

# BCS certification: Shaping the programme

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## Background

The system of evaluating body condition score (BCS) in New Zealand dairy cows assesses the fat cover over eight body parts, (measured on a scale from one to 10 where one is emaciated and 10 is obese) and has been in use since the 1980s. The benefit of this system is that it allows for breed and conformation variability inherent to the New Zealand dairy cow (Roche *et al.* 2009). Benchmarks for BCS that optimise productivity and welfare are based on research undertaken in New Zealand and the method is recognised as the official scale in the Ministry for Primary Industries Codes of Welfare for Dairy Cattle.

The National Body Condition Score Assessor Certification Programme was launched in 2012. The Body Condition Score Assessor Certification Programme is a process to ensure dairy sector access to trained, competent rural professionals who maintain calibration to the DairyNZ BCS national reference standards. It delivers this by prescribing the training, initial and on-going assessment, and BCS assessment activity levels necessary to achieve and retain calibration. It certifies those achieving the set requirements and agreeing to provide service and reporting to clients as outlined in the Programme Code of Practice and are then promoted as Certified BCS Assessors.

Accurate BCS assessment is essential when farmers are using it to support decision making or when the BCS is a criterion in animal welfare assessments. Farmers are encouraged to conduct BCS assessments themselves, but many do not, due to lack of time or confidence. Equally, in corporate farm structures, grazing arrangements and herd sales, a BCS assessment provided by a Certified BCS Assessor holds more weight than un-validated assessments. The value of using a Certified BCS Assessor centres on the benefits of increased accuracy of scoring.

The Code of Welfare for Dairy Cattle stipulates a minimum acceptable BCS of 3.0. Farmers can be prosecuted under the Animals Welfare Act 1999 if they have cows thinner than this and fail to take action to improve the situation or demonstrate practical steps to rectify the situation. Since half of a BCS unit could mean the difference between compliance and non-compliance with the code, any operator scoring cows at the lower end of the range needs to be certain that they are accurate. In time, BCS will be increasingly adopted as a measure in welfare assurance schemes; thus, accuracy of scoring is required throughout the BCS range.

Accurate BCS assessment is also essential when farmers are using it for decision-making purposes. Decisions about drying off and purchase of autumn supplements are often driven by BCS. For example, cows may be dried off so that they have time to regain BCS lost during lactation before calving. When using the BCS dry-off rules for cows in a low input system, incorrectly estimating a cow's BCS by 0.5 could lead to premature dry off, and mean missing out on another 30 days in milk; alternatively, cows may calve thinner than optimum recommendations. Although affected by milk price, the value of increasing BCS at calving from 4.5 to 5.0 is conservatively estimated at \$60/cow (InCalf), through increased milk production and better reproductive performance. The positive relationship between calving BCS and milk production continues above BCS 5.5 but the risk of metabolic disease increases significantly.

Peripartum health is very sensitive to calving BCS. For example, the risk of ketosis is doubled in cows that calve at a BCS >6, compared with cows that calve at a BCS 5.5 (Gillund

*et al.* 2001). In a recent DairyNZ study, 40% of cows that calved at a BCS of 5.5 had  $\beta$ -hydroxybutyrate concentrations greater than 1.4mmol/L postpartum whereas none of the cows calving at 4.5 exceeded this threshold (Roche *et al.* 2013). In the same study, although all cows underwent an inflammatory response around calving, cows that calved at BCS 4.5 appeared to recover faster than cows calving at either BCS 3.5 or 5.5 (Akbar *et al.* 2015). As farmers move toward the use of winter crops such as fodder beet and put more value on achieving BCS targets, it is essential that we provide accurate BCS at the top end of the scale as well as the lower end, to ensure farmers don't inadvertently increase the incidence of metabolic disease in their herds.

Given that subtle changes in the BCS at calving can have significant effects on subsequent productivity and health, particularly when BCS is greater than 5.0, it is important that farmers are making management decisions based on accurate BCS.

## Development of a certification system

Despite evidence of the importance of BCS management for productivity and welfare, it is a subjective measure that requires practitioners to be trained and perform regular calibration (Kristensen *et al.* 2006; Roche *et al.* 2009). Although rural professionals (RP), particularly vets, consider themselves well placed to assist their clients to score their herds, farmers had little confidence in the ability of RP to score accurately. As Richard Tiddy quoted: "The consistency of Body Condition Scoring among rural professionals has been questioned by many farmers, and regarded as a joke by some" (Tiddy 2013).

