

Farm Structures FACTSHEET



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VEAL CALF HOUSING

INTRODUCTION

A properly designed housing system is very important in producing healthy veal calves. Careful consideration should be given to building construction, general layout, utility areas, environmental control and manure handling facilities. The housing system should be designed to provide low maintenance costs and ease of operation and to satisfy pollution control regulations.

BASIC REQUIREMENTS

In choosing a housing system for veal calves, primary consideration should be given to the well being and performance of the animals. The building should be:

- constructed of materials that are durable and can be easily cleaned.
- clean, dry and free of drafts.
- provided with adequate storage and utility areas.

TYPES OF HOUSING

Controlled – Environment Housing

Commercial veal production is carried out principally in controlled environment units equipped with ventilation and heating systems. In order to prevent undesirable fluctuation in temperature, it is important that barns be adequately insulated. Housing temperatures may range from 13° C to

21° C (55° F to 70° F) with a relative humidity of 60% to 70%. Adequate mechanical ventilation is required to provide a minimum of 3 complete air changes per hour in winter and up to 30 air changes per hour in summer.

Controlled environment housing requires considerable expenditure in heating and ventilation. However, under controlled conditions, calves show superior growth rates and improved feed conversion.

Regardless of the type of building materials used, there are two construction features that are essential in controlled environment units. They are:

- **Insulation** – Adequate insulation is required to conserve on heat energy from the calves or from supplemental sources. Housing for veal calves would require wall insulation R values of at least RSI 2.1 (R12) and ceiling insulation values of at least RSI 3.5 (R20). Insulation should be protected by a polyethylene sheet vapour barrier.
- **Surface Covering Materials** – A considerable amount of water is used in veal barns. To protect internal wall surfaces from penetration by water, they must be clad with materials which are impervious to water. This can be accomplished with sheet metal or thin fiberglass panels bonded to plywood sheets. All interior surfaces should be smooth and preferably light coloured.

Cold Housing

Cold open structures are an adaptation of the units commonly used for raising dairy replacement calves. This type of housing is generally not insulated and is without any mechanical ventilation. Calves are protected from the elements but no attempt is made to modify the environment.

Cold housing units are characterized by relatively low construction cost. Fluctuating environmental conditions generally result in lower growth rates but calves are less prone to respiratory problems provided that there is good natural ventilation. Very young calves may have to be supplied with supplemental heat from heat lamps during periods of low temperatures. This type of housing is generally not recommended for very young veal calves from 1 to 6 weeks old.

Cold Modified – Environment Housing

This type of housing is tight, insulated and equipped with mechanical ventilation. There is no supplemental heat. Temperature within the building is higher than but fluctuates with outside temperature.

Where the temperature of an insulated barn can be kept above the freezing point without supplemental heating, this type of barn will function quite well. The major shortcoming of this type of structure lies with moisture buildup and varying temperatures in the absence of adequate ventilation. This can lead to respiratory problems and unsatisfactory performance among calves. Mechanical ventilation is therefore essential for cooling in summer and moisture removal in winter.

For more on ventilation for veal calves contact the Resource Management Branch.

Housing Management

Housing systems should be designed for groups or batches of calves rather than having large numbers of animals under one roof. Thus, a veal calf barn is generally made up of 2 or more housing units. The availability of calves is a factor in deciding upon unit size. All calves housed in a unit should be held together through the housing cycle. At the end of the housing cycle, the unit is thoroughly cleaned and disinfected before a new group of calves is introduced.

PENS AND SYSTEM LAYOUT

Individual Stalls

Veal calves are generally housed in rows of individual tie stalls or box stalls. Buildings are designed to provide 19 – 25 ft² (1.8 – 2.3 m²) per stall excluding support facilities. Stalls are made of wood and measure about 4.5 – 5 ft (1373 – 1524 mm) long, 3.5 ft (1067 mm) high and stand at about 1 foot (305 mm) off the floor. The stall floors consist of slats with ½ inch (13 mm) openings. Slatted floors eliminate the need for bedding and enables manure to be handled in liquid form. Calves are fed from pails attached to the stall. They may be restrained by a short tethering chain. Details of a typical stall construction are shown in Figure 1.

