Benefits of Heifer Liveweight Targets

This Infosheet covers:

- The influence of meeting liveweight targets on lifetime milk production and reproductive performance.
- Using liveweight targets when making farm management decisions.

Key points

- Liveweight is the best measure of heifer performance.
- Achieving heifer liveweight targets will increase stock longevity in the farming business and the return on investment.
- Establishing heifer liveweight targets, and the growth required to meet them, will aid farm management decision-making.
- Liveweight targets are the most important tool to use when setting expectations between stock owners and graziers.

Importance of liveweight targets

Liveweight is the primary measure the dairy industry uses to indicate how well-grown dairy heifers are. Liveweight targets are used to measure a heifer’s progress towards her target mature liveweight. Heifers that reach their target liveweights will have the greatest chance of fulfilling their milk production and reproductive potential.

Heifers grown to liveweight targets are also more likely to meet body condition score (BCS) targets at calving (5.5 for first calving heifers)\(^1\), which contributes to better milk production and improved reproduction in the first lactation.

Opportunity

Meet heifer liveweight targets to improve cow lifetime productivity

FARMER VIEWPOINT

Weight is the only objective way to measure heifer performance.

Contract grazier, 1,000 heifers, Patea, Taranaki

You can’t look at heifers and say that they’re at their weight targets. Getting heifers to target can be a real challenge because every year is different. The first year we grew our own heifers we had a 33% empty rate. We’d had a really good grazier before that and we didn’t appreciate him until we did the job ourselves.

Dairy farmer, 265 cows, Inglewood, Taranaki

More information

- For more about how heifer liveweight targets were developed, see Heifer Infosheet: Science Behind Heifer Liveweight and Body Condition Score Targets.
- For more about the process of setting heifer liveweight targets, see Heifer Infosheet: Setting Weight-for-Age Targets.

Effect on lifetime performance

Return on investment

Farmers estimate that it costs around $1,400 - $2,000/head to rear a heifer, with most expenses incurred by the end of their first mating. Based on industry estimation, every empty animal after the first mating results in a loss of $700 - $1000 in stock value (this is the difference in the value of an in-calf heifer versus an empty heifer sold at the works). The longer animals stay in a herd, the greater the payback in milk production and the higher the return on the initial investment. Stock owners gain the greatest return from heifers that reach their liveweight targets, as these animals have the greatest chance of meeting their lifetime production potential, of being an early-calver at their first and subsequent calvings, and being retained in the herd beyond their first lactation.

Improved reproductive performance

Heifers need to get in calf, the earlier the better, to maximise their lifetime production and provide the best return on investment. Ideally, heifers should calve in the first six weeks of the season; well-grown heifers have the best chance of achieving this goal.2

An early calving heifer has a better chance of:

- calving early next season,
- producing an AB heifer at her second calving, which will improve the herd’s genetic gain,
- producing more milk, since she will have 18-24 more days in milk,
- remaining in the herd for more lactations.

Since heifers typically take two weeks longer than mature cows to start cycling again post-calving,3 mating well-grown heifers a week or two earlier than the milking herd gives them every opportunity to maximise their lifetime productivity.

High heifer empty rates can also be avoided if heifers meet liveweight targets. Rates greater than 10% will limit a herd’s genetic progress and increase costs as more replacements will be required.4

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Greater milk production

In general there are four causes of low heifer growth rates and missed target liveweights: calf rearing factors (inadequate milk or colostrum intake), rumen development (poor weaning management or transition to a forage diet), animal health issues (parasites or illnesses), and inadequate energy for growth (low feeding levels or poor quality feed). Where milk production is concerned, feeding differences are the only factors which have been researched in controlled trials.

A review of national and international trials which examined the effect of first calving liveweight on subsequent milk production found that the impact on milk production varied.5 Most reports of large increases in production linked to higher liveweights have come from association analyses, which utilised data sets collected by farmers or grazing companies, and not from controlled trials, which are managed by scientists and are designed to test cause and effect.

A New Zealand association analysis5 used heifer liveweight data from the New Zealand national database to compare the relationship between weight and subsequent lactation performance (collected from herd testing). The study investigated the first two lactations and found milk production increased for every kilogram the heifer was closer to her target liveweight (Table 1). In the first lactation heifers’ liveweight, and their breed, had the greatest influence on milk production, in the second lactation these factors still had the greatest influence, but the region the heifers were in also became influential.

Table 1. Milksolid response (kg) for every kilogram of liveweight heifer is closer to the to target liveweight.

<table>
<thead>
<tr>
<th>Liveweight</th>
<th>Milksolid response (kg)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Lactation 1</td>
</tr>
<tr>
<td>Pre-mating</td>
<td>0.32</td>
</tr>
<tr>
<td>Pre-calving</td>
<td>0.39</td>
</tr>
</tbody>
</table>

An Irish association analysis6 weighed heifers pre-mating and then investigated their milk production over three lactations. This trial used Friesians with similar genetics to New Zealand cattle and they were at least partially grazed in pastoral systems. The results indicated that liveweight had an impact on milk production over all three lactations (Table 2).

