

Guidelines for raising replacement heifers

Raising dairy heifers is one of the most neglected tasks on the dairy farm. It is, however, one of the most important economically. A heifer calf's ability to develop her milk production potential, depends on how well she is raised and managed.

A dairy cow must be given the best possible start to ensure a long and productive life, and extra effort in this phase will pay dividends throughout her milking life. Heifers that reach target weights make successful milking cows, which means that growing out heifers starts from birth.

If improved breeding and management practices are followed, heifers will most likely perform better than the cows currently in the dairy herd. Total cost associated with raising dairy replacements contributes significantly to the total operational costs of a dairy, depending on the farm, production system and rearing practices. Heifers must grow at an optimal rate to avoid calving problems and to have a successful first lactation.

The newborn calf

A clean, dry, draught-free environment at calving is essential for the health of the cow and calf. Immediately after birth:

- Remove any mucous from around the mouth and nose area.
- Ensure that the calf is dry and kept away from draughts.
- Feed colostrum to the calf as soon as possible.
- Treat the navel with a suitable disinfectant.

Calves are unable to produce antibodies (immunoglobulins) for the first few weeks after birth and must acquire them through colostrum. A newborn calf can absorb

these antibodies through the intestinal wall, but this ability rapidly diminishes during the first 24 hours after birth. It is therefore critical that the calf receives colostrum as soon as possible after birth, preferably within the first hour. Apart from the antibodies that help combat disease, colostrum is also a rich source of proteins, minerals and vitamins (*Table 1*).

The newborn calf should drink at least 2ℓ of fresh colostrum during the first six hours of life to attain adequate protective antibodies. Feed again within twelve hours to maximise the chances of obtaining sufficient immunoglobulins. Feeding should be continued for at least three days.

The birth to weaning phase

Whole milk or milk replacer can be fed to calves during the first two months until their digestive systems are sufficiently developed to utilise grains and quality forage. Calf starter concentrate mixtures are introduced from day two.

Calves must receive 10% of their body weight in milk per day (typically 4ℓ per day for Holstein calves and 3ℓ per day for Jersey calves). Provide fresh, clean water

daily. When feeding milk replacers, follow the manufacturer's directions.

Hygiene and health practices

- Scrub all feeding equipment well with hot water and detergent.
- Promptly move sick calves to a designated sick pen.
- Frequently clean and disinfect pens where sick calves are treated.
- Disinfect hard surfaces and ensure that bedding is regularly refreshed.
- Control the spread of disease by minimising movement between pens.
- Vaccinate, treat for parasites and provide access to shelter.
- Calves must be checked twice daily for signs of ill-health and treatment given when needed.
- Quickly respond to early symptoms of scours. Isolate and treat sick calves and address the cause.

Calf starters and hay

In addition to milk or milk replacer, calves need free access to a high-quality calf starter concentrate from two days old. The calf starter should be palatable, high in energy and contain a minimum of

Table 1: Typical composition of colostrum, transition milk and normal Holstein milk.

Item	Milking number			Whole milk
	1	2	3	
	Colostrum		Transition milk	
Total solids (%)	23,9	17,9	14,1	12,9
Fat (%)	6,7	5,4	3,9	3,5
Protein (%)	14,0	8,4	5,1	3,1
Casein (%)	4,8	4,3	3,8	2,5
Immunoglobulins (g/ℓ)	48	25	15	0,6
Lactose (%)	2,7	3,9	4,4	5,0
Minerals (%)	1,11	0,95	0,87	0,74
Specific gravity	1,056	1,040	1,035	1,032

18% protein (air-dry basis) to encourage eating at an early age. This is critical as it will stimulate the development of rumen papillae, which is essential for the development of a fully functional rumen.

At two weeks of age the calf should be ingesting approximately 200 to 250g of starter meal per day. Fresh, clean water should also be available, as it will encourage starter intake and rumen development. Top-quality hay should be offered at around six weeks of age. Calves can be weaned from milk or milk replacer as soon as they ingest 1kg of dry feed daily for three consecutive days. This might happen as early as six weeks of age.

Calf housing

Keep calves in an environment that is clean, dry and draught-free. Adequate ventilation is important when housing calves indoors. Keep calves in individual pens or stalls during the milk-feeding period to minimise the spread of disease.

The weaned and growing heifer

The objective of a feeding programme for replacement heifers is to produce well-developed heifers that can be bred at a relatively early age. Inadequate size at first calving may limit milk production and

conception rates during the first lactation. Overfeeding energy between three and ten months of age can, however, have negative effects on mammary gland development, which impairs subsequent lactations.

From around three months of age, concentrate supplements can be changed from a calf starter to a calf grower. Calves up to six months of age usually need 2 to 3kg of concentrate per day in addition to good quality forage. The amount of concentrate can be reduced as calves get older.

Concentrates containing urea or other non-protein nitrogen sources should not be fed to young calves, but these mixtures can be fed to heifers once they are ruminating. Precautions for urea feeding are the same as for the milking herd. When feeding urea-containing feeds, the manufacturer's directions need to be followed.

Target weight for breeding is 60% of mature weight. Holstein heifers should therefore weigh 340 to 380kg at breeding age, while Jersey heifers should weigh 240 to 260kg. To reach these weights by a breeding age of 15 to 18 months, Holstein heifers should gain 650 to 800g and Jerseys 500 to 550g per day. The growth of

in-calf heifers should continue to ensure that heifers weigh approximately 90% of mature weight before calving.

Meet nutritional requirements

It is essential that calves and heifers are fed a high-quality diet. Protein, energy, mineral and vitamin requirements must be met to achieve optimum growth rates. Calf starter, calf grower and complete calf feeds could be either home-mixed or commercially available products. The amount of grain and protein percentage in the concentrate mix depends on the quality of forage and age of the calves. It is prudent to make high-quality forage the basis for economical heifer-growing rations.

In conclusion

Healthy, productive replacement heifers are the result of good management from the day they are born to the time they enter the milking herd. Proper management of the heifer herd is one area on most dairy farms in which herd productivity and profitability can be improved. **SF**

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