

2

The two phases of young stock management

This chapter lists the key objectives during the two phases of heifer rearing.

The main points in this chapter

- The first phase is milk rearing, from birth to weaning.
- The second phase is post-weaning up until point of first calving.
- The key objectives of these two phases are listed.

There are two phases of young stock management on any dairy farm, namely:

- the milk feeding calf phase, from birth to weaning at 2–4 months of age
- the weaned heifer-rearing phase, from weaning to point of first calving.

The key objectives are presented in Figure 2.1 for milk-fed calves and Figure 2.2 for weaned heifers. This chapter simply lists the key objectives during the various steps in these two phases. The logic behind these objectives is discussed fully in the following chapters of this book. In my previous books for dairy farmers in Australia (Moran and McLean 2001, Moran 2002), I summarised the most important objectives as ‘John Moran’s golden rules for calf and heifer management’ and these are presented in Appendix 1 of this book.

2.1 The milk feeding calf phase

The key principles of milk-rearing herd replacements are:

- ensuring healthy cows can give birth to healthy calves in a clean and comfortable environment
- providing suitable colostrum to allow adequate transfer of immunity
- supplying milk, fresh water and appropriate and timely supplements
- providing appropriate and clean housing
- minimising the risk of disease and disease spread

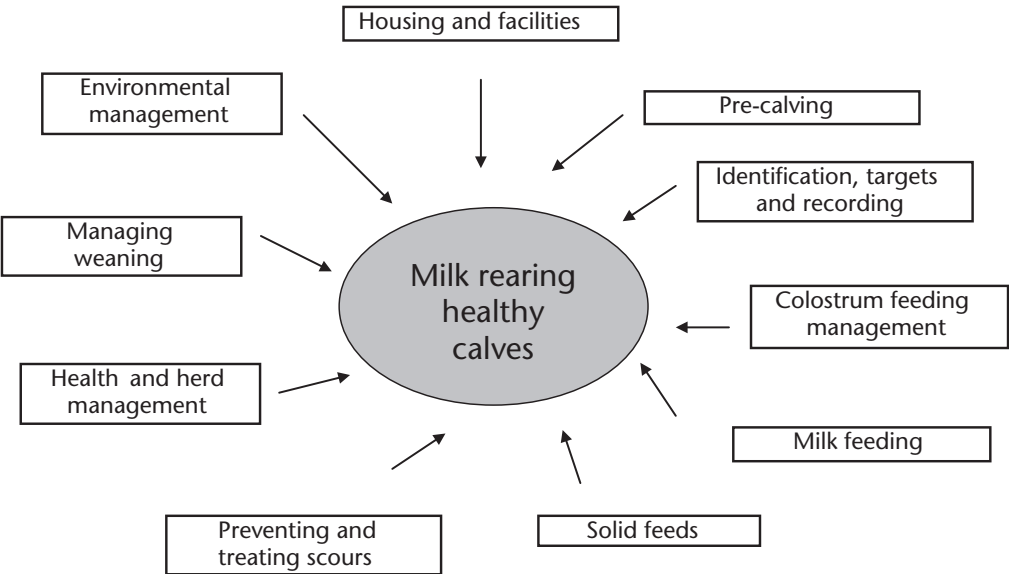


Figure 2.1. Key objectives during the milk-rearing phase of young stock management

- managing the weaning process
- instigating practices that reduce the risk of antibiotic and chemical residues
- ensuring calf and welfare requirements are met for any calves sold.

The process of milk rearing can be broken down to 10 steps, which together with some of the key objectives are described in Sections 2.1.1 to 2.1.10.

