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HEAT *For Dairy Calf Housing*

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A CRITICAL PROBLEM FOR MANY DAIRYMEN is how to reduce losses in young animals. Many farmers use a cold open system with excellent results. In this system, individual pens must be constructed so that drafts cannot get to the calves. Therefore, three sides of the pens must be tight walls. Water has to be carried to each animal, since no attempt is made to keep the temperature above freezing. Labor requirements for these pens are high, both for feeding and cleaning.

Farmers who are having problems should use all possible methods to keep the animals alive, which may include veterinary practices, antibiotics, heated housing, nutritional changes, etc.

If heated housing is to be used, the amount of insulation, ventilation, and heat should be selected to obtain a balanced system.

INSULATION

A small calf cannot supply enough body heat to heat the air required to remove the moisture it produces. When heat is added, a reasonable amount of insulation should be installed in the walls and ceiling to reduce the heating cost.

Figures 1 and 2 show the recommended construction for a frame wall and a masonry wall.

In most situations, 6 inches of good commercial insulation in the ceiling is satisfactory. In a frame wall, 3 inches of commercial insulation is recommended. In a masonry wall, 2 inches of expanded polystyrene is most convenient to use. This can be put on a "core" wall, or it can be glued to the masonry wall with a plaster coat as the finished inside surface.

VENTILATION

An exhaust fan should be provided that will remove $\frac{1}{10}$ cfm (cubic feet of air per minute) for each one pound of animal to be housed in the building. Do not use too large a fan, as it will cause a quick drop in temperature each time it operates. Too much ventilation capacity may be as bad as too little capacity, since it will cause frequent fluctuations in room temperature.

When the fan exhausts air, the fresh dry air must come in through a planned system of inlets. A simple inlet such as the one shown in figure 3 works well. The inlet slot should be on the side of the building opposite the fan.

Another easy method of providing for the inlet of air is to install openings with sliding doors in the ceiling, as shown in figure 4. Air is drawn into the attic and enters the facility through the openings in the ceiling. It is important here to locate the openings in the ceiling over an alley so that the cold incoming air will not drop directly on the calves.

Be sure to buy a fan designed for farm building ventilation. These fans are more rugged than commercial fans, have the automatic louvers on the inside of the fan, and have totally enclosed motors.

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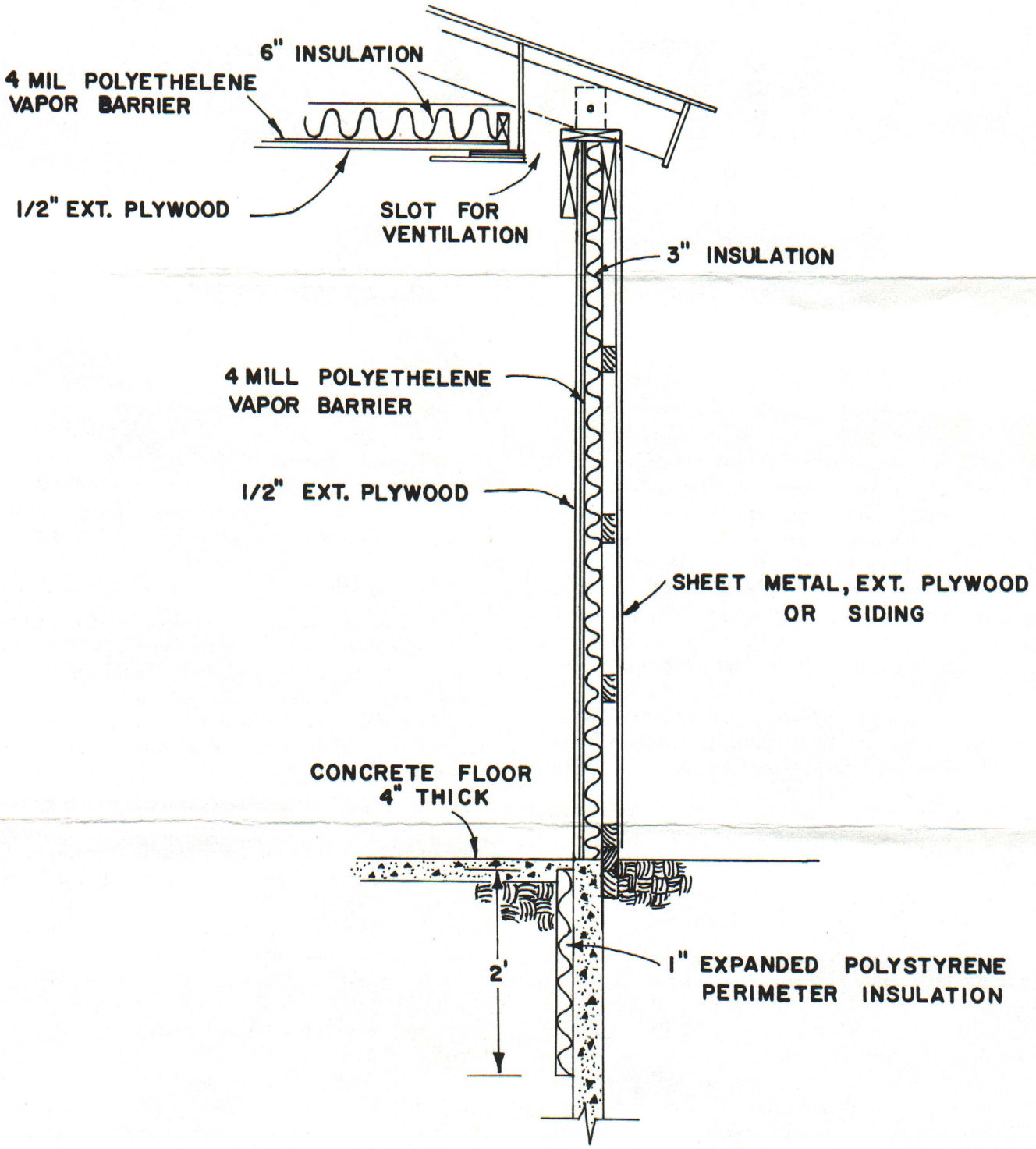

