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Calf and Youngstock Housing
Michigan State University
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CALF and YOUNGSTOCK HOUSING



James S. Boyd, Professor
Agricultural Engineering

Small calves are the most neglected animals on a dairy farm. In small herds, a few little calves are often tied in a manger, or in any old building. Even though caring for them is inconvenient, the animal usually survives. But, as herds increase in size, more minutes are lost caring for each calf and more calves may die of neglect.

TYPES OF HOUSING

Good calf housing should provide (1) an environment in which the calf not only survives but grows, (2) facilities to reduce the labor required for raising calves, including feeding and cleaning. With proper facilities, wives, children or retired people can do a good job of raising calves. And, when calf raising is one person's major responsibility, calf mortality is usually very low.

Two methods are used to house calves:

1. A cold, or dry, draft-free cubicle.
2. An artificially heated calf barn.

COLD CALF

With good planning, cold calf housing can be very satisfactory. This system is usually used in smaller herds where not more than six or eight calves are handled at one time.

A cold calf cubicle should have at least three solid sides (Fig. 1 and 2). This prevents drafts and isolates the calf from all other calves. The cubicle can be made 4' x 8' so that plywood can be used economically for the partition walls. A slotted or wire floor with bedding allows liquids to seep through to keep the floor dry. Feeding and watering is done by hand since cold temperatures would freeze water piped into the pens.

Cold calf housing is usually planned for one end of the free stall barn. If the calf pens are made the same dimension as a free stall, the calves and youngstock

*Replaces part of Extension Bulletin 412, "RAISING CALVES." For more information, refer to Extension Bulletin 601, "HEAT FOR DAIRY CALF HOUSING."

Figure 1 — A cold calf barn using free stalls with solid sides for individual calf pens. Two stalls are combined to allow for grouping larger calves.



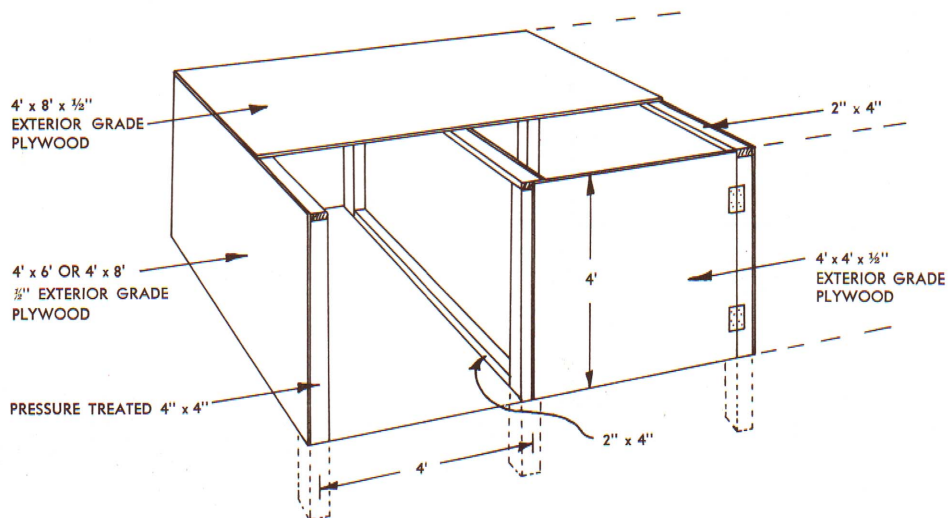


Figure 2 — Details for individual calf pens for cold housing.

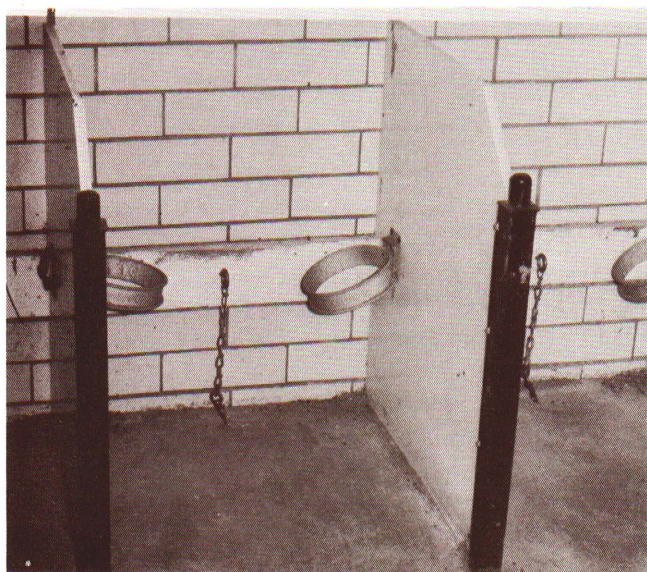


Figure 4 — Calf stalls in a warm calf barn. Smooth, easily cleaned concrete floor slopes to a gutter. Ring holders are provided for milk and feed pails.

can be moved to a new building and the calf pens used as free stalls, when expanding (Fig. 3, page 5).