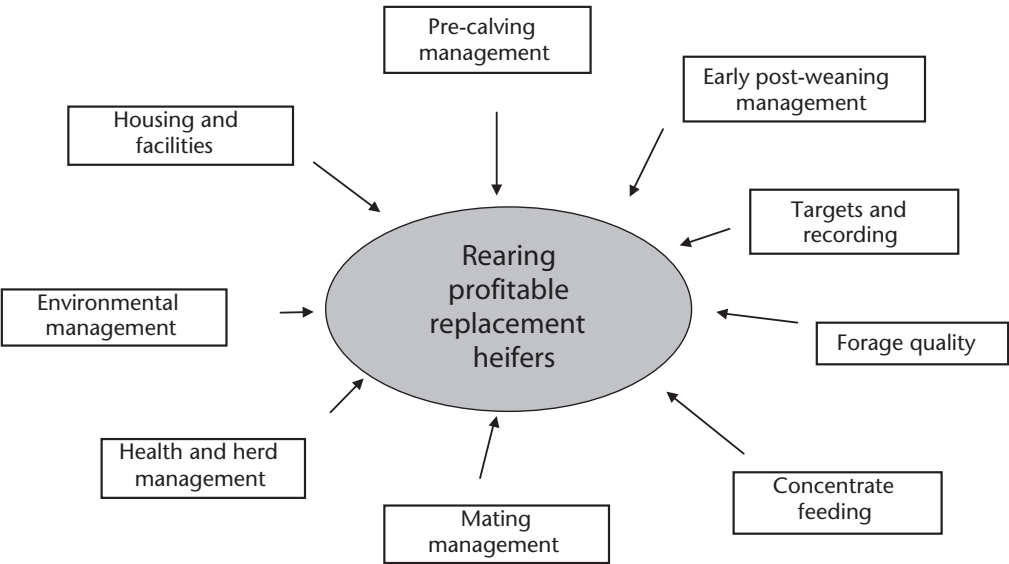


Figure 2.2. Key objectives in the weaned heifer phase of young stock management



The first phase is milk rearing the calf.

2.1.1 Pre-calving

- Select sires for ease of calving.
- Manage the transition period, before and after calving, to minimise metabolic diseases.
- Ensure that target mating weights are achieved before joining heifers.
- Implement a farm-specific vaccination program.
- Prepare facilities for calving, concentrating on space and hygiene.

2.1.2 Identification, targets and recording

- Record all details of the birth.
- Permanently identify each calf.
- Set targets for feeding, weaning and disease control.
- Decide on a protocol for culling very sick calves, following treatment.
- Establish a method for humane destruction, if required.
- Decide on whether to use individual or group pens.
- Develop a calf recording schedule (in a notebook or on a computer).
- Record all calf-rearing costs (including labour input) to calculate the total costs to weaning.

2.1.3 Colostrum feeding management

- Consider vaccinating the cows for local diseases to improve the colostrum quality.
- Preferably separate the cow and calf within a few hours and administer the colostrum by hand.
- If the cow and calf run together for 12 hr or more, ensure the calf has a good drink of colostrum from her dam.
- Ensure an adequate colostrum feeding program, including:
 - the quality of colostrum
 - the quantity of colostrum fed
 - quickly feeding the calf after birth, within the first 6 hr
 - the method of feeding colostrum
 - ensuring bull calves also receive adequate colostrum even if they are to be sold
 - continuing feeding colostrum, when available, for several days.

2.1.4 Milk feeding and access to drinking water

- Select the type of milk (whole milk or calf milk replacer – CMR).
- Be aware of the potential problems with very cheap CMRs.
- Decide on the method of feeding milk (buckets, teats, trough or restricted suckling)
- Seriously assess the benefits of an automatic calf feeding system for large calf-rearing enterprises.
- Do not dilute milk or colostrum with water.
- Decide on a feeding frequency (once versus twice each day).
- Decide on a warm or cold milk-feeding system.
- Be consistent each day (volume and temperature).
- Ensure good utensil hygiene when collecting and feeding milk.
- Provide clean drinking water from day 1 of life.
- Use hot water, detergents and sanitisers when washing feeding equipment.

2.1.5 Solid feeds

- Provide good quality concentrates (consider energy, protein and minerals).
- Understand the importance of adequate protein in the concentrates; milking cow concentrates are unsuitable due to low protein.
- Decide on a formulation (mixed on farm from base ingredients or commercially formulated).
- Provide to appetite from first week of age.
- Ensure fresh concentrate is on offer at all times.
- Do not mix concentrates with water.
- Monitor daily concentrate intakes to aid with the weaning program.
- Decide on forage supplements (preferably hay rather than fresh forage).
- Feed limited amounts of forages.

