

# Transitioning on to winter crops

A key goal for the winter period in a pasture-based system is to gain body condition prior to calving. In areas where there is very little pasture growth during winter, dairy cows are primarily fed on forage crops (e.g. kale, fodder beet or swedes) plus supplement (e.g. straw, silage, and hay). This is because forage crops produce high yields of good quality feed at a relatively low cost per kilogram of dry matter.

Changing diets from pasture to winter crop does have risks that need to be managed, at the time of this transition. Poor transitioning can result in ruminal acidosis, low Body Condition Score (BCS) gain and worst case scenario death. A good transition plan can help in avoiding these risks.

## Body Condition Score

- Achieving recommended BCS targets is important to optimise milk production, reproduction, health and welfare.
- Cows need time to gain BCS. Little BCS is gained during the first week after dry-off and during the last month before calving.
- Different feeds have different efficiencies for BCS gain in dry cows.
- See "Feeding for condition score gain", *TechnicalSeries* April 2014, [dairynz.co.nz/techseries](http://dairynz.co.nz/techseries).

## Forage crops

- Forage crops provide different nutrients compared with the typical diet of a grazing lactating cow.
- Cow's diet should not be changed abruptly. Bacteria in the cow's rumen need time to adjust to new feeds.
- Forage crops have little effective fibre and supplementation with a high fibre feed (e.g. hay, straw, silage) is recommended to aid transition.
- Plan the transition of winter crops and calculate daily feed allocation careful to prevent metabolic disorders and to maximise body condition gains.

## Risks to transitioning on to winter crops

### 1. Acidosis

If the transition period is too short or cows consume too much crop too quickly, ruminal acidosis can occur.

Forage crops are relatively high in rapidly fermented energy (sugars) and low in fibre. The microbes in the gut rapidly convert the sugars resulting in large quantities of volatile fatty acids (VFA), which lower the pH (increasing acidity) of the rumen and can result in the build-up of specific fatty acids such as lactic acid. The low level of fibre limits the amount of cud chewing and saliva production which helps to buffer the rumen pH. The high level of VFA production combined with reduced rumen motility and saliva production can result in clinical acidosis.

Consequences of rumen acidosis include lowered intakes, rumen stasis, and long lasting damage to rumen and liver and even death if the cows are not removed from crop and treated appropriately.

Fodder beet bulbs are particularly high risk because they are very high in sugar and low in fibre. To help reduce acidosis adding 30-40% roughage to the crop diet to increase fibre intake, and the gradual adaptation of cows to a crop. Often the poor performers in the first 2-3 weeks of transitioning onto crops suffer from sub clinical acidosis. These animals need to be identified, and removed from crops and fed more roughage.

### 2. Nitrate poisoning

The signs of nitrate poisoning are cows appearing uncoordinated, sudden deaths; this is due to anoxia (lack of oxygen to tissues).

Leafy crops such as kale pose the greatest risk of nitrate poisoning, due to a high concentration of nitrates in the plant.

This can be caused by; dry spells, frosting followed by rapid growth and recent or high application of nitrogen fertilisers,

Nitrate poisoning is caused by nitrates in plants being converted to nitrites and ammonia by microbes in the rumen.

Nitrites are absorbed into the bloodstream, lowering the blood's ability to carry oxygen.

The risk can be reduced by:

- Gradually adapting cows to crops and ensuring they get enough roughage before feeding the breaks
- Double fencing during transition to prevent breakouts onto large areas of crop.

### 3. S-methyl cysteine sulphoxide (SMCO) toxicity

S-methyl cysteine sulphoxide are found in brassicas and especially kale. Excessive use of nitrogen and sulphur fertilisers can increase the concentration of SMCO's in the plants. Cow's urine is discoloured from the typical yellow to a dark pink/red colour. Other clinical signs include weakness, diarrhoea, decreased appetite and poor performance.

Avoid feeding cows flowering brassica crops as flower heads have the greatest concentration of SMCO's in the plant, increasing the risk of poisoning. Ensure animals have adequate levels of selenium before going onto crops.

### 4. Glucosinolate toxicity

Glucosinolate toxicity is most common when cows are grazing mature brassica crops late in the growing season, when glucosinolate levels are very high in the new leaves and the flower heads.

During digestion, the glucosinolates are broken into isothiocyanate, nitriles and thiocyanates. These can, individually or in combination cause;

- Reduced feed intake in young stock and adult cattle
- Goitre in new born calves
- Photosensitivity in all stock.

