Dairy Australia

FEED PLANNING

Transition cow management

The modern dairy cow undergoes significant metabolic challenges in the 'transition' period, defined as the four weeks before and after calving.

In adult dairy cattle, 80 per cent of disease costs occur in the first four weeks after calving. Research over the last 20 years or so has demonstrated that an integrated approach to transition cow management (TCM) can have significant benefits in reducing occurrences of metabolic diseases post calving (See Table 1). It has also been shown that a transition feeding program costs $20–60 per cow but returns up to $200 per cow.

A good TCM programme reduces costs and creates more milk income by delivering a live calf and establishing a successful lactation. In addition, a good TCM programme results in:

- Almost no clinical milk fever cases in the herd
- Low occurrence of other cow health problems post-calving
- Low culling and death rates in the first two weeks post calving
- Higher herd fertility
- Greater number of lactations and enhanced animal welfare
- Less labour and stress from time spent dealing with sick cows.

KEY MESSAGES

Test transition cow forage to establish mineral status of the forage, and reduce the risk of milk fever by offering a diet with a negative DCAD in the three weeks pre calving

Pre calving: target calcium in diet = 0.4–0-65% DM; post calving: target calcium in diet = 0.8–1.2% DM

Maintain magnesium content of 0.45% DM in the three weeks pre-calving

Use a highly digestible forage in the post-calving diet to encourage greater DMI

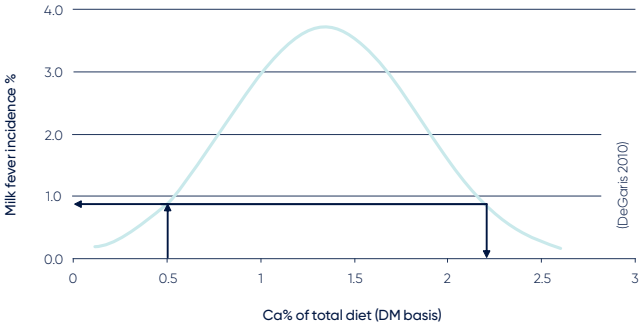
Table 1 Four main aims of a successful TCM programme

Aim	Details
Reduce ruminal disruption	Lactating cows are very vulnerable to sub-acute ruminal acidosis (SARA) resulting from suppressed appetite prior to calving and the rapid introduction of grains/concentrates.
Minimise macromineral deficiencies	Mainly refers to calcium, magnesium and phosphorus. Milk fever and grass tetany (hypomagnesaemia) can result from a conditioned deficiency where excess potassium reduces the capacity of the cow to maintain stable blood concentrations of calcium and magnesium.
Minimise lipid mobilisation disorders	Includes ketosis, fatty liver and pregnancy toxaemia; diseases that are largely influenced by a failure to provide sufficient or effective energy sources around calving.
Avoid immune suppression	Often associated with lack of energy or protein intake – micronutrients are often involved, including copper, selenium, zinc, iodine, vitamin D and vitamin E.

Table 2 Achievable targets for cow health problems (expressed as percentage of cases of calving cows within 14 days of calving)

Health problem	Target	Seek help if
Milk Fever	1% (2% in cows over 8 years old)	>3%
Clinical Ketosis	<1%	>2%
Abomasal displacements (left or right)	<1%	>2%
Clinical Mastitis	Less than 5 cases per 100 cows in first 30 days post calving	More than 5 cases per 100 cows in first 30 days post calving
Grass Tetany	0%	One case
Retained Placenta more than 24hrs post calving	<4%	>6%
Calvings requiring assistance	<2%	>3%
Clinical acidosis	0%	1%

Figure 1 Effect of calcium on milk fever risk



Two of the key aspects farmers should consider when planning their TCM strategy are milk fever and ketosis.

Milk fever: a gateway disease

Incidences of hypocalcaemia (milk fever) are affected by the levels of minerals in the transition diets, as well as the age and breed of the cow. It is well known as a 'gateway disease', leading to many other metabolic disorders. Milk fever also depresses immune function around calving, thus causing a greater risk of mastitis, metritis and poor reproductive function.

- For every case of clinical milk fever detected, there may be eight or more cases of sub-clinical milk fever.
- Older cows are more likely to get milk fever due to reduced absorption of bone calcium
- Channel Island breeds like Jerseys have been shown to be twice as susceptible to milk fever as Holsteins.

Dietary Cation-Anion Difference (DCAD)

The DCAD of the pre-calving diet is one of the most important factors affecting milk fever incidences post-calving. Pre-calving diets high in sodium and potassium (cationic elements) and low in chlorine and sulphur (anionic elements) have been shown to increase the risk of milk fever. Many commonly fed forages on Australian dairy farms such as pasture silage or even freshly grazed pasture often contain excessive levels of potassium for pre-calving cows which result in a positive DCAD. For this reason it is recommended to use a lead feed containing anionic salts or added sulphur or chlorine for pre-calving cows to create a negative DCAD in the overall diet. The target DCAD for a pre-calving transition diet is -50 mEq/kg DM or lower. Testing of forages for mineral analysis, preferably using wet chemistry methods, is essential to accurately calculate the dietary DCAD.

Positive DCAD post-calving

A further challenge is that post-calving, the cow actually needs a positive dietary DCAD. However most commonly used forages in Australian dairy systems naturally have a positive DCAD. In addition, sodium bicarbonate is commonly added to lactating cow concentrates to increase the DCAD post-calving. The post calving dietary DCAD target level is >250 mEq/kg DM. However, we still highly recommend getting specialist advice from your nutritionist when formulating DCAD levels of transition diets.