2.1.6 Preventing and treating scours

- Be aware that good colostrum feeding management is the key.
- Be consistent with all feeding and herd management.
- Minimise stresses on calves (overcrowding, climatic conditions, rough handling).
- Understand the difference between nutritional and infectious causes of scours.
- Understand types of scours and age when they can occur.
- Understand how to identify type of scours from symptoms (age, body temperature, faecal characteristics).
- Understand how to assess degree of dehydration in sick calves (sunken eyes, skin pinch test).
- Have good quality electrolyte fluid replacement on hand.
- Keep feeding milk but space out feeding times.
- Do not consider antibiotics until the type of infectious scours is identified by a veterinarian.
- Have a hospital pen for isolation of sick calves.

2.1.7 Health and herd management

- Dip the calves' navels in iodine solution soon after birth.
- Understand calf behaviour.
- Be confident with veterinarian support.
- Be aware of how to assist the veterinarian with follow-up treatments of sick calves.
- Purchase items for a 'calf nursing kit' (thermometer, stomach tube feeder and watch).
- Develop knowledge of local disease problems (such as pneumonia, joint-ill or bloat).
- Minimise faecal contamination of the calf-rearing area.
- Minimise exposure to infections.
- Identify, record and isolate all treated calves.
- Within group pens, don't mix calves of different ages.
- Plan for disease prevention rather than treatment.
- Consider routine vaccination against Clostridial diseases.
- If using antibiotics, record treatment dates and the withholding period to avoid sale of contaminated stock.
- If selling stock, ensure they are fit for travel and sale.
- Ensure excellent hygiene in calf pens and of milk feeding equipment.
- Be aware of important calf welfare issues.
- Record all instances and degree of health problems for later reference.
- Decide on protocol for other herd management (disbudding, vaccinations, and internal and external parasite prevention and treatment).
- Ensure newly introduced stock are kept in a separate quarantine area.
- Ensure all staff are aware of farm health protocols.
- Ensure any children wash their hands and change into clean clothes after leaving the calf-rearing area.

2.1.8 Managing weaning

- Because weaning is a process, not an event, it must be carefully planned.
- Decide on a weaning protocol (based on concentrate intake, age or weight or some combination of these).
- Preferably use concentrate intake and wean once calves are eating 750 g to 1 kg/calf/day.
- Immediately remove milk from the diet (don't dilute with water or gradually reduce intake).
- Note whether concentrate intakes quickly increase following weaning.
- Minimise early post-weaning stress, such as vaccinations and disbudding.
- Move weaned calves to other pens only after a few days.
- Continue feeding concentrates for many months even if forage quality is good.

2.1.9 Environmental management

- Protect stock from climatic stresses.
- Consider sprinklers and fans in very hot climates.
- Maintain a clean environment to minimise the disease risk.
- Ensure the rearing facilities do not cause undue stress on newborn calves.
- If cold weather is likely to be experienced, ensure the walls are solid to calf height.
- Provide artificial heating for sick calves in cold conditions.