Do not feed brassicas in their reproductive growth phase, recognisable when new growth, flowers and seed heads develop.

## Develop a winter transitioning plan

It is recommended to develop a winter crop transition plan. When developing a plan consider the nine points below and attached check list.

### 1. Shape of paddocks

Consider how you will set up the first break for cows. For most winter crops, space can be created by opening up and eating/trampling a headland area or using a time based approach to feeding (i.e. 0.5 hours on day 1, 1 hour on day 2 etc. over the first 1-3 days until there is sufficient space).

If feeding fodder beet a time based approach should not be used, as cows are likely to only eat the leaves to begin with, leaving more bulbs for other cows resulting in rapid rate of intake of a high sugar diet creates a high risk for acidosis.

### 2. Planting direction

When setting up a paddock it is important to consider the planting direction of the crop, as it can be more accurate to allocate rows rather than by square meter. With Fodder beet for example, if the crop is grazed across the planting rows (typically 0.5m), then it is easy for staff to allocate a number of rows. If the standards are correctly placed, the inter-row spacing's will reduce the risk of cows eating significantly more dry matter from under the wire.

### 3. Consider risks for crop type

**Fodder beet** has a higher risk of acidosis due to the high soluble sugar content of the bulb (50-70%) and the ability of cows to eat large quantities of crop in a short time. Depending on the final target intake for fodder beet, the transition period should be between 14 to 28 days.

**Swede bulbs** also have relatively high soluble sugar content (45-50%) and require a transition period of approximately 14 days.

**Kale and swedes** tend to have increased concentrations of nitrates at the start of winter and glucosinolates and SMCO's at the end of winter when the plant is more mature. There are many variables that affect anti-nutritional (compounds that effect nutritional uptake, nitrates, SMCO, glucosinolates) levels, including climate, location, fertiliser history and growth stage. Do not feed brassicas in their reproductive growth phase, recognizable when new growth, flowers and seed head develop in all brassicas and stem of swedes elongates.

### 4. Get an accurate crop yield for crop allocation

- Use measured dry matter yield values (not book values or yield estimates) for the area that will be used for transitioning
- Using the measured dry matter yield use the crop allocation calculator to allocate crop ([dairynz.co.nz/feed/feed-management-tools/more-feed-tools/](http://dairynz.co.nz/feed/feed-management-tools/more-feed-tools/))
- Round up yield measurements to avoid over-allocation. A small miscalculation in allocation can easily result in cases of acidosis especially when feeding fodder beet
- Ensure sufficient supplement and/or pasture is offered during the transitioning period to avoid BCS loss and help prevent acidosis
- Measure any crop left behind and factor this into the allocation for the next day.

## 5. Crop to supplement ratio

### Fodder beet

Ensure cows have access to at least 35% good quality supplement (straw, hay, silage). Reducing the supplement level too quickly increases the risk of acidosis. Additionally, for a pregnant, non-lactating cow a minimum crude protein (CP) content of approximately 12% DM is required to maintain good rumen function and to meet the requirements for maintenance and pregnancy.

Fodder beet is often lower than 12% CP, so a higher protein supplement (e.g. good quality pasture silage) should be part of the diet. Avoid whole crop silage that has high grain content, as it may contribute to an overload of fermentable carbohydrates in the rumen.

### Brassicas

Compared with fodder beet, it is safer to feed a higher proportion of the diet as brassicas. However, it is still recommended that high fibre supplements make up 20% of the diet. The fibre will act as a behaviour modifier by increasing rumen fill, making the cow feel fuller and therefore more settled for longer.

## 6. Crop utilisation

- To minimise the risk of acidosis when grazing swedes and fodder beet, cows should eat leaves and bulbs/ roots together. Additionally, fodder beet leaves are higher in CP while swede leaves contain lower concentrations of anti-nutritional factors.
- It is important to monitor the utilisation of fodder beet bulbs as the build-up of uneaten bulbs in the early transition phase becomes a risk to cows that are quick to start eating the crop. These cows will back graze these areas, increasing their daily intake at a rate faster than the rumen can cope. Any crop remaining should be measured and incorporated into the next allocation.
- The lower stem of kale is of poor quality, so high utilisation needs to be balanced with meeting ME requirements of the cow over winter (maintenance, pregnancy and BCS gain). Aim for 85% utilisation on kale to meet energy intake requirements.