Fig. 1 CROSS SECTION OF FRAME WALL CONSTRUCTION

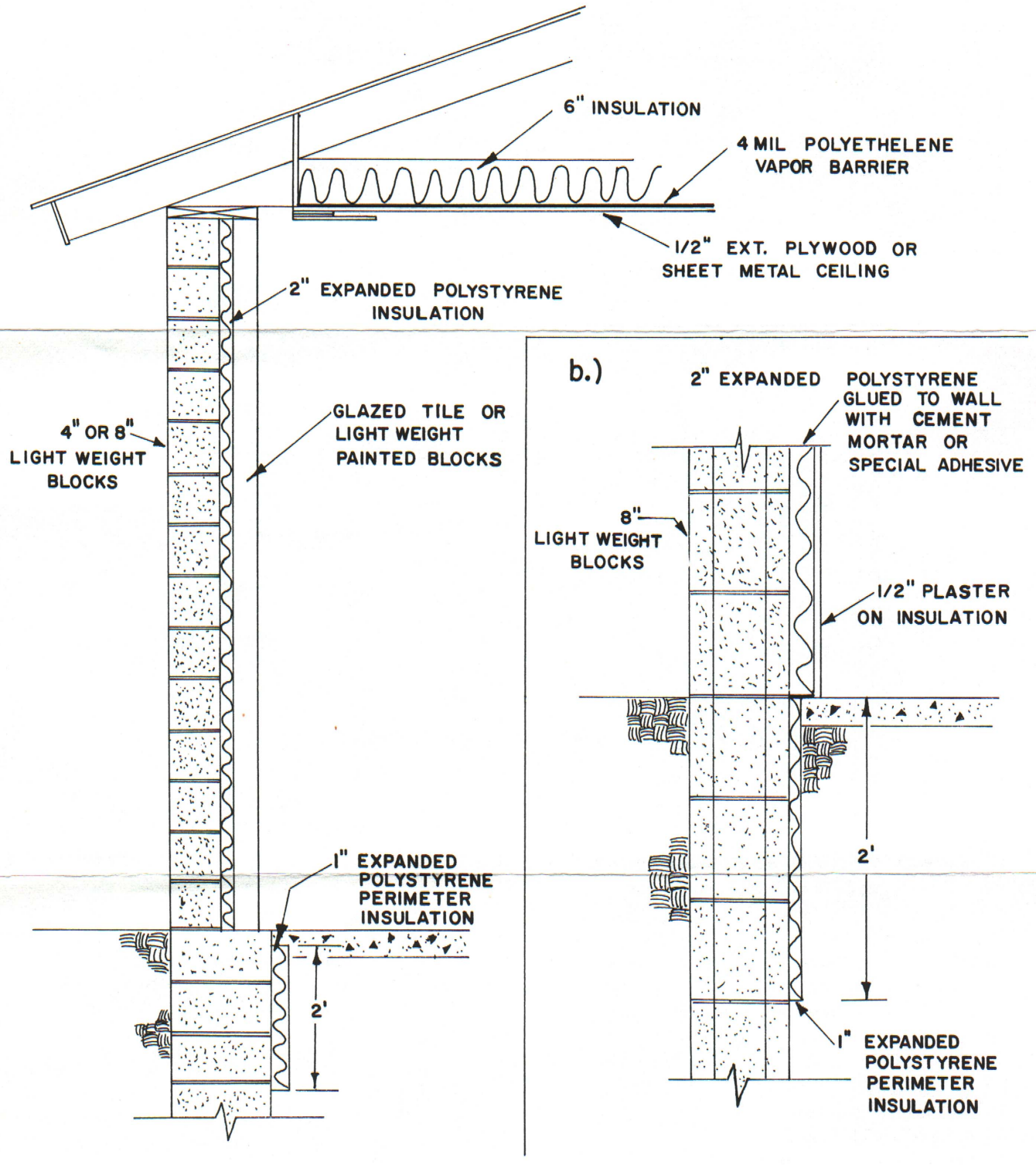

Fig. 2 CROSS-SECTION OF MASONRY WALL CONSTRUCTION
a.) Cavity wall with tile on inside
b.) Lightweight masonry block wall

