

Growth targets: benchmarks of performance

To achieve our goal for dairy heifers - grown to 85% of their mature size to calve at 2 years of age, we need to be able to assess their performance along the way to ensure that growth targets are achieved at the desired age. Every farmer does this intuitively within his herd - at weaning, at mating and at other times for management decisions. The limitation to this is a lack of objective benchmarks to compare our animals with. Without some way of measuring growth i.e. live weight at a given age, it is almost impossible to know if the heifer is actually gaining at an optimum rate for best use of feed and ultimately, life time production.

Record keeping

How can you tell if your heifers are on track? The answer lies in identifying calves at birth, keeping records (date of birth, breeding) and monitoring their performance. Sequential numbering coded by year of birth, with ear tags and subsequent freeze branding, will also allow you to recognise and compare animals in the paddock without reference to records.

Weight-for-age

The most relevant statistic in recognising how well heifers are developing is their 'weight-for-age'. To reach a mating weight of 350 kg at 15 months and to calve at 550 kg at 2 years of age, large breed heifers (Holstein-Friesian, AIS) need to maintain an average growth rate of 0.7 kg/day. Equivalent targets for smaller breeds (Jersey, Guernsey) are 260 and 400 kg at mating and calving respectively, requiring a gain of 0.51 kg/day. Figure 1 illustrates the ideal live weight/age relationship for heifers gaining at these rates. Fitting your heifers on this graph will reveal whether your animals are on target.

Unfortunately, a healthy heifer doesn't look much different whether she is gaining at 0.4 or 0.7 kg/day. The problem does not become apparent until mating or calving, which may be 6 months later than desired. Consequences of this can include failure to maintain a preferred calving program for herd management and market supply, and a limited ability to cull cows for production, age or health (mastitis, cell count). Knowledge of the heifer's age and weight will indicate whether feeding levels have been adequate (or perhaps even excessive) so that corrective action can be taken before any problem becomes entrenched. A secondary benefit is the more accurate dosage of animals for parasite control or other treatment.

A minimum level of recording requires animal identification and date of birth. Performance monitoring thereafter can be related to age. Computer-based records allow the heifer program to be assessed and weaknesses identified. The farm's current program is the starting point, and with year-round calving, a lot of information can be obtained by comparing weight-for-age across all classes of heifers (Figure 1). Often when a 30-month calving is the norm, calves and weaners are grown well but from about 9-10 months heifers fall below target when they are grown out on the worst paddock with the dry herd. Unlike the mature cow however, heifers require a higher level of nutrition for continued growth.



Figure 1. Optimum live weight-age relationship for heifers to calve at 2 years. Average daily gain (ADG): Holstein-Friesian = 0.7 kg/day; Jersey = 0.51 kg/day.

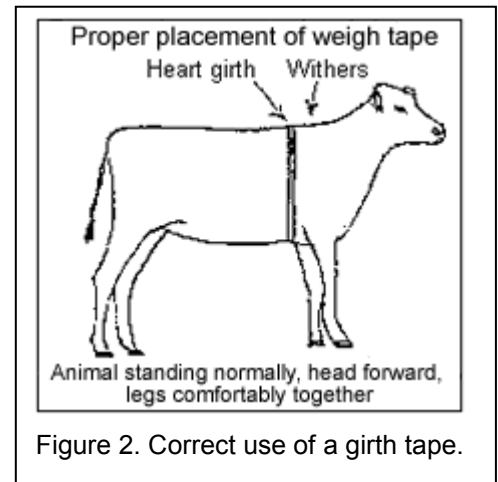
How to measure animals' live weight on farms

Scales

Milk processors and dairy extension teams have electronic scales and some farmers have or may be considering buying some. Although not overly expensive using an existing race and crush, the time and labour involved could preclude their regular use for many farmers. Costs will be recouped through improved management of the herd and feed supplies. An alternative is to use a correlated measure of size such as heart girth or height at the shoulder or hip to monitor the heifers growth.

Girth tapes

These tapes measure heart girth and are marked to indicate live weight for both large and small breed dairy cattle. Their accuracy depends on correct use. Have the animal standing square with her head up and the tape firm (not too tight or too loose) (Figure 2). Tapes can be less accurate for older and pregnant cattle but can be a very useful, cheap aid for monitoring the performance of growing heifers. Its disadvantage is the necessary constraint and contact with the animal.



Wither height

A quick and easy starting point to monitor heifer growth is her height measured at the shoulder or hip as her size and weight are correlated. Figure 3 illustrates the relationship between wither (shoulder) height and age desired for Holstein-Friesian (large breed) or Jersey (small breed) heifers calving at 2 years of age. While less accurate than scales or girth tape, a few very simple tools - a measuring stick and/or appropriate marks painted on a board, wall or fence where the animals routinely are handled - can be used to gauge the heifers' progress (Figure 4). Wither height will under estimate weight of well fed animals in very good condition (e.g. if fed maize silage).