A very common design used in veal calf barns is one in which the stall rows run parallel to the length of the building. This design makes it difficult to use partitions for grouping of calves. Stalls are usually arranged in four rows with two common feeding alleys and three litter (manure) alleys. This requires a raised feeding alley with floors sloping beneath the stalls to gutters at the rear of the stall.

An alternative design has rows of stalls running across the building. A service alley along one side of the building can be used for moving calves as well as portable feed mixers. This design allows each unit to be managed independently using true “batch” system. An example of this layout is shown in Figure 2.

Group Pens

Some producers wean their calves off milk replacer at about 6 weeks and feed a grain ration. At that point, calves are moved to group pens with or without bedding. Group pens are usually set up in naturally ventilated cold barns.

Calves are grouped according to age and size. Each calf is allowed about 1.9 m² (20 ft²) of bedded space in pens holding from 10 to 15 animals. Feeding space of about 300 mm (12 inches) per calf is allowed along one wall of each pen.

Support Facilities

A veal calf barn should be provided with separate areas for feed storage and mixing, animal handling and general utility area. The feed storage area may be part of the mixing room. It should provide:

- a sink for washing utensils
- storage racks for pails
- mobile or fixed feed mixers
- refrigerator for medical supplies

An animal handling room is desirable for handling new or sick animals. Such a room should be close to the loading area for transferring animals to and from the barn.

A general utility area would contain water heating and space heating equipment.

Manure Handling and Storage

Manure in veal operations is generally handled in liquid form. Hand held hoses or water flushing systems with specially designed gutters are used to remove the manure from beneath the stalls. The manure and waste water from the operation is then collected in a storage tank or receiving structure outside the building.

Each veal calf will generate 7.1 litres (1.5 gallons) of waste per day. Total waste water including wash water and water for cleaning utensils and the feed room is estimated at 1705 – 1818 litres (375 – 400 gallons) per 100 calves per day. Therefore, manure storage should be planned on the basis of about 23 litres (5 gallons) per calf per day.

The storage period required for manure is dependent upon such factors as climatic conditions, available equipment, available land and cropping practices. For practical purposes, a 90-day storage period is considered a minimum. Inadequate storage can result in manure being spread at periods during which the land is frozen or too wet.

Effective storage capacity can be limited by precipitation where the storage tank is not covered. This should be taken into account at the design stage. Within practical limitations, depth of the storage unit should be as great as possible to minimize the surface area exposed to precipitation.

ENVIRONMENTAL CONTROL

Temperature

Recommended temperatures for housing veal calves range from 13° C - 21° C (55° F - 70° F). It is advisable to maintain the temperature at about 21° C for calves up to 3 weeks of age. Older calves will tolerate the lower temperatures without any difficulties.

Humidity

Specific humidity levels for veal calf housing have not been firmly established but a range of 60% - 70% appears to be satisfactory. Calves begin to show signs of discomfort when the relative humidity exceeds 80% or drops below 40%.

Ventilation

Many of the common health problems encountered in veal operations may be related to poor ventilation. Adequate ventilation is required for:

- removal of excess moisture
- removal of excess heat
- introducing a continuous supply of fresh air

Ventilation rates are generally quoted as litres per second (L/s) or cubic feet per minute (cfm) per calf. Actual rates used will be influenced by population density, the amount of water used for cleanup and the method of waste handling. An adequate ventilation system must accomplish the conditions outlined above without introducing unnecessary drafts into the building.

Supplemental Heat

In order to maintain relatively constant temperatures within the veal calf barn, it may be necessary to provide supplemental heat during periods of low outside temperatures. This is particularly important when population density is low.

Any type of commonly available heating system can be used in veal calf housing. Heating can be accomplished by radiation using hot water systems or by oil or gas-fired space heaters. Information on the design of heating and ventilation systems for veal calf housing can be obtained from the Resource Management Branch of the BC Ministry of Agriculture and Food.