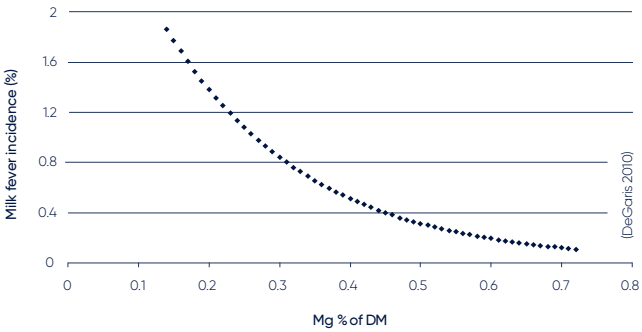
DON'T feed milker ration as a pre-calving transition feed. Milker feeds usually contain higher levels of calcium and added sodium bicarbonate (which has a positive DCAD of over 10,000mEq/kg DM.

DO conduct a mineral analysis on your transition forage. Hay and silage can vary hugely in DCAD, potassium, calcium and magnesium status due to season, maturity, fertiliser and effluent applications.

Calcium

Calcium is a key mineral in the transition period. Milk fever results from a sudden dramatic surge in demand for calcium post-calving as milk yield increases. The effect of dietary calcium levels pre-calving on milk fever incidence post-calving is actually quadratic as shown below. Below 0.5% DM and above 2 per cent DM of calcium, milk fever incidence is at its lowest. As it is more difficult in practice to sustain dietary calcium concentrations pre-calving above 2 per cent consistently, it is recommended to target a pre-calving calcium level of 0.4–0.6 per cent DM in the diet. Importantly however, the post-calving calcium levels in the diet must increase to 0.8–1.2 per cent DM in the diet as the demand for calcium after calving increases 2–4 fold.

Figure 2 Effect of magnesium on milk fever risk



Magnesium

Magnesium (Mg) levels in the pre-calving diet actually have been shown to have a greater influence on milk fever occurrence than calcium (see below). Magnesium affects the mobilisation, intestinal absorbtion and bone resorbtion of calcium and also prevents hypomagnesemia. It is recommended to have a minimum level of 0.45 per cent DM as Mg in the transition diet. Most forages used on farms will have insufficient levels of Mg, especially if high in potassium and so Mg supplementation is required.

Phosphorus

High phosphorus levels of the diet can also contribute to milk fever incidences and therefore it is recommended to target <0.45 Phosphorus in the precalving diet.

Timing of lead feed programme

In terms of the time required to feed a transition diet, 21 days pre-calving is considered optimal. Depending on the specifications of your lead feed, 3–4kg/day should be sufficient feeding rate during the transition period, alongside a good quality forage with a low DCAD. This will allow an increase in dry matter intake in early lactation, as the rumen will already be adapted to a moderate level of grain feeding, this allowing the cow to regain her appetite quicker post calving and reducing the risk of acidosis.

DO Pregnancy test cows and heifers from 5–15 weeks gestation to get accurate due dates for the herd.

Practical tips for lead feeding:

- If lead feeding through a rotary dairy, consider installing an extra feed head and silo for lead feed
- In a herringbone, ensure feed heads are all calibrated to provide the same amount of feed to all bails.
- If lead feeding in the springer paddock, ensure all cows have adequate trough space (0.75m/cow). Avoid feeding lead feed on the ground – second hand troughs or conveyor belt could be an alternative option.
- If you can individually feed cows in the dairy post calving, ramp up grain provision gradually for each cow in the first week

Ketosis

Ketosis is defined as increasing levels of circulating ketones caused by incomplete oxidation of mobilised body fat when cows are in negative energy balance. In simpler terms, it is commonly observed when fatter cows are milking too much 'off the back' in early lactation and their DMI is reduced. It is often prevalent in cows that are carrying excessive body condition scores at calving (>5.5 on the 8 point scale) and can also be indicated by very high milk fat concentrations and low milk protein concentrations in individual cows in early lactation.

Most ketosis cases are not diagnosed and the cost of undiagnosed subclinical ketosis on dairy herds is very significant, including reduced milk yield, greater somatic cell counts and other metabolic diseases (displaced abomasums, metritis, mastitis, lameness).

Preventative measures for ketosis should form an important component of TCM.

- The main aim should be to reduce the depth and duration of negative energy balance post-calving by maintaining DMI as high as possible. This can be achieved more easily by offering fresh cows' digestible, high quality forage.
- Where possible, avoid feeding lower quality forage post calving with high NDF levels, or poorly fermented silage containing high levels of butyrate (which is converted to ketones, thus increasing the risk of ketosis).
- Avoid cows calving down in excess BSC (>5.5). These cow are more likely to have severely depressed appetites immediately before and after calving. Often carryover cows are most at risk in this scenario.
- Provide adequate feed space to all cows in the herd (minimum 0.75m/cow).

Summary

This fact sheet only briefly touches on some of the main points for consideration in order to achieve a successful TCM programme. Dairy Australia has a number of resources on its website related to TCM, as well as TCM workshops run by the regional development programs at various times of the year. It is highly recommended to seek specialist nutritional advice if implementing major changes in this aspect of your herd and feeding management.

FOR FURTHER INFORMATION

Please visit **feed.dairyaustralia.com.au**

Dairy Australia Limited ABN 60 105 227 987
E enquiries@dairyaustralia.com.au
T +61 3 9694 3777
F +61 3 9694 3701
dairyaustralia.com.au

1731.15 | Sep 2019