



COMPARISON OF CALF HOUSING SYSTEMS

Numerous calf housing options are available, each with their advantages and disadvantages, but all calves should be raised in an environment that is:

- clean
- dry
- well drained
- provided with sufficient bedding and enrichment
- draught free and well ventilated
- free of projections that may cause injury.

When selecting a calf housing system, you will need to consider your climate, budget and labour constraints and individual preferences. Calf housing does not have to be elaborate to be effective. The focus should be on providing calves with shelter from the weather and plenty of clean bedding. Remember, even the very best facilities will not succeed without proper management.

Within a farm, combinations of housing systems may be used for calves of different ages. For example a common hybrid system is to keep calves in smaller groups for the first 2-3 weeks followed by a larger group. Whatever system you use, calves housed in pens must have at least 1.5-2.0m² of space for newborns, increasing to 2.5m² or greater as calves grow.

Individual versus group housing

Group housing

Group housing is preferred as it gives calves opportunities to play, bond and learn from their peers.

Group management is simpler than individual management but equally, it is harder to respond to individual needs. Calves should be grouped by size and age to reduce competition and facilitate observation and management. Small group sizes of 5-10 calves combine the advantages of group management with ease of record keeping and monitoring. Fewer pen divisions are needed, and access for cleaning is usually easier in larger pens.

The increased physical contact between calves can increase disease risk so it is essential to have facilities for segregating or isolating sick calves.

When calves are fed in groups, care is needed to ensure that all calves, even the slowest drinkers, are consuming what they need and that fast drinkers are not consuming too much.



Individual housing

Individual housing may achieve the best disease control and allows the rearer to closely monitor each calf. However, social isolation can have detrimental effects on calves.

Dismountable individual pens should be designed so that partitions can be taken apart and stored when they are not needed, and the pens are easily cleaned with available equipment. As pens form a microclimate inside the larger housing system, it is important to consider ventilation and draughts at the calf level within the pen.

A floor area of at least 2.0 m² should be provided for each calf in individual pens to permit self-grooming and prevent overcrowding. Calves housed in single pens should be able to see neighbouring calves, and kept in the company of other calves from three weeks of age.

Table 1 A comparison of individual and group housing

	Group housing	Individual housing
Disease control	✗ More disease risk due to increased contact between calves	✓ Least risk of diarrhoea and respiratory disease
	✗ Harder to monitor individuals	✓ Close monitoring of each calf
Cleaning and hygiene	✓ Easier access for mechanized cleaning	✓ Easier record keeping
	✗ Good hygiene needed to control disease	✓ Reduced exposure to faecal material
Labour	✓ Less labour intensive, easier management, suited to group feeding systems	✗ More labour intensive
Behaviour and growth	✓ Better for social development, learning, play and exercise	✗ Labour intensive feeding
	✗ Competition for milk access between calves	✓ Less cross sucking
	✓ Improved solid feed intake and weight gains before and after weaning	✗ Little opportunity for contact between calves
	✗ Good ventilation is essential	✗ Growth check at weaning
		✗ More fearful at 3 months, deficient social skills, poorer learning abilities and difficulties in coping with new situations

Fully enclosed versus open housing

Fully enclosed

Fully enclosed, controlled climate (heated and ventilated) calf sheds are usually not justified under Australian conditions.

Open housing

Open or partially enclosed housing that provides passive cooling is the most cost effective option in most regions. The closed sides should protect calves from prevailing winds and rain but windows can be used to improve ventilation in good weather. Remember to check natural ventilation at calf level.

Table 2 A comparison of fully enclosed and open housing

	Full enclosed housing	Open housing
Disease control	✗ Increased disease if ventilation & climatic conditions not managed well	✓ Less disease risk
Ventilation	✗ Reliance on mechanical ventilation	✓ Good ventilation
Shelter	✓ Warmer for calves	
Cleaning and hygiene		✓ Easier access for mechanized cleaning
Labour	✓ Pleasant work environment	✗ More exposure to unpleasant weather conditions
	✗ Higher level of staff training and competence to operate	
Costs	✓ Higher stocking rates	✓ Cheaper construction
	✗ Greater start-up costs	✓ Lower energy use
	✗ Higher cost per unit area	

Purpose-built versus retro-fit/temporary

Purpose-built

A purpose-built shed could include:

- a storage area for feed, medications and equipment
- a hospital area for sick calves
- an area for handling calves e.g. a draughting race with crush pens or stalls
- weighing equipment
- computer facilities
- electronic scanning equipment
- a loading ramp

Retro-fitting/Temporary

Temporary pens can be constructed out of steel reinforcing mesh, weldmesh or gates or hurdles. If outdoor, shelter can be provided using tarpaulin to cover one corner from prevailing winds or large hay bales. Temporary outdoor pens can easily be moved to a clean area of the paddock.

Existing buildings can be converted to calf sheds, but they may need modifications. For example hay sheds can be effective calf shelters, using stacks of fodder to block the weather. The air space of the building needs to be considered when planning stocking rates, not just floor area, otherwise respiratory disease can result. In some buildings, ceiling height can severely limit air space.