RECOMMENDED VENTILATION RATES

for controlled environment housing:

Winter (minimum) ventilation 3.3 L/s (7 cfm) per calf

Summer (maximum) ventilation 33 L/s (70cfm) per calf

METRIC CONVERSIONS

LENGTH

Imperial

Metric

1/8"	3 mm
1/4"	6
3/8"	10
1/2"	13
5/8"	16
3/4"	19
1"	25
1' - 0"	300
4' - 0"	1200
6' - 0"	1800
8' - 0"	2400
10' - 0"	3000

GENERAL CONVERSIONS

Length

$$m = ft \times 0.3048$$

$$ft = m \times 3.281$$

AREA

$$m^2 = ft^2 \times 0.0929$$

$$Ft^2 = m^2 \times 10.764$$

VOLUME

$$L = gal \text{ (Can.)} \times 4.546$$

$$gal \text{ (Can.)} = L \times 0.220$$

FLUID FLOW

$$L/s = cfm \times 0.472$$

$$cfm = L/s \times 2.12$$

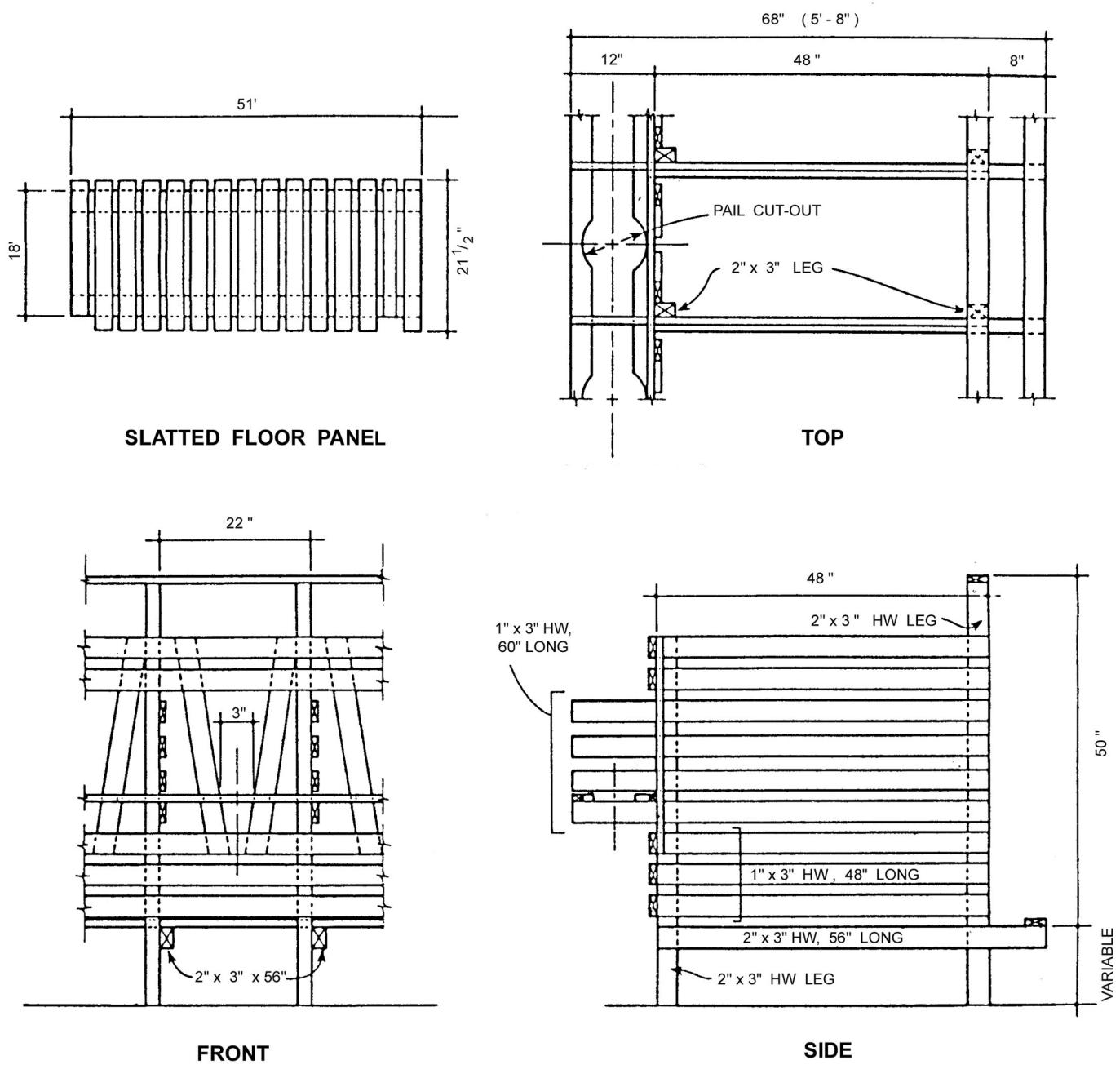
TEMPERATURE CONVERSIONS

$$K = C + 273.15$$

$$C = 5/9 (F - 32)$$

$$F = 9/5 (C) + 32$$

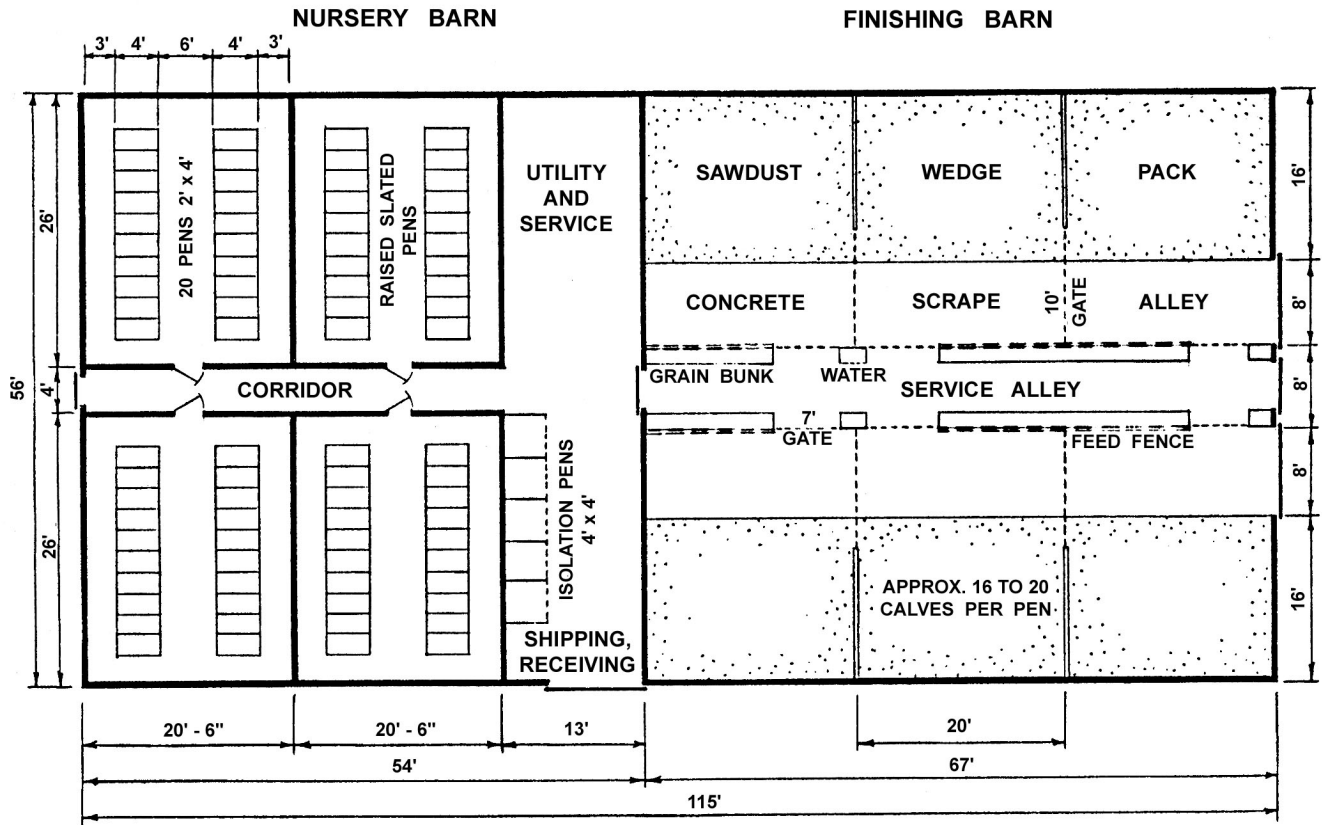
FIGURE 1



VEAL CALF PEN

NOT TO SCALE
 (PLAN SHOWS IMPERIAL DIMENSIONS ONLY)

FIGURE 2



FOR FURTHER INFORMATION CONTACT

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