Part of the problem may have been the use of alternative BCS methods, such as the Dalton or Boyd method (Boyd 2011), which can result in a different score for individual cows depending on how they carry their condition. Anecdotally, this has continued to cause confusion for some assessors who have performed poorly in assessments because they use rigid rules, for example: if the backbone is bumpy, she cannot be more than BCS 4.0, and consequently don't account for higher fat cover on other areas of the cow.

To address the inconsistency problem, DairyNZ began the development of a BCS certification scheme in 2011. Initially, this constituted a one day training course, which aimed to improve the scoring capability of attendees (vets and other RP), so that they could score a group of cows to within 0.2 of the trainer-derived mean for the group. However, it quickly became apparent that most RPs believed they were fully competent and therefore, did not need to attend training. In autumn 2012, a BCS operator test scheme was piloted, which assessed individuals for their ability to score a group of cows (i.e. mean and range) as well as their ability to score individual animals. The test fee of \$200+GST was regarded by candidates as 'fair' (Tiddy R. National body condition scoring programme – a test is born, 2013).

A gold standard team provides the model scores against which assessors are tested. The gold standard team all calibrate against the industry reference standard together to remove regional biases and are tested for consistency between scorers so as to ensure assessors are not disadvantaged by who might be the gold standard scorers for their assessment.

In the first two rounds of testing, only 69% of newly trained practitioners passed (i.e. were within 0.2 BSC above or below the model). There was also a marked difference between regions. For example, in the first round, candidates in Northland scored an average of 0.21 above the model, whilst candidates in Waikato scored an average of 0.26 below the model, i.e. there was a difference between those two regions of almost 0.5 BCS (Table 1; Tiddy 2013).

Region	Number tested	Number passed	Average difference from model mean
Northland	9	4	+0.21
Waikato	29	7	-0.26
Bay of Plenty	17	15	-0.08
Taranaki	30	20	+0.06
Manawatu	18	12	-0.02
Canterbury	16	10	-0.11
Southland	33	23	-0.10

**Table 1.** BCS assessment results by region, Autumn 2012 (Adapted from Tiddy, 2013)

## The case for regular retesting

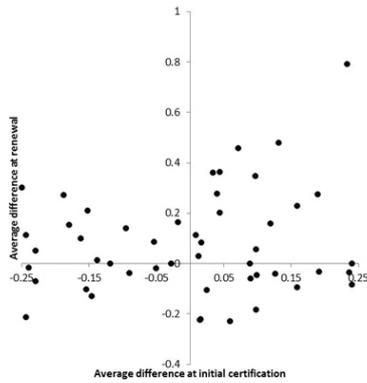
The general consensus was that annual retesting was appropriate because of the international evidence of the need for calibration to reduce drift, that is, that accuracy of BCS declines with time since training (Ferguson *et al.* 1994, Kristensen *et al.* 2006, Vasseur *et al.* 2013). However, participants in the BCS programme frequently state that annual on-farm retesting is excessive. In a study by Vasseur *et al.* (2013), agreement to within 0.6 BCS had declined somewhat when rechecked five to 15 weeks after training. These findings are supported by the data being generated by the programme that shows that 15% of assessors who passed the initial assessment no longer met their target for agreement within 0.2 BCS units (converted to New Zealand scale of one to 10) when re-assessed approximately 12 months later.

Results from the New Zealand BCS certification assessments suggest that the scoring of most assessors changes relative to the DairyNZ reference standard from one assessment to the next (Figure 1). Additionally, assessors tend to under-score cows with high BCS and over-score cows with low BCS, indicating that assessors were inclined to score toward the average or the scores they were familiar with.

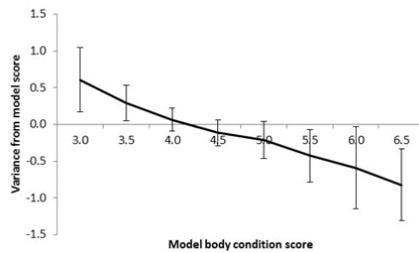
On average, candidates scored too high at low BCS and too low at high BCS, tending to score toward the herd average across the BCS range (Figure 2). Even for candidates who had passed, and had an acceptable difference from the gold standard overall, scores were biased toward the herd average, and the range of scores allocated to the same cow by different assessors was more variable at the extremes of BCS (Figure 3).

This highlighted the importance of re-calibration and re-testing to maintain high scoring accuracy among Certified Assessors, and the need to expose them to unfamiliar BCS scores in between on-farm assessments.

