

The 'right' fat can fuel productivity and safeguard fertility

Get all the facts before adding fat

It pays to know your 'fat facts' when adding supplements to cow rations. Do you know your C16s from your calcium-salt products? And what about the pitfalls of adding 'free' oils? Read on to find out more.

text **Rachael Porter**

Adding fat to cow rations is a popular method of improving energy intake. Cows typically suffer an extended period of negative energy balance during the early part of lactation, when the demands for nutrients and energy to meet the genetic drive for producing milk are at their maximum.

Feeding fat can help this energy balance and help to maintain productivity while, at the same time, protecting cow health and fertility.

Fat is an extremely useful ration ingredient when it comes to meeting the specific needs of high genetic merit and high yielding cows. It contains around 2.5 times the ME concentration of typical cereals. So the inclusion of fat improves dietary energy density and the cow gets more energy per bite – invaluable in early lactation when the cow's ability to consume a high volume of dry matter is limited despite rapidly increasing milk yield.

But with so many fat supplements on the market it's important to choose the one that's best suited to your system and your herd's ration.

Huge variation

"Producers are well-aware of the major differences in quality of protein supplements available; protein sources differ greatly in terms of rumen degradability and amino acid composition for example," says Volac nutritionist Richard Kirkland.

"Fat supplements vary widely in terms of the percentage of fat in the product and the structure of the fat. The type or balance of the individual fatty acid

building blocks from which the fat is composed can also vary, as can the degree of rumen protection of the fat. These attributes have a major effect on the digestibility, and therefore the energy value, of the particular fat and on the overall functional attributes of the fat."

There's a huge variation between fats available for dairy cow rations and emphasis should be placed on considering the type of fat that supplements comprise, rather than simply looking at the total fat concentration.

"Adding 'free', unprotected oils to a ration may increase energy levels on paper, but these can lead to undesirable effects in the rumen and reduced cow performance," explains Dr Kirkland. "Free oil will coat the fibre components of the ration, reducing fibre digestibility. Excessive levels of ingredients with high concentrations of free oil, for example brewers' grains and distillers' grains, can have similar effects."

Oils from these sources are primarily composed of unsaturated fatty acids, such as linoleic acid. This fatty acid is the primary precursor of specific 'trans' fatty acids, which are known to be highly potent in reducing milk fat percentage. "Supplementing with rumen protected or rumen inert fatty acids minimises or removes the potential negative effects associated with the unsaturated fatty acids," he adds.

The best known of the rumen-protected fat supplements are those generally classified as 'calcium salts'. These are a combination of calcium and fatty acids and such products can be produced from many different types of fat. Volac's



Richard Kirkland

Megalac, for example, was the original product developed using this technology. The calcium salts in this product are inert in the rumen but are broken down in the acidic conditions of the abomasum to release the fat and calcium components for absorption by the animal. Proven benefits include increased milk yield and milk solids, together with improved oocyte (egg) quality and herd fertility.



Adding fat boosts yields and BCSs

Knowing his fat facts is vital for Cumbria-based producer David Martin. He's adopted a high-input, high-output dairy management system at Lords Plain Farm, near Kendal, where he runs a 200-cow Holstein herd, currently averaging 10,400 litres with a 392-day calving interval.

"We need to spread the unit's fixed costs over as many litres as possible on our limited area, so we are very yield-driven. Every litre counts," he says.

Fat plays a key role in maximising dietary energy and milk yields, while at

the same time safeguarding herd health and fertility. "Incorporating fat enables us to formulate a diet high in energy without taking up any real space in the rumen or adding to the risk of acidosis.

"We keep the diet's energy density up by feeding a semi-TMR ration based on grass silage and alkalage supplemented with fat to provide maintenance plus 32 litres, and then top-up with parlour-fed concentrate," he adds.

Mr Martin had been feeding two different types of fat for specific

reasons. A high-C16 product was fed to increase milk fat percentage and a calcium-salt product was fed to lift milk yield and help maintain body condition.

"But our milk contract has recently been changed and it no longer proves cost-effective to feed the high-C16 fat so we've removed it from the diet. We are, however, continuing to feed Megalac as we can't expect our high yielding Holsteins to milk well on low-energy rations, never mind try to get them back in calf."

The 'high-C16' fat supplements have increased in popularity during the past few years, targeted primarily at increasing milk fat percentage. These products are largely inert in the rumen due to the high melting point of the saturated C16 fatty acid component, though the level of C16 in different products in this category does vary. Typically, C16 content can range from 70%, to almost 100% of the total fat.

Improving fertility

Trials have demonstrated improvements in milk fat of more than 0.30% following the incorporation of a 100% C16 fat product into lactating dairy cow diets. "But digestibility of the high-C16 products will be lower than the calcium-salt type

products and their contribution to overall energy supply of the animal to promote production or to improve fertility in the cow is not well established," says Dr Kirkland.

A number of products on the market contain approximately 50% fat and are generally composed of fat and oil blended with fibrous components. The fat is said to be released slowly into the rumen and some products are promoted as containing omega-3 fatty acids, which can help to improve fertility if supplemented at the appropriate time in the cycle.

"But potential benefits of omega-3 inclusion can only be achieved if these fatty acids are protected from rumen microbes that change their structure and their mode of action.

"Composition of the fat in these products, including the proportion of omega-3 fatty acids, can vary greatly and there is limited scientific evidence of the rumen-inertness and protection of the fat in these supplements, or of their effects on animal performance," he adds.

There are also a number of fat supplements, generally referred to as 'hardened' fats, available.

This type of fat is produced by hydrogenation – a chemical process – of a fat source such as palm oil, producing a highly saturated fat with high melting point.

The digestibility of saturated fatty acids is lower than that of unsaturated fats and where the fat is composed of triglycerides digestibility will be further reduced. |