Table 2. Milksolid response (kg) for every kilogram of liveweight heifer is closer to the to target liveweight.

<table>
<thead>
<tr>
<th>Lactation</th>
<th>Milksolid response (kg)</th>
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<tbody>
<tr>
<td>Lactation 1</td>
<td>0.59</td>
</tr>
<tr>
<td>Lactation 2</td>
<td>0.60</td>
</tr>
<tr>
<td>Lactation 3</td>
<td>0.64</td>
</tr>
</tbody>
</table>

These association analyses include all four of the factors that could reduce heifer growth; however, the data will also be affected by genetic influences, farm management differences, and farm system variation.

A controlled study in New Zealand\textsuperscript{6} assessed the impact of deliberately undergrowing heifers, through limiting available feed, on milk production. The heifers were reared under controlled conditions up to 22 months of age and then, when lactating, were on farms under normal commercial management. Researchers found a first lactation advantage of 0.21 to 0.26 kg MS for each additional kilogram of liveweight at first calving, but no difference in milk production in subsequent lactations. This research indicates that a heifer which is 30 kg below target at first calving will forfeit 7.5 kg MS (30 kg liveweight x 0.25 kg MS) in her first lactation only.

It is important to note that although the heifers in this study were deliberately undergrown, they were healthy and grazed on good quality pasture i.e. there were no other factors which would adversely affect their growth, apart from feed quantity. The study concluded that the outcome for undergrown heifers could be improved through good management from the first lactation on, if feed is the only factor limiting growth. However, if other factors, such as calf or heifer health, or low quality feed, also contribute to the initial poor growth then it is plausible to conclude that production losses could be greater, and future lactations might also be affected. In commercial situations in New Zealand it is likely that more than just feed quantity is limiting heifer growth. Therefore, this study’s results probably show the minimum impact of missing heifer target liveweights; the milk production impact experienced on farm is likely to be higher and prolonged over multiple lactations.

More information
\begin{itemize}
  \item For more about the factors that can affect an animal’s lifetime production see Heifer Infosheet: Causes of Poor Heifer Growth.
\end{itemize}

FARMER VIEWPOINT

We can’t financially afford hiccups in health and growth of our heifers, particularly if milk price is low so we put time and effort to make sure they are well grown.

Dairy farmer, 630 cows, Winton, Southland

Heifers are the last area in our farm system where would cut expenses because they are an investment for the future.

Dairy farmer, 520 cows, Te Awamutu, Waikato

When it comes to growing heifers, dairy farmers shouldn’t get trapped in the mentality of paying minimums, minimum prices get minimal results.

Contract grazier, 1,250 heifers, Stratford, Taranaki

Use in farm management decisions

Establishing heifer liveweight targets, and the growth required to meet them, will aid farm management decision-making. They can be tailored for different mob compositions e.g. mixed breeds and varying ages. The information can be used when answering a range of questions, including:

\begin{itemize}
  \item If a farm grows 10 tonnes DM/ha what is the best stocking rate? What is the most efficient nitrogen policy?
  \item How much supplement is required, either made or purchased?
\end{itemize}
• What complementary enterprises could be run on the farm?
• What crops would be most suitable when pasture availability is limiting?
• What factors could make attaining the required heifer weight gains challenging? For example, the type of land class, the farm system, or if stock have previously been poorly managed.

Liveweight targets can give farmers a better understanding of what the cost of growing heifers is going to be, which can then be used to assess the costs and benefits of using land for heifer grazing, to decide whether to purchase or lease land, and to negotiate a fair price.

They are a valuable tool to use when reviewing heifer management. Final weights can be compared with targets to identify missed opportunities and review costs.

Heifer liveweight targets are also important for both stock owners and graziers, for long term planning and to achieve results that will benefit both parties. If the targets are known before stock changes hands then an informed negotiation is possible, or a grazing contract may be declined if there is a mismatch with a grazier’s system. Targets can also be used to set minimum weights, establish rejection criteria, or to prompt early culling. At the end of a contract stock owners can compare the weight achieved with the target, to evaluate the grazing fee paid.

### More information

- For more about liveweight targets, see Heifer Infosheets: Selecting Mature Liveweights, Setting Weight-for-Age Targets, and Planning Heifer Growth.
- For more about using feed planning to meet heifer liveweight targets, see Heifer Infosheet: Feed Management for Growing Heifers.
- For more about sending heifers to a grazier, see Heifer Infosheet: Shifting Heifers Off-Farm.
- For more about setting stocking rates and feed allocation, see Heifer Infosheet: Setting Stocking Rates and Feed Management.
- For more about managing heifer liveweights, see Heifer Infosheet: Analysing Heifer Liveweight Data.