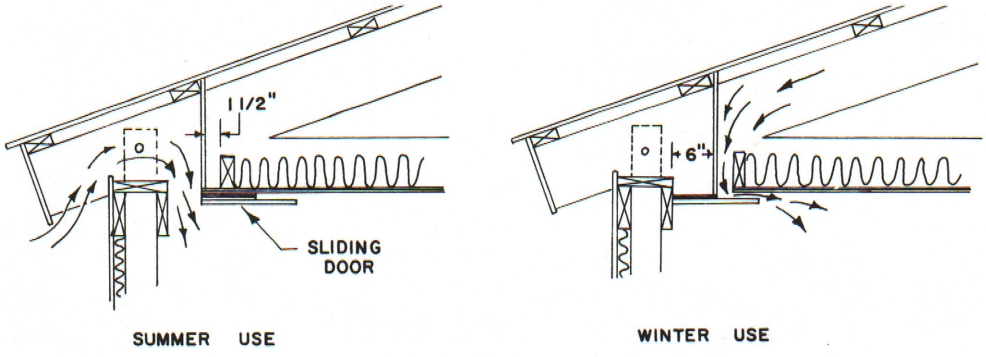

Fig. 3 A SLOT INLET FOR FRESH AIR

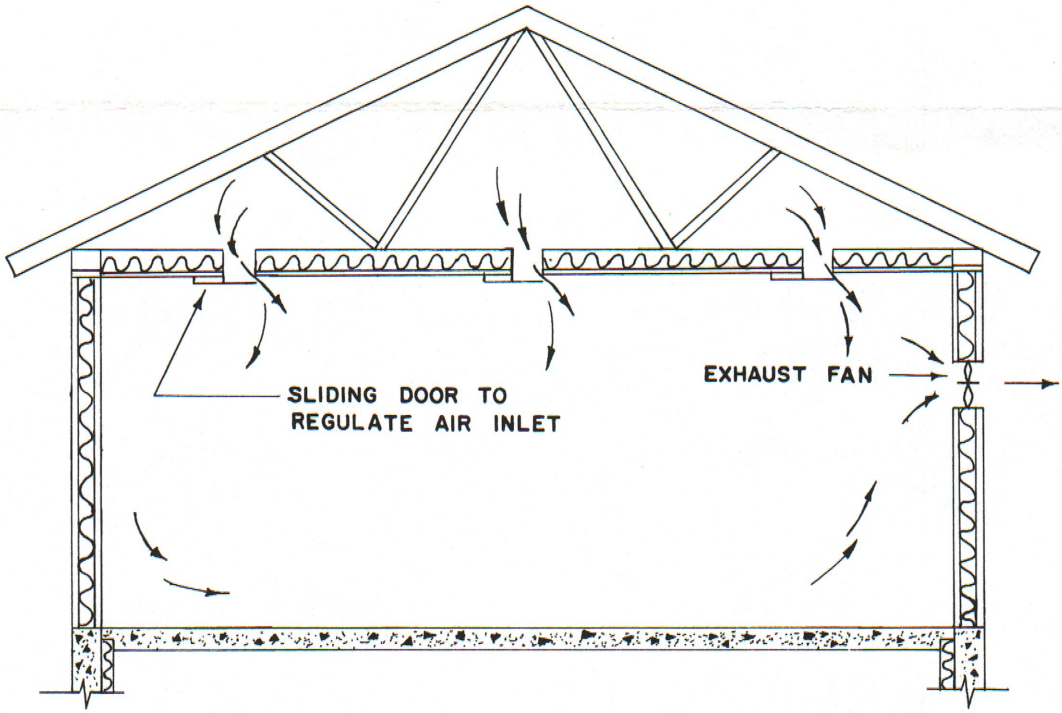

Fig. 4 FRESH AIR INLETS LOCATED IN THE CEILING

HEAT

The amount of additional heat necessary to keep the building at the desired temperature will depend upon the number of calves, the number of windows, and the wall area. Each factor requires a different amount of heat to insure a proper heat balance. The total capacity of the heater is estimated as follows:

10 x area of windows (sq. ft.) =
5 x area of wall (sq. ft.) =
4 x pounds of calf in bldg. = _____
Total Heater Capacity (BTU) =

When electric heat is to be used, the total capacity in BTU's, divided by 3, will give the wattage of the heater.

$$\text{Size of Electric Heater (Watts)} = \frac{\text{Total Heat (BTU)}}{3}$$

The source of heat should be controlled with a thermostat to make it automatic. In most situations humans should not be depended on to regulate fans. They are not usually available when adjustments are needed.

The temperature setting for the thermostat should be regulated so that the heater turns off before the fan turns on. The fan should stop when the temperature drops to 50 degrees, and the heater turns on when the temperature drops to 48 degrees F. The relation between the starting and stopping of the fan and heaters is important because, if both operate at the same time, they will work against each other. The two thermostats will have to be carefully set by trial and error. Once set they should not be changed.