Table 3 A comparison of purpose-built and retro-fitted calf housing facilities

	Purpose-built facility	Retro-fitted facility
Cost	✗ Higher start-up costs	✓ Construction materials can be relatively cheap
		✗ Feeders may be expensive
		✗ May be compromises in existing building design or facilities available
Ventilation	✓ Likely to be more efficient to operate	✗ No planning permission needed although if poorly sited or managed, EPA may enforce changes
	✗ Planning permission needed and design must be approved by a structural engineer	

Hutches

Hutches are used to house calves individually. While this can provide some benefits, it also comes with several disadvantages to group housing (see Table 1).

Hutches made of polyethylene or fibreglass can be purchased commercially. Homemade hutches can be constructed from material such as marine plywood. Some designs can be turned upside down for thorough cleaning and wheels may be fitted to make them easier to relocate.

Hutches are usually 1.2-1.5 m width and 2.0-2.4 m length. To provide shelter from the wind, hutches should be twice as long as they are wide.

Hutches should be placed so calves can see each other. Placing hutches at least 1m apart will prevent physical contact between calves when using to control the spread of disease.

Hutches should be slightly elevated to allow drainage and prevent flooding. A 15cm layer of sand, gravel or crushed stone, or a pallet can be used to provide a base layer under appropriate bedding. Ideally the outdoor run should slope away from the hutch.

Securing the feed and water buckets outside the hutch is labour efficient and helps keep the calf's pen dry.

Hutches should not be placed in excessively hot, windy and wet locations, but a sunny location in winter will allow the run and part of the bedding to dry out. Light coloured, reflective hutch materials will reflect sunlight and prevent the hutch from heating up too much.

During hot summer conditions hutches should be placed in a shady area, or extra shade may need to be provided. Fold down or removable ventilation panels may be used and hutches can be raised on concrete blocks to increase airflow underneath.



Table 4 Advantages and disadvantages of hutches for calf housing

	Advantages	Disadvantages
Disease control	✓ Good for disease control with limited contact between calves	✗ Disease control can be a problem if there is poor drainage or the area is not rotated
	✓ Easy observation of all calves	
Ventilation	✓ Excellent ventilation	
Shelter	✓ The inside is dry and protected from the weather and outside the calf is able to get limited exercise and sunlight.	✗ Extra shade may need to be provided in summer
Location	✓ Hutches can be oriented towards the sun, or moved to locations that are most suitable according to the season.	
Cleaning and hygiene	✓ Synthetic materials are easy to properly disinfect; can be moved to clean ground	✗ Cleaning can be very labour intensive and some corners may be hard to reach
Costs	✓ Cheaper than purpose-built sheds	✗ Can be quite costly, depending on source, when set-up costs are considered
Labour	✓ Better work environment, with less air pollution, in good weather	✗ Carers work outdoors in all weather
		✗ Feed and water may need to be carted some distance, unless automated systems can be designed.
		✗ Twice weekly removal and replacement of bedding material may be required

Igloos

Igloos are designed for groups of calves, and allow the calf to choose between a sheltered warm environment and an outside area for exercise and play.



Table 5 Advantages and disadvantages of igloos for calf housing

	Advantages	Disadvantages
Disease control		✗ Group housing can allow spread of disease if not well managed
Ventilation	✓ Good ventilation	
Shelter	✓ Excellent shelter with calves able to choose their preferred environment and exercise freely	
Location	✓ Can be oriented towards the sun	
Cleaning and hygiene	✓ Synthetic materials are easy to properly disinfect; can be moved to clean ground	
Costs	✓ Cheaper than purpose-built sheds	
Labour	✓ Suited to group feeding systems, such as calfeterias, for ease of management	✗ Carers work outdoors in all weather

Deep litter sheds

Deep litter sheds (also known as Greenhouse barns) are available in all sorts of designs, sizes and materials, or are commercially available as Ecoshelters™. Site preparation is needed.

Curtains can be incorporated so sides and ends can be used for controlling temperature and ventilation. They retain heat so are warm in winter, although care needs to be taken to maintain ventilation when side curtains are rolled down.

Table 6 Advantages and disadvantages of deep litter sheds for calf housing

Advantages		Disadvantages	
Disease control		✘	Group housing can allow spread of disease if not well managed
Ventilation	✔ Excellent ventilation for calves	✘	Ventilation can be poor if all openings are closed to keep in the warmth
Shelter	✔ Excellent shelter for calves, warm in cold climates		
Cleaning and hygiene	✔ Allows easy access for cleaning equipment		
Costs	✔ Fairly inexpensive		
Labour	✔ Provides protection for carers from the weather; allows flexible management		

Conclusions

There is no single best way to rear calves and endless variations within each system. Any calf housing system will need to be tailored to the individual farm's particular circumstances (budget, staffing, facilities, preferences, and climate). Remember that the aim of all calf housing systems is to protect the calves' welfare by providing a clean, safe and comfortable environment.

FOR FURTHER INFORMATION

Visit the Calf Rearing page of the Dairy Australia website dairyaustralia.com.au/calfhousing

Or scan the QR code below:

