Need To Know: Beef cattle requirements for light, air & ventilation

Cattle are social animals that live in herds. Cattle should have access to outdoor pastures for most of the year. All cattle need a chance to get some exercise every day, if weather allows it.

Barns used to house cattle must maintain adequate air quality and ventilation. Ventilation systems should be capable of keeping the barn dry, removing stale air and strong odours, bringing in fresh air without drafts and removing excess heat and moisture.

Barns should also provide a sufficient source of natural or artificial light so as not to cause discomfort to cattle. Enough light should be provided to enable adequate inspection of the animals in particular for cows in late pregnancy and young calves.

Animals that are acclimatized to a particular temperature range will face challenges if suddenly required to adjust to extremes of temperature outside of that zone of comfort (i.e., hot to cold or cold to hot).

DO YOU KNOW how to ensure adequate ventilation in housing facilities? If you think you need to know more, go to Housing & fencing structures for beef cattle in the inquiry topic, Know livestock housing & equipment at www.ctsanimals.ca/va2040/environment.html.

KNOW WHY ADEQUATE AIR AND VENTILATION ARE REQUIRED

Good ventilation is important for the health and productivity of beef cattle. Cattle give off heat and moisture as they grow, especially feeder cattle on high energy rations. They also produce manure and urine, which add moisture to the environment and produce gases like ammonia.

The purpose of ventilation is to replace moist, warm air inside the barn with cool, dry air from outside.

It is important to remove stale air with excess moisture and gases and replace it with fresh air to avoid respiratory problems. When the weather is hot, it is important to remove animal heat to keep the cattle comfortable. A good ventilation system will do these things.
Insulation helps improve ventilation. Insulation is used to reduce the flow of heat or cold in a barn. In cold weather a small amount of insulation under the roof steel can minimize condensation from occurring as moisture from warm moist air will condense on cold surfaces. Insulation is also important in warm weather to reduce the flow of heat into the barn and keep it cooler.

All ventilation systems require three basic components:

1. An **inlet system** to allow fresh air into a building.
2. An **exhaust system** to remove the stale air from the building.
3. A **control system** to provide the correct amount of air entering and leaving the building.

The amount of fresh air required for beef cattle will depend on the size of the animal, and the time of year.

It is important to provide fresh air without drafts. Cattle notice air movement when it is moving too fast relative to the room temperature, or if it is much colder than the room temperature.

It is important during cold weather to bring in fresh air as high as possible on a wall, so it has a chance to mix with room air before it reaches the animals. You should try to avoid bringing in fresh air along the floor. This means that it is important to seal along the bottom of doors in the winter, or sometimes it may be necessary to cover gates with plywood to block air movement along the floor.

**KNOW WHY ADEQUATE LIGHT IS REQUIRED**

Light is important in housing, since animals need to see so they can behave normally — moving, feeding or resting. It is also important for the cattle owner to see properly to inspect, care for and manage cattle.

Natural light can be provided with translucent material in the roof or walls. If in the roof, an area equivalent to 8 to 10 percent of the floor area is recommended. If in the walls, an area 10 to 15 percent of the floor area is recommended. The orientation of the building to the sun will determine the location of translucent materials. Large openings for ventilation can also add to the natural lighting.

Reproduction can be affected by light. There is evidence that shows that changes in light intensity and time, whether naturally with changes in season or artificially through lighting, can affect reproductive cycles.

Sunlight can also provide warmth. This can warm animals when it is cold, but also contribute to heat stress in hot conditions. Direct sunlight can also have a positive impact on overall health.

**LINK**

For additional information, see *Design Recommendations of Beef Cattle Housing: Report of the CIGR Section II, Working Group No. 14 Cattle Housing (September 2004).* [http://lbt.tj.slu.se/publikationer/mise_pub/eigr-recommendations_b_c.pdf](http://lbt.tj.slu.se/publikationer/mise_pub/eigr-recommendations_b_c.pdf)

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**What does the Code of Practice for the Care and Handling of Beef Cattle say about the effects of temperature and humidity?**

Cattle are generally able to tolerate low temperatures better than high temperatures. Humidity levels and ventilation affect an animal’s ability to cope with heat stress. Extreme heat is generally more stressful to cattle early in the summer season before they have had a chance to acclimate to the increased temperatures.

Signs of heat stress in cattle include:
- Open-mouth panting with tongue protruding
- Laboured breathing
- Drooling or froth around the mouth.

Cattle are at risk of heat stress when combined temperature and humidity exceed a *Humidex* value of 40. However, factors such as shade, air movement and length of exposure all influence the impact of high *Humidex* values on animals.

Heat stress can lead to reductions in feed intake, weight gain, reproductive efficiency and milk production. Severe heat stress may result in illness and death. Water requirements are greater during hot weather.

These **recommended practices** are provided in the Code of Practice.

a. When cattle are showing signs of heat stress, consider the following strategies:
   - Provide shade.
   - Avoid handling cattle.
   - Feed cattle at dusk or dawn.
   - Moisten the ground in part of the pen.
   - Sprinkle cattle with water.

Although cattle can generally tolerate colder temperatures if acclimatized, wet cattle (especially newborn calves), cattle in poor body condition, and cattle fed inadequate energy are less able to cope with cold temperatures. Cattle require additional feed resources during cold weather.

Signs that cattle are not coping well with extreme cold (*hypothermia*) include:
- Shivering (cattle may stop shivering if hypothermia worsens)
- Low core body temperature (less than 35°C or 96°F)
- Cold mouth
- Inability to get up
- No suckling reflex (in calves)
- Frostbite (especially newborn calves).

**DO YOU KNOW**

enough about the effect of hot and cold weather on beef cattle health and well-being? If you think you need to know more, go to About livestock & the environment in the inquiry topic, **Know about environmental influences** at [www.ctsanimals.ca/na2040/environment.html](http://www.ctsanimals.ca/na2040/environment.html).
The following **requirement** is identified in the **Code of Practice**.

**Provide additional feed to meet animals’ increased energy requirements when facing cold stress.**

This **recommended practice** is also provided in the Code of Practice.

a. Provide bedding to insulate against bare ground and to reduce mud and manure build-up on hides, which can increase heat loss.

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The process for the development of updated Codes can be accessed through the National Farm Animal Care Council at [www.nfacc.ca/codes-of-practice](http://www.nfacc.ca/codes-of-practice).