

Pre-calving diet sets cows up for lactation

Around calving, the dairy cow undergoes a dramatic transition from dry and heavily pregnant to fully lactating. This is a stressful period for the cow and she is vulnerable to many problems and disorders that can affect her health and productivity.

Feeding during the last 2-3 weeks before calving not only determines what happens to body condition at this time, but also provides an opportunity to prepare the cow for the coming lactation.

So called 'transition feeding' pre-calving aims to achieve four things for the cow:

1. Meet her nutritional requirements, not just for maintenance, but also for final development of her foetal calf, and development of her udder.

2. Give her rumen microbes time to gradually adapt to the milker diet they will need to handle once she calves.
3. Reduce the chances of her suffering metabolic disorders and other health problems around calving, such as milk fever, grass tetany, ketosis, twisted stomach (displaced abomasum or DA) and retained foetal membranes (RFMs).
4. Enable her to eat more in the first few critical weeks of her lactation, and thereby lose less body condition and produce more milk.

What's it worth?

A sound transition feeding program not only decreases each cow's risk of milk fever and other health problems, you can also expect it to increase her milk production by several hundred litres over the lactation, improve her reproductive performance and reduce her likelihood of being culled.

This spring presents some extra challenges

If you have cows to calve this spring, and have little or no conserved forage on hand, you may need to feed them a pre-calving diet containing more pasture and more grain/concentrate that is lower in NDF and effective fibre. Such a diet may consist of 7 kg dry matter of lush pasture and 2 kg grain/concentrate.

Lush, early spring pastures can be very low in fibre (around 30-35% NDF) and quite high in sugar content. Fed with some grain/concentrate, this increases the risk of acidosis and displaced abomasum (DA) due to low rumen fill, reduced chewing and saliva production, and unstable rumen conditions.

Increasing the level of pasture in the diet also increases the risk of milk fever and grass tetany. These conditions relate to levels of macrominerals in the pre-calving diet – high calcium (>0.6%), high phosphorus (>0.4%), low magnesium (<0.3%) and high concentrations of sodium and potassium compared



Prevention of milk fever is better than cure.

to chloride, and sulphur increase the risk of milk fever. Low calcium and magnesium intake after calving and high potassium concentrations will increase the risk of grass tetany.

What can you do?

If possible, set aside some high quality cereal or pasture hay. Straw is less suitable, but it is also valuable in limited amounts (up to 3 kg per cow per day). Larger amounts of straw can increase the risk of a displaced abomasum (DA).

Provide adequate feeding space per cow for concentrates, hay or silage sources to minimise competition. A minimum of 70 cm of linear trough space per cow is ideal.

Don't be afraid to include pasture in your pre-calving diet. It is an ideal feed for far-off dry cows. If the cows are going on to pasture after calving, it is important to include it in their transition diet pre-calving. After all, transition diets are about a smooth change, not an abrupt change to diets fed after calving.

Keep in mind ...	Management tip
Know exactly what you are feeding your cows each day.	Work out how much dry matter you are feeding per cow per day and be alert to changes in pasture growth and changes in the number of cows in the groups as cows calve down. Test the feed to determine what the feed values and mineral concentrations are likely to be in the feed. Ask an adviser to recommend a laboratory.
Pasture pre-grazing height.	Don't put cows onto pasture that is too short, as it will provide them with very little effective fibre - the less other forage there is in the diet, the more critical it is not to do this! If your pasture is eaten down too low it will also take longer for it to recover/re-grow. Ideally, cows should be put onto pasture at the 3+ leaf stage.
Pasture fertiliser history.	Don't put cows onto pasture that has been heavily fertilised with potassium or effluent. Avoid these pastures if at all possible! High concentrations of potassium increase the risk of milk fever.
Avoid abrupt changes to grain/concentrate intake.	If you will be feeding grain/concentrate after calving, be sure to feed it in your transition diet pre-calving. If you are not currently feeding grain/concentrates, consider doing so.
Transition diet minerals differ from milker diet minerals.	Don't include milking cow minerals - the transition minerals are very different to those fed after calving and the grain/concentrate fed to the milkers is NOT suitable (see page 3). Sodium bicarbonate (bicarb) is also a big no-no in transition diets pre-calving.
Take care with grains to manage acidosis risk.	Ensure that cows are not too abruptly introduced to large amounts (>2-3kg) of rapidly fermentable grains (e.g. finely crushed wheat), especially if long stem conserved forage is not available. In this situation, consider using lower risk grains (barley, oats) if available, and by-product feeds (e.g. wheat millrun, barley maltings, corn gluten feed, palm kernel extract, copra meal) to lower the risk of acidosis. Many of these feed ingredients are available through feed manufacturers who can integrate these into grain-based mixes and pelleted feeds.
Rumen modifiers can help reduce acidosis risk.	Consider including rumen modifiers in the transition diet pre-calving such as ionophores and possibly virginiamycin if you have to feed a diet that is low in effective fibre (assess your risk of developing acidosis using the Risk Assessment Grid - Fact Sheet D). Ensure that you feed the same rumen modifiers before calving as after calving.
Pros and cons of feeding transition diets to dry cows through the dairy.	Consider the time needed for cows to consume the required amount. Some cows let down milk in the dairy and this can increase the risk of mastitis, so cows fed in dairies should have teat spray applied. Springing cows close to calving with large, swollen udders that are leaking milk should enter the herd and be milked – they have finished their transition.

