

Farm Structures FACTSHEET



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HOUSING FOR HEALTHIER CALVES

The environment for the calf is the subject of this Factsheet. The term “environment” encompasses many factors that can profoundly affect the well being of the calf. The following stress-creating factors are often part of the calf’s environment.

1. POOR AIR QUALITY

- extremes in humidity
- extremes in temperatures
- fluctuating temperatures
- high concentrations of manure gas (NH₃, H₂S)
- high concentrations of dust particles
- high air velocities or drafts at calf level

2. POOR SANITATION

- damp or dirty bedding
- high concentrations of disease organisms
- parasite infestations
- large fly concentrations
- accumulation of manure

3. POOR PENNING ARRANGEMENT

- overcrowding
- sharp or uncomfortable objects in the pen
- lack of social interaction among calves
- inadequate isolation for disease prevention

4. POOR MANAGEMENT

- low or imbalanced nutritional levels
- rough treatment
- unusual sights and sounds

This comprehensive list can be reduced to some very basic necessities for a good calf environment:

1. Fresh air (without drafts)
2. A dry, clean bed
3. Tender and loving care
4. Freedom from stress

AIR TEMPERATURE AND HUMIDITY

High relative humidity in the calf environment has long been associated with poor performance and high incidence of respiratory disease in housed calves. In the south coastal climate, we are so familiar with high humidity and calves suffering from pneumonia in damp calf houses. The humidity in calf houses come from respired moisture from the animals, urine and feces of the calves and from water spillage. Even with good ventilation, if the humidity outside is high, then high humidity inside cannot be controlled by ventilation alone. In this case, supplementary heat is required.

High humidity at cool temperatures seems to have a chilling effect on the calf. In addition, the air has little capacity to absorb moisture so little or no drying of wet surfaces takes place. In fact, condensation compounds the dampness problem in the pen. Heat loss from the calf increases if required to lie in a wet pen.

As the temperature in the calf house increases up to 20°C, it appears that high relative humidity is more favourable to the calf. Low RH (less than 50%) can dry the epithelial tissues of the respiratory tract leading to respiratory infections.

As the temperature increases further, the calf cools itself through respiration. This cooling process is inhibited by high RH. A complicating factor in this is the fact that airborne disease organisms favour warm, damp conditions. We do not have the conclusive evidence to tell us in what conditions calves do best. We do not have the conclusive evidence to tell us in what conditions calves do best. Experience tells us that when it is cool, high humidity does lead to problems. We also know that rapidly fluctuating temperature and humidity can cause stress in the young animal. This condition often exists in mechanically ventilated buildings controlled by thermostats.

AMMONIA ODOUR

Another indicator of poor air quality is the presence of ammonia in the air. When you can detect ammonia with your nose, the NH₃ level is probably around 10 to 25 ppm, depending upon the sensitivity of your nose. Here is a good rule of thumb for you – if you can smell it, it is probably too high and it is an indicator that there is inadequate ventilation. NH₃ levels can be measured fairly simply and inexpensively using a gas detection kit by Draeger.

AIR MOVEMENT - DRAFT

How do you define a draft? Air movement can be detrimental to the calf at low temperatures and especially if the calf is wet. The recommended upper limit for air movement close to the calf is 0.25 m/s (50 fpm) if the temperature is 10°C or less. In practice, this means that your building should be designed so that incoming air currents are not directed into calf pens but over top of them. Another rule of thumb: if you can feel air moving at calf level with your hand, it is probably too drafty if the air is less than 10°C.

PEN FLOOR AND BEDDING

About 3/4 of the time, calves are lying down so the condition of the floor and bedding is important. Concrete is widely used for floors of calf stalls. A steep slope of 1 in 20 will promote drainage beneath the bedding if you are using straw or loose, dry shavings.

Slotted floors have been widely used in elevated stalls. Two inch-wide slats with 1-inch gaps are satisfactory. Slotted floors reduce cleaning and bedding costs but the pen cost is greater. Controlling the environment is more important with a slotted floor, elevated stall since the calf has very little protection from drafts.

Straw is the most effective form of insulation material for calves to lie on. It is clean, free-draining and easily handled. Sawdust is most widely used for bedding in this region but it does not allow moisture to drain through it – it absorbs moisture. A new option is shredded newspaper. It can be purchased by the bale, it is very clean and the ink does not pose a problem but, like wood shavings, it does absorb moisture and it forms a thick manure pack.

INDIVIDUAL CALF PENS

You have some options for penning newborn calves up to age 2 to 3 months. The most popular choice is an individual, floor-level box stall. From the calf's point of view, larger is better. It has been demonstrated by British researchers that calves do better in a 4' x 6' than a 4' x 5' stall. Sufficient dry bedding must be maintained in the stall to keep the calf dry. This stall takes up the most space in a building and takes more work.

A second option is an elevated stall with partially slotted floor. These stalls are generally 2' x 5' so they take up half as much space in a room and they generally take less work to maintain. Such stalls do not afford much protection from draft for the calf so closed, mechanically ventilated, heated buildings are recommended. Some straw bedding may be used with elevated stalls to provide more comfort for the calf.

A third option is the floor level tie stall. These stalls are 2' x 5' and are bedded, as is the box stall. This stall has a sloping base and is cleaned daily.

GROUP PENS

After weaning the calves, they can be grouped according to age in a loose pen or in a freestall area. Solid-sided stalls are good since they afford greater isolation and they reduce drafts. You may have to tie calves into the stalls at first to get them used to the new environment. Keep alleys as clean and dry as possible by scraping at least once per day. Use lime to keep odours down. Remember that NH₃ and humidity go up with wet floors.

Suggested stall sizes:

0 – 3 months	24" x 48"
3 – 6 months	30" x 48"

Suggested area for loose pen:

0 – 3 months	12 – 16 sq ft per calf
3 – 6 months	20 – 25 sq ft per calf

VENTILATION

Natural ventilation is normally adequate to prevent moisture build-up in the calf barn. Provide ridge vents to let warm, moist air escape and vents in the eave to allow fresh air to enter.

In converted buildings or lean-tos, it is often necessary to assist natural ventilation by blowing in fresh air mechanically. A small 12" fan and poly-tube duct work will do for this purpose. Be very careful of draftiness in selecting your ventilation system.

In planning calf facilities, there is good help available. Spend time talking to your veterinarian and your colleagues. Visit a number of operations to see how a particular system works. Do some planning on paper. Good technical advice and plans are available through the BC Ministry of Agriculture and Food, Resource Management Branch.

FOR FURTHER INFORMATION CONTACT

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