Setting Stocking Rates and Feed Management

This Infosheet covers:

- Calculating stocking rates for heifer grazing.
- Planning feed allocations.
- Managing feed deficits and surpluses.

Key points

- Calculate your stocking rate i.e. how many heifers you can carry, before taking on heifer grazing. To calculate the stocking rate:
  - determine the areas suitable for heifer grazing,
  - calculate how much pasture these areas grow annually, and
  - match this feed supply to heifer feed demands.
- Heifers need high quality feed throughout the year. Pasture surpluses need to be managed to maintain pasture quality and any feed deficits should be filled.

Determining heifer stocking rates and allocating feed

Heifers need sufficient high quality feed so that they can grow fast enough to reach their weight-for-age targets. Once you have decided you are going to add heifer grazing to your farm business and the type of contract/age of animals you will carry you will need to calculate:

- how many heifers your farm can carry (stocking rate) given the amount of feed you can supply,
- how to manage the feed flow through the season to meet feed requirements.
Calculating stocking rate

First identify the areas which are suitable for heifer grazing. Then calculate the annual amount of feed grown to determine how many heifers can be carried.

How to calculate the stocking rate

1. **Assess the proportion of the farm that is suitable for heifer grazing.**
   
   Use land use capability (LUC) maps to identify suitable areas. Land with a LUC of 2-4 is ideal for dairy heifers. Landcare Research has published a LUC handbook which will help you to identify appropriate areas, available from: landcareresearch.co.nz/publications/books/luc.

2. **Estimate the annual amount of pasture grown on the selected block.**
   

3. **Estimate the level of pasture utilisation (pasture eaten per ha).**
   
  Under intensive and best management this is around 80 % of annual pasture production. Pasture grown and utilised will vary from year to year and stocking rates should be reviewed annually if new to heifer grazing, end then every 2-3 years to align with growth and management.

4. **Calculate the total utilisable pasture.**
   
  Annual pasture production X proportion (%) utilisation.

5. **Estimate heifers’ annual feed requirements.**
   
  The total feed requirements of R1 and R2 heifers are in the DairyNZ Facts and Figures booklet, available at dairynz.co.nz/facts-and-figures.

   Calculating the feed required to meet heifer growth rate targets is in Heifer Infosheet: Feed Planning for Heifer Growth.

6. **Calculate the potential number of heifers which can be carried.**
   
  Total utilisable pasture/total heifer feed requirements (answer from Step 4 divided by answer from Step 5).

7. **Pasture production can be variable between seasons so factor in some flexibility e.g. by including other stock classes.**
   
   Options: carrying a stock class that can be sold if pasture growth is low, carrying a supplement buffer, or growing crops.

   A farmer “rule of thumb” is to carry 10 % trading stock to offset dairy heifer grazing e.g. for every 300 R2 heifers carry 30 trading cattle.

**Example**

1. 250 ha Manawatu hill/finishing farm. 100 ha of this farm is suitable for heifers i.e. flat to easy rolling country (LUC class 2-4).

2. This area produces 10,000 kg DM/ha pasture annually (10,000 tonnes).

3. The pasture utilisation is 80 % (0.8 as a proportion).

4. Feed supply = 10,000 kg DM/ha x 100 ha x 0.80 = 800,000 kg DM/yr.

5. The grazing contract is from 3 to 22 months of age (18 months). The annual requirement for R1 heifers is 960 kg DM/year (from 3 to 12 months of age) and R2 heifers is 2,600 kg DM/year (from 12 to 22 months of age).

6. Number of heifers which can be carried: 800,000 / (960 + 2,600) = 450 heifers, i.e. 225 R1 heifers and 225 R2 heifers.

7. Allow for a feed buffer. Using the rule of thumb of 10% trading stock, carry 400 heifers i.e. 200 R1 and 200 R2 heifers, plus a total of 50 trading cattle to modify the feed demand profile on the farm or be sold in a feed deficit.
I break my farm into units so every client has their own unit. I know my paddock sizes and set the stocking rate based on paddock production. Stocking rates vary from 3.5 to 5 heifers/hectare on our flat to rolling farm.

Contract Grazier, 850 heifers, Stratford, Taranaki

Dry stock farms should always be slightly under-stocked to manage variable pasture growth.

Contract Grazier, 720 heifers, Oamaru, North Otago

Stock owners should make sure there is an incentive to feed heifers to meet liveweight targets. There can be a conflict for what’s best for the grazier versus what’s best for the dairy farmer during the season. Winter stocking rates set graziers up for the spring but the trade-off is that the heifers might be limited for feed.

Dairy farmer, 250 cows, Inglewood, Taranaki

Seasonal feed management

Growing heifers require high quality feed, especially in the period from weaning to 9 months of age. Managing surplus pasture to maintain quality and meeting any feed deficits are critically important.

Example feed management process

1. **Calculate the monthly feed requirement per hectare on the heifer block (feed demand).**
   
   See Heifer Infosheet: Feed Planning for Heifer Growth.

