TechNote 30

Achieve body condition score targets at calving

IN THIS TECHNOTE

The primary focus of the dry period is to:

- achieve body condition score (BCS) targets at calving to optimize milk production, reproduction, and health,
- allow the secretary cells of the mammary gland to rejuvenate in preparation for the next lactation.

Target BCS scores at calving are:

- mature cows at BCS 5.0
- first and second calvers at 5.5 BCS.
- with less than 15% of the herd greater than, and less than 15% of the herd less than these targets.

For more details see DairyNZ InCalf resources.

30.1 Determine appropriate feeding strategies for body condition score gain

Body condition score (BCS) gain during the dry period depends on time available and the amount and type of feed offered.

A critical factor in managing BCS gain in dry cows is the time required for a cow to gain BCS. Two things are important.

1. A dry cow will not gain BCS for one to two weeks after drying off (and can sometimes lose BCS during this period). BCS loss is due to the active immune response involved in the drying off process (involution of the mammary gland). BCS loss can be exacerbated by underfeeding cows during this period.

2. Dry cows gain very little BCS in the month before calving (less than 0.1 BCS units) due to the large energy demands and inefficient use of nutrients by the growing calf. In addition, it is not recommended to feed more than requirements for maintenance and pregnancy during the last few weeks of the dry period, as depending on BCS, this can increase the risk of metabolic disorders.

For more details see TechNotes 12: Feed the transition cow appropriately, and 13: Monitor and mitigate milk fever.

Therefore, there are 30 – 40 days during the dry period that the cow will not be gaining BCS. This needs to be taken into consideration when developing feeding strategies for BCS gain.

30.1.1 Determine feed type and amount

There are different efficiencies for BCS gain (often referred to as k_g) with different feeds during the dry period (Table 1).

Autumn saved pasture is used less efficiently for BCS gain compared with pasture silage, maize silage or PKE, and PKE tends to be the most efficient feed for BCS gain in a dry cow.

For example: A 500 kg cow requires 125 kg DM of PKE to gain 1 BCS unit during the dry period, compared with 160 kg DM of maize silage or 205 kg DM of autumn saved pasture (Table 1).

Table 1. *Approximate amounts (kg DM) of commonly used feeds required (down the throat) for a 1.0 unit increase in BCS (above requirements for maintenance, pregnancy, and activity).*

Breed	Kg Lwt[1]	Kg Lwt/ BCS	Autumn Pasture	Pasture Silage	Maize Silage	PKE	Kale	Swedes	Fodder Beet
			MJ ME/kg DM						
			11.5	10.5	10.5	11	11	12	12.5
Jersey	350	23	145	110	115	85	150	125	110
Jersey	400	26	165	130	130	100	175	145	125
Crossbred	450	30	185	145	145	110	195	160	140
Holstein Freisian	500	33	205	160	160	125	215	180	155
Holstein Freisian	550	36	225	180	180	135	235	195	170

30.1.2 Determine time required for BCS gain

The time taken to achieve BCS gain is a key factor to consider. It is rare for cows to gain more than 0.5 BCS units/month. Although greater monthly gains can be made when cows are properly adapted to crops such as fodder beet, the long transition period often required to adapt to these high starch/sugar crops needs to be factored in.

Maximum intake of a dry cows is approximately 2.2-2.4% of liveweight.

For more details see TechNotes 24: Use supplements and crops profitably and 31: Manage winter pasture and crops appropriately.

Figure 1a: *Average daily requirements (kg DM eaten/d) for a 450 kg Kiwi Cross cow eating pasture/pasture silage to gain 1 BCS unit with dry periods of varying lengths (120, 90 and 60 days).*

