and maize silages, 1.5kg rolled wheat, 3kg soya, 0.37kg Supa-Cream and 150g of minerals with added methionine. In addition SC Toxisorb is included to reduce any mycotoxin risk.

"Since moving onto Supa-Cream milk quality has increased further to 4.32% fat and 3.48% protein which has had a big impact on our milk price and the cows are averaging over 30 litres per day," Will continues.

"The physical form of the diet is better than when we fed the C16:0 fat and cows are clearing the diet well."

"We added the extra methionine as we used to feed rape and maize distillers. This year soya is a better price working on protein percentage but is lower in methionine than the rape so we have balanced the diet up."

"Changing to a balanced fat source has had a big impact on performance which will be important as we expand the herd," he concludes.