2. **Estimate monthly pasture growth rates (feed supply).**
   

3. **Compare feed demand with supply.**
   
   For an example using the Manawatu data from above see Figure 1. Note that heifer grazing demand does not match pasture growth patterns very well.

4. **Identify any periods of feed deficit or surplus and consider options to manage them (see Figure 2 and Figure 3).**

5. **Select the option that best suits the farm, the available resources, and farm management.**

**Figure 1.** The feed demand vs. pasture growth utilised (kg DM/ha/day) for a stocking rate of 4 R1 and 4 R2 crossbred
dairy heifers per hectare using the Manawatu example.

In this example, excess feed could be transferred from the spring period to the autumn and winter. This could be achieved by making silage or baleage to be fed later; reducing the grazeable area in the spring by planting a crop that will be eaten in another season (see Figure 2); or utilising another stock class with a feed demand which is more similar to the feed supply, like a flock of ewes (see Figure 3).

In Figure 2 the spring surplus has been reduced by taking land out for a crop, and could be further reduced by also making silage. Both the crop and silage could be used to meet the winter deficit.

**Figure 2.** The feed demand vs. pasture growth rate (kg DM/ha/day) for 4 R1 and 4 R2 crossbred dairy heifers per hectare, with 10 % of farm sown in summer herb crop (using the Manawatu example).
In Figure 3 a spring lambing ewe flock has been used to control the spring surplus. Their demand will be lower in autumn when the lambs have been sold, so the deficit is reduced.

**Figure 3.** The feed demand vs. pasture growth rate (kg DM/ha/day) for 2 R1 and 2 R2 crossbred dairy heifers/ha with 6 ewes/ha lambing at 150% (using the Manawatu example).

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**FARMER VIEWPOINT**

Reliability of feed supply is really important. We are improving our farm’s feed supply through irrigation and cropping. Our farm is a 6.5 tonne/hectare farm as dry land but under irrigation it becomes a 14 tonne/hectare farm. We picked a variety of crops to meet different animal needs and fill seasonal feed gaps so we are growing kale, fodder beet, oats, rye corn, and a maize for standing grazing.

*Contract Grazier, 720 heifers, Oamaru, North Otago*

To make sure our heifers maintain weight gains during their first winter they are grazed on rape and chow. The heifers can’t have static weights over the winter for them to get to mating weights.

*Dairy farmers, 680 cows, Winton, Southland*

We find autumn is the most difficult season for us to grow heifers because it is peak demand for feed while pasture growth can be variable depending on the autumn rain. We know we need to have silage on-hand in case we need it to lift heifer growth rates.

*Contract grazier, 430 heifers, Greytown, Wairarapa*
**Planning feed allocation**

While it is ideal to feed all stock optimally, there will be times when feed is limited and decisions need to be made about which stock classes to prioritise.

**Feed allocation process**

1. **Set feeding priorities for stock classes.**
   Refer to Heifer Infosheet: Setting Feed Priorities for more information on prioritising stock classes.

2. **Decide which type of feed is most suitable for each stock class** (see example in Figure 2), e.g. turnips for R2 heifers, leafy turnips or rape for R1 heifers, silage for R2 heifers and trading cattle.
   In the Manawatu example baleage could be used for the R1 and R2 heifers and a summer crop for the R1 heifers (see Table 1).

3. **Monitor liveweight gain and modify plan if required.**
   For example, if the R2 heifers are behind their liveweight target they should become the first priority; however, if they are well ahead of target then the trading cattle can increase in priority.

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**FARMER TIP**

We know we don’t grow enough feed over the winter so we budget on one 200kg bale of silage per heifer, so we need to cut over 500 bales of silage during the spring. Eventually we’ll move to winter cropping once we’ve lifted soil fertility.

Contract grazier, 400 heifers, Matawi, Gisborne

We put our fodder beet into our beef cattle rather than dairy heifers because we get better returns on it with the beef. Fodder beet has excellent utilisation during wet winters and we can get growth rates of 0.85kg liveweight/day feeding it, but we don’t need that high of growth rates for our heifers so it makes sense to feed it to beef cattle.

Contract graziers, 720 heifers, Oamaru, North Otago
To get the best results you should carry out some preliminary calculations before starting heifer grazing, including working out the number your property can carry and how you are going to manage seasonal feed fluctuations so you can meet weight-for-age targets.

You will need to identify the areas on-farm which are suitable for heifer grazing and then calculate how much feed these areas can grow. Then heifer feed demands can be compared to feed supplies to identify any periods of surplus or deficit. Once you have these figures you can develop strategies to manage feed fluctuations, which could include running other stock classes, planting crops or making supplements.

Finally, ongoing monitoring is required so that you can make decisions about prioritising stock classes and adjustments to manage any changes. This process is most easily done with a feed budgeting software package or employing a farm consultant to work through the process.

**Summary**

Table 1. A feed chart which uses baleage and a summer crop to balance feed demand and supply for the Manawatu example.

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<th>Stock Class</th>
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- pasture
- summer crop
- baleage