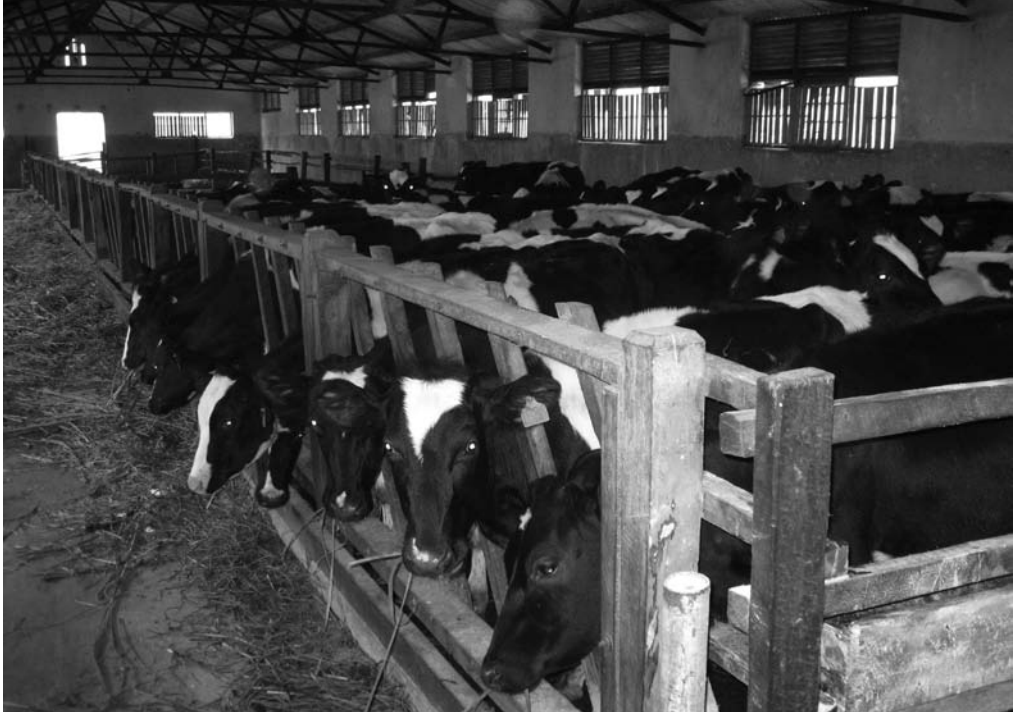
2.1.10 Housing and facilities

- Consider individual calf cages for rearing calves for the first few weeks of life.
- If using individual pens, provide a slatted floor or comfortable bedding, such as straw or sawdust.
- Ensure each pen has containers for fresh water, milk, concentrates and, if being fed, forage.
- If using group pens, ensure no more than six calves per group, with sufficient floor space for each calf (at least 1.5 m²/calf).
- Ensure good ventilation in the calf shed.
- Provide adequate lighting in the shed for night-time activities.
- Ensure hot water is readily available for cleaning purposes.
- Provide a small refrigerator for storing vaccines and other drugs in a secure area.
- Clean and disinfect each calf pen between batches of calves.
- Devise a good effluent disposal system for the regular cleaning of facilities.

2.2 The weaned heifer phase

The key principles of rearing weaned replacements heifers are:

- ensuring they grow well to achieve target live weights for mating and calving
- basing the ration on high-quality forages with concentrates specially formulated for growing heifers



The second phase is rearing the weaned heifer.

- supplying fresh water at all times
- providing appropriate and clean housing
- minimising the risk of disease and disease spread
- ensuring welfare requirements are met for any calves sold
- monitoring heifer performance to fine tune feeding management.

The aim of heifer rearing is to achieve maximum growth and development and earliest puberty at least cost. This ensures that maintenance costs are minimised, that there is the earliest possible return on the investment in the original animal and that the heifer can produce well during her first lactation. Any small growth check, due to sub-optimal feeding, is unlikely to have a permanent effect on her future productivity (unless it is severe), but can delay puberty; increasing rearing expenses hence decreasing profitability. The feeding of high-quality forages, including legumes, should ensure acceptable growth rates, but will invariably require additional high-energy and protein supplements and possibly additional forages to ensure good year-round live weight gains. Growing heifers may need to be housed to protect them from ectoparasites, such as ticks and biting flies and, in Central and southern America, from vampire bats during the night.

Tropical cattle do not grow as quickly in the tropics as do temperate dairy heifers in temperate regions. This is primarily because of the nutritional limitations of tropical forages, compounded by heat stress, which reduces appetite. Tropical dairy cattle also have lower mature sizes, hence less propensity for live weight gain.

In temperate areas, dairy heifers are first mated at 15–18 months, depending on mature size. However, in the tropics, the majority of heifers are too small, hence too immature, to breed at these ages. Live weight, rather than age, should be used as the criterion for mating heifers. Adequate live weights should be 200–225 kg for smaller and 290–315 kg for larger breeds. Following conception, heifers must continue to grow as well as produce a viable calf 9 months later. In addition, parasite control and routine vaccinations should continue during their rearing. Vaccinations for clostridia, anthrax, brucellosis, rinderpest, and foot and mouth disease should be routine, depending on the dairy region. During their last 2 months of pregnancy, additional feeding is required, usually with concentrates.