During extremely cold weather, a sheet of plywood placed over the pen will conserve heat from the small calf. Note two pens covered with plywood in Fig. 1.

WARM CALF

As calf numbers increase, problems in raising calves increase. Careless methods used for a small number of calves multiply until calf losses are unreasonably high. Warm calf housing can be used to prevent these high losses.

An environment of 50° F. offers the best chance for calf survival. With this temperature, water under pressure can be provided to each pen. Calves can be tied in a 2' x 4' stall (Fig. 4 and 5), one half the space

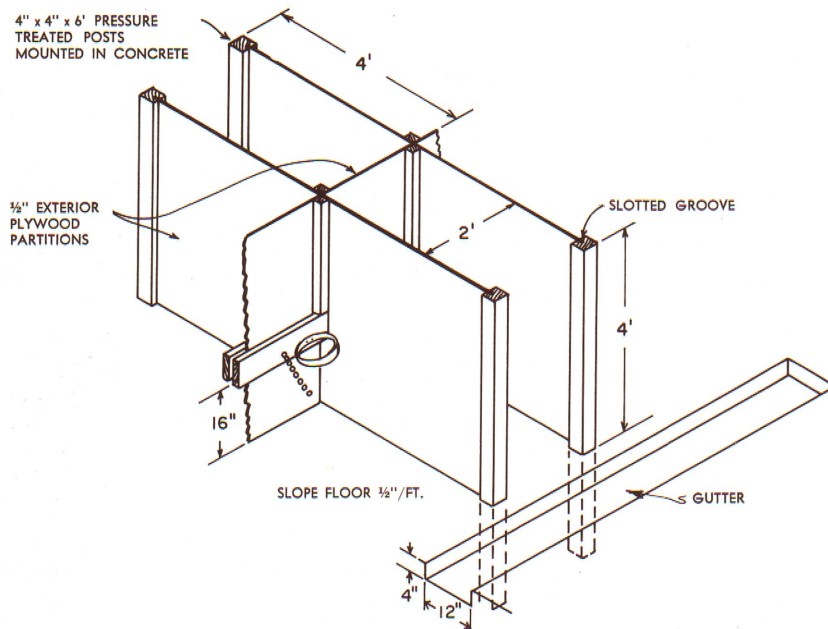


Figure 5 — Details for individual calf stalls for warm housing.

required in cold housing. Manure drops in a small area behind the calf and can be easily removed.

Feeding is usually done from pails set in holders in the front of the stall. Each calf is fed from a separate pail which can be removed to a service room to be washed and sanitized between each feeding. A plastic nipple bottle and a metal rack on the pen wall can be used. A dozen bottles can be picked up and distributed about as fast as one can walk down the alley.

When animals are confined, moisture accumulates, humidity rises and the room feels damp. Fans can be used to remove this moisture (Fig. 6). For winter operation, provide 0.1 cfm (cubic feet per minute) of air per one pound of animal when all stalls are full. Be sure to get a small enough fan or a two-speed fan with a low volume equal to the calculated rate. Air should enter the building through the attic. A slot along the wall which is opposite the fan or an inlet in the ceiling over an alley keeps cold air off the calves and provides good ventilation (Fig. 7).

For summer ventilation, windows providing cross ventilation are satisfactory. When this is not possible, a fan capacity of 2 cfm per one pound of animal or an air change every two minutes is recommended.

Since vented air removes heat, the small amount of heat the calf gives off has to be supplemented. The amount of supplemental heat depends upon the number of animals and amount of wall and window space.

Heat is usually measured in BTU'S (British Thermal Units). To determine the amount of supplemental heat necessary:

Weight of calf (pounds) x 4
Wall area (square feet) x 5
Glass (square feet) x 10
Total (add)
	BTU Required

Figure 6 — An exhaust fan mounted in the side wall and controlled by a thermostat removes moist, warm air. Thermostat should not be located over a calf stall or near a heater.