## 7. Cow status at transition

- Allow enough time between dry-off and transitioning. Cows that have only just been dried off will be under more physiological stress and therefore less resilient to diet changes than cows that have been dry for a week or more
- Transport: cows that have not eaten for 8-10 hours (fasting, trucked long distances) or who have been walked long distances will have a high hunger drive. Offer them 8-10kg of conserved supplement and/or pasture to satiate their hunger before offering 1-2kg of crop
- Extent of diet change: the greater the change in diet the more caution required in transitioning. Transitioning should occur if; changing forage crops (e.g. kale to fodderbeet), moving between paddocks of the same crop type if they are in different geographical locations (e.g. swedes with a grazier to swedes on the milking platform), or between different varieties, especially if this is occurring during late winter.

## 8. Transitioning naïve animals

The sooner naïve cows begin eating the bulb/root crops, the less time non naïve cows have to eat more than their allocation. Options to get naïve animals trying the bulb are;

- Kicking some out of the ground and chopping with a spade
- Slicing through them with a spade in the rows
- Driving over them with a Cambridge roller to damage the top of the bulb
- As a last resort you can reduce their daily allocation of supplement/pasture to make them hungrier so they try the bulbs/roots. NOTE this can only be done for 1-2 days and extra care is required with crop allocation so they are not being over allocated.

## 9. Mob management

Ensure the crop face allows enough room for all cows to have access. A long narrow strip provides them with more opportunity to eat the crop than a short deep (block) area.

Grazing heifers with mature cows allows them to learn from the older cows: however, you need to ensure the heifers are not bullied off the crop.

If re-sorting mobs during winter, take care with feed allocation for the next few days due to social re-ranking (i.e. within a mob of cows there will be a range of intakes being achieved by individual animals). Removing dominant animals could result in 1-2kg DM more being available to the submissive animals which, even though they are transitioned, could be enough to cause acidosis.

If cows are putting pressure on the break fence and pushing standards include some hot feet (electrified) standards along the length of the fence line.

If you are having problems with cows jumping the front fence add some taller standards intermittently along the length to vary the height. This will deter cows from jumping.

Use a catch fence to minimise the risk if breakouts occur, especially during transitioning.

Mob size is not critical to good crop allocation. The more important factor is ensuring sufficient space for all cows to access the crop face at the same time and there is sufficient bale feeders/access to supplement.

### Available resources

#### *DairyNZ Resources – [dairynz.co.nz](http://dairynz.co.nz)*

- BCS tracker App
- Body condition scoring made easy: The official field guide
- DairyNZ Body condition scoring: The reference guide for New Zealand Farmers
- Feeding winter brassica crops to dairy cows (1-75)
- Fodder beet: feeding dairy cows (1-73)
- Transitioning cows onto crops; Southern Wintering systems fact sheet
- Winter crop allocation calculator: [dairynz.co.nz/feed/feed-management-tools/more-feed-tools/](http://dairynz.co.nz/feed/feed-management-tools/more-feed-tools/)

## Winter crop transitioning checklist

Use the check list below when developing a winter crop transition plan.

If using a grazier for winter crops agree on who is responsible for transitioning.

Y/N	Checklist winter crop transitioning
	Have goals for wintering been written down?
	How much does BCS need to increase to meet target? _____
<i>In October to November consider:</i>	
	1. Select a paddock based on shape.
	2. Make contractor/staff aware of the planting direction.
	3. Consider transitioning when selecting crop type.
<i>In late February:</i>	
	4. BCS your animals and create autumn feed plan, to minimise range of BCS going into winter
<i>In April</i>	
	5. Create a transition feed budget – do you have enough supplement/pasture?
<i>In May/June</i>	
	6. Use BCS to set up mobs for wintering.
	7. Get an accurate crop yield for transitioning crop allocation.
	8. Use crop allocation calculator to work out requirements to hit transitioning requirements.
	9. Consider crop utilisation when setting up paddocks; especially of fodder beet.
	10. Plan for cow status when transitioning, considering <ol style="list-style-type: none"> <li>Drying off time before transport</li> <li>Preparation for transport</li> <li>Extent of diet change.</li> </ol>
	11. Plan for transitioning naïve animals and let staff or grazier know what the plan is
	12. Manage mob structure over transitioning.
	Last but not least, has this plan been explained to the whole team? A suggestion is to have laminated instructions for each mob given to all members of the team.