Dairy Australia
Your Levy at Work

Comparison of calf housing systems

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

- clean
- dry
- well drained
- provided with sufficient bedding
- 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 e.g. a common hybrid system is individual housing for the first 2-3 weeks followed by group housing. Whatever system you use, calves housed in pens must be able to turn around, lie down and fully stretch their limbs.

Individual versus group housing

Individual housing may achieve the best disease control and allows the rearer to closely monitor each calf.

Individual housing

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 2.0 m^2 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.

Group housing

Group housing is preferred unless disease control issues require individual penning.

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. A floor area of 1.5 to 2.0 m^2 should be provided for each calf in group pens to permit self-grooming and prevent overcrowding.

The increased physical contact between calves increases 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.

Tethering

Tethering is considered acceptable as long as calves are provided with suitable shelter, and access to adequate water and nutrition. Tethering method should not cause injury to the calf and all calves should be able to move around and exercise.

	Individual housing	Group housing
Disease control	✓✓✓ Least risk of diarrhoea and respiratory disease ✓ Close monitoring of each calf ✓ Easier record keeping	× More disease risk due to increased contact between calves × Harder to monitor individuals
Cleaning & hygiene	✓ Reduced exposure to faecal material × More labour intensive	✓ Easier access for mechanized cleaning × Good hygiene needed to control disease
Labour	× Labour intensive feeding	✓ Less labour intensive, easier management, suited to group feeding systems
Other	✓ Less pizzle sucking × Little opportunity for contact between calves × Growth check at weaning × More fearful at 3 months	✓ Better for social development, play and exercise × Competition between calves × Uneven growth rates × Good ventilation is essential

Table 1. A comparison of individual and group housing

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.

	Fully 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 & hygiene		✓ Easier access for mechanized cleaning
Labour	✓✓✓ Pleasant work environment × Higher level of staff training and competence to operate	× More exposure to unpleasant weather conditions
Costs	✓ Higher stocking rates × Greater start-up costs × Higher cost per unit area	✓ Cheaper construction ✓✓ Lower energy use

Table 2. A comparison of fully enclosed and open housing

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 e.g. 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.

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

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

Hutches

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 although smaller hutches (1.2x1.2m) are cheaper and acceptable in warm climates. To provide shelter from the wind, hutches should be twice as long as they are wide.

The calf can either be restrained using a collar and chain or contained in an outdoor run (at least another 2 m^2), enabling some contact with other calves.

Hutches should be placed so calves can see each other, but at least 1 m apart, to prevent physical contact between calves (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 and 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.

	Advantages	Disadvantages
Disease control	✓✓✓ Great for disease control with limited contact between calves ✓ Easy observation of all calves	× Disease control can be a problem if there is poor drainage or the area is not rotated
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. The calf is able to choose its preferred environment.	× 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 & 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. Better suited to once a day feeding × Twice weekly removal and replacement of bedding material may be required

Table 4. Advantages and disadvantages of hutches for calf housing

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.

	Advantages	Disadvantages
Disease control		× Group housing can allow spread of disease
Ventilation	✓ Good ventilation	
Shelter	✓✓✓ Excellent shelter with calves able to choose their preferred environment	
Location	✓ Can be oriented towards the sun	
Cleaning & 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

Table 5. Advantages and disadvantages of igloos for calf housing

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.

	Advantages	Disadvantages
Disease control		× Group housing can allow spread of disease
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 & hygiene	✓ Allows easy access for cleaning equipment	
Costs	✓ Fairly inexpensive	
Labour	✓ Provides protection for carers from the weather; allows flexible management	

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

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.

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