Why feed pre-calving diets with a low DCAD?

Pre-calving diets with a low DCAD (Dietary Cation Anion Difference) make the cow's blood more acidic. The cow responds by releasing more carbonate from her bones to buffer this acid and maintain normal blood pH. As a result, the cow is much better able to cope with the huge demands for calcium after calving due to milk production, avoiding milk fever and other metabolic disorders associated with low blood calcium levels.

DCAD = meq/kg of (potassium plus sodium) minus (chloride plus sulphur)

An ideal pre-calving diet has a DCAD between 0 and -100 meq/kg. This is achieved by increasing the chloride and sulphur in the diet through inclusion of 'anionic salts' or commercial anionic feed supplements (e.g. Biochlor™).



Check that your pastures are at the right stage of growth before grazing.

Urine pH is a useful check

To check how well your transition feeding program pre-calving is working, collect a few urine samples from cows after 3-4 days and test their pH using urine test strips.

If your program is making your transition cows' blood more acidic, as intended, you should see their urine pH lowered to less than 7.

The ideal urine pH for Holstein-Friesian transition cows pre-calving is in the mid 6s. For Jerseys it's in the mid-high 6s.

If your results suggest that your transition feeding program needs adjusting, seek help from an adviser.



Urine test strips help you monitor your transition feeding program

Using anionic transition feed supplements

Anionic salts include magnesium sulphate, magnesium chloride, calcium sulphate, calcium chloride, ammonium sulphate and ammonium chloride. Some of these salts can be applied by water, but for best results daily intakes of salts must be well controlled, so administration by feed is recommended.

Anionic salts are quite bitter to taste, so cows may try to sift them out of grain-based supplements if presented in powdered form. This is why most commercial anionic salt-based feed supplements are in pelleted form and contain flavours to make them more palatable.

There are many commercial transition feed products available to help you lower the DCAD of your pre-calving diet. Some are 'complete' supplements which incorporate anionic salts with grain, protein sources and other additives such as a rumen modifier. These may be presented either as a grain mix or pelleted supplement, and are usually recommended by the manufacturer to be fed at rates between 2 and 4 kg per cow per day.

Other 'concentrated' transition feed supplements are also available, containing anionic salts and other additives such as a rumen modifier. These are designed to be mixed on farm with grains and other feeds.

As well as lowering the DCAD of the pre-calving diet, an ideal transition feed supplement also provides additional magnesium.



Be sure to choose a well-formulated transition feed product and feed it strictly according to the manufacturer's directions for 2-3 weeks leading up to calving. Feeding for longer than 4 weeks is not recommended. Feeding at less than the recommended rate per cow per day will result in your cows being under-dosed and give disappointing results.

Pastures typically have very high DCADs, so the more pasture fed in the pre-calving diet the more difficult it is to bring the overall diet's DCAD down to the ideal level with anionic transition feed supplements. However, even a partial reduction in DCAD will help control the risk of milk fever. Ask an adviser to help you design the best possible transition feeding program for your circumstances.

Note – After calving, a low DCAD diet is no longer desired. The milker diet must provide sufficient levels of calcium and magnesium. Failure to provide these will result in milk fever and grass tetany.

Will your transition feeding program hit the mark this spring?

**Not sure?
Ask an adviser**