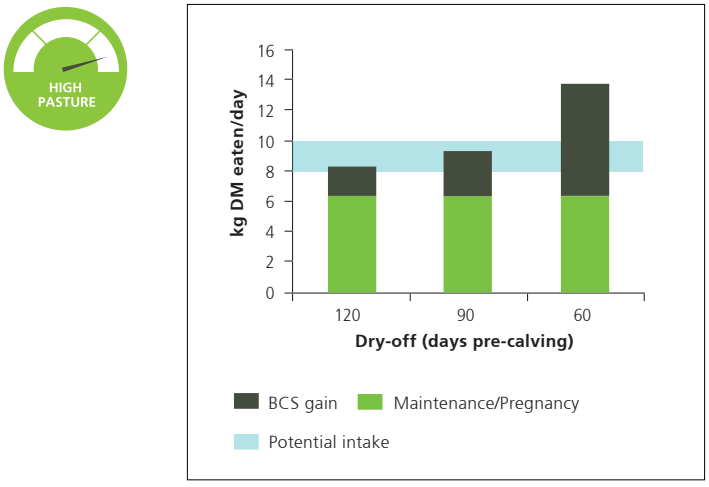
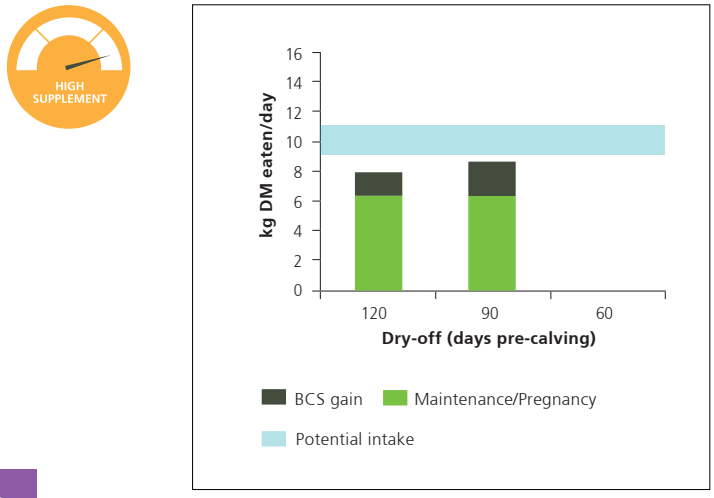


Figure 1a considers the average daily feed requirements (maintenance, pregnancy and BCS gain) and potential intakes of a 450 kg non-lactating cow needing to gain 1 BCS unit.

These highlight that a cow fed a diet containing autumn pasture + pasture silage requires at least 90 days dry to gain 1 BCS. If the cow was milked on and only had 60 days dry to gain BCS, she would not be able to eat enough on a daily basis to gain one BCS unit before calving.

Figure 1b indicates that if infrastructure and farm system enables high utilisation of good quality supplements during winter, this can enable cows to be milked on for a little longer while still achieving BCS targets at calving. Once again, it still takes time for cows to gain BCS. If cows are fed a diet containing pasture PLUS high energy supplements they can gain 1 BCS unit in 45 – 60 days. Therefore, a cow needing to gain 1 BCS unit, would require a 75-day dry period.

Figure 1b. *Average daily requirements (kg DM eaten/d) for a 450 kg Kiwi Cross cow eating pasture/PKE to gain 1 BCS unit with dry periods of varying lengths (120, 90 and 60 days).*



Rule of thumb

Factor in a maximum gain of 0.5 BCS unit per month PLUS one month where these is minimal BCS gain. For example: a cow that must gain 0.75 BCS units requires 1.5 months for BCS gain PLUS 1 month of minimal/no BCS gain. Therefore, this cow needs a 2.5 month (75 day) dry period.

For more details see TechNote 27: Measure and monitor body condition score.

30.1.3 Rate of BCS gain is not important

In a seasonal pasture-based system, the speed at which a cow gains BCS during the non-lactating period does not affect cow performance in the following lactation. An experiment with cows fed on pasture and PKE, to gain BCS at different rates through late lactation and the dry period, measured no difference in cow health or milk production during the following lactation between cows that gained BCS quickly or slowly during the dry period.

Q: Are BCS targets at calving important?

A: Yes, calving at 5.0 for mixed ages cows and 5.5 for 2 and 3 year olds improves the sustainability of the system through alleviating welfare concerns, reducing the need for health and reproductive intervention, reducing the risks of low BCS associated with a wet spring and increasing the ability to cull on production rather than health and reproduction.

30.2 Identify at-risk cows

Cow that are below BCS targets at the start of the dry period require preferential treatment. This is because cows below BCS targets at calving produce less milk (Figure 2), have reduced reproduction and are more prone to infectious diseases, in particular metritis and mastitis.

First it is important to determine why these animals may be below targets, and are there any non-nutritional concerns. If in doubt have them checked by a veterinarian.