This amount of heat can be supplied by either gas, oil or electric heaters (Fig. 8). A non-directional heater equipped with a fan for circulation is recommended. Since a radiant heater is directional, all objects or animals in its rays get very warm before animals outside the rays are warmed. If a directional heater is used, be careful not to aim it at a calf stall. When electric heaters are used, the kilowatt rating is equal to total BTU's divided by 3000.

Each heater should be controlled by a thermostat set to shut off before the ventilation fan starts.

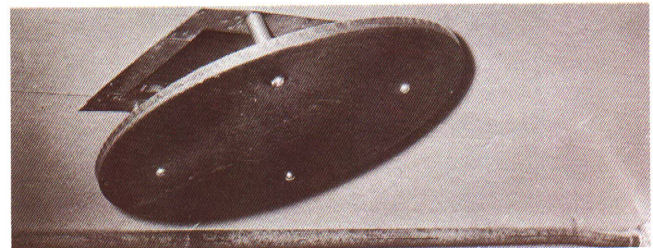
SERVICE AREA

A utility area (Fig. 9) is one of the important features of a good calf barn. It should provide:

1. Hot and cold water under pressure.
2. Good drain facilities for urine and washing wastes.
3. Wash vats for washing and sterilizing calf pails.
4. Storage racks for clean utensils.
5. Cabinets for storing veterinary and other supplies.

Insulation is necessary to prevent condensation on cold walls and conserve heat so that the ventilating fan can operate but not cool the barn too quickly. Without insulation, an excessive amount of heat will be used. Install 6" of insulation in the ceiling and 3" in all sidewalls. Cover the inside of the insulation with polyethylene and plywood or other materials. Any air space in the wall should be left between the insulation and the exterior sheathing.

Figure 7 — A continuous slot inlet along the edge of the ceiling allows fresh air to enter (above). A hinged door helps direct the cold air along the ceiling and become warmed before dropping on the small calves. A fresh air inlet in the ceiling over an alley (below).



YOUNGSTOCK AREA

When the calves are 6 to 8 weeks old, they can be transferred into group pens. These pens need not be heated but should be kept dry and protected from cold wind.

This area should be planned to minimize hand labor. Pen partitions should be hinged so that a tractor and loader can be used to remove all manure. When silage is fed to these young animals, an access to the silage bunk can be provided for mechanical feeding of the young animals and dry cows. A concrete alley along at least one side of the pen permits the use of a cart for baled hay, grain and bedding.

Free stalls for young stock are proving quite satisfactory, significantly reducing the amount of bedding required. Proper planning and access to mechanical feeding can keep labor down. Animals should be grouped according to size to fit the free stalls. Recommended free stall sizes for large, medium and small animals:

Large (1,200 lbs.)	4' x 7'3" to 7'6"
Medium (900 lbs.)	3'4" x 6'
Small (600 lbs.)	3' x 5'6"

Figure 8 — Electric heater equipped with a circulating fan and thermostat (left) is recommended. Electric heater (right) is a radiant heater. Be careful not to point this type of heater at a calf stall. Direct it onto the alley.

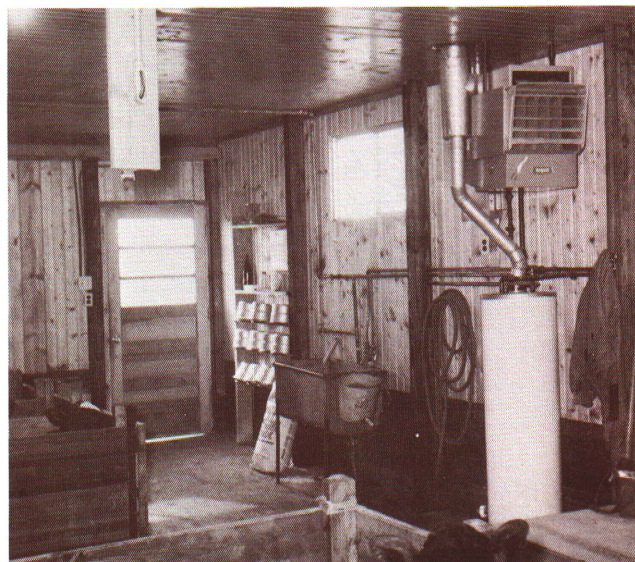
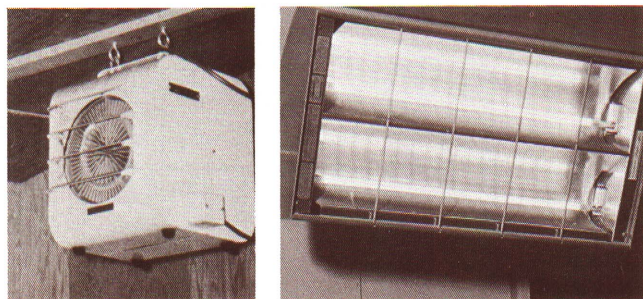


