

Growth targets: age and live weight

How we manage our replacement heifers can have a substantial effect on potential production and profit. The way we rear these heifers influences herd productivity in two important ways: time she is non-productive (growing) and live weight (size) at calving.

The important criteria to consider are age and live weight at mating and calving. We can reduce time to calving by increasing growth through better nutrition. (Cheap rearing is not the best solution as income foregone exceeds the extra feed cost.)

Age at calving

The age of heifers at calving has a major impact on lifetime productivity of cows in the herd through:

- competition for resources (feed, labour and finance)
- number of lactations per cow
- rate of genetic progress (generation interval).

The average age of heifers at calving in Queensland and throughout Australia is about 30 months but can be as old as 3 years. Heifers often are of a satisfactory size by calving but calving is delayed for two reasons:

- inadequate growth in the first 12 months delaying sexual maturity and hence age at mating and calving. Sexual maturity is related to live weight not age. Holstein-Friesian heifers achieve puberty around 250 kg live weight, which may be anytime from 9 to 20 months depending on how well she has been fed.
- inadequate nutrition for older heifers causing farmers to delay mating of sexually mature animals to avoid calving, production or fertility problems.

Potential productivity increases achievable by calving closer to 2 years of age would considerably exceed the cost of feed and fertiliser needed for heifers to reach a suitable mating size by 15 months instead of 21 months.

Live weight influences milk yield

Milk production and live weight are closely related. Well-grown heifers display oestrus and can be mated at a younger age. The heifer has a lesser period non-productive and will produce more milk to a given age. Increased live weight at calving will also increase lifetime milk yield. By first calving closer to her full mature size, more of the feed consumed by the lactating heifer can be used for milk production and less is needed for her continued growth. Larger heifers also eat proportionally more, so more feed is available to be converted to milk.

Each 1 kg increase in live weight attained before the heifer calves equates to 7 litres of milk per lactation after calving, and this response is apparent for at least 3 lactations. Thus a 50 kg increase in live weight can be rewarded with 350 L of milk in the heifer's first lactation or 1000 L during her lifetime.

Target weight

The target live weight for heifers at calving is 85% of mature weight (before calving) for cows in the herd or 90% of the weight of lactating cows. Cows in herds that are fed to produce more milk are larger and have more condition, which is used to support their higher production. As herd yields increase, live weight targets for replacement heifers should also be increased (Figure 1) if they are to maintain their production above 80% of their herd average.

A live weight target of 500 kg is acceptable for herds producing less than 5000 L/cow. However cows at this level have limited fat reserves and both cows and heifers would benefit from better

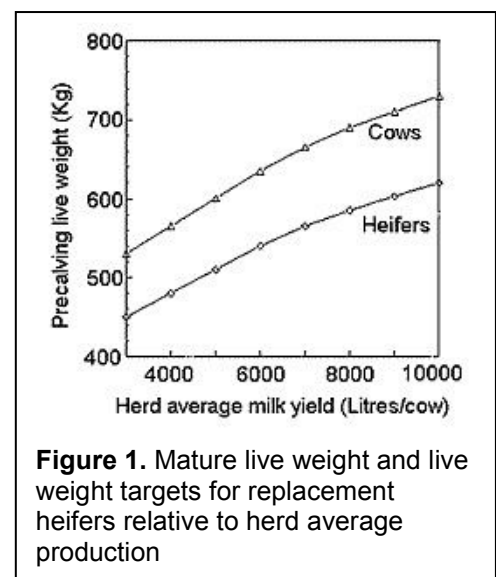


Figure 1. Mature live weight and live weight targets for replacement heifers relative to herd average production

feeding. This target is no longer applicable to the majority of dairy farmers in Queensland with herd recorded herds now average 5500 L/cow and many herds producing in excess of 7000 L.

Efficient use of feed resources

A general target of 550 kg at 2 years is now more appropriate for Holstein-Friesian, but with greater variation in feeding systems used and hence production levels achieved, we need to consider differing optimum targets for particular feeding regimes. While production targets suited to pasture-fed herds are not adequate for high-production herds, growing a heifer to 600 kg live weight to calve at 2 years will not be the most economically efficient use of feed resources for pasture based farms. Recommended heifer live weight and age targets at various farm production levels are summarised in Table 1.

Table 1. Milestones for dairy replacement heifers to meet differing herd production targets

Heifer age/weight	< 5000 L	5000 - 8000 L	> 8000 L
Birth weight (kg)	38	40	42
Mating weight (kg)	300-330	330-360	350-380
Mating age (months)	15	12-15	12-15
Pre-calving weight (kg)	500-530	530-580	600+
Calving age (moths)	24	22-24	22-24
Average daily gain (kg/d)	0.65	0.7+	0.77

Is too rapid growth a problem?

If young (pre-puberty) heifers are grown too rapidly (in excess of 0.8 kg/day) during the period from 4 to 9 months of age, there can be some risk of reducing the heifers potential milking capacity because of excess fat impeding alveolar (milk secretory tissue) development of the udder.

This can occur if heifers are fed very high energy levels, particularly if energy and protein levels in the diet are not balanced e.g. with high intakes of maize silage. It is unlikely to be a problem for heifers reared on fertilised pastures with moderate levels of concentrates (1-2 kg/day). Risk of excessive fattening as a consequence of rapid, early growth can be minimised by mating heifers at a younger age when they are big enough (350 kg). Calving younger than 22 - 23 months is not advised.

High production herds can achieve heavier live weights at calving by feeding for higher growth rates after puberty. Rapid gains by sexually mature heifers do not adversely affect udder development or production. High levels of feeding in late pregnancy (last 3 months) however, will increase the size of the calf, increasing the risk of dystocia and associated problems at calving.

It is more efficient to maintain a consistent level of gain throughout the heifer's growing phase than to have to feed older animals to 'catch up' to achieve their required live weight at calving.

Puberty and productivity are influenced more by live weight than by age so mate on size not age for increased production and profit.

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