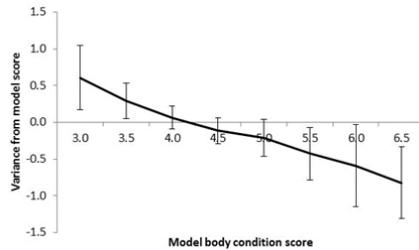
One of the complaints about annual retesting was the time required to attend an on-farm test, which could be particularly difficult when a number of people in the same practice were due to re-sit. To address this, while still maintaining a high standard of scoring accuracy among certified assessors, there has been further development of the certification programme.



**Figure 1.** Results from New Zealand BCS Certified Assessor Programme (2015), showing average difference from model at renewal, relative to average difference at initial certification as measured at in-paddock scoring assessment of 70 cows. . Candidates whose dot appears on the x axis have no drift between certification and renewal.



**Figure 2.** Results from New Zealand BCS Certified Assessor Programme (2015), showing tendency to deviate score toward herd average. Error bars indicate standard deviation.



**Figure 3.** Results from New Zealand BCS Certified Assessor Programme (2015), showing average difference at assessment compared to BCS model score by the assessors, for candidates that passed (Pass), or failed as scoring too low (Fail – score low) or too high (Fail – too high).

## Expanded gold standard team

At the launch of the DairyNZ BCS certification scheme, the gold standard team consisted of five DairyNZ animal husbandry extension specialists. Because two gold standard scorers were required to score the herd for every assessment day, the small team was limited in their ability to deliver assessments in more locations or to put on extra assessments. To facilitate greater flexibility, rural professionals with a history of BCS accuracy, availability, and supportive of the programme were invited during 2015 to join the gold standard team. Initially, they participated in a whole team calibration followed by an on-farm assessment that mirrored the regular assessments for certification but with greater numbers of cows to assess, and a higher pass requirement (i.e. tighter standard deviations).

Once certified to the gold standard, these additional trainers have been supporting delivery of training and assessment days in their regions. Every six months, the whole team reconvenes to repeat BCS calibrations, address drift since the last exam, followed by re-assessment to confirm that they all meet the gold standard.

The calibration consists of hands-on scoring of a range of cows in a vet race, openly discussing all eight points of each cow, using the *DairyNZ BCS Made Easy field guide*, followed by scoring approximately 80 cows, in a paddock. Both activities are conducted in small groups followed by a whole group discussion, reviewing individual cows or the range and average recorded by each group in the paddock. Most of the gold standard candidates also spend time scoring alongside one of the DairyNZ team in the months beforehand.

For the Gold Standard Assessment each candidate scores a whole herd of 300 to 600 cows during milking, followed by hands-on scoring of 15–20 cows in a vet race. The candidates score are then compared with the modal score generated by a group of gold standard scorers (minimum  $n=5$ ), who have been accepted to this standard for at least 12 months. To pass the gold standard, a candidate must achieve 75% agreement across a range of criteria, whereas regular certification requires 50% agreement.

There are currently twelve gold standard scorers in the team, five DairyNZ extension specialists and seven contracted assessors, three of whom joined the program in November 2015 and four in February 2016. They have been supporting delivery of assessment days, and participating in training for those with good training skills. This has increased flexibility and capacity of delivery and reduced reliance on any particular individual.

## Online calibration

Over the past twelve months, we have been trialling an online calibration tool, to determine whether it may be used to maintain accuracy over time and potentially to extend the interval between on-farm assessments for those who demonstrate continued accuracy. Unfortunately, the trial has been plagued with technical issues which were not apparent during piloting. Consequently, the calibration is not developed and proven to the point that it could be relied on for either of the intended purposes.

In a recent survey of participants in the programme, 75% of respondents supported some use of online calibration, including further development so that it performs as originally intended.

## Conclusion

Since its launch in 2012/13, as at end March 2016 there were 223 Certified BCS Assessors and a total of 676 rural professionals were recorded as having engaged with the Programme.

The uptake by farmers of the BCS system has been encouraging. The BCS management initiative has exposed farmers in most regions to the benefits of using a certified assessor to help manage BCS; in the 2014/15 season, 21% of 485 surveyed farmers reported they used a certified assessor. The real proportion is likely to be higher since many are unaware that assessors are certified. Also, 53% of farmers believed that assessors provide BCS as a 'value-add' service, and are unlikely to query the credentials of an assessor if they are not specifically paying for the service. Nevertheless, there is no doubt that farmers value 'free' BCS so advertising one's certification creates trust and a point of difference.

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