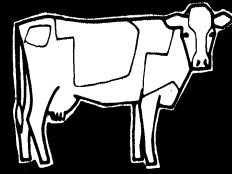




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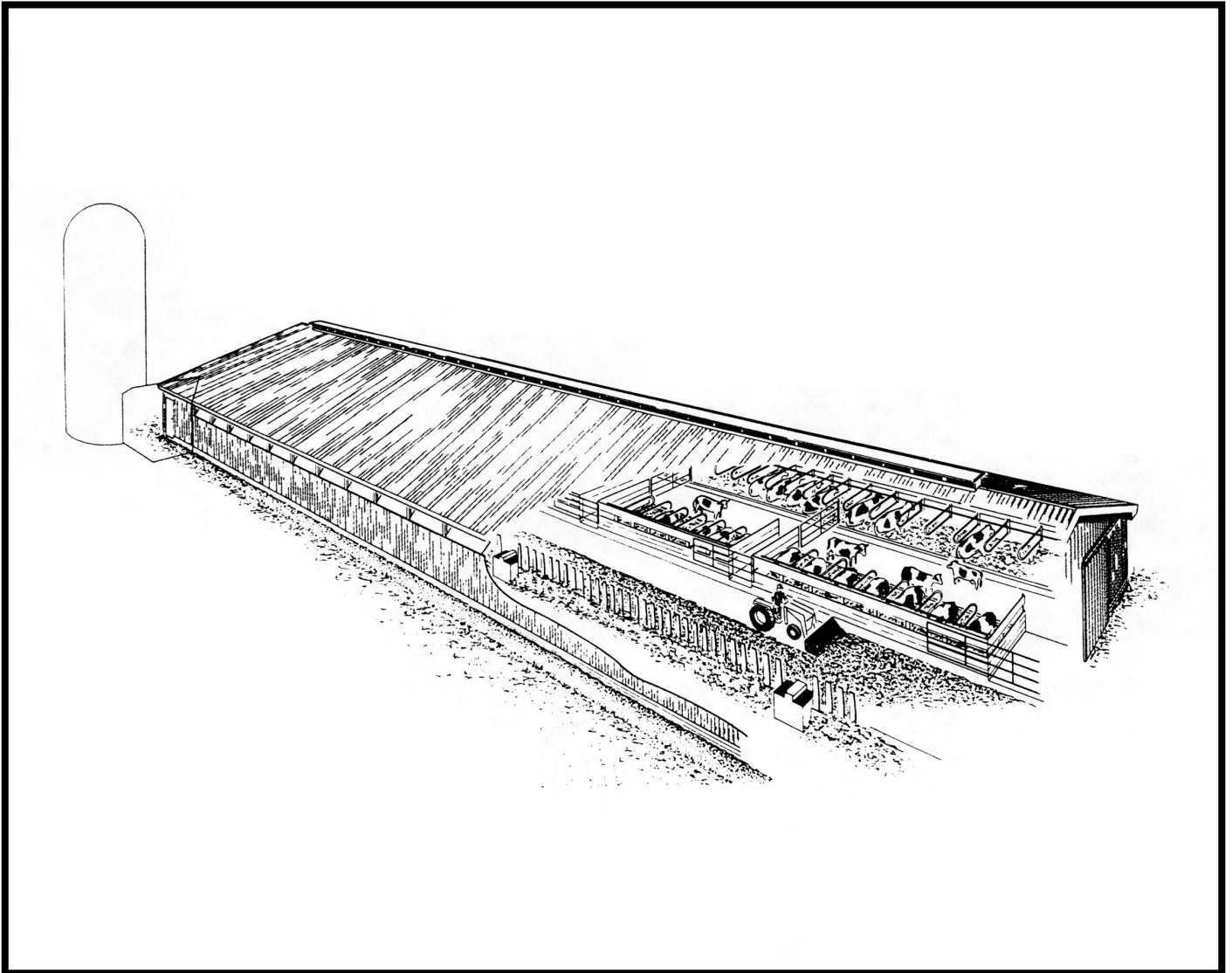
Agricultural Building Systems Handbook



PLAN

321-25

FREE STALL DAIRY CALF AND HEIFER BARN



DEVELOPED BY CANADA PLAN SERVICE

FREE STALL DAIRY CALF AND HEIFER BARN

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This leaflet describes detailed plans for a barn to house calves from 3 months of age, open and bred heifers and dry cows, for an adult herd of 100 cows (milking and dry). Feed storage and preparation are not included.

This barn has two rows of free stalls, a cattle feeding passage and a feed alley, all fitted into a 11.4 m (38 ft) clear-span building with post-frame walls. A series of gates in the cattle passages divide the free stalls into eight groups—seven groups of thirteen stalls each for calves and heifers aged 3-6 months, 6-9 months, and so on up to 21-24 months, plus one group of 17 stalls for dry cows. For larger or smaller milking herds, adjust the number of stalls per group accordingly. The recommended stall width and length for each group is given in the plan. The effective stall length is controlled by the location of the neck rail on top of the stall dividers. For smaller calves, another cross-rail or an adjustable false front may be added at the front of the stall to prevent the calf from moving too far forward. Alternatively, you can build these smaller stalls from plywood. Stall sizes are based on Holstein cattle; other breeds may require slightly different stall sizes.

One stall space becomes a cross alley for each group. If two cross alleys are desired for the dry cow or 21-24 month-old bred heifer group, simply delete one more stall at the other end of that group of stalls.

No provision is made for a separate area for individual animal treatment or handling. A locking headgate feed fence could be used.

This free stall barn can be built as a controlled environment (fully insulated with exhaust fan or automatic natural ventilation) or a modified environment (minimum insulation and natural ventilation). In most of the dairy regions of Canada, a modified environment, as shown in the plan, can be successful and is considerably less expensive. A controlled environment may be needed in the colder parts of Canada, where manure can freeze in the passages.

With the modified environment, a system of adjustable flap openings under both eaves and a continuous slot at the roof ridge provide natural ventilation. As one row of free stalls is directly under the open roof ridge, a rain-cap over the ridge is recommended. Flash the ridge baffles, made of rigid insulation, with metal on the top and outside, not the inside. This reduces condensation and dripping in cold weather. If dripping is a problem, install a narrow strip of roofing or translucent fiberglass panels in the truss space about 1 m (3 ft) below the ridge to catch the drip, and sloped to drain. Without fans, thermostats and full insulation, there is no precise control of temperature. The eave flaps can be regulated with a cable and winch control to keep out snow and maintain an inside temperature between 5 and 20°C above outside, but heated waterers are needed. For ventilation in warmer weather, use tilt-in window panels as shown.

MANURE HANDLING

Manure from a modified environment free stall barn is normally scraped with a small tractor to nearby storage. Large access doors are provided at both ends of each animal passage. A series of gates in the passage can be used to confine the cattle in one passage so that the other can be cleared for scraping. Plans of storages suitable for the wet manure from free stalls are available from the Canada Plan Service; contact your local extension engineer or specialist.

To control water pollution, manure storages should be manure tight and sized to provide sufficient storage to eliminate the need to spread manure on snow, frozen ground or sensitive crops. For most situations in Canada, spring and fall applications are best, requiring 6 months or more of storage.

Obtain approval for your plans from proper local authorities before construction is started.