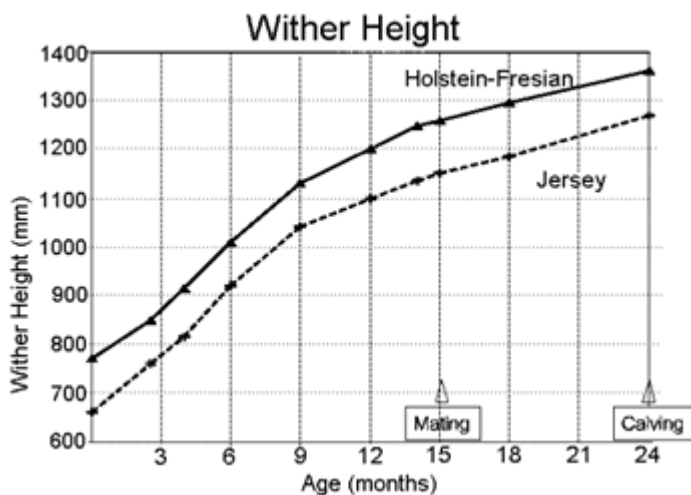


Figure 3. Wither height - age relationship; Holstein-Friesian and Jersey heifers calving at 2 years.

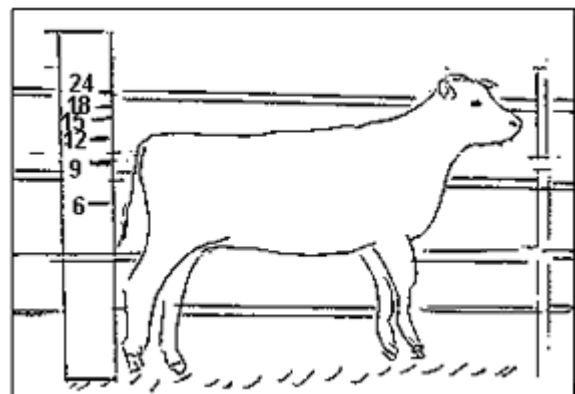


Figure 4. Fence indicator of wither height at different ages.

Other indicators

The heifer's appearance, condition and coat are useful indicators to her health and performance (Figure 5). A heifer with a solid, slab-sided appearance and sleek coat (1) is obviously doing well, but look for excess conditioning - too much fat cushioning around the hips, pins especially if maize silage is a major part of the diet. Over-conditioning could be a problem if the ratio of digestible energy (grain or maize silage) to protein in the diet is high.

Conversely an animal with a 'gutty' appearance (2) and with more prominent backbone and hips reveals inadequate energy in the diet - young animals fed mainly on pasture (often unfertilised) or low-quality roughages with insufficient concentrate.

The coat of poorly grown animals may also appear more coarse and hairy. Nutrition should be improved - using fertiliser and concentrates. These symptoms can also indicate a high internal parasite burden.

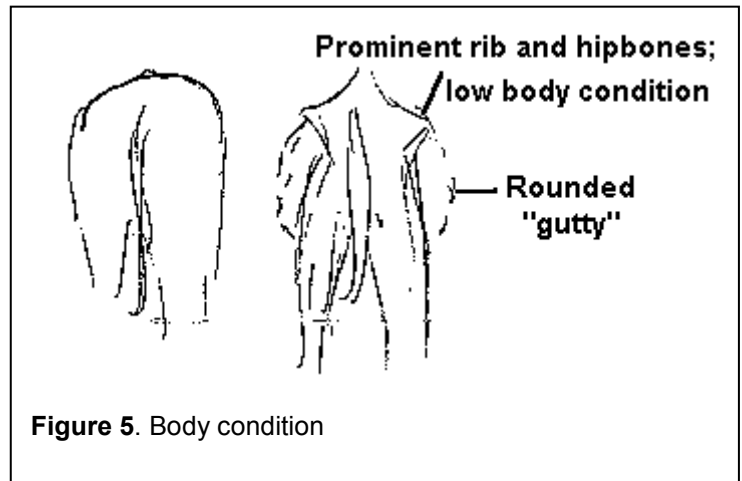


Figure 5. Body condition

Body condition Target live weight and heights at various ages for Holstein-Friesian heifers (gaining 0.7 kg/day) and Jerseys (gaining 0.51 kg/day) are summarised in the following table.

Table 1. Target live weight and wither height targets for Holstein-Friesian and Jersey heifers to calve at 2 years of age.

Age (months)	Holstein-Friesian (ADG = 0.7 kg/day)		Jersey (ADG = 0.51 kg/day)	
	Live weight (kg)	Wither height (mm)	Live weight (kg)	Wither height (mm)
0	40	770	27	660
2 weaning	70	840	55	760
4	115	915	75	815
6	150-160	1010	110	920
9	225	1130	160	1040
12	280-300	1200	210	1100
15 mating	330-360	1260	260	1150
18	425	1295	310	1185
24 calving	530-560	1360	400	1270
<i>High production - higher targets from 12 months of age</i>				
24 calving	600	1385		

Good management and long-term progress can be achieved using both simple aids for immediate assessment plus permanent records. Software allows us to monitor heifer performance and determine the efficacy of our rearing program.

Source: Queensland Department of Agriculture, Fisheries and Forestry; 2009