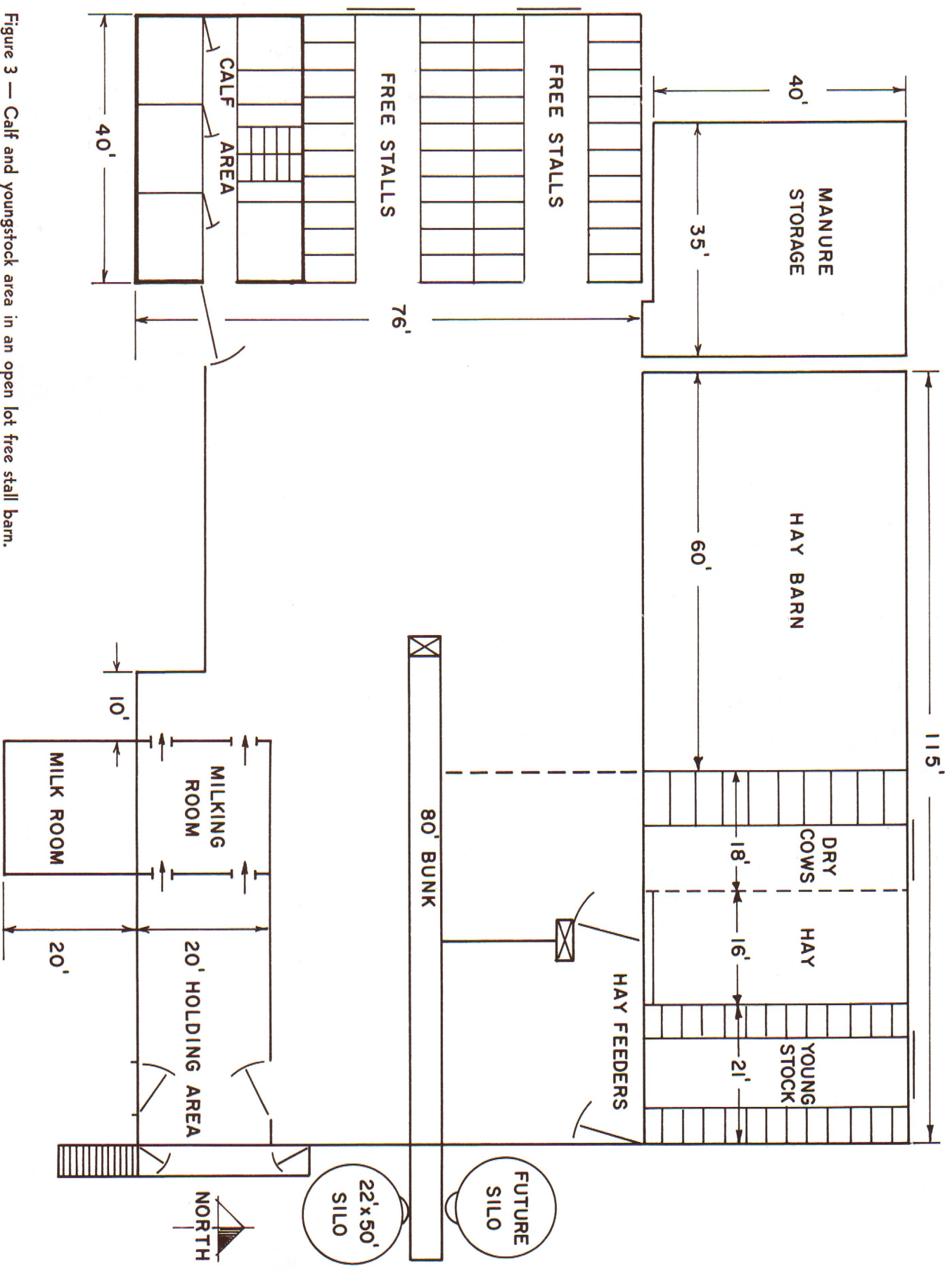
Figure 9 — Utility area should be equipped with water heater, hot and cold running water over wash vat, storage for clean pails, supplies and space heater.