- lameness
- Facial eczema
- mineral deficiency
- parasites
- infection
- disease

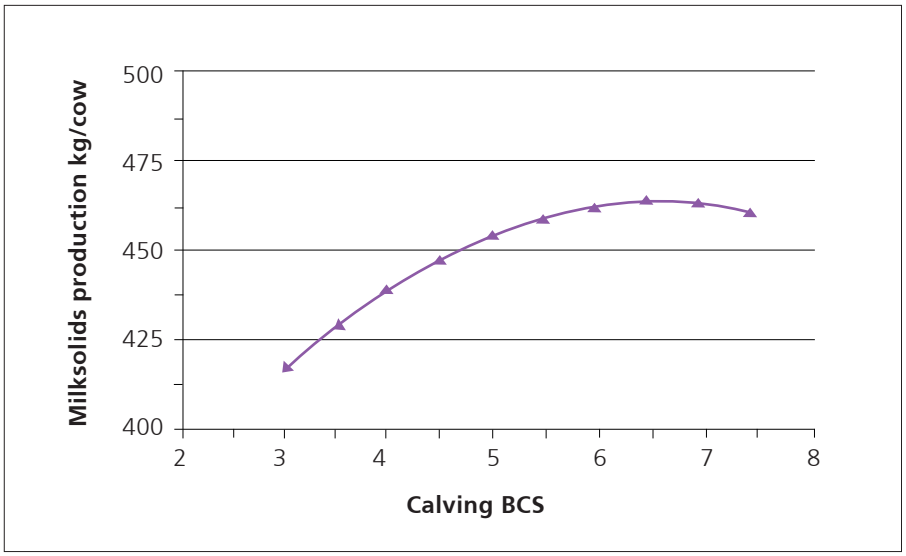
If it is due to nutritional factors:

- Remove competition by separating animals into their own herd.
- Offer high quality feed (both pasture and supplement).
- Feed pasture to generous residuals (above target of 4 cm or 7-8 clicks) and use other dry cows to follow behind to ensure target residuals are met.
- Use high quality supplements that have a high efficiency for BCS gain (e.g. PKE).
- Monitor and measure these cows continuously.

Cow that are at or above BCS targets should be monitored and fed appropriately to ensure they do not exceed BCS targets at calving. Cows that are above BCS targets at calving have an increased risk of metabolic disorders during the transition period.

For more details see TechNotes 11: Understand the transition cow; 12: Feed the transition cow appropriately; 13: Monitor and mitigate milk fever.

***Figure 2**. Average milksolids production from cows calving at different body condition scores.*



30.3 Further reading

DairyNZ body condition scoring. The reference guide for New Zealand dairy farmers. ww.dairynz.co.nz/publications/animal/body-condition-scoring-reference-guide/

DairyNZ Facts and Figures. dairynz.co.nz/publications/dairy-industry/facts-and figures/

Holmes, C. W., I. M. Brookes, D. J. Garrick, D. D. S. Mackenzie, T. J. Parkinson, and G. F. Wilson. 2007. Milk production from pasture (2nd rev. ed). Massey University: Palmerston North, New Zealand.

Kay, J. K., S. McCarthy, J. Roche, and K. Macdonald. 2014. Feeding for condition score gain. DairyNZ Technical Series April 2014 21: 5 - 8.

Mandok, K. M., J. K. Kay, S. L. Greenwood, J. P. McNamara, M. Crookenden, R. White, S. Shields, G. R. Edwards, and J. R. Roche. 2014. Efficiency of use of metabolizable energy for body weight gain in pasture-based, nonlacting dairy cows. Journal of Dairy Science 97: 4639 – 4648.

NRC. 2001. Nutrient requirements of dairy cattle (7th rev. ed). Washington, United States of America: National Academy Press.

Roche, J. R., D. P. Berry, J. M. Lee, K. A. Macdonald, and R. C. Boston. 2007. Describing the body condition score change between successive calvings: a novel strategy generalizable to diverse cohorts. Journal of Dairy Science. 90: 4378 - 4396.

Roche, J. R., N. C. Friggens, J. K. Kay, M. W. Fisher, K. J. Stafford and D. P. Berry. 2009. Invited review: Body condition score and its association with dairy cow productivity, health, and welfare. Journal of Dairy Science 92: 5769 – 5801.

Roche, J. R., A. Heiser, M. D. Mitchell, M. A. Crookenden. C. G. Walker, J. K. Kay, M. Vailati Riboni, J. J. Loor, and S. Meier. 2017. Strategies to gain body condition score in pasture-based dairy cows during late lactation and the far-off nonlactating period and their interaction with close-up dry matter intake. Journal of Dairy Science 100: 1720 – 1738.