The process of rearing weaned heifers can be broken down to nine steps, which together with some of the key objectives for each step are presented in Sections 2.2.1 to 2.1.9. There is inevitably some duplication with the lists above for milk-fed calves.

2.2.1 Early post-weaning management

- Minimise stress immediately before and after weaning.
- Avoid moving calves out of milk-rearing pens for several days after weaning.
- Monitor individual concentrate intake after weaning to ensure rumen development is adequate.

2.2.2. Targets and recording

- Routinely weigh (or use chest girth tapes) to monitor changes in live weight during heifer rearing, say every 3 months.
- Use target live weights to modify feeding management, if required.
- Use body condition as an extra guide to heifer feeding management.
- Continue recording animal health treatments until first calving.
- Plan mating at target mating weights.
- Record mating times to aid with planning additional inseminations.
- Decide on protocol for culling very sick heifers, following treatment.
- Establish a method for humane destruction, if required.
- Develop a heifer recording schedule (in a notebook or on a computer).
- Record all heifer rearing costs (including labour input) to calculate total costs to first calving.

2.2.3 Forage quality

- Ensure the forage is of good quality.
- Provide adequate forage.
- Chop forages into small lengths.
- Consider wilting fresh grass to increase forage intakes.
- If possible, include legume forages to provide additional forage protein.

2.2.4 Feeding of concentrates

- Continue feeding concentrates until puberty and even after, depending on forage quality.

- Ensure concentrates contain adequate protein for heifer growth.
- Understand the importance of adequate protein in the concentrates; milking cow concentrates are unsuitable due to low protein levels.
- Decide on the formulation (from base ingredients or commercially formulated).
- Do not mix concentrates with water.
- Provide fresh drinking water at all times.
- Clean out the feed troughs at least once each day.

2.2.5 Mating management

- Ensure target weights are achieved before joining heifers.
- Seriously assess the benefits of synchronising oestrus in large groups of heifers.
- Consider mating heifers in specific seasons, particularly if summers are hot and humid.
- Ensure adequate infrastructure and support if depending on artificial insemination (AI) for mating heifers.
- Select bulls and semen on ease of calving.
- Consider access to bulls for natural mating following several cycles of AI.
- Ensure heifers are well fed and gaining weight during the mating period.

2.2.6 Health and herd management

- Develop a routine disease control protocol for heifer rearing. This should include vaccinating against diseases relevant to the location, control and prevention of external parasites as necessary.
- Develop skills in understanding stock behaviour.
- Be confident with veterinarian support.
- If using bulls for natural mating, ensure they have been assessed for fertility and treated to prevent spread of reproductive diseases.
- Plan for disease prevention rather than treatment.
- If selling stock, ensure they are fit for travel and sale.
- Be aware of important calf welfare issues.
- Record all instances and degree of health problems for later reference.
- Ensure newly introduced stock are kept in a separate quarantine area.
- Ensure all staff are aware of farm health protocols.
- Ensure any children wash their hands and change into clean clothes after leaving the calf-rearing area.
- Be aware of how to assist the veterinarian with follow-up treatment of sick calves.
- Purchase items for a 'calf nursing kit' (thermometer, stomach tube feeder and watch).
- Develop knowledge of local disease problems (pneumonia, joint-ill or bloat).

2.2.7 Environmental management

- Minimise heat (and cold) stress, as with milking cows.
- Protect stock from climatic stresses.
- Consider sprinklers and fans in very hot climates.

- Maintain a clean environment to minimise the disease risk.
- If cold weather is likely to be experienced, ensure the walls are solid to calf height.

2.2.8 Housing and facilities

- Ensure heifers have adequate space in their pens (at least 1.5 m²/heifer).
- Ensure good ventilation in the heifer shed.
- Provide adequate lighting in shed for night-time activities.
- Provide a small refrigerator for storing vaccines and other drugs in a secure area.
- Clean and disinfect each pen between batches of heifers.
- Devise a good effluent disposal system for regular cleaning of facilities.

2.2.9 Pre-calving management

- Manage the transition period, before and after calving, to minimise metabolic diseases.
- Implement a farm-specific vaccination program.
- Prepare facilities for calving, concentrating on space and hygiene.