MATERNITY PENS

One maternity pen for each 8 to 10 milking cows is recommended for average herds. These pens should be well protected from cold winds, rain and snow. A cow about to freshen should be isolated in a stall with clean bedding. Since more than one cow may calve on the coldest days of the year, it is convenient to have two or three maternity pens in the warm calf barn. These pens can alternate as grouping pens for calves between individual stalls and colder, outside conditions. A maternity pen should contain about 100 to 110 square feet, with neither dimension less than 9 feet. Narrow stalls can cause large cows to have more trouble calving.

The calf and youngstock building, shown in Fig. 10, can mean the difference between raising good herd replacements and buying heifers for replacement.

Figure 3 — Calf and youngstock area in an open lot free stall barn.



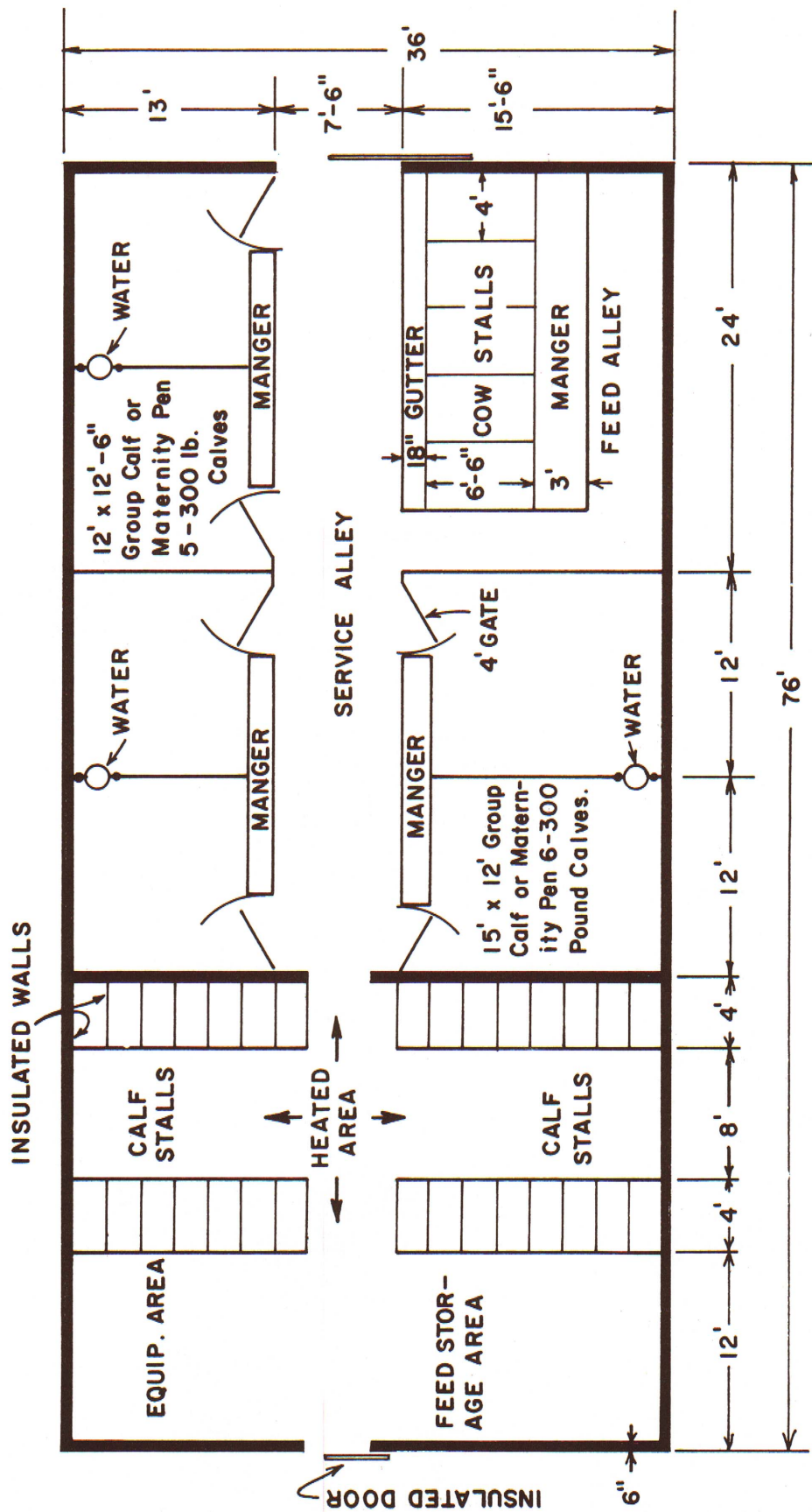


Figure 10 — M.S.U. plan No. 732-CI-19 